Project Title:

Canyon Creek Watershed Management Project: Collaborative Research, Analysis, and Design to Meet Water Supply and Natural Resource Needs

Applicant Information:
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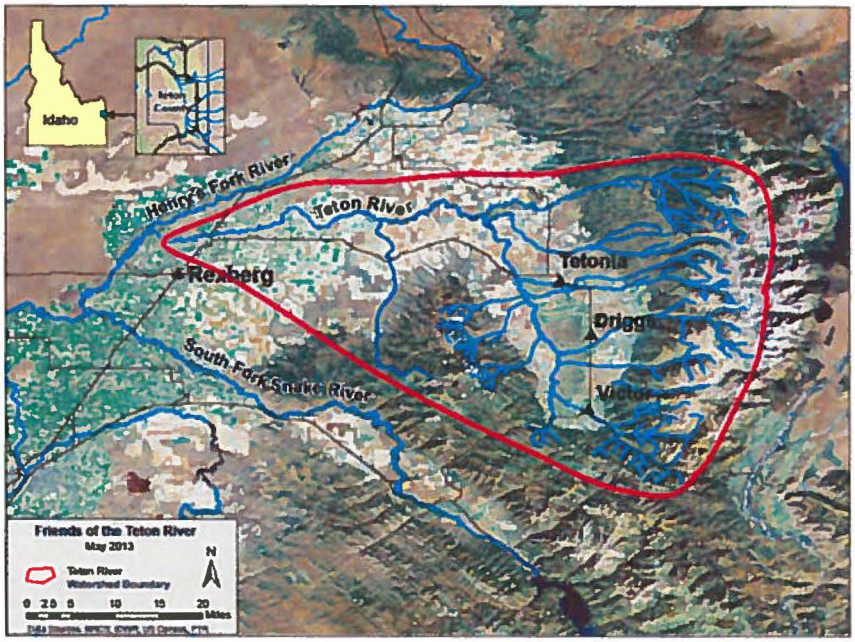
Executive Summary:

Date: 11/8/2019
Applicant: Friends of the Teton River
City and State: Driggs, Idaho
County: Teton County

Friends of the Teton River (FTR) is a grassroots, membership-based, non-profit organization legally incorporated as a 501(c)(3) in December 2000 that works in Teton County, Idaho to promote clean water, healthy streams, and thriving fisheries in the Teton Watershed. Through this grant, FTR proposes to work with the stakeholders in the Canyon Creek sub-watershed to research, prioritize, and plan for irrigation infrastructure improvements and water management projects that will maximize a limited water supply and improve water reliability to meet irrigator needs, while improving instream flows and habitat connectivity for fish and wildlife. With Reclamation funding, FTR will have the capacity to conduct a watershed analysis (hydrologic and biological conditions); conduct preliminary design and cost estimates; research environmental compliance requirements; and meet with stakeholders to develop a plan (including timelines, milestones, and a funding plan) for future implementation of prioritized projects that will meet defined water supply and natural resource objectives. Funds will support a project manager who will coordinate stakeholder engagement and communication; oversee the coordination of contracted and FTR staff activities including data collection, research; planning, and design; and develop an action plan for implementation. FTR staff and contractors will work collaboratively with the Canyon Creek irrigators to develop local solutions addressing their water management needs in a plan that identifies, prioritizes, and provides cost estimates for a specific projects that will modernize irrigation infrastructure and modify the current water management strategies being used on Canyon Creek to meet water supply and natural resource objectives for the long-term. By bringing together representatives from all interest groups within this sub-watershed, it is anticipated that unique projects and strategies will be developed which satisfy the needs and demands of multiple stakeholders, thereby decreasing the potential for water conflicts and forwarding the most practicable solutions for implementation. Grant activities will be completed within two years of grant award, with work being conducted from July 1, 2020 through June 30, 2022. The proposed project is not located on a federal facility.

Background Data:

The Teton Watershed drains an area of 806 square miles in Idaho and 327 square miles in Wyoming. The river originates from snowmelt dominated headwater streams in the Teton, Big Hole, and Snake River mountain ranges and flows more than 64 miles to the point at which it discharges to the Henry's Fork of the Snake River. Twenty river miles southwest of this point, the Henry's Fork joins the South Fork to form the main stem of the Snake River. FTR works in the Teton Watershed, outlined on the map, which extends from the headwaters down to the confluence with the Henry's Fork River, with a primary focus on the Teton River upstream of the old Teton Dam site (managed by Reclamation).



The Teton Watershed encompasses approximately 664 square miles of the Greater Yellowstone Ecosystem (GYE), with Grand Teton National Park to the east, and Yellowstone National Park to the north. Approximately 25% of the Teton Watershed is federally or state-owned, and most of this land is managed by the Caribou-Targhee National Forest. Land on western flank of the Teton Mountain Range (the eastern portion of the sub-basin located in Wyoming) is primarily in the Jedediah Smith Wilderness Area, which borders Teton National Park. Management of forest lands in the Big Hole Mountains (to the west) is directed toward opportunities for motorized and non-motorized recreation, management of big game habitat, and improvement of ecosystem, forest and stream health. The Big Hole Mountains have been logged extensively and livestock grazing is a common land use.

The proposed project is located within the Canyon Creek drainage, a wild and remote stream which spans more than 45 miles from its headwaters on the northern flank of the Big Hole Mountains to its confluence with the Teton, is a spawning stream for large, river-run (or fluvial) Yellowstone Cutthroat Trout. Historically, each spring, large numbers of native cutthroat made their way to the headwaters of Canyon Creek to spawn. However, as the land was settled and used for agriculture and recreation, numerous factors combined to drastically impact spawning runs. While a few fluvial fish are still able to make it up Canyon Creek to reproduce, their numbers have been severely reduced. Road building, beaver dam removal, and grazing produced sediment that clogged spawning gravels. Irrigation diversion dams and dewatered stream reaches and blocked upstream movement of spawning adults and downstream migration of fry. The uppermost reaches of Canyon Creek are within the Caribou-Targhee National Forest Boundary and are used for cattle grazing and hunting and fishing access. The proposed project will focus on the lower 10 miles of Canyon Creek (down to the confluence with the Teton River Canyon).

This reach is adjacent to private land and is used to irrigate lands within an irrigation service area spanning almost 30,000 acres that produces primarily potatoes, barley, and hay crops. There are also a few private residences, a private hunting and fishing lodge, and a privately-owned hot springs complex and campground located along Canyon Creek.

Water has long played a central role in the cultural and economic prosperity of the Teton Watershed. The first permanent settlers of Teton Valley, members of the Church of Jesus Christ of Latter Day Saints, arrived in the early 1880's from Utah and other parts of Idaho and established dairy, potato, and grain farms. Since that time, agriculture has remained one of the central drivers of the regional economy. More recently, the region has attracted new residents, both full and part-time, that place a high value on recreational access and intact ecosystems which support high quality fish and wildlife habitat. Teton County, Idaho grew by 39% between 2000 and 2007, making it the fourth-fastest growing county in the nation during that time. While the break-neck pace of development has slowed since the 2008 economic recession, population growth and associated water use and land development remain steady.

Agricultural uses and human (development) pressures have most greatly impacted water quality and quantity, and the native Yellowstone Cutthroat Trout (YCT) fishery in the Teton Watershed. Cumulative impacts on water quality from agricultural production and over-grazing have resulted in elevated nitrogen levels in both ground and surface water. The switch from flood irrigation practices to sprinkler irrigation in the 1970's created a situation that dewaters Teton River tributaries, contributing to the depletion of the aquifer (up to 50 feet in some locations), and has disconnected critical fish and wildlife habitats. Over the past twenty years, accelerated development pressures have resulted in increased stream alterations, destruction of riparian habitat, and additional impacts to water quality (e.g. increase in the number of individual septic systems) and supply (individual wells, lawns, and growing municipalities).

In spite of these challenges, the Teton Watershed is one of the few remaining watersheds where Yellowstone Cutthroat Trout persist in the entire GYE and it is the predominant wild fishery left in the range. Historically, YCT occupied much of the region stretching across southern Idaho, Montana, and northwest Wyoming. Currently, non-hybridized YCT are found in 23% of their historic range. The protection, conservation, and restoration of YCT and their spawning habitats are a priority for numerous agencies (and associated management plans) including the Idaho Department of Fish and Game, US Forest Service, US Fish and Wildlife Service, and the National Fish Habitat Partnership, to name a few. Primary threats to the persistence of YCT include (1) non-native species competition (2) habitat degradation—primarily surface water diversions for agricultural production and grazing, road building and development and (3) climate change impacts including a reduced and unpredictable water supply (Gresswell 2009).

Relevant climate science indicates that as a result of climate change, the GYE can expect hotter, drier summers with warmer, wetter winters, leading to a higher potential for winter flooding, reduced snowpack, earlier runoff, summer drought, and increased wildfires. It is noted that high-elevation headwaters in the Upper Snake and Teton Basin, including Canyon Creek, will provide important habitat refugia and offer opportunities to harness ecosystem benefits that will increase resilience to changing climatic conditions. Yet in the Teton Watershed, the majority of core high-elevation habitats are disconnected from the main stem Teton River at least part of the year due to dewatering of tributary streams for agricultural use. This is the case on Canyon Creek, where

the Canyon Creek Canal and agricultural pumping dewater the creek, disconnecting it from the Teton River Canyon.

Despite habitat fragmentation, Canyon Creek is one of the few remaining YCT strongholds with a remnant fluvial spawning run in the entire Teton Watershed (Schrader 2002; Mabey 2009). It contains intact high-elevation habitat on the National Forest, historic spawning productivity, and an unhybridized native trout population. While productivity and YCT lifecycle completion are limited by irrigation practices that cause seasonal dewatering and entrapment hazards, fisheries data shows that fluvial migrations of YCT from the Teton River Canyon still occur during the spring run-off when the lower 10 miles of the tributary is connected. The Teton River Canyon itself contains one of the largest remaining populations of Yellowstone Cutthroat anywhere in their range, which provides a significant source population of spawning YCT for Canyon Creek.

