COLORADO
Colorado Water Conservation Board
Department of Natural Resources

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TO: Colorado Water Conservation Board Members

FROM: Chris Sturm, Stream Restoration Coordinator

DATE: January 23, 2018

AGENDA ITEM: 21. Colorado Watershed Restoration Program – Grant Funding Recommendations

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Background: The Colorado Watershed Restoration Program (CWRP) is designed to provide planning and project implementation funding for watershed and stream restoration and protection efforts. The program supports stakeholder driven collaborativess committed to restoring and protecting the ecological processes that connect land and water. The CWRP guidance document and application was approved by the Board in September of 2008. The Board approved revisions to the program in May 2012 and July 2015. The latest revision requires board approval for applications greater than $100,000. It also added Stream Management Plans (SMP) as a grant type. Other grant types include Watershed/Stream Restoration, Flood Mitigation, and Monitoring grants

Discussion: Staff received 38 applications by the November 3, 2017 deadline. Each application was scored by a minimum of three staff members. Stream Management Plan applications were scored by seven staff members, including a representative from CPW. Sixteen applications requested funding greater than $100,000. Table 1 (attached below) depicts the applicants, location, project title, funding request, and recommended funding amount.

The total funding request for the sixteen applications is $3,681,476. The recommended award is $2,640,013. Eleven applications are recommended for full funding, and two are recommended for partial funding. Two applications are not recommended for funding, and one applicant withdrew their application during the review process.

The application summary sheets are included after Table 1. They are followed by the full applications including the scopes of work. The summary sheets and applications are organized by two grant types: Watershed/Flood/Monitoring followed by SMPs. They are further organized alphabetically by basin within the grant types.

Issues/Additional Needs:
SMP grantees must demonstrate that the planning effort put as much or more emphasis on environmental and recreational water needs as it does on other water uses.

All CWCB funding awards are contingent upon applicant's ability to secure match funding.

All grantees should adhere to their organizational procurement policies when hiring contractors and consultants. CWCB recommends that State procurement polices be used as a guide if an organization does not have procurement policies.

Grantees should adequately address CWCB staff comments to scopes of work, engineering designs, and applications. This may result in changes.

Staff recommendation: Staff recommends that the Board approve a non-reimbursable expenditure up to $2,640,013 from the Colorado Watershed Restoration Program for the purpose of providing match funding to the projects identified in Table 1.

TABLE 1

Stream Restoration/Flood Mitigation Plans and Projects + Monitoring Grants

Applicant	Location (Stream, Town or County, Basin)	Project	Funding Request	CWCB Recommended Funding
Big Thompson Watershed Coalition and Larimer County	Big Thompson River Watershed, South Platte Basin	Adaptively Managing the Big Thompson Watershed for Long-Term Health	$175,342	$175,383
City and County of Denver	Cherry Creek, South Platte Basin	Cherry Creek Restoration Project - East Iliff Avenue to Quebec Street	$500,000	$500,000
Lefthand Watershed Oversight Group	Left Hand Creek, South Platte Basin	Building a Legacy in Left Hand Creek Watershed	$176,085	$176,085
Town of Carbondale	Crystal River, Colorado Basin	Carbondale Crystal River Restoration and Weaver Ditch Efficiency Project	$100,000	$100,000
Conservation Legacy	Dolores River, Southwest Basin	Dolores River Restoration Parnership - Ensuring Riparian Restoration following 8 years of accomplishments	$281,300	$200,000
City of Fort Collins	Cache la Poudre River, South Platte Basin	Fish passage and monitoring of fish movement on the Cache la Poudre River	$200,000	$200,000
Fountain Creek Watershed, Flood Control, and Greenway District	Fountain Creek nr. Pueblo, Arkansas Basin	Fountain Creek Channel Restoration Design in Pueblo, Co	$190,000	$190,000
Middle South Platte River Alliance	South Platte River nr Kersey, South Platte Basin	Plumb Ditch Planning Effort	$150,000	$150,000
Arkansas River Watershed Collaborative, Fiscal Agent - Coalitions and Collaboratives, Inc.	Hayden Pass Fire, Lower Ark Se Study, Purgatoire Watershed - Arkansas Basin	Arkansas River Basin Watershed Restoration: 2018 ARWC Initiatives	$588,000	$291,500
Saint Vrain Creek Coalition	Saint Vrain Creek nr Lyons, South Platte Basin	Emergency Watershed Protection (EWP) Project Maintenance & Monitoring	$133,120	$0
Town of Lyons	St. Vrain Creek, South Platte Basin	Lyons Valley River Park McConnel Ponds Fuse Plugs	$283,084	$0
Saint Vrain Creek Coalition	Saint Vrain Creek nr Lyons, South Platte Basin	Design-Build of Stream Restoration at Hall Ranch “Gap” Area on South Saint Vrain Creek	$247,500	**Application Withdrawn**
			$3,024,431	**$1,982,968**

