Rainey Creek Restoration, Bridge-to-Bridge: Phase 2

Henry's Fork Foundation-South Fork Initiative

Project Completion Report-Final Report

Grant Program: Western Native Trout Initiative

January 18, 2024

Project summary:

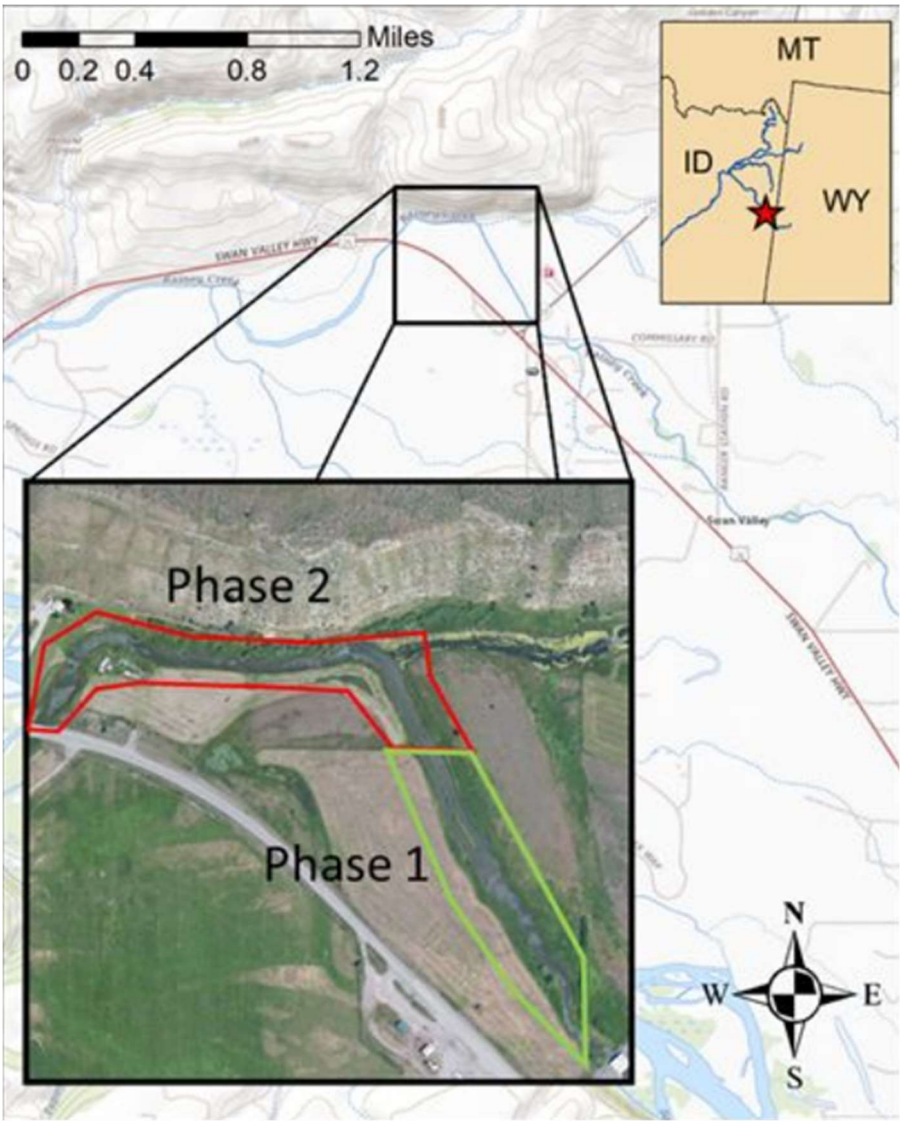
Historic land-use practices have over-widen, impounded, and degraded much of the lower five miles of Rainey Creek, and Rainey Creek is the least productive Yellowstone Cutthroat Trout (YCT) tributary of the four major South Fork Snake tributaries. Over the last two years, the Henry's Fork Foundation (HFF) - South Fork Initiative program has collaborated with state and federal agencies and local landowners to work towards the goal of restoring the lower five miles of Rainey Creek. In general, restoration goals are focused on restoring the heavily degraded riparian and instream habitat and improving habitat complexity to promote native Yellowstone Cutthroat Trout spawning and rearing, as well as improve habitat for other native, cold-water aquatic species.