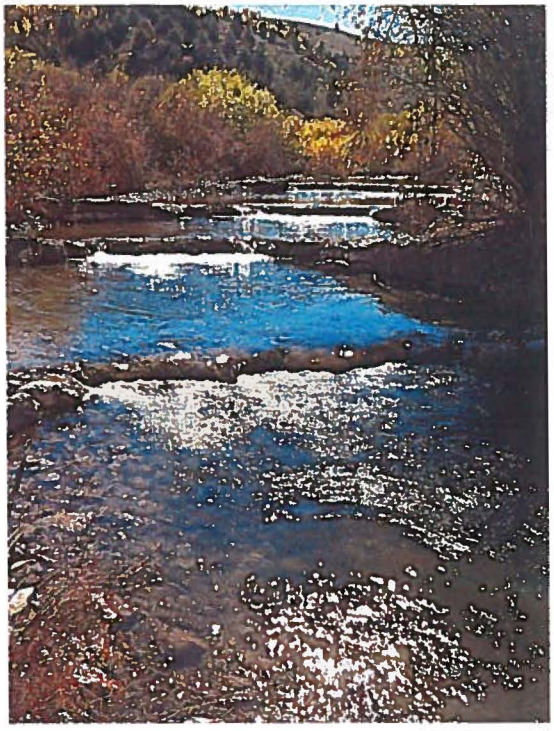
Beyond these environmental factors, Canyon Creek typifies the socio-economic dynamics at play in the larger Teton Watershed. As agriculture and the family farm face more and more hurdles to stay in business (e.g. economic, changing climate, water scarcity) there is a greater potential for agricultural land to be taken out of production in favor of subdividing and selling out to large-scale development. During the 2007 development boom, Canyon Creek had one such development proposal on the table for a 2,600-acre, 350-unit subdivision that eventually failed and expired during the recession. While agriculture is often viewed in direct opposition to achieving conservation and water management objectives in much of the West, FTR and agricultural partners in the Teton Watershed are shifting this paradigm. Irrigators across the watershed, including those on Canyon Creek, are working with FTR and the Teton Water Users Association on localized solutions—including regenerative farming techniques and innovative water management strategies (such as stream flow restoration transactions, point of diversion changes, and aquifer recharge) —to address the aforementioned watershed issues (water quality, quantity, and fisheries health) while allowing family farms to stay in business and improving farm sustainability for the long-term. As a result, irrigators in the Teton Watershed are shaping a future water management paradigm where well-managed farms and conservation go hand-in-hand. Given the various interests that rely on water in the region, and the dynamic social, environmental, and political drivers affecting water use, it is necessary to promote collaborative approaches to address water resource issues. This proposal seeks to work with a ready and willing group of irrigators on Canyon Creek to identify solutions and plan for a future that satisfies the needs of a wide variety of stakeholders – including farming and ranching families, nearby public and private landowners, downstream water users, and the fish and wildlife that rely on flowing streams to provide critical habitat to ensure their persistence in the watershed.

Past Working Relationships with Reclamation:
FTR has a collaborative working relationship with Reclamation. FTR participated as a stakeholder in the Henry's Fork Basin Study (2013-2015) which analyzed water supply and storage options in the Henry's Fork and Teton Basins. Currently, FTR is a member and participates in meetings of the Teton Canyon Recreation Coalition; a group of state and federal agencies, counties, Fremont-Madison Irrigation District, and conservation organizations working under a Reclamation sponsored charter in order to forward a number of mutual water supply, natural resource and recreation goals in the Teton River Canyon; these include recreation, safety, and irrigation diversion improvements.

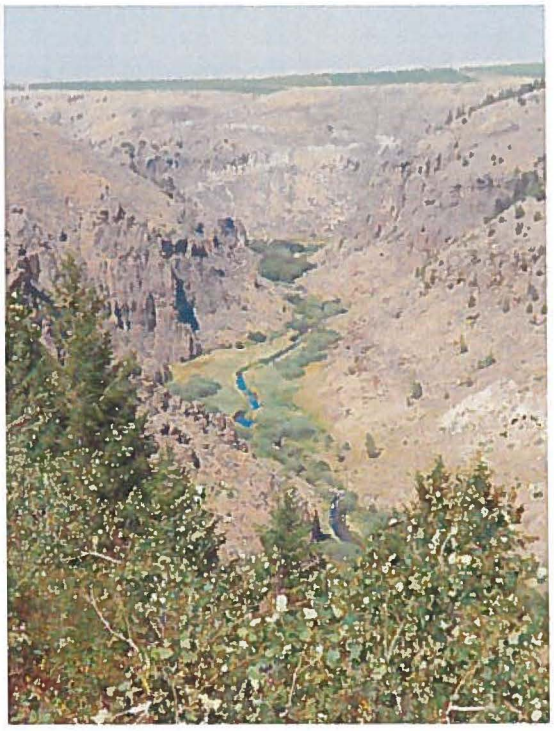
FTR implemented a Phase 1 WaterSMART grant from 12/31/2013-6/30/2016 (# R13AP80029) titled: *Expansion of an Existing Watershed Group: Improving Ecological Resilience, Conserving Water and Reducing Conflicts through formation of the Teton River Advisory Council.* This funding convened the Teton Water Users Association (which is still active today) who developed a mission, vision, and Water Management Plan for the Teton Watershed. Specific projects and objectives identified in this plan are currently being implemented under a Phase II WaterSMART grant: *Improving Ecological Resilience through Water Management Activities in the Teton River Watershed* (#R17AP00105; grant period 3/20/2018-12/31/2019). This funding has supported successful GIS mapping, piloting and monitoring of targeted aquifer recharge efforts to increase late-season flow in the upper Teton River. FTR is currently in the final month of implementation and will be closing this grant at the end of the 2019 calendar year having successfully achieved all identified objectives.

Project Location:

The Canyon Creek sub-watershed is located in Teton and Madison counties in southeast Idaho; approximately 8 miles E of Newdale (direct distance) and 15 miles W of Tetonia (direct distance). The United States Geological Survey (USGS) Hydrologic Unit Code for the Teton Basin is HUC 17040204. The project area is located from the Canyon Creek Canal headgate, downstream to the confluence with the Teton River (Canyon section), which is ~10 miles of stream (please see map on next page).

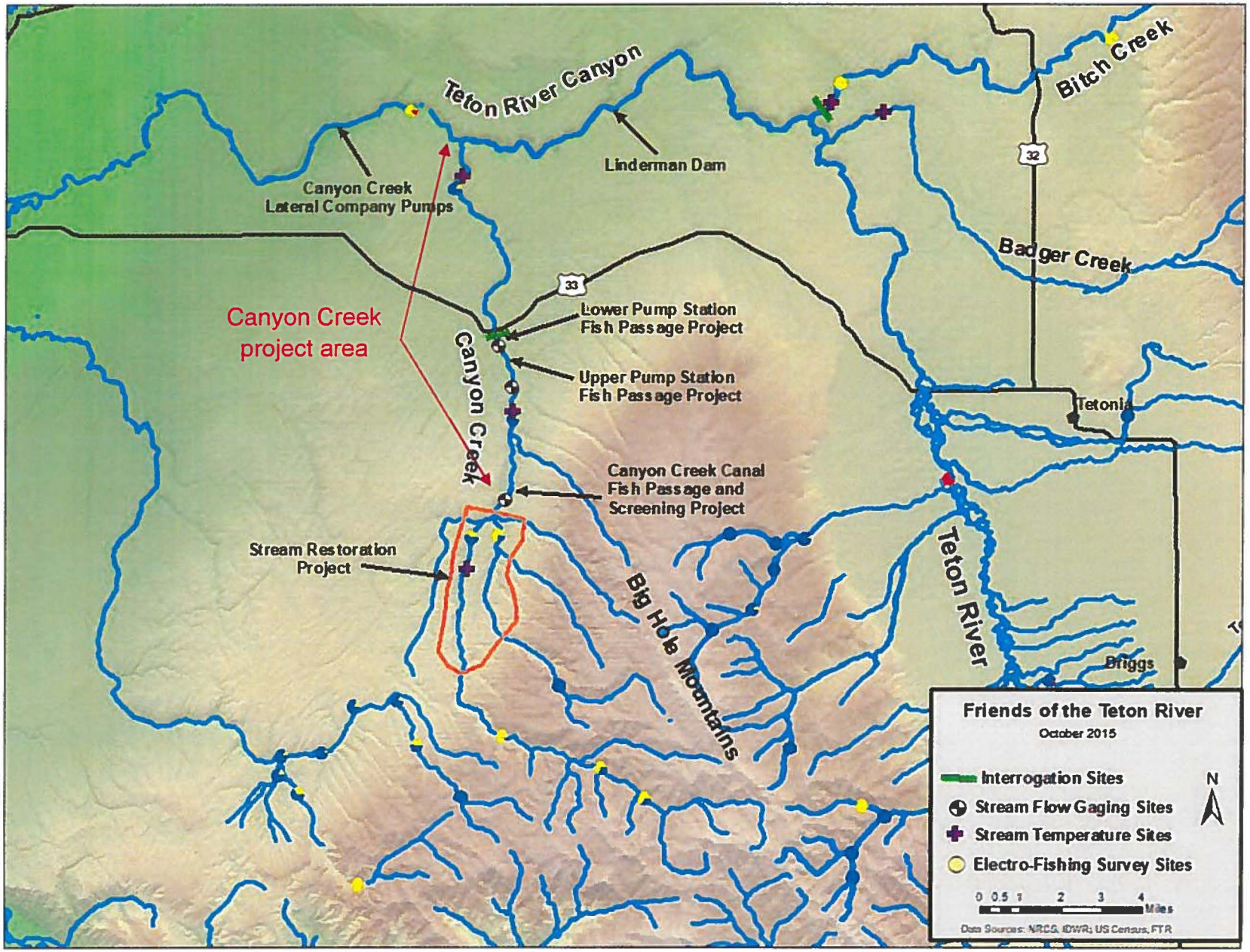


Canyon Creek, looking upstream, at the step-pools near the Canyon Creek Canal.



Lower Canyon Creek, looking downstream to the confluence with the Teton River Canyon.

Canyon Creek project area locator map



Technical Project Description

Applicant Category:

Friends of the Teton River (FTR) is seeking funding as an Existing Watershed Group.
FTR is a grassroots, membership-based, non-profit organization working for clean water, healthy streams, a thriving wild fishery, and watershed education in the Teton River watershed. FTR was started in 2000 by a group of farmers, fishing guides, scientists, conservationists, and government agency representatives who shared concerns about the health of the watershed, specifically declining water quality, ground water supplies and the fishery. The mission of FTR is to use sound science to protect and restore the water resources of the Teton Watershed by collaborating with local and regional partners to implement effective on-the-ground watershed projects and programs. FTR spent its first few years primarily focused on research and establishing baseline data for water quality, ground and surface water hydrology, and fisheries in the Teton River and its tributaries. Building on the results of this intensive (and ongoing) research, FTR developed an action-based strategic plan to guide work in the watershed, focusing on instream habitat improvements, stream flow restoration, and activities to limit sediment and nutrient inputs on the Teton River tributaries to the main stem. To implement this plan, FTR has organized its work in the following program areas: (1) stream channel and habitat restoration, including fish passage improvements, fish screens, and ladders (2) stream flow restoration (3) a "Farms and Fish" Program that works specifically with the farming and ranching community to implement strategies for improving soil health, water quality and use; (4) community education and outreach; and (5) watershed research and monitoring. FTR is committed to a collaborative approach, and regularly works with other nonprofit groups (local, regional, and national), government agencies (local, state, and federal), and a diverse cross-section of local stakeholders, both formally and informally, to find creative solutions to water resource problems in the Teton Watershed.