Stream Management Plan Grants

Applicant	Location (Stream, Town or County, Basin)	Project	Funding Request	CWCB Recommended Funding
Eagle River Watershed Council	Eagle River, Colorado Basin	Eagle River Integrated Water Management Plan (ER-IWMP)	$181,445	$181,445
St. Vrain and Left Hand Water Conservancy District	St. Vrain and Left Hand Watersheds, South Platte Basin	St. Vrain & Left Hand Stream Management Plan	$150,000	$150,000
Middle Colorado Watershed Council	Colorado River, Glenwood - Debeque, Colorado Basin	Middle Colorado Integrated Water Management Plan	$207,600	$207,600
Colorado Rio Grande Restoration Foundation	Rio Grande Watershed, Rio Grande Basin	Rio Grande, Conejos River, and Saguache Creek Stream Management Plan – Phase 1	$118,000	$118,000
			$657,045	**$657,045**
		Total All Grant Types	**$3,681,476**	**$2,640,013**

Colorado Watershed Restoration Program
PROJECT PROPOSAL SUMMARY SHEET
Project Title: Arkansas River Basin Watershed Restoration: 2018 ARWC Initiatives

Project Locations: Arkansas River Basin Watershed - Hayden Pass, Lower Arkansas River Valley and Purgatoire watershed
Grant Category: Watershed Restoration and Protection
Grant Request: $588,000

Cash Match Funding: Matching funds exist through diverse stakeholders and agencies: NRCS Emergency Watershed Protection funding (for a match of 75%); the U.S Geological Survey, Fremont County, and the City of Trinidad. ARWC and the CO Department of Health & Environment are actively committed to additional funding sources.

In-kind Match Funding: The Lower Arkansas Water Quality Work Group is providing in kind match of staff, as is ARWC. Commitments of in-kind volunteer assistance exist through ARWC and partnering agencies.

Project Sponsor: Arkansas River Watershed Collaborative (ARWC)
Primary Contact: Carol Ekarius
PO Box 726, Lake George, CO 80827
Carol@co-co.org 719-748-0033

Grantee and Fiscal Agent:
Coalitions & Collaboratives, Inc.
Primary Contact: Carol Ekarius
PO Box 726, Lake George, CO 80827
Carol@co-co.org 719-748-0033

Brief Project Description(s):
This is a three-part initiative that continues collaborative efforts by the Arkansas River Watershed Collaborative (ARWC). The work has multiple benefits, diverse stakeholders, and works across key geographic areas in the Arkansas watershed. The projects protect water, lands and natural resources and address long-term needs. All work includes the task of project management and oversight, utilizing stakeholder involvement and outreach.

1. The **Hayden Pass Fire** recovery work in the upper Arkansas watershed is imperative to protect infrastructure, habitats and to prevent on immediate and downstream water quality issues. This addresses ongoing urgent needs and provides critical cash match for Emergency Watershed Protection funds.
2. A **Lower Arkansas Valley Selenium Science Plan** is identified in the Colorado Water Plan as a significant gap in the Arkansas Basin Project Database. The project will provide a sound scientific basis for mitigating water-quality impacts on municipal, agricultural and rural communities, and help prioritize future projects. In addition, the project provides an opportunity for constructive dialogue with downstream interests, and reducing the risks of non-compliance with Clean Water Act.
3. Establish organizational and project-building capacity for the **Purgatoire Watershed Partnership (PWP)** to strategically build partnerships supporting long-term watershed health initiatives. Work includes monitoring and a hydrology assessment to determine status and needs, and to be used as guidance in future stream management.