The Bridge-to-Bridge: Phase 2 project aimed to restore natural stream function in the reach by restructuring 1,638 feet of stream channel that would increase water velocity, habitat complexity, stream cover, and reduce fine sediments in the channel. The Phase 2 project connected the upper Phase 1 project for a combined total of 2,753 feet of restored channel. During construction, wide and shallow channels were narrowed, fine sediment was removed from the streambed, gravels and cobbles were introduced into the system, and the restructured reach incorporated deep pools, spawning-pool tail outs, riffles, and glides. Additionally, large woody debris and riparian vegetation were placed and planted throughout reach to provide cover and decrease solar loading, effectively decreasing water temperatures within, and below, the reach. SFI and volunteer crews will revegetate the restored reach with native plants in the Fall of 2023.

Location description:

The project is located ~2.3 miles upstream from the confluence of Rainey Creek and the South Fork Snake River near Swan Valley, Idaho.

GPS coordinates; 43.455045°, -111.341777°



Map: Rainey Creek, Bridge-to-Bridge restoration reach

Length restored: 1,636 feet of stream channel

Work Period: 03/15/23-5/1/23

Project Cost:

The overall cost of this project was approximately $167,000 which included financial support and volunteer efforts from a wide range of organizations, agencies, and individuals.

Below is a list of partners, collaborators, and supporters that helped make this project possible: Jackson Hole One Fly, Patagonia, Rivernetwork.org, Trout and Salmon Foundation, National Fish and Wildlife

Foundation, Western Native Trout Initiative, Idaho Department of Fish and Game, US Fish and Wildlife Service, Idaho National Laboratory (Dept. of Energy), US Forest Service, Wild Waters Restoration, Brad Elg (landowner), Trout Unlimited, Snake River Cutthroats, Madison High School, Swan Valley Elementary, HFF-SFI supporters and numerous volunteers who helped with on the ground efforts!

Volunteer opportunities: >40 volunteers are anticipated to assist with the native tree planting in the Fall

Education and outreach: We worked closely this year with the Madison High School and Future Farmers of America (FFA) and the Swan Valley Elementary School to participate in propagating over 600 native cottonwoods, red osier dogwoods, and willows for the Phase 2 project and the Third Creek restoration projects. We also worked with the Westminster College in Utah to conduct pre-surveys of the phase 2 project and anticipate the University to conduct post-surveys in August, 2023. This opportunity has provided students with hands on experience that plan to further their education and work experience in the natural resource fields.

Media/presentation highlights: In 2021-2023, HFF-SFI did 10 social media posts and had several short blogs regarding the project and Rainey Creek restoration. The project was also highlighted in our HFF newsletters and will be highlighted in future articles and additional social media posts.

Ongoing monitoring and efforts:

The success of this project will ultimately be evaluated by increases in annual spawning run counts of Yellowstone Cutthroat Trout at the Rainey Creek weir, visual monitoring of adult Yellowstone Cutthroat Trout using the restored habitat during spawning, and index counts of juvenile Yellowstone Cutthroat Trout occupying the reach in August obtained through single-pass electrofishing surveys. The ecological benefits of this project may not be realized until 2-4 years after the completion of the restoration but IDFG intends to operate the fish weir on Rainey Creek for the foreseeable future and monitoring of adult and juvenile Yellowstone Cutthroat Trout will occur for a minimum of four years after the restoration by HFF and/or IDFG employees. During the restoration implementation, HFF-SFI worked with IDFG to install a new electronic array station that will evaluate Passive Integrated Responder (PIT) tags in Rainey Creek. This PIT tag station will also further the monitoring efforts in the Rainey Creek Watershed.

HFF-SFI and Trout Unlimited along with local school's planted native cottonwoods and other native species in October 2023. The restoration project was completed in early May, and then natural snowmelt occurred raising the levels of Rainey Creek and preventing the Spring planting. We planted approximately 400 different native plants within the 1,600 feet of streambank.