Projects and Watershed Planning Activities:

The success of FTR over the past nineteen years is attributable, in part, to our collaborative partnerships and stakeholders with which it works. FTR has formed partnerships with a range of individuals and organizations including NGO's, government agencies, elected officials, local businesses, educational institutions, local stakeholders and landowners to conduct research, restoration, and education programs. Some of FTR's current work with these entities includes:

- **Farms and Fish Initiative**—This program is a direct outgrowth of the Teton Water Users Association (TWUA), which FTR convened in 2015-2016 through a WaterSMART Phase I grant. This advisory group is made up of individuals and irrigation companies, the Teton Soil Conservation District, Teton County Farm Bureau, NRCS, and conservation NGO's. FTR's current work under this program is driven by the collaborative planning process of the group that identified specific pilot projects to meet the needs of diverse constituents within the community including "farmers who depend on water for crop and livestock production, municipalities that require clean and adequate water for residents, and conservation interests seeking water for fish and wildlife."

- As identified by the TWUA's Phased Water Management Plan, FTR is nearing completion of a two-year Aquifer Recharge Pilot (funded in part through a WaterSMART Phase II grant),

that recharged 10,000 acre-feet in the early in the spring to augment groundwater levels and late-season flows in the Teton River.

- FTR works closely with TWUA participant and NGO science partner, the Henry's Fork Foundation (HFF), with whom we share a staff member, the Landowner Outreach Coordinator, to implement regenerative farming techniques such as piloting (test and control parcels) conservation tillage, cover crop, and managed grazing strategies to improving soil health, moisture retention, and water quality—which are monitored by FTR in partnership with the Idaho Department of Environmental Quality.

- **Teton Creek Corridor Project**—FTR and the Teton Creek Stakeholders Group (landowners) have led major stream channel rehabilitation/ restoration efforts (on over two miles of stream) since 2006. FTR has coordinated all major assessment work (geomorphic, hydrologic, and biological survey), planning, fundraising, stakeholder outreach, and instream restoration on this priority tributary since that time. In the last five years, FTR and Teton Valley non-profit partners—the Teton Regional Land Trust, Valley Advocates for Responsible Development, and Teton Valley Trails and Pathways—have formed a unique partnership called the Teton Creek Collaborative to leverage their expertise and fundraising for protection of this important riparian corridor. While FTR's focus remains instream, the partners are able to collectively work on issues from land conservation (TRLT), reducing impacts from development (VARD) and stewarding a public pathway to public lands adjacent to the corridor (TVTAP). IDEQ 319 and a FEMA flood mitigation assistance grant have been a major sources of funding for the $3.85 million in restoration work to-date. The next section of substantial flood risk concern falls within the jurisdiction of the City of Driggs. FTR is working closely with the City, the Flood Control District, and Teton Creek stakeholders to help secure federal grant funding to continue this multi-million-dollar mitigation effort.

- **Community and Peer-to-Peer education**—An active watershed education program for youth and adults has been an important cornerstone of FTR's work. FTR believes that educating the public (of all ages) about watershed science fosters a sense of stewardship and promotes collaboration among stakeholders. Currently, the Community Outreach Coordinator is supporting implementation of educational goals associated with the Farms and Fish Initiative and floodplain management/stream restoration. Over the next two years, EPA Environmental Education funding will support a series of educational workshops, classes, print and digital resources, and peer to peer networking opportunities for agricultural producers to learn and share knowledge about agricultural best management practices that can be implemented to improve water quality, soil health, and climate resilience while increasing farm or ranch productivity. FTR is also focused on providing education and resources to landowners about the importance of riparian corridors, the impacts of development on those corridors and key information on healthy ecosystem functioning, permitting requirements, and restoration resources.

- **Watershed Research**— FTR has conducted extensive research and monitoring since 2001, to establish baseline data for fisheries, water quality, stream habitat, and stream flows, with the goal of improving our overall understanding of watershed issues and threats, as a driver for prioritizing projects that will improve watershed function and native YCT populations.

Research includes a juvenile trout study, outmigration, spawning, genetic, and telemetry studies; remote temperature and stream flow data logging, ground and surface water quality testing (supported by Teton Conservation District and IDEQ); and floodplain modeling. FTR has an established network of 12 interrogation sites on spawning tributaries throughout the watershed, including Canyon Creek. Interrogation sites are fisheries monitoring stations that record the migration of individually tagged trout when they swim past an antenna. To-date, FTR has tagged 4,200 trout in the Teton Watershed, which has provided valuable data about habitat utilization, migration timing, and relative importance of tributaries to YCT life histories. Collectively, this data has been used to inform watershed-wide strategies for implementation of a *Teton Watershed Restoration and Monitoring Plan* (2005-present), which was developed and is reviewed annually at a *Science Review Committee Meeting* in conjunction with our agency partners and organizations. The FTR "Science Review Committee" reviews the most current data available for the Teton Watershed and makes recommendations regarding future monitoring and research needs and restoration activities at an annually-held meeting. Participants include the Idaho Department of Fish and Game (IDFG), Wyoming Game and Fish Department (WYGF), US Forest Service (USFS), US Fish and Wildlife Service, the Bonneville Environmental Foundation, USGS Northern Rocky Mountain Science Center (USGS), Teton Regional Land Trust (TRLT), and Henry's Fork Foundation (HFF). All monitoring and research efforts are prioritized by this committee and are aimed at providing the data necessary for guiding our work and adaptively managing our approach. Currently, FTR is planning for a watershed wide 2020 Tributary Trout Assessment (conducted once every five years in 2005- 2015) to monitor trends at established fisheries sites throughout the watershed. FTR is a non-regulatory entity, but provides valuable scientific data to agencies that is used to inform state and federal management plans and strategic documents such as the *US Fish and Wildlife Service Strategic Habitat Conservation in Idaho: Landscape Conservation Strategy* (IFWO 2016), *IDFG Fisheries Management Plan* (2019-2024), the *Idaho State Wildlife Action Plan* (2017), IDEQ water quality plans *(IDEQ Teton River sub-basin Total Maximum Daily Load Implementation Plan)* and 303(d) listings, the Idaho State Forest Action Plan, and the National Fish Habitat Action Plan.

- **Stream flow restoration—**FTR's stream flow restoration program began in 2008, as a first-of-its-kind effort to benefit a non-anadromous species in the State of Idaho. This program has primarily been supported by the Columbia Basin Water Transactions Program and the National Fish and Wildlife Foundation. This program has had a number of instream flow restoration successes on Teton, South Leigh, Spring Creek, and Badger Creeks including 3- and 5-year leases through the Idaho Water Supply Bank, and the first permanent water acquisition in Teton Valley (and southeast Idaho) in November 2019. FTR works directly with the Idaho Water Resource Board on all stream-flow related work and is contracted to monitor these transactions through the Idaho Department of Water Resources. FTR has worked closely with IDFG to integrate flow restoration strategies, where appropriate, for native trout conservation and recovery. The *IDFG Fisheries Management Plan 2019-2024* supports a management direction inclusive of stream flow restoration in the Teton River and its tributaries; including the only mention of restoring "hydrologic regime" anywhere in the

State.[1] Due to the complex and sensitive nature of this work, stream flow restoration efforts and stakeholder relationships can take years to cultivate. Current stream flow restoration opportunities are being developed for Teton and Canyon Creeks, which have been prioritized based on their high ecological significance and suitability, strong stakeholder relationships, and other factors (agency support, cost, readiness, etc.) contributing to their likelihood of success.

- **Fish passage restoration—** In 2005, FTR completed a fish passage barrier assessment to prioritize restoration of entrainment hazards or impoundments preventing the migration of native trout into spawning tributaries. FTR has completed fish passage improvements on Trail, Teton, South Leigh, Badger and Canyon Creeks including irrigation diversion and head gate improvements, and installation of fish ladders or step-pools instream. FTR worked with Canyon Creek stakeholders from 2011-2014 to improve fish passage at three locations, which helped build stakeholder trust while meeting irrigator needs and conservation objectives.

- **Other planning efforts:**
  - In 2010, FTR was awarded the prestigious "Model Watershed" designation and 10-year support from the Bonneville Environmental Foundation (2010-2020). As a component of that, FTR worked with leading Yellowstone Cutthroat Trout experts and climatologists to develop a document, termed the Upper Teton River Model Watershed Document, which details conservation outcomes for the watershed. The document includes baseline and target restoration metrics, a long-term monitoring plan, and outlines an adaptive management approach framework. In short, the document catalogs science-based targets for improved ecological resilience, and preservation and protection of water resources in the Teton River Watershed.
  - FTR has partnered with Idaho State University and Utah State University on fishery, hydrology, and watershed planning studies. FTR completed a Teton River Recreation and Use Study with the Henry's Fork Foundation in an effort to quantify use and economic impact of the upper Snake fisheries. FTR also partnered with HFF on a $640,000 U.S. Department of Agriculture grant, (Dr. Rob Van Kirk, Principal Investigator) to develop a conjunctive ground and surface water management plan for the Henry's Fork and Teton watersheds.
  - FTR has close working relationships with the Driggs, Victor, and Tetonia city councils and planning and zoning commissions, and since its inception has worked with the Teton County Commissioners on water-related technical issues in the county, including the Source Water Protection Plan, a Nutrient Pathogen Ordinance, and floodplain protections.

Eligibility of Applicant

Friends of the Teton River FTR is a 501(c)(3) non-profit, grassroots, non-regulatory legal entity which was founded in 2000 by a diverse group of stakeholders, including farmers, anglers, scientists, agency personnel and conservationists concerned by declines in the health and quality

[1] **For the Teton River:** "Manage as a wild trout fishery emphasizing efforts to improve Yellowstone Cutthroat Trout population. Work cooperatively to restore connectivity, habitat, and hydrologic regime."
For the Teton River Tributaries: "Work cooperatively to restore connectivity, habitat, and hydrologic regime. Strategically implement connectivity projects where risks to isolated populations are minimal."

of the Teton River fishery, and the quality and quantity of the watershed's valuable water resources. Since that time, FTR has completed extensive scientific research on which to base our work. FTR collaborates with diverse stakeholders to develop locally-driven and consensus-based solutions that meet a variety of needs/interests in the watershed .