PROJECT PROPOSAL SUMMARY SHEET

Project Title: *Fountain Creek Channel Restoration Design in Pueblo, CO*

Project Location: *Fountain Creek between 8th Street and 13th Street in Pueblo, CO. See Attachment II for project map.*

Grant Type: *Watershed/Stream Restoration and /or Protection (Restoration) Grants*

Grant Request/Amount: *$190,000 (CWCB)*

Cash Match Funding: *$200,000 (District)*

In-Kind Match Funding: *$45,000 (Stakeholder labor from Pueblo, Pueblo County, District Technical Advisory Committee and District Citizens Advisory Group)*

Project Sponsor(s): *Fountain Creek Watershed, Flood Control and Greenway District*

Contact Person: *Name: Mr. Larry Small, Executive Director*
E-mail Address: lsmall42@comcast.net or Fountainckdist@aol.com
Phone Number: (719) 447-5012

Brief description of the project: *The District-funded Fountain Creek Corridor Restoration Master Plan, published in October 2011 (the Planning Phase), identified as one of its goals to improve watershed health by reducing erosion, sedimentation and flooding within the 50 mile mainstem of Fountain Creek from Colorado Springs, CO to the confluence with the Arkansas River in Pueblo, CO (referred to as the Corridor). The goal of the jointly funded District and CWCB (Grant PDAA5000) Fountain Creek Corridor WARSSS Study, published in March 2017 (the Analysis Phase), was to analyze the contributing factors that lead to sedimentation pollution, sediment yield, and channel stability and instability factors within the 50 mile mainstem of Fountain Creek in the Corridor; with the overall goal of creating a priority list of sites to direct future efforts aiming to reduce sediment sources and improve water quality and channel stability within the Corridor and reduce flooding. The created priority list identified and prioritized 215 sites that require attention. The project funded by this Grant starts the Design Phase for five adjacent sites, PC053, PC054, PC055, PC115 and PC116 (as shown on the project map at Attachment II) combined into a single project. The work to be performed under this Grant, in cooperation with our in-kind funding Stakeholders, will complete a resilient design to reduce erosion and sedimentation; correct channel instability; restore and protect wetlands; restore and protect riparian habitat; protect recreational assets; protect transportation infrastructure; and mitigate future impacts from storm-induced flooding along the reach of Fountain Creek associated with this Grant activity. Completion of the design will immediately lead to start of the Construction Phase that will be performed under separate funding designated for this project area.*

Colorado Water Conservation Board
Colorado Watershed Restoration Program Grant

Grant Application	
Date:	**11/3/2017**
Grantee & Fiscal Agent:	**Town of Carbondale**
Project Name:	**Carbondale Crystal River Restoration and Weaver Ditch Efficiency Project**
Project Location:	**Riverfront Park, Carbondale, CO (between Carbondale Fish Hatchery and Crystal Bridge Drive along the Crystal River)**
Primary Contact:	**Mark O'Meara** **Utility Director** **Town of Carbondale** **511 Colorado Avenue** **Carbondale, CO 81623** **(970) 963-3140, c. (970) 319-6259** **momeara@carbondaleco.net**
Grant Amount Requested:	**$100,000**
Cash Match Funding:	**$20,000 (Town of Carbondale)**
In-Kind Funding:	**$0**
Other Grant Funding:	**$80,000 (pending, see 'Exhibit B - Budget & Schedule')**

Project Overview: Provide a brief description of the project. (Please limit to half a page)

The Town of Carbondale, with partners Aspen Valley Land Trust, Roaring Fork Conservancy, American Rivers, Trout Unlimited, Colorado Parks and Wildlife and Public Counsel of the Rockies is proposing to restore and enhance a one-half mile, 18-acre reach of the Crystal River as it flows through the town of Carbondale, AND improve the efficiency of the town-owned Weaver Ditch head gate and diversion. The project goals are as follows:

1) Restore the ecological integrity of the riparian zone through streambank stabilization, reconnection of the floodplain, and replace invasive weed communities and plant monocultures with healthy and diverse riparian plant regimes, while preserving healthy bird and wildlife habitat.
2) Develop a long term, self-sustaining solution to improve river channel stability, fish habitat and spawning areas by promoting conditions that support and enhance instream biotic structure and diversity.
3) Create a self-sustaining diversion and head gate structure for the Weaver Ditch to function as part of the river system while improving the water delivery for the Town of Carbondale and consistent with future ditch improvements and efficiencies
4) Enhance passive user experiences of Riverfront Park through interpretive signs, trails, gathering spaces, and educational programs.