Photos and Supplementary material:

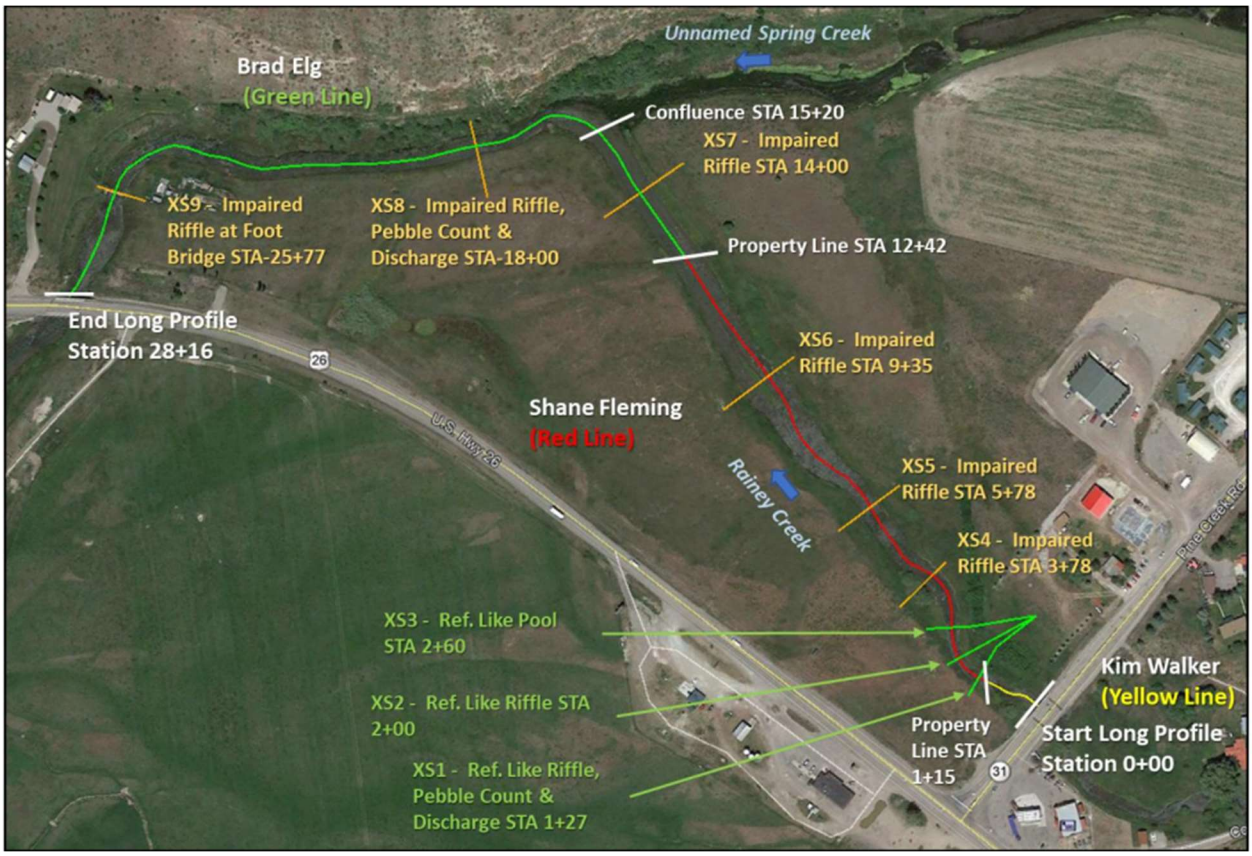


Figure 1. Aerial image (6-21-17) showing the location of the stream survey elements. (Wild Waters Restoration)