FTR is a nationally-recognized leader in community-based watershed protection and restoration; basing all of our projects in sound science and collaboration. We live and work in a community that is a melding of the old and new West, where a strong agricultural heritage exists side-by-side a tourism and recreation-based economy. We collaborate with a diverse group of stakeholders to accomplish our work; from farmers and ranchers, to subdivision and golf course developers, municipalities and small business owners, to NGO's, and state and federal agencies. We realize that our success rests largely upon stakeholder involvement, support and buy-in. Thus, a large component of our work centers on building bridges and cultivating effective communication between these various interests. We have successfully completed habitat and fisheries restoration projects, water conservation and efficiency improvements, water quality and trout monitoring programs, and flow restoration projects with a diverse group of constituents. Due to our unique positioning, FTR is uniquely situated to address water quantity and quality issues within the watershed in a manner which promotes water conservation, ecological resiliency and reduces water conflicts.

Goals:
The goal of Friends of the Teton River, the existing watershed group, and the Canyon Creek Irrigators is to work together to assess existing conditions, identify, prioritize, and plan for irrigation infrastructure improvements and water management projects in the Canyon Creek sub-watershed that will maximize a limited water supply and improve water reliability to meet irrigator needs, while improving instream flows and habitat connectivity for fish and wildlife. With Reclamation funding, FTR will have the capacity to conduct a watershed analysis (hydrologic and biological conditions); conduct preliminary design and cost estimates; research environmental compliance requirements; and meet with stakeholders to develop a plan (including timelines, milestones, and a funding plan) for future implementation of prioritized projects that will meet defined water supply and natural resource objectives.

Approach:
It is envisioned that the funds from this grant will build upon existing scientific data, current efforts in the watershed, conservation priorities, and stakeholder relationships in order to develop a strategic and collaborative plan that provides site specific and feasible solutions that can meet the needs of the irrigators and conservation outcomes (Task C).

Friends of the Teton River has been working with the stakeholders on Canyon Creek since 2008 to develop and implement a suite of strategies to improve instream flow and habitat conditions on (the lower 10 miles of) Canyon Creek. FTR and the Canyon Creek irrigators started by working to remove barriers that prevent fish migration and restore degraded habitat. Four major restoration projects were completed by 2015, with the participation and support of adjacent landowners and an irrigator willing to modify his pumping structures. These projects, combined, provided instream habitat connectivity to the uppermost 35 miles of Canyon Creek (to the headwaters), and through the lower 10 miles to the confluence, when stream flows are adequate.

The completed projects include: Restoring fish passage at two pump stations (2012 and 2013); completing 1,650 feet of stream bank restoration at Lazy Triple Creek Ranch (2014); and replacing the Canyon Creek Canal check-dam with step-pools (2015) to restore fish passage. FTR installed an interrogation site on Canyon Creek near the lower pump station in 2014 to collect data about trout movement from the lower Canyon.

It has been FTR's goal over the past decade to eventually work with the Canyon Creek water right holders to investigate and identify mutually agreed upon strategies that re-water the lower 10 miles of stream during critical periods for native trout, but our collaborative approach relies on the readiness of the stakeholders with whom we work. Due to a number of challenges including, but not limited to, changes in water availability, aging infrastructure, and rising costs of farming and irrigation, the Canyon Creek irrigators have recently expressed their support to engage in a planning and design process and are ready to seek solutions that provide more efficient water delivery, reliability, a modernized system and water management strategy, and one that will meet mutual irrigation and conservation goals (please see attached Canyon Creek irrigators letter of commitment, Appendix B).

WaterSMART Phase I funding will support a Project Manager—FTR Water Resource Director Sarah Lien—who will coordinate stakeholder engagement and communication; oversee the coordination of contracted and FTR staff activities including data collection, research; planning, and design; and develop an action plan for implementation. The proposed grant activities will be completed within two years of grant award, with work being conducted from May 1, 2020 through April 30, 2022. The project team and their qualifications are listed below:

Sarah Lien, Project Manager, is the FTR Water Resources Director and a licensed attorney, primarily practicing in water law. She earned a B.A. in Biology (Colorado College) a B.A. in Business Administration (Fort Lewis) and her J.D. from Lewis and Clark School of Law in 2007. Sarah joined FTR in 2010, working primarily on water quantity and water policy matters relevant to the Teton River watershed. Since that time, Sarah has developed a water transaction program in the Teton Watershed—the first of its kind in Idaho—forged critical partnerships with Idaho's water leadership and agricultural community, and completed numerous water transactions in eastern Idaho.

Mike Lien, FTR Fisheries Research and Restoration Director, has a B.S. in Forest Resources and Hydrology from the University of Minnesota. He joined FTR in the summer of 2002 after 10 years of working as a Hydrologic Technician for the U.S. Forest Service. Since 2005, he has directed the implementation of the Yellowstone Cutthroat Trout population assessment and fisheries research and monitoring activities in the watershed, as well as implementing all of FTR's fish passage and stream restoration projects. Mike manages seasonal field employees, monitoring, and stream restoration field work and coordinates activities with appropriate agency personnel, partners and landowners.

Rankin Holmes, Watercourse Engineering, will be contracted to conduct hydrologic assessment, data analysis and environmental compliance research. Mr. Holmes has twenty years of environmental and hydrologic monitoring experience; 15 of those years have been focused on water transaction investments, effectiveness monitoring and restoration outcomes of freshwater riverine systems through both regulatory mitigation and voluntary restoration market settings.

His experience in water transactions and water markets spans all areas of water transaction project work, from negotiations and developing projects, water-right investigations, legal water right transfers, project implementation/stewardship, to project effectiveness monitoring and quantification.

FTR staff and contractors will work collaboratively with the Canyon Creek irrigators and stakeholders (including non-irrigation interests and "affected" stakeholders) to develop local solutions addressing their water management needs in a plan that identifies, prioritizes, and provides cost estimates for a specific projects that will modernize irrigation infrastructure and modify the current water management strategies being used on Canyon Creek to meet water supply and natural resource objectives for the long-term. By bringing together representatives from all interest groups within this sub-watershed it is anticipated that unique projects and strategies will be developed which satisfy the needs and demands of multiple stakeholders, thereby decreasing the potential for water conflicts and forwarding the most practicable solutions for implementation.

Task 1: Conduct a watershed analysis to gather biologic and hydrologic information to fill specified data gaps in the project area that will help inform planning and design by establishing baseline conditions and conservation metrics.

1a—Fisheries Assessment and Data Collection:
FTR Fisheries Research and Restoration Director Mike Lien will coordinate and conduct the following assessments and data analysis during the 2020 field season (May-September):

- Electrofish established 100 meter survey sites on Canyon Creek in 2020 and analyze data (from 2005, 2010, 2015, 2020) for trends in native trout populations.
- Electrofish the Canyon Creek Canal to assess entrainment and mortality of fluvial and juvenile trout in the canal.
- Monitor the existing interrogation site on Canyon Creek, to assess movement of tagged YCT through the lower reach.
- Survey habitat and geomorphic conditions in the lower Canyon Creek reach to identify any unknown habitat limitations, barriers, sediment conveyance, or other issues.

1b—Hydrologic Assessment and Data Collection:
FTR has contracted with Rankin Holmes of Watercourse Engineering over the past year to install gages, collect data and conduct stream flow monitoring and analysis on priority streams throughout the Teton Watershed. He has familiarity with the Canyon Creek drainage and has been the point-person for the irrigators there. Watercourse Engineering has provided an estimate (see Project Budget) to conduct the following Hydrologic Assessment work during the 2020 field season (May-September):

- Install 3 stream flow logging devices in the project reach to assess flow thresholds for environmental targets (temperature and fish passage), irrigation needs, and the stream flow required (amount and duration) to keep Canyon Creek connected to the confluence.
- Water Temperature loggers will be installed and data will be collected at 8 locations on the Canyon Creek from just above the Canyon Creek Canal location, downstream to the mouth of Canyon Creek, to create an array of water temperature loggers needed to determine longitudinal temperature signal on the stream.

- Install a meteorological station to measure climatic conditions such as air temperature, wind and precipitation to be correlated with stream temperature and flow measurements. Canyon Creek is a remote location with its own microclimate, making the nearest weather station data inadequate.

Investigations are aimed at answering questions like: How much water do we need to reconnect the lower 10 miles of Canyon Creek and under what conditions? By how much can irrigation water be reduced to meet farming needs and what are the potential "savings?" What are the environmental minimum threshold targets for creating usable habitat?

1c—Analyze fisheries, flow, and temperature data

Mike Lien and Rankin Holmes will analyze the above data which will be summarized in a technical report in the autumn of 2020 (October-December 2020) in order to assist and inform potential water transaction development and the prioritization of various water management scenarios.

Task 2—Stakeholder Recruitment

From May-December 2020, the Project Manager will recruit stakeholders—including the irrigators on Canyon Creek and other "affected stakeholders" (see Evaluation Subcriteria A1) to establish their involvement in a stakeholder group, a process that is:

- Inclusive, transparent, adaptive, and collaborative;
- An iterative process that will respond to and adapt to outside conditions and requirements as necessary (e.g. permitting, economic forces, social conditions).

Task 3—Water Management Project Development

- Using the data and analysis above, the Project Manager will meet with the Canyon Creek irrigators and other "affected stakeholders" to vet and prioritize water management changes, projects, and scenarios for further scoping. This process will take place via stakeholder meetings, watershed council and other regional meetings (please see Evaluation Sub-criteria A1) from January 2021 throughout the remainder of the grant period. This process will be refined as necessary based on input from Canyon Creek irrigators and stakeholders in order to meet the needs of the entities involved.

Task 4—Preliminary Project Design and Environmental Compliance Research (April 2021-September 2021).

- Once the stakeholders have identified a list of projects, the Project Manager will work with a regional irrigation equipment and technology firm to provide site specific system configurations, design, and cost estimates for these options.
- It is a part of the Watercourse Engineering contract to research what type of site-specific environmental compliance will be necessary to implement these projects, to ensure there are no significant hurdles to future implementation and that associated environmental compliance costs are known.

Task 5--Develop a Canyon Creek Water Management Project Plan

In Year 2, the Project Manager will work with the Canyon Creek stakeholders to develop a Water Management Project Plan that will include site-specific:

- Design and cost estimates for implementation of the prioritized irrigation infrastructure or water management strategy.

- Specific conservation outcomes, biological metrics, stream flow and temperature targets that are related to each project design
- Environmental compliance, permitting, or other requirements related to each project
- Timelines, milestones, and a funding plan for future implementation of identified projects

Friends of the Teton River previously received a CWMP Phase I grant, which supported the formation of the Teton Water Users Association, a diverse watershed advisory group that developed a Water Management Plan for the Upper Teton Watershed; leading to the current aquifer recharge work being implemented under a CWMP Phase II grant. The current application for Phase I funding certainly builds upon the momentum generated by this prior effort, due to strengthened relationships, trust, and on-the-ground successes of the project, from planning to implementation. The proposed project will be similar in its collaborative approach but will achieve a higher level of detail necessitated by the complexities of project design (Task C).

