



Memorandum

To: Nick Scribner, Wyoming Game and Fish Department
Mike Mazur, US Fish and Wildlife Service

CC: Jennifer Graves, Desert Fish Habitat Partnership
Therese Thompson, Western Native Trout Initiative

From: Leslie Steen, Trout Unlimited

Re: Final Report – Spread Creek Fish Passage Project Phase 2
Grant #003097 and F17AC1206

Date: December 27, 2022

Project Description:

In 2010, the Spread Creek dam, a crumbling, obsolete diversion dam for irrigation located just outside of Grand Teton National Park on Bridger-Teton National Forest lands, was removed by a partnership effort led by TU, opening up over 50 miles of Spread Creek to migratory Snake River cutthroat trout for the first time in over 50 years. Since the dam was removed and replaced with a fish passage-friendly diversion structure and new water delivery system, project partners have documented successful fish movement through the project area – but have also discovered that native fish are being entrained in the Spread Creek irrigation system. In addition, the Spread Creek channel within the project area has been highly unstable following dam removal, which has caused continued damage and issues with maintaining water delivery during high flow events (and associated sedimentation, bank instability, and scouring). Phase 2 of the Spread Creek Fish Passage project has been a large-scale collaborative effort to prevent future losses of cutthroat trout and other native fish by installing a fish screen on the Spread Creek irrigation system. It has also resulted in much-needed improvements to stabilize the diversion structure, banks, and channel within the project area. The project's completion represents the culmination of over 10 years of effort by TU, project partners, water users, and community members to implement a win-win-win solution for fish, land management agencies, and irrigators.

Project Goals and Objectives:

The goals of the Spread Creek Fish Passage Project Phase 2 were to ensure unimpeded fish migration between the Snake River and Spread Creek by installing a fish screen that prevents losses of native fish and by stabilizing, improving, and protecting the diversion and irrigation infrastructure.

The project objectives were to accomplish this by:

- 1) installing a fish screen in the Spread Creek irrigation system that returns entrained fish back to Spread Creek;
- 2) rehabilitating the diversion structure for long-term stability and optimal fish passage conditions;
- 3) adding instream structures to protect banks and irrigation infrastructure within the project area; and
- 4) engaging community members, volunteers, and partners in project activities.

Project Budget and Matching Contributions:

Project Expenditures

Cash Expenses	Total
Consulting Expense: Design and Engineering	\$105,631
Consulting Expense: Construction Oversight	\$47,727
Construction and Materials Expense: Fish Screen	\$388,511
Construction and Materials Expense: Diversion and Instream	\$342,335
Other: Film, Interpretive Signage and Outreach Expense	\$12,489
Other: TU Staff Expense, Grant Funded	\$6,437
Other: TU indirect	\$46,955
Cash Subtotal	\$950,085
In-Kind Expenses	
Materials Expense: In-Kind Rock Donation (GTNP)	\$306,000
TU and Partner Staff Expenses: In-Kind	\$340,203
In-Kind Subtotal	\$646,203
Total	\$1,596,288

Partner Contributions - \$1,142,624 Total Cash and In-Kind

Partner	Cash	In-Kind
Bridger-Teton National Forest		\$27,391
Community Foundation of Jackson Hole	\$25,000	
Desert Fish Habitat Partnership	\$50,000	
Grand Teton National Park (\$306,000 = donated rock value)		\$582,582
Jackson Hole One Fly	\$80,000	
Jackson Hole Trout Unlimited Chapter	\$36,282	\$8,140
National Fish and Wildlife Foundation	\$85,000	
National Forest Foundation	\$50,000	
Snake River Fund	\$50,000	
Teton Conservation District	\$100,000	
The Nature Conservancy – Wyoming	\$74,883	
Trout Unlimited		\$19,450
US Fish and Wildlife Service	\$111,500	
Vail Resorts EpicPromise	\$3,000	