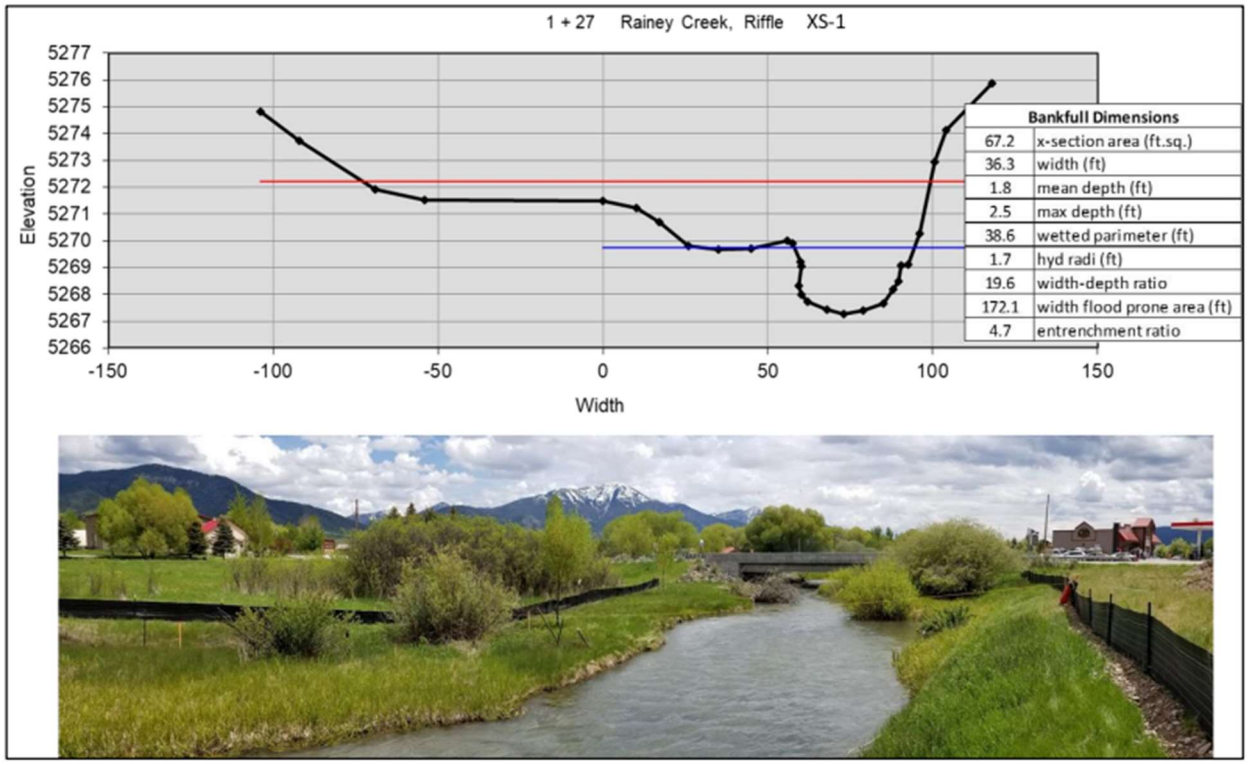


Figure 2. Example of a riffle cross section that was utilized to develop the restoration design.