Evaluation Criteria

Sub-criterion No. A1—Watershed Group Diversity:

The "affected stakeholders" in the Canyon Creek sub-watershed include residents, landowners and water right holders, farmers, and business owners (Green Canyon Hot Springs, Lazy Triple Creek Ranch) that live or make a living within the drainage. The majority of the watershed lies within and is managed by the US Forest Service (Caribou-Targhee National Forest); which permits a number of uses, affecting stakeholders such as cattle ranchers, hunters and anglers, and recreationists. In addition to these entities, Canyon Creek provides water supply to the Teton River (Canyon), thus stakeholders also include downstream water users, the Fremont-Madison Irrigation District, Fall River Rural Electric Co-op, the Idaho Department of Water Resources, Idaho Department of Environmental Quality, the Idaho Department of Fish and Game, the Bureau of Reclamation, and the Bureau of Land Management. Affected stakeholders also include conservation organizations (Henry's Fork Foundation), fishing guides, and tourists.

FTR was founded in 2000 by a diverse group of stakeholders, including farmers, anglers, scientists, agency personnel and environmentalists concerned by declines in the health and quality of the Teton River fishery, and the quality and quantity of the watershed's valuable water resources. Since the inception of the organization, a large component of FTR's work has centered on building bridges and cultivating effective communication between these various interests. Our board and membership continue to reflect this diversity. Additionally, over the past decade, FTR has cultivated tributary-specific stakeholder groups (Trail Creek and the Teton Creek Stakeholders Group) that meet regularly to discuss issues related to their tributary, such as water conservation, flooding or stream restoration. FTR helps facilitate the Teton Water Users Association, representing a diverse group of irrigation and conservation interests. FTR also works closely with the City of Driggs, City of Victor, Teton County, Teton Regional Land Trust, Trout Unlimited, Idaho Fish and Game, US Forest Service, US Fish and Wildlife Service, Natural Resources Conservation Service, National Fish and Wildlife Foundation, among others. These working groups, and FTR's monthly participation in the Henry's Fork Watershed Council ensure that our projects and activities integrate and harmonize with various interests throughout the region. FTR actively participates in many interagency and regional meetings, coalitions and committees; including the YCT Interstate Working Group, the Teton Canyon Recreation Coalition, and the Columbia Basin Water Transactions Program, to name a few.

This Project will leverage the existing diversity and partnerships of Friends of the Teton River to engage with the Canyon Creek stakeholders and recruit a broader range of workgroup members to participate in project development, and review of data, conservation metrics and water management project design. Because FTR has worked for nearly 20 years in the Teton River watershed, it has formed strong working relationships with many of the individuals, entities, and organizations discussed above. FTR will place particular emphasis on ensuring participation from stakeholders and irrigators from within the sub-watershed, as their involvement is key to the success of this project. In the case of this project, the Canyon Creek stakeholders approached FTR for a partnership and are motivated to undertake this planning effort at this time. FTR will reach out/engage with affected state and federal agencies and other affected stakeholders to give them opportunity to influence the deliverables funded by this grant.

- For natural resource management concerns, data collection and review, and development of solutions that meet conservation metrics, FTR will engage with: the Idaho Department of Fish and Game, Idaho Department of Environmental Quality, Idaho Department of Water Resources, the US Forest Service, US Bureau of Land Management, and US Bureau of Reclamation.
- For irrigation and water quantity concerns and review of prioritized projects, FTR will engage with: the Teton Water Users Association, Fremont-Madison Irrigation District, Fall River Rural Electric Co-op, the Idaho Department of Water Resources, the Bureau of Reclamation, and the Bureau of Land Management.

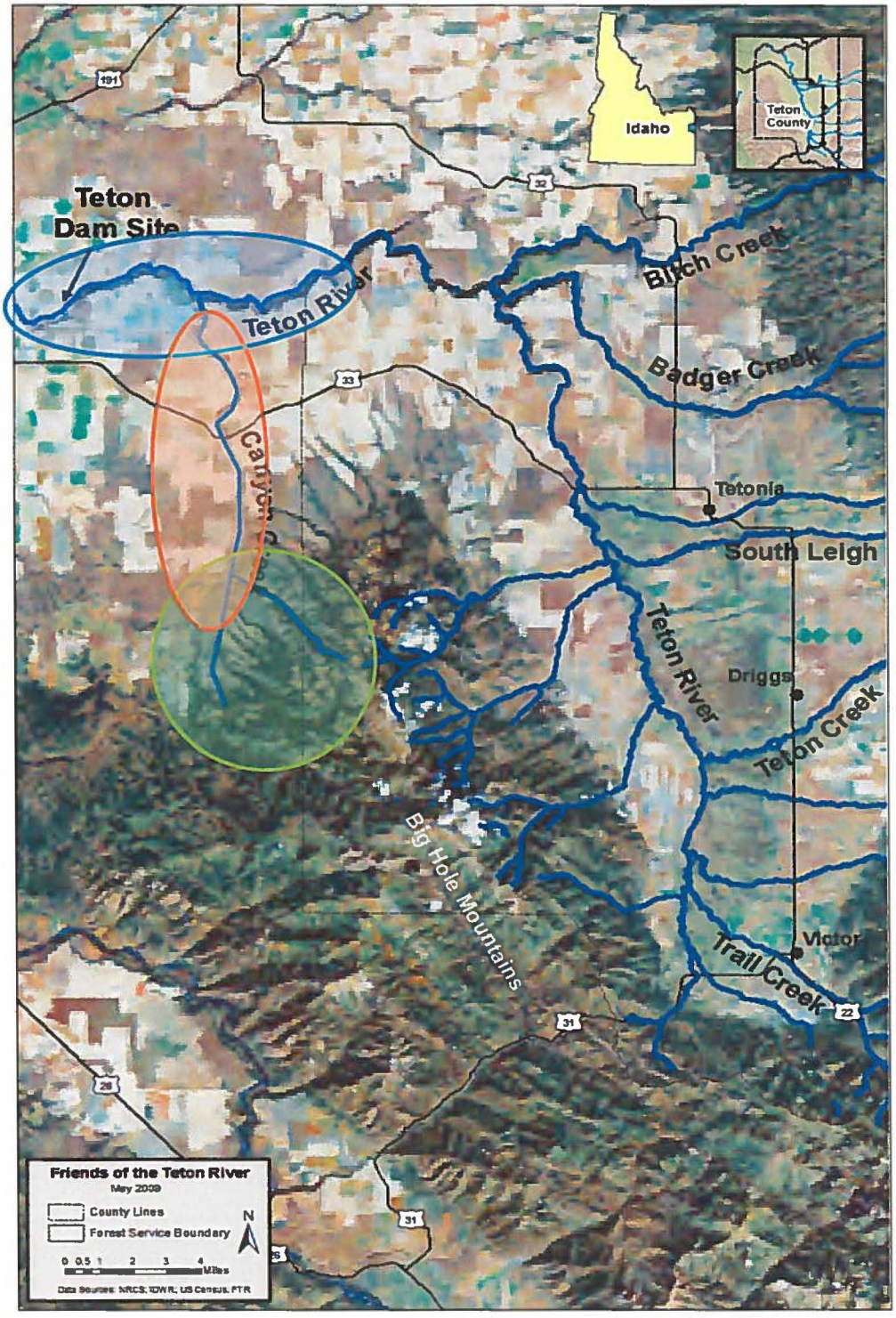
These stakeholders will be reached and engaged through Canyon Creek stakeholder group meetings, or other meetings that FTR regularly updates and attends, including meetings of the Teton Water Users Association, Henry's Fork Watershed Council, Teton Canyon Recreation Coalition (facilitated by Reclamation), and Science Review Committee annual meeting. The work of the Canyon Creek stakeholders will be conveyed to the watershed as a whole in a variety of ways. FTR has an established track record of stakeholder and community engagement through the following methods: Wednesday Water Wise public education presentations, K-12 outreach program, teacher trainings, donor events, community picnics, field trips (including the Basin Advisory Group and Henry's Fork Watershed Council field tours), fishing guide events, membership drives, bi-annual newsletters, monthly e-newsletters and social media posts.

Sub-criterion No. A2—Geographic Scope:
FTR operates in the Teton River Watershed, from the headwaters of the Teton River, to the old Teton Dam site. The Teton Watershed's 8-didgit USGS HUC # is 17040204.

Friends of the Teton River is an Existing Watershed Group that works in partnership with individuals, agencies, and organizations throughout the entire geographic area as described previously in the Technical Description portion of this application. As discussed above, Friends of the Teton River will recruit a diverse and far reaching group of individuals and organizations to participate in this Project. While this project is focused in on a single sub-watershed, Canyon Creek comprises a remote and vast portion of the larger Teton Watershed as a whole; a drainage that makes up nearly one quarter of the total Teton Watershed area. Canyon Creek is representative of the watershed as a whole, culturally and ecologically. However, due to the lack of current development and a limited number of residents inhabiting Canyon Creek, unique opportunities exist to significantly improve conditions on a landscape scale which will have a

larger impact for stakeholders up- and downstream. This project will be a model for developing practical solutions to address water supply and conservation issues collaboratively in the Teton Watershed, leading the way for similar efforts in the future.

Project Area and Stakeholders



Stakeholder Map Key:

Orange represents the Project Area. ***Stakeholders:*** Canyon Creek irrigators, landowners, and business owners; Friends of the Teton River, Teton Water Users Association, Idaho Department of Fish and Game, Idaho Department of Water Resources, Idaho Department of Environmental Quality

Green represents National Forest upstream of the Project Area. ***Stakeholders:*** US Forest Service, stakeholders using the forest (grazing, recreation, other uses).

Blue represents the Teton River Canyon, downstream of the Project Area, including area of natural resource impact (fishery). ***Stakeholders:*** include those listed above and the Idaho Water Resource Board, Bureau of Land Management, Bureau of Reclamation, Fremont-Madison Irrigation District, Fall River Rural Electric Co-op, the Henry's Fork Foundation, Teton Canyon Recreation Coalition, and communities downstream.

Sub-criterion No. B1—Addressing Critical Watershed Needs or Issues

Before FTR began, very little scientific water resource data for the upper Teton watershed existed, including basic fisheries, hydrologic, and water quality data. FTR's first priority as a new organization in 2000 was to implement a comprehensive research and monitoring program, in order to understand the ecological character of the upper Teton watershed and identify factors limiting the system's ability to support important ecosystem services, including the keystone species native Yellowstone cutthroat trout. Based on this research, interrelated watershed issues emerged. Previous sections discuss these critical issues and needs in the Teton Watershed (and the Canyon Creek sub-watershed) relating to water quality, quantity, declining fisheries, climate change impacts, and the importance of implementing best practices (land and water management) on farms and ranches to sustain watershed health and create more reliable and resilient water supply. The following discussion will elaborate on the critical issues of water quality, quantity/supply, fisheries, and the role of agriculture in providing solutions to conflicts over water.