Western Native Trout Initiative	\$50,000	
Wildlife Tourism for Tomorrow / The WYldlife Fund	\$20,000	
WorldCast Anglers	\$3,000	
Wyoming Department of Environmental Quality	\$31,420	
Wyoming Game and Fish Department	\$50,000	\$8,640
Wyoming Water Development Commission	\$35,000	
Wyoming Wildlife and Natural Resources Trust	\$95,000	
Total	\$950,085	\$646,203

- WGFD funding was spent on design and engineering and construction expenses for the diversion and instream structures.
- USFWS funding was spent on construction expenses for the fish screen and the diversion and instream structures.
- DFHP and WNTI funding was spent on the construction of the fish screen.
- An additional \$11,500 from funds originally allocated to the River Bend Ranch Fish Passage and Stabilization project in a separate WGFD-USFWS-TU agreement was spent on materials hauling.

Project Outcomes:

Project implementation was completed in 2021 and 2022 by Trout Unlimited and key technical partners including Grand Teton National Park, Bridger-Teton National Forest, and Wyoming Game and Fish Department, who provided in-kind staff support for project planning, permitting, design review, monitoring, fish rescues, grant administration, construction oversight, outreach and education, and operations and maintenance throughout the project. The project design and engineering for the diversion and instream structures was completed by Quadrant Consulting, Inc. of Boise, ID, and for the fish screen by One Fish Engineering of Fort Collins, CO. The excavation contract work was completed by Aqua Terra Restoration of Driggs, ID. The project was a large-scale collaboration that took many partners and volunteers to complete, including five years of coordination, planning and fundraising from 2016 to 2021.

The project goals and objectives were met. The project addressed the fish passage barrier posed by entrainment into the Spread Creek ditches through the installation of the Corrugated Water Screen type fish screen, which now ensures that native fish can migrate the 5 miles from the Spread Creek irrigation diversion down to the Snake River confluence. It stabilized the irrigation diversion, banks, and channel located on 1,250 feet of stream in the project area (on Bridger-Teton National Forest land), thereby improving passage conditions for native fish, increasing instream habitat, and improving water quality. These improvements will also serve to maintain and protect existing infrastructure and minimize future land loss, including the protection of an established Forest Service campsite. 950 willow stakes were planted in the bank stabilization structures. Volunteers assisted with several aspects of the project, including with the fish rescues, willow stake harvesting, project film, and youth education. A project film was produced that will be used for additional outreach and engagement.

Objective 1 was accomplished in July 2022. A corrugated water screen or CWS fish screen was installed behind the Spread Creek irrigation system's headgate to screen fish out of both of the Spread

Creek irrigation system's ditches. The sediment basin in front of the fish screen was expanded per the project plans. Now complete, it has reconnected the downstream 5 miles between the fish screen and the Snake River confluence.

Objective 2 was accomplished in October and November 2021. Nearly 3,000 cubic yards of boulders were hauled to the project site and used to construct a new rock ramp diversion to create a more stable long-term solution to the previously-installed rock weirs, for the benefit of both irrigation water delivery and fish passage through the diversion structure.

Objective 3 was accomplished in October and November 2021. A robust set of treatments including the placement of rock barbs and weirs for channel stabilization and thalweg redirection, installation of toe rock structures and engineered log jam structures for bank stabilization, and a sluiceway for better sediment management and water delivery, were installed. Together, they have protected fish habitat, irrigation infrastructure, and water quality, as well as prevented future land loss along 1,500 feet of stream located on Bridger-Teton National Forest lands.

Objective 4 was accomplished in fall 2021 and 2022. Several project partners volunteered to participate in the filming project in August 2021. A fish rescue was held in late September in which partners and volunteers captured fish stranded in the Spread Creek irrigation ditches through electrofishing and returned them to Spread Creek. A volunteer day was held in early October that engaged volunteers through participation in willow pole cutting to assist with the project's bank stabilization component. A final fish rescue was held in September 2022 to document fish entrainment levels following the installation of the fish screen. Two field days to educate 240 7th grade students from TU's Jackson Adopt-a-Trout Program were held out at the project site.