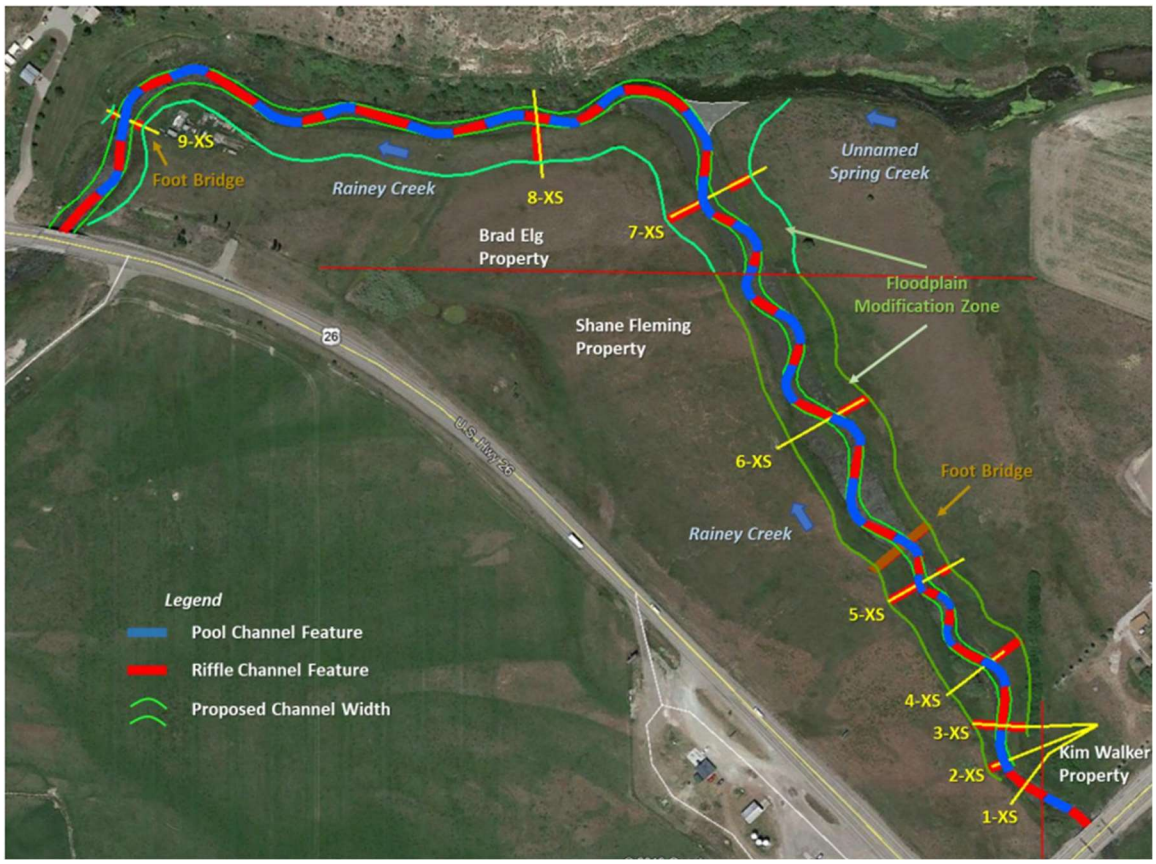


Figure 3. Planview of the proposed Rainey Creek restoration across all properties to achieve a holistic restoration from Bridge to Bridge (Wild Waters Restoration)

Phase 2-During Construction

Photo 1. Phase 2, during project implementation. Newly constructed large wood debris log structure.

Photo 2. Phase 2, during implementation. Rockin T construction installing large wood and modifying channel.

Pre and Post Restoration Photos

Photo 3. Pre-Restoration. Top of Phase 2 facing upstream into recently completed Phase 1.