A surface water quality monitoring program revealed elevated nutrient and sedimentation issues (some tributaries are listed as 303(d) streams for these parameters), exacerbated by agricultural run-off, overgrazing, habitat degradation, and development in riparian corridors.

Declining aquifer levels led FTR to partner to conduct a watershed-scale, aquifer study in 2003. The study was conducted to assess the impact of a growing population on local groundwater resources, and model effects on the aquifer. In 2012, FTR worked with Humboldt State University professor Dr. Rob Van Kirk to complete an analysis of surface water hydrologic alteration (Van Kirk and Jenkins 2005; VanKirk (2012). This work led to important insights regarding the relationship of altered hydrology due to irrigation diversions and decline of native trout in the Teton Basin fishery. Irrigated agriculture is still the dominant land use, and most of the water that is diverted from streams for irrigation use seeps into the ground as canal seepage. This serves to increase groundwater levels, making more water available for domestic, commercial, or industrial use and groundwater irrigation. Sustaining groundwater (aquifer) levels in the upper Basin are critical to sustaining residential growth and development, as many individuals rely upon individual, exempt groundwater wells to provide water to their homes. Conversely, widespread agricultural diversions result in the annual dewatering of the middle sections of Teton Valley's tributaries, serving to favor nonnative species over the native Yellowstone Cutthroat Trout. A component critical to any effort to restore viable Yellowstone Cutthroat Trout populations in Teton Valley is restoration of the natural hydrologic and geomorphic processes in the Teton Range tributaries, between the base of the mountains and the river. Yet such restoration efforts must be balanced against the reality that the agricultural community and many residents of Teton Valley rely upon the practice of diverting water (often entire streams) down canals. Restoration efforts must also be placed within the context of increasing demand for water, as both residential growth and prolonged drought are anticipated to continue to increase over time.

Between 1999 and 2003 population surveys performed by Idaho Fish and Game (IDFG) on the mainstem Teton River showed a precipitous 95% decline in native Yellowstone cutthroat trout populations and a 319% increase in non-native rainbow/hybrid and Eastern Brook Trout in the Teton River. Following the discovery of this decline, FTR began a series of investigations to

better understand why the decline had occurred and identify possible recovery strategies. Between 2004 and 2007 FTR partnered with IDFG, Utah State University, and Idaho State University to sponsor graduate research by Martin Koenig to investigate habitat and biotic factors influencing the distribution and recruitment of juvenile YCT in the Teton River. This study concluded that although the factors (including habitat degradation, nonnative competition, and hybridization) responsible for the decline of native fish species are numerous and interrelated; it is clear that loss of flows (due to irrigation diversions) in tributaries that feed the Teton River plays a major role in YCT decline. "Most importantly, water diversion modifies the hydrologic regime and changes stream habitat conditions to favor invasive trout" (Koenig 2006).

In 2005, FTR partnered with the USFS, IDFG, and the National Fish and Wildlife Foundation on an extensive baseline assessment of trout populations in 15 major tributaries of the Teton River. This assessment showed that the upper sections (historically inhabited by resident and fluvial YCT) of all but four tributaries have been invaded by and are now dominated by non-native brook trout. These four priority tributaries for YCT conservation include Teton Creek and South Leigh Creek in the upper Teton River; and Bitch Creek and Canyon Creek in the lower Teton River Canyon section. These studies suggest that the Teton Watershed has lost much of the YCT fluvial life history and resident trout in the major tributaries are in decline; however it has also been proven (on Teton and South Leigh Creeks) that fluvial YCT will utilize restored habitat to the extent that restored stream flows allow (in other words, YCT will migrate into rewatered habitat if it's available to them). A subset of the original survey sites on these tributaries were re-surveyed in 2010, and 2015, and will be included in a 2020 Tributary Trout Assessment.

Given the range-wide decline in YCT abundance and distribution, it is likely that the species will be petitioned for listing under the ESA in the future unless significant progress is made towards stabilizing and increasing populations throughout the region.

This potential listing could pose significant and drastic curtailments on irrigation, stressing the local agricultural economy, which is already facing climate change impacts, economic challenges, and added pressure from downstream water users. FTR's recent success in engaging with local water users, piloting regenerative agriculture techniques, recharging the upper Teton Basin aquifer and completing the first water transactions in Idaho for a non-anadromous species, set the stage for the development of collaborative water management strategies on Canyon Creek that address the host of issues facing the watershed as a whole, and the stakeholders involved..

Sub-criterion No. B2—Developing Strategies to Address Critical Watershed Needs or Issues

Task C - Watershed Management Project Design: Describe the process that the watershed group will use to design projects and how completing the project design will contribute to the management of the critical watershed issues and needs.

- To the extent known, the project(s) that the Canyon Creek stakeholders will investigate and complete a design for include:
  i. Retirement and/or restoration of the Canyon Creek Canal point of diversion.

ii. Diversion reduction, changing locations of pump stations, and developing other water management solutions and strategies (such as water leasing) that will return (later defined) adequate environmental stream flows through the lower 10 mile reach of Canyon Creek to the confluence with the Teton River.

- Will the group complete an analysis to prioritize watershed management projects and identify specific project locations?

  i. This analysis was described in the Technical Proposal and includes Stakeholder Group review of the targeted fisheries, hydrology and stream temperature monitoring data. This data will identify site-specific locations which will be prioritized based on environmental, economic, and engineering factors (For example, the group may prioritize the placement of a new groundwater pump that would create more favorable flow conditions than the current ones, meet the needs of irrigators and meet conservation outcomes, while also being an economically practicable solution).

  ii. FTR has experience facilitating prioritization processes and will be well-situated to provide a framework for the Canyon Creek Stakeholders. FTR facilitates a similar process with the Teton Water Users Association and has recently completed work (peer-reviewed) on the development of a YCT Decision Support Model. This tool provides weighted parameters to support the prioritization of fisheries restoration projects in the Teton Watershed.

- What type of site-specific project design and engineering will the watershed group complete?

  i. Depending on the prioritized work, project design will likely fall under two categories: 1) water management strategies not requiring infrastructure and 2) water management changes that require new irrigation infrastructure and/or removal/restoration of old infrastructure.

  ii. The Project Manager will provide specific project design for water management strategies that do not require infrastructure. Sarah Lien has experience shepherding water transactions, diversion reduction agreements, etc. through the Idaho State Water Board and will be able to provide specific design on how to accomplish these strategies and what is required (legally, financially) to get them done.

  iii. A local irrigation design and technology company will provide site specific system configurations, design, and cost estimates for irrigation infrastructure options.

- How will the watershed group develop a project timeline and milestones for the project?

  i. Collaboratively developing project timelines and milestones, as well as potential funding sources for future implementation will be included in the Canyon Creek Water Management Project Plan, which is a deliverable of funded activities under this grant. It is the goal of the stakeholders to have an actionable plan to move forward toward implementation at the conclusion of this effort.

- Will the watershed group work with Reclamation's environmental and cultural resource staff to determine what type of site-specific environmental compliance will be necessary for the project(s)upon implementation?

  i. As stated in the Technical Proposal, Watercourse Engineering will be tasked with completing environmental compliance research for the prioritized water management projects as a part of the planning process. FTR will work with Reclamation staff to ensure that these requirements (if any) are necessary and sufficient for future implementation, which is not anticipated to occur on federal facilities or property.

- If the watershed group will build on previous efforts, describe these efforts and how the watershed group will expand upon them through the proposed work.

  Please see where this was addressed at the end of the Technical Proposal, following the description of Task 5.

Sub-criterion No. C1—Understanding of and Ability to Meet Program Requirements

Please refer to the Technical Proposal for description of Tasks 1-5, milestones, the FTR staff or contractor who is responsible for completing each task/milestone, and the timeline for completion. The costs associated with these tasks are detailed in the project budget and budget narrative.

Sub-criterion No. C2—Building on Relevant Federal, State, or Regional Planning Efforts

The Projects and Watershed Planning Activities section in the Technical Proposal describes some of the relevant local, state and federal plans that this project will support. These include:

Teton Model Watershed Document (FTR and Bonneville Environmental Foundation, 2010-2020)

The Canyon Creek Water Management Project Plan will assist FTR in the selection of conservation projects and inform the timing and sequencing of project activities, such that FTR is able to strategically address the conservation objectives identified in the Upper Teton River Model Watershed Document, which includes Teton Watershed restoration and monitoring objectives and metrics. As such, this project will help direct the goals and metric of this planning document, as it is updated for the next ten years (2020-2030).

YCT Decision Support Model (FTR and the USGS, 2018)

The results of fisheries and hydrology data collected through project activities will be used to inform this decision support tool to adaptively manage and assess the projects of highest priority in the Teton Watershed that support the protection and restoration of native YCT populations.

Teton Water Users Association Water Management Plan for the Teton Watershed

Teton Water Users Association (TWUA) formed in 2015 under a Reclamation Phase I grant, serving to bring together individuals who can, collectively, identify solutions that satisfy the needs of all constituents within the Teton River watershed – farmers who depend on water for

crop and livestock production, municipalities that require clean and adequate water for residents, and conservation interests seeking water for fish and wildlife. The proposed project meets the vision of the TWUA working group by addressing problems and implementing projects that:

- Keep working lands working by securing and maintaining a reliable and affordable supply of water to sustain agriculture,
- Protect and restore stream flows and water quality in the Teton River and its tributaries, for the benefit of people, wildlife and fish.
- Secure and maintain a safe, affordable, and high-quality water supply for municipalities and residential water users

Idaho Comprehensive State Water Plan The Comprehensive State Water Plan, prepared by the Idaho Water Resource Board, imparts designations on certain stretches of the State's rivers. Certain portions of the Teton River and its tributaries are designated recreational rivers and natural rivers. The State's Comprehensive Plan encourages activities which maintain the aforementioned values with these river reaches and encourages cooperative basin planning particularly where management entities have overlapping interests. The Water Management Project Plan will incorporate and support these river designations and their associated values and will directly contemplate integration of management activities which support overall watershed health and resiliency.