Improved connectivity throughout the Spread Creek system is an additional conservation outcome of the project. Over 50 miles of fish habitat – the estimated mileage of Spread Creek and its major tributaries upstream of the Spread Creek diversion site – will benefit from the elimination of entrainment and better habitat utilization. In addition, the Spread Creek project is located on National Forest System lands, and the irrigation infrastructure provides water to public land as well (Grand Teton National Park). It showcases an example of two land management agencies working together to implement best practices for irrigation and natural resources management, and provides a highly visible, publicly accessible demonstration of a fish screen to other water users in the region (in which fish screens are still relatively uncommon) interested in addressing entrainment.

Milestones:

- Stakeholder discussions were first initiated in 2016. Project goals and objectives were defined and alternatives analyses, accompanying reports, and 60% designs were developed from 2017 to 2018. 60% designs and construction budget estimates were completed in 2019. Final 100% design plans were completed in 2020.
- A monitoring plan with the BTNF, GTNP, and WGFD was developed and pre-project monitoring completed in 2020. Post-project monitoring is in progress. The final fish rescue held in September 2022 documented a significantly lower number of cutthroat trout entrained, and primarily young of year native suckers, dace, and sculpin – presumably fish that entered the irrigation ditches prior to the fish screen being installed in mid-July 2022.
- Materials procurement began in summer 2020 and was completed in fall 2021. The majority of

the rock for the project was donated by Grand Teton National Park from their RKO rock pit, at a value of more than \$300,000. The remainder of the rock was hauled to the project site from the Gros Ventre levee and Pinedale area. The trees for the project were donated by the Bridger-Teton National Forest from near the project area.

- Construction mobilization and implementation began in late October 2021. The diversion, bank, and channel instream work was completed in November 2022. The fish screen construction was postponed due to concrete pricing and contractor availability as well as the onset of cold weather. It was completed from March 2022 to July 2022.
- A film about the Spread Creek project and partnerships was produced. It was distributed [via TU.org](#), TU's social media channels, and by project partners in August 2022, and engaged the local community as well as national audiences with the project. View online at: https://www.youtube.com/watch?v=CVlpIgl0q_g
- A press release was distributed to regional newspapers and [posted online at TU.org](#), and was covered as follows:
 - An article on [Buckrail.com](#), an online news source based in Jackson, WY. 11/12/21.
 - An radio story on [BYU-Idaho Radio](#). 11/15/21.
 - An story on [Jackson Hole Radio](#). 11/16/21.
 - An article in the [Jackson Hole News and Guide](#). 11/24/21.
 - A story on [Wyoming Public Media](#). 12/14/21.
- Several project tours were held in fall 2022 for TU supporters and partners.
- To further highlight the project's benefits and engage the public, interpretive signage about the project and its partnerships, as well as the importance of the native cutthroat trout fishery in Spread Creek, are being designed. They will be installed across from the irrigation infrastructure at a Bridger-Teton National Forest campsite that overlooks Spread Creek.
- An operations and maintenance plan was developed for the project and transferred to Grand Teton National Park, who will oversee operations and maintenance of the project into the future.

Project Photos:



Photo 1. Bank stabilization structures using a combination of wood, rock, resloping, and erosion fabric were installed in November 2021.



Photo 2. Large boulders were imported to create a rock ramp diversion structure in November 2021, a design expected to be much more robust than the previous diversion structure.



Photo 3. Volunteers from Jackson Hole Trout Unlimited helped to harvest willows in October 2021.



Photo 4. Volunteers and partners help with the final fish rescue on Spread Creek in September 2021.



Photo 5. Native Snake River cutthroat trout being released back into Spread Creek during the 2021 final fish rescue.



Photo 6: Spread Creek screenshot from TU-produced film released in August 2022.



Photo 7. Spread Creek fish screen.



Photo Set 8. Before and after. Rock weir diversion falling part (above), new rock ramp diversion (below).



Photo Set 9. Before and after. Eroding bank (above), engineered log jam (below).



Photo Set 10. Before and after. Steep eroding bank (above), regraded bank with toe rock, logs with rootwads, and willows (below).



Photo Set II. Previous headgate and sediment basin (above), expanded sediment basin and new fish screen at far end (below).