Photo 4. Post Restoration. Looking upstream at top end of project into Phase 1

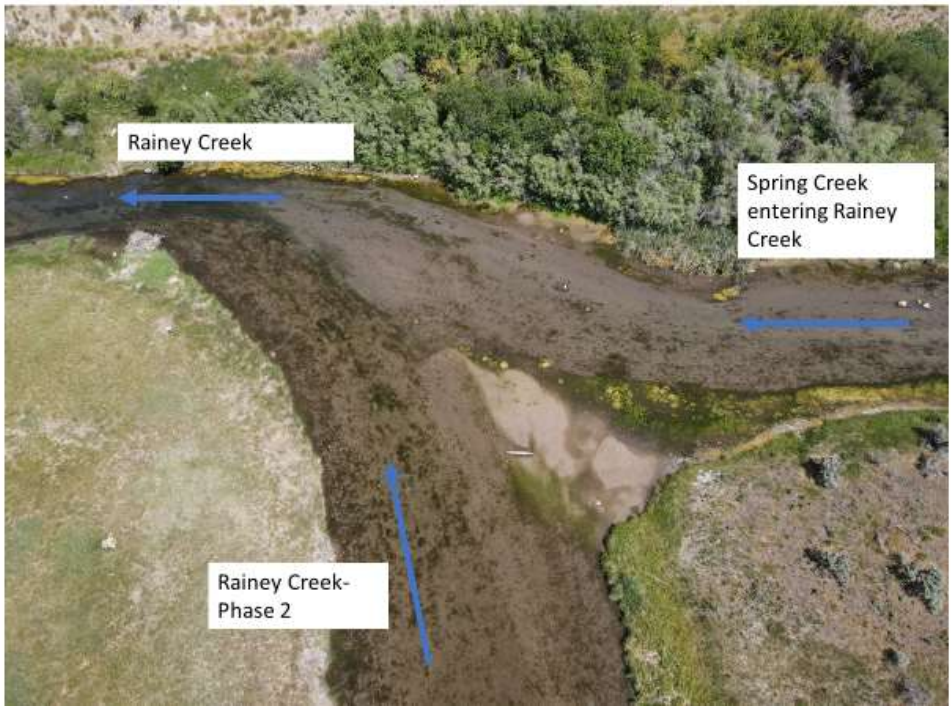


Photo 5. Pre-Restoration Phase 2, facing downstream directly below Spring Creek. Notice heavy sediment and wide channel

Photo 6. Post Restoration. Facing downstream directly below Spring Creek. Notice the narrowing of channel.

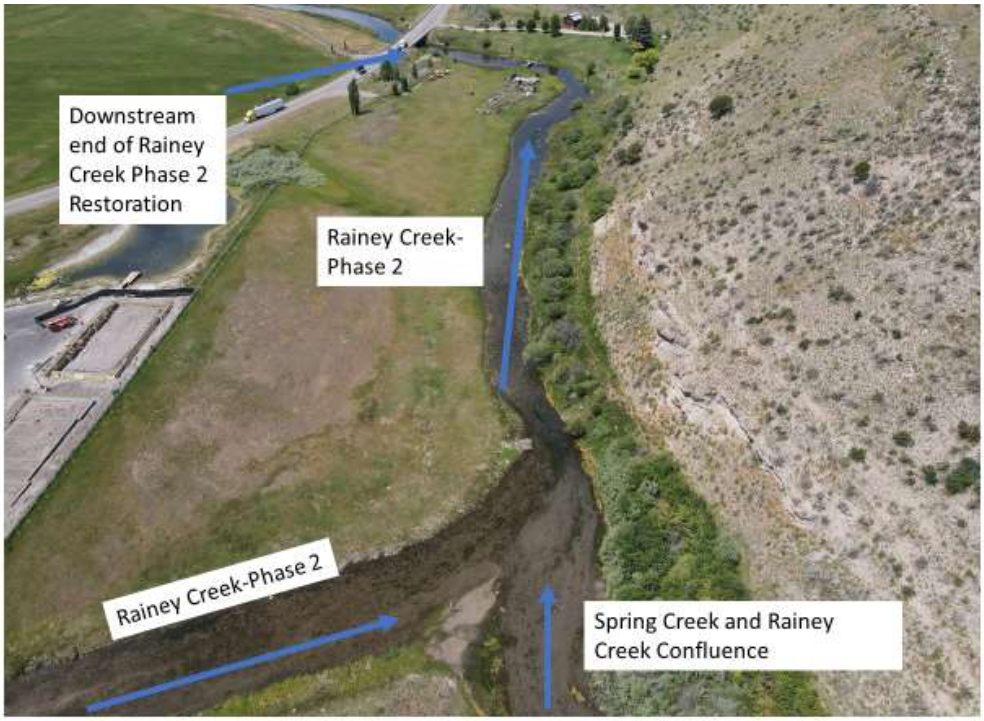


Photo 7. Pre-Restoration-Phase 2, facing downstream, notice wide straight channel with little habit complexity.

Photo 8. Post Restoration-Phase 2. Facing downstream, Notice narrower channel with improved sinuosity and habitat (large wood added).

Photo 9. Group photo of Madison High School, Future Farmers of America. Students planted over 400 mixed riparian trees/shrubs along the recently restored Rainey Creek.

Photo 10. Students and Trout Unlimited volunteers planting mixed riparian trees along Rainey Creek.

Post Follow Up Work

- SFI will continue to monitor plant survival for 1-3 years and plant additional plants as needed.

- SFI is also working with Westminster University, Utah on hydrologic assessments as a classroom exercise. This will be the second year that Westminster has performed these surveys. In 2022, crews conducted the pre-restoration survey, and in 2023, crews will perform the post-restoration survey.

- SFI will continue to take drone footage of the project to show long-term trends.

- SFI will continue to work with IDFG on electrofishing surveys and spawning surveys.