This project supports Idaho Department of Fish and Game and the US Fish and Wildlife Service management goals/actions below by developing strategies to restore stream flows and connectivity in Canyon Creek, a priority tributary for YCT that contains valuable habitat for the future persistence of the species:

IDFG Fisheries Management Plan (2019-2024) seeks to ensure the long-term persistence of YCT within its current range and to do so at levels capable of providing angling opportunities. The proposed project supports the following goals of the Management Plan:

- Ensure the long-term persistence of the subspecies within its current range in Idaho;
- Restore YCT to those parts of its historical range in Idaho where practical.
- Work cooperatively to restore connectivity, habitat, and hydrologic regime
- Strategically implement connectivity projects where risks to isolated populations are minimal.
- The plan also supports a management direction inclusive of stream flow restoration in the Teton River and its tributaries: including the only mention of restoring "hydrologic regime" anywhere in the State of Idaho.

US Fish and Wildlife Service Strategic Habitat Conservation in Idaho: Landscape Conservation Strategy (IFWO 2016)

- The project supports Landscape Strategy 4: Secure and enhance riverine/riparian habitats in the Middle Rockies Priority Landscape (including the Teton Watershed) for the continuing benefit of Priority Species (Yellowstone cutthroat trout)
- Goal 4a: Ensure resilient, ecologically functioning riverine/riparian habitats capable of supporting native Priority Species

- Goal 4b: Ensure abundant, diverse (including life histories), and resilient populations of Priority Species within the riverine/riparian habitats of the Middle Rockies Priority Landscape
- Goal 4c: Ensure that riverine/riparian habitats within the Middle Rockies Priority Landscape are biologically connected to adjacent habitats outside of the landscape area.
- Conservation Objectives: i. Protect or restore native habitats that support key life history components of Priority Species. ii. Identify and address threats to Priority Species and their habitat. iii. Promote connectivity between important habitat patches for Priority Species. iv. Protect and restore streams, rivers, and associated riparian habitat to ensure habitats for all life history needs of Priority Species are available and connected. v. With partners, plan restoration and/or mitigation efforts for riverine/riparian habitats that connect adjacent priority landscapes or functional blocks of riverine/riparian habitat.
- Action 5: Within Focal Drainages assess human water use in drainage and secure necessary in-stream flow sufficient for healthy salmonid populations (identified as Yellowstone cutthroat trout populations).

Teton River Subbasin Assessment and Total Maximum Daily Load (2003) - This subbasin assessment was prepared pursuant to the Idaho total maximum daily load (TMDL) development schedule (Idaho Sportsmen's Coalition v. Browner, No. C93-943WD, Stipulation and Proposed Order on Schedule Required by Court, April 7, 1997), §303(d) of the Clean Water Act (Public Law 92-500 as amended, 33 U.S.C. §1251 *et seq.*), and the United States Environmental Protection Agency (EPA) Water Quality Planning and Management Regulations (40 CFR Part 130.7). The goal of the TMDL is to restore identified impaired waterbodies to a condition that meets state water quality standards. The projects developed through the collaborative efforts of Canyon Creek Stakeholders will incorporate water quality data that support the TMDL and assist in restoration of these reaches, including the Teton River Canyon below Canyon Creek.

Criterion D— Department of the Interior Priorities

This project proposal demonstrates support for the following Department priorities:

1. ***Creating a conservation stewardship legacy second only to Teddy Roosevelt***

a. Utilize science to identify best practices to manage land and water resources and adapt to changes in the environment

All project development, design, and planning will be based on the best available science, including targeted ecological and hydrological data collected in Year 1 of this proposal. Water management solutions forwarded by the Canyon Creek Stakeholders will be developed to meet conservation metrics and outcomes, which will be adaptively managed as existing conditions change.

2. ***Restoring trust with local communities***

a. Be a better neighbor with those closest to our resources by improving dialogue and relationships with persons and entities bordering our lands;
b. Expand the lines of communication with Governors, state natural resource offices, Fish and Wildlife offices, water authorities, county commissioners, Tribes, and local communities.

This project has been cultivated over the past decade, and now has the expressed support of the Canyon Creek irrigators. FTR is responding to their needs by proposing to improve communication and engage in a collaborative dialogue and planning process that is also inclusive of the other affected stakeholders up and downstream (state and federal natural resource management agencies, water authorities, and conservation organizations).

--End of Technical Proposal and Evaluation Criteria (24 pages)—

D.2.2.5 Project Budget

Budget Proposal

BUDGET ITEM DESCRIPTION	COMPUTATION $/Unit	COMPUTATION Quantity	TOTAL
SALARIES AND WAGES			
Sarah Lien, Water Resources Director			
(year 1) 25% of time	$34.39/hour	520	$17,883
(year 2)	$35.08/hour	520	$18,242
Mike Lien, Fisheries Restoration and Research Dir.			
(year 1) 10%	$27.60/hour	160	$4,416
(year 2)	$28.15/hour	160	$4,504
SUBTOTAL WAGES			$45,044
FRINGE BENEFITS			
Sarah Lien, Water Resources Director			
(year 1) 25% of time	$3.73/hour	520	$1,940
(year 2)	$3.86/hour	520	$2,007
Mike Lien, benefits			
(year 1) 10% of time	$4.56/hour	160	$729.60
(year 2)	$4.73/hour	160	$756.80
SUBTOTAL BENEFITS			$5,433
TRAVEL			
Travel to Canyon Creek (local staff travel 40 mi/RT)	.58 cents per mile	1,600	$928
EQUIPMENT			
None.			
SUPPLIES/MATERIALS			
Water temperature loggers	$150	8	$1,200
Pressure transducers	$400	3	$1,200
Meteorological Station	$1,200	1	$1,200
CONTRACTUAL WAGES			
Watercourse Engineering (see attached contractor quote)	-	-	$34,425
Irrigation Design and engineering (contractor TBD)	-	-	$5,000
ENVIRONMENTAL/REGULATORY COMPLIANCE			
N/A			
TOTAL DIRECT COSTS			$94,431
INDIRECT COSTS			
10% de minimis applied to salaries/wages, fringe benefits, materials/supplies, travel.	$55,055.60	10%	$5,500.56
TOTAL PROJECT COSTS			$99,931

Table 1.—Total Project Cost Table

SOURCE	AMOUNT
Costs to be reimbursed with the requested Federal funding	$ 99,931
Costs to be paid by the applicant	$ 0
Value of third-party contributions	$ 7,556*
TOTAL PROJECT COST	**$ 107,487**

*Watercourse Engineering voluntarily provided a 20% contractor discount, which is detailed in the budget narrative, and their scope of work/budget (attached). The budget proposal does not include any project costs incurred prior to the award date (April 1, 2020).

Budget Narrative

Salaries and Wages:

The Project Manager will be Sarah Lien, FTR's Water Resource Director. It is estimated that Sarah will spend 25% of her time (520 hours annually) on the project in Year 1 and Year 2. Sarah will oversee the development and completion of the project including: obtain input from stakeholders, analyze new technical (hydrologic, fisheries, and engineering) data, work with and coordinate the activities of contractors, and compile this information into a Canyon Creek Water Management Project Pan.

Mike Lien, Fisheries Research Director will spend 10% of his time (160 hours annually) on the project in Year 1 and Year 2. Mike will oversee fisheries data collection, installation of monitoring sites, data analysis and coordination of biological objectives with stream flow and engineering recommendations.

Compensation calculations and rates are shown in the table below, and reflect the total cost of employment per year, per employee. A "Cost of Living Adjustment" for Year 2 was calculated using the rate of 2%. FICA, Workers' Comp and Idaho State Unemployment Costs were calculated using standard rates for Idaho.

Salaries Year 1

Employee	Base Salary	FICA Taxes	Workers Comp	State Unemployment	Total Cost of Employment	Employee Hourly Cost
Program Manager	$65,231	$4,990.17	$789.30	$525.76	$71,536.23	$34.39
Fisheries Research Dir.	$39,269	$3,004.08	$475.15	$307.89	$43,056	$27.60

Salaries Year 2

Employee	Base Salary +2%	FICA Taxes	Workers Comp	State Unemployment	Total Cost of Employment	Employee Hourly Cost
Program Manager	$66,536	$5,089.97	$805.08	$536.28	$72,967	$35.08
Fisheries Research Dir.	$40,054	$3,064.13	$484.65	$307.89	$43,911	$28.15

Fringe Benefits:

Fringe benefits are calculated using the annual health insurance premium rate (Idaho Blue Cross), a $600 FSA/DRCA employer contribution (flex spending account/dependent care), a 3% employer matched retirement contribution with employee match, and a cellular phone plan reimbursement for $360/annually. A 5% increase in health insurance was estimated in Year 2, according to anticipated increases. Please see the table below for rates/calculations.

Fringe Benefits Yr. 1

Employee	Health Insurance	FSA contribution	Retirement 3% match	Cellular Phone Plan	Total Cost of Benefits	Hourly Benefits Cost
Program Manager	$4,844.44	$600	$1,956.93	$360	$7,761.37	$3.73
Fisheries Research Dir.	$4,975.17	$600	$1,178.07	$360	$7,113.24	$4.56

Fringe Benefits Yr. 2

Employee	Health Insurance +5%	FSA contribution	Retirement 3% match	Cellular Phone Plan	Total Cost of Benefits	Hourly Benefits Cost
Program Manager	$5,086.20	$600	$1,996.07	$360	$8,042.27	$3.86
Fisheries Research Dir.	$5,223.93	$600.00	$1,201.62	$360	$7,385.55	$4.73

Travel:

The anticipated travel expenses include local travel from the FTR office located in Driggs, Idaho to Canyon Creek, which is 40 miles RT. It is budgeted that the FTR staff (Program Manager and Fisheries Research Director) will make 40 trips to Canyon Creek (20 trips each over two years), reimbursed with the federal mileage rate of $.58/mile.

Equipment: No equipment to implement the proposed grant activities.

Materials and Supplies:

FTR is requesting funding to purchase 8 water temperature loggers ($150/each), 3 pressure transducers ($400/each), and one meteorological station ($1,200) as requested by the contractor Watercourse Engineering, for their scope of work. The contractor provided FTR with the cost estimate for these items and FTR will purchase them for installation by the contractor.

Contractual:

FTR will contract with Rankin Holmes of Watercourse Engineering, who has an established relationship with the Canyon Creek irrigators and familiarity with the system and stream flow monitoring objectives. A scope of work, detailed hours and a cost estimate are attached on next page. Watercourse gave an in-kind 20% discount on services, as a non-profit discount.

An Irrigation design/ engineering contractor will be hired out as a competitive bid for no more than $5,000 to provide initial cost estimate and system requirements for prioritized irrigation infrastructure projects. FTR has experience working with a number of private engineering firms to provide hydraulic analysis and preliminary designs for irrigation improvements within this price range for similar projects (fish screens and head gate designs for South Leigh and Badger Creeks).

Watercourse Engineering, Inc.
424 2nd Street, Suite B
Davis, CA 95616
530-750-3072 (tel.)
530-750-3074 (fax)

Date: November 5, 2019

To: Friends of the Teton River
P.O. Box 768
Driggs, ID 83422

From: Rankin Holmes, Senior Water Resources Scientist,
Watercourse Engineering, Inc.

Re: Canyon Creek - Streamflow and Water Temperature monitoring investigations to inform and guide water project development with Canyon Creek Canal Co.

Scope of Work

Watercourse Engineering, Inc. (Watercourse) has been requested to submit a scope of work and budget to assist the Friends of the Teton River (FTR), located in Driggs, ID with support with streamflow and water temperature data collection on Canyon Creek, an important Yellowstone Cutthroat (YCT) tributary to the Teton River, located near the community of Newdale, ID, over the course of the next two-years (2020-2021).

Proposed action objectives are to monitor the stream-discharge and water temperature, above and below the Canyon Creek Canal Co. point of diversion (POD) to inform desired instream flow thresholds and identify flow targets which would enhance habitat conditions, longitudinally connect surface flows, enhance specific YCT life-stage(s) such as juvenile and adult holding, as well as juvenile recruitment to the Teton River. These proposed activities are divided into four primary tasks to be implemented over a two-year period:

Term

Start: Spring, 2020

End: Spring, 20222

Watercourse Engineering, Inc.
424 2nd Street, Suite B
Davis, CA 95616
530-750-3072 (tel.)
530-750-3074 (fax)

Proposed Work

Project Year-1 (2020)

Task1: Build instrument housing, calibrate instruments, install (8 temp loggers, 3 pressure transducers and a meteorological station), collect and analyze streamflow and temperature for the project reach on Canyon Creek in Year 1.

Task 2: Develop a Flow and Temperature Summary Report from data collected in Task 1 for Canyon Creek for FTR in the autumn of 2020.

Project Year-2 (2021)

Task 3: Produce report, which will identify flow and Temperature needs and thresholds for the lower reaches of Canyon Creek. The report and model will look at flow scenarios and potential flow restoration objectives for prioritizing alternatives.

Task 4: Conduct Environmental Compliance Research for prioritized model alternatives.

Budget

	Labor Costs							
	Labor Hours by Staff Level							
	Principal Engineer	Senior	Senior Scientist	Staff Scientist	Technical	Field	Admin	Total Cost ($)
	Hourly Rates							
Project Task (Timeline)	$ 178.27	$ 149.72	$ 135.00	$ 116.43	$ 85.26	$ 65.00	$ 52.44	
Task 1. : Monitor stream-discharge and water temperature on Canyon Creek **(YEAR 1 - 2020)**	0	0	96	0	0	0	4	$13,169.76
Task 2. Develop a Flow and Tw Summary Report from data collected in Task 1 for Canyon Creek for FTR **(YEAR 1 - 2020)**	0	0	40	0	0	0	0	$5,400.00
Task 3: Develop a Canyon Creek Water Temperature Transaction Tool (W3T) model with data collected **(YEAR 2 - 2021)**	8	0	40	40	0	0	0	$11,483.36
Task 4: Produce a Canyon Creek W3T model report **(YEAR 2 - 2021)**	0	0	40	20	0	0	0	$7,728.60
							Subtotal:	$37,781.72
In-Kind Contribution							20%	$7,556.34
Sub Total								**$30,225.38**
Travel Expenses (7 visits @$600/each)								$4,200.00
Grand Total							Total:	**$34,425.38**

Environmental and Regulatory Compliance Costs:
FTR contacted the Regional Reclamation Office to inquire about environmental compliance costs. This project is a planning effort, so no environmental compliance will be necessary until future implementation. The contractor, Watercourse Engineering, has included researching environmental compliance costs during the planning grant.

Indirect Costs:
FTR does not have a federally-approved cost rate agreement in place, so has opted to apply the 10% de minimis applied to salaries/wages, fringe benefits, materials/supplies, and travel.

Total Cost:
The total cost of the project is **$107,487**. Of this, FTR respectfully requests **$99,931** from the Bureau of Reclamation. The remainder of the project funds, **$7,556** are accounted for as an in-kind contribution (20% discount on services) from Watercourse Engineering, as noted in the Budget Narrative and Scope of Work (dated 11/5/2019).

Letters of Commitment:
See explanation above and attached Watercourse Engineering documentation.

Budget Form SF-424, SF-424A and SF424-B are attached in Appendix A.

Environmental and Cultural Resources Compliance

- Will the proposed project impact the surrounding environment (e.g., soil [dust], air, water [quality and quantity], animal habitat)? Please briefly describe all earth-disturbing work and any work that will affect the air, water, or animal habitat in the project area. Please also explain the impacts of such work on the surrounding environment and any steps that could be taken to minimize the impacts. ***There is no earth disturbing work proposed during this planning grant. All monitoring activities will be properly permitted. According to Watercourse Engineering, stream flow and temperature logger installation is exempt, as loggers are weighted or placed instream without earth disturbance.***

- Are you aware of any species listed or proposed to be listed as a Federal threatened or endangered species, or designated critical habitat in the project area? If so, would they be affected by any activities associated with the proposed project? ***No federally threatened or endangered species are in the project area.***

- Are there wetlands or other surface waters inside the project boundaries that potentially fall under CWA jurisdiction as "Waters of the United States"? If so, please describe and estimate any impacts the proposed project may have. ***Yes, Canyon Creek is within the project boundaries. Canyon Creek is a surface water system, a tributary to the Teton River, and potentially falls under the CWA jurisdiction as a "Waters of the United States." The grant objectives associated with this application are exclusively planning in nature and thus will not generate any impact to Canyon Creek.***

- When was the water delivery system constructed? ***The earliest water right on this system is June 1, 1900. The original water delivery system was likely completed shortly thereafter.***

- Will the proposed project result in any modification of or effects to, individual features of an irrigation system (e.g., headgates, canals, or flumes? ***No modifications to the irrigation system features are proposed during this planning grant.***

- Are any buildings, structures, or features in the irrigation district listed or eligible for listing on the National Register of Historic Places? A cultural resources specialist at your local Reclamation office or the State Historic Preservation Office can assist in answering this question. ***There are no proposed impacts to any structures, irrigation or otherwise, at this time.***

- Are there any known archeological sites in the proposed project area? ***No.***

- Will the proposed project have a disproportionately high and adverse effect on low income or minority populations? ***No.***

- Will the proposed project limit access to, and ceremonial use of, Indian sacred sites or result in other impacts on tribal lands? ***There are no tribal lands in the vicinity of the project area.***

- Will the proposed project contribute to the introduction, continued existence, or spread of noxious weeds or non-native invasive species known to occur in the area? ***No. FTR practices "clean, drain and dry" for all equipment entering streams including waders, wading boots, and dip nets.***

Required Permits or Approvals

Scientific data collection permits are required, and are applied for each January/February, for electrofishing and fish sampling through the Idaho Department of Fish and Game. FTR will be obtaining permits for data collection in conjunction with the 2020 Tributary Trout Assessment.

FTR also has the permission of the Canyon Creek irrigators to collect stream flow data and data in the canal system, which does not require a permit.

Letters of Support

Please see the letter of committment from the Canyon Creek irrigators for the proposed project (Appendix B).

Official Resolution

Please see the official resolution adopted by the Friends of the Teton River Board of Directors (Appendix C).

Unique Entity Identifier and System for Award Management

FTR is registered in the System for Award Management (SAM) with the unique Cage #3N4Y6 and DUNS #110921801

Appendix A:

Mandatory Financial Forms

SF-424

SF-424A

SF424-B

SF-LLL*

*Form SF-LLL is not required; Friends of the Teton River does not participate in any lobbying activities under our 501(c)(3) designation.

Appendix B:

Letter of Project Commitment

Canyon Creek Canal Company, Inc.
13289 E. Highway 33
Newdale, Idaho 83426

Canyon Creek Lateral Ditch Association
12241 E. 3749 N.
Newdale, Idaho 83436

Valley View Ranch
1509 North Canyon Creek
Newdale, Idaho 83442

Skyline Farms, Inc.
1509 North Canyon Creek
Newdale, Idaho 83442

October 2019

Re: Water Right Holder Letter of Commitment

To Whom It May Concern:

Canyon Creek Canal Company, Inc., Canyon Creek Lateral Ditch Association, Valley View Ranch, and Steveco Canyon Farms, Inc., individually, own and manage water rights historically diverted from Canyon Creek, tributary to the Teton River. The water rights support robust agricultural operations in the vicinity of Newdale, Idaho and the failed Teton Dam. There is opportunity to change the legal points of diversion for the water rights and re-design the water delivery infrastructure to allow for water to be withdrawn from the Teton River rather than Canyon Creek, thereby generating benefits for native Yellowstone Cutthroat Trout and improving water right reliability and deliverability.

Canyon Creek Canal Company, Inc., Canyon Creek Lateral Ditch Association, Valley View Ranch, and Steveco Canyon Farms, Inc. understand that Friends of the Teton River, a

501(c)3, intends to submit grant applications for the purpose of securing funding to support the collection of hydrologic and fisheries data, coordinate the work of project partners, research associated legal water right and land matters, develop project plans, and identify project funding. Canyon Creek Canal Company, Inc., Canyon Creek Lateral Ditch Association, Valley View Ranch, and Steveco Canyon Farms, Inc. hereby submit this letter of commitment, demonstrating its support for the project and its commitment to working with Friends of the Teton River, and other project partners, to secure project outcomes. Further, Canyon Creek Canal Company, Inc., Canyon Creek Lateral Ditch Association, Valley View Ranch, and Steveco Canyon Farms, Inc. commit to supporting the development of the project by: (1) providing access for fisheries and hydrologic data collection; (2) providing historic water use records; (3) work with project partners on project design iterations; and (4) identify match to support implementation of final project, in the form of in-kind contributions and materials.

Sincerely,

Canyon Creek Canal Company, Inc.

Canyon Creek Lateral Ditch Association

Valley View Ranch

Steveco Canyon Farms, Inc.

Appendix C:

FTR Board of Directors Official Resolution

Friends of the Teton River
Board of Directors Resolution

TO: Bureau of Reclamation

This is a certified copy of resolution that was passed by the Friends of the Teton River Board of Directors, by vote and endorsed by a quorum of members, on 10/31/2019.

RESOLVED, that this Board of Directors hereby authorizes and directs Amy Verbeten, Executive Director, and Sarah Lien, Water Resources Director and Staff Attorney, on behalf of Friends of the Teton River, to enter into a Cooperative Watershed Management Program Grant agreement to conduct collaborative research, analysis, and design to meet water supply and natural resource needs in the Canyon Creek Watershed.

10/31/2019

Bill Horn, President **Date**