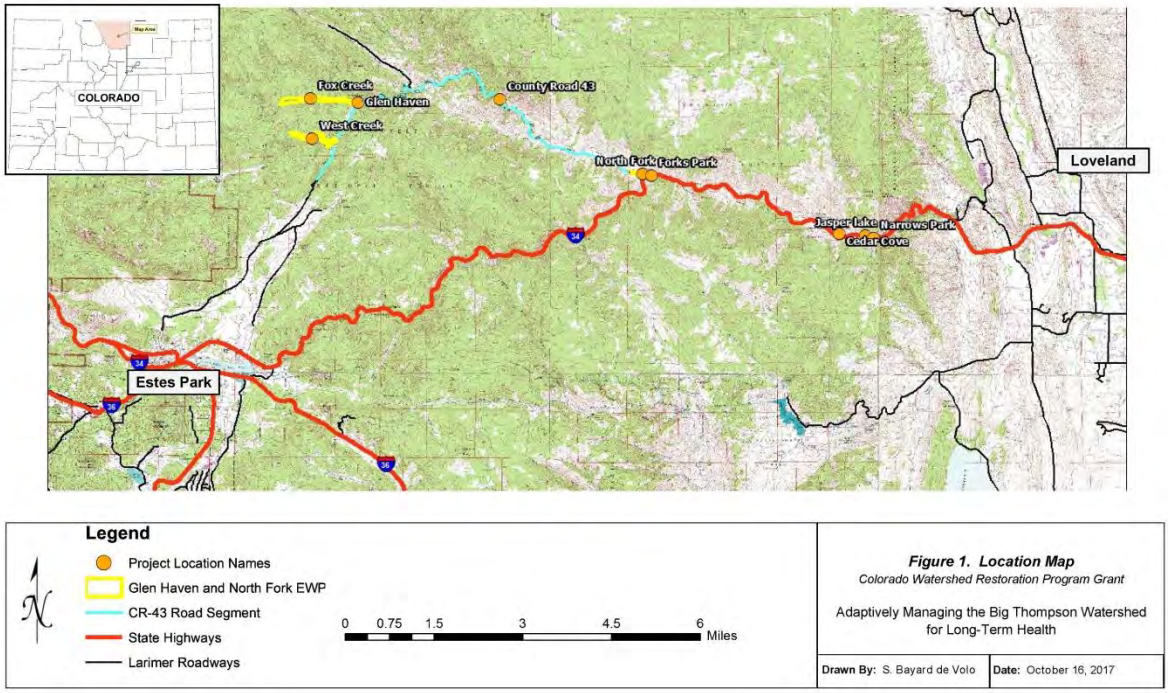
The requested grant monies will be used to fund the planning, design, and permitting for the project.

2017 CWCB Grant Application

Project Proposal Summary Sheet – Big Thompson Watershed Coalition

Project Title: Adaptively Managing the Big Thompson Watershed for Long-Term Health

Project Location: Additional maps included in the Attachments Section



Grant Type: Watershed/Stream Restoration Grants

Grant Request Amount: $165,343

Cash Match Funding: $102,046

In-kind Match Funding: $63,337

Project Sponsors:

Shayna Jones
Big Thompson Watershed Coalition
Shayna.jones@bigthompson.co
970-800-1126

Rusty McDaniel
Larimer County Engineering
rmcdaniel@larimer.org
970-498-5730

Brief description of the project: Since the floods of 2013, multiple organizations across the Big Thompson Watershed have been hard at work and have invested millions of dollars in federal, state and local funds to improve the resiliency of the watershed and health of the river corridor and ecosystem. As of November 2017 the Big Thompson Watershed Coalition and Larimer County have completed projects along ~15 miles of the Big Thompson River and the North Fork of the Big Thompson River. While these initial projects were critical to jump-start the recovery of the Big Thompson River ecosystem, ongoing monitoring, adaptive management, maintenance and stewardship is needed to ensure that the systems continue on a trajectory for long-term watershed health, resiliency and ecosystem function. The proposed project will focus on these critical elements, and is a partnership will continue the cyclical process of Coalition-building, data collection, planning prioritization, implementation and monitoring, which requires collaboration across political boundaries and requires continued efforts.

Colorado Watershed Restoration Program
Watershed/Stream Restoration Grant Application

Applicant Contact Information:

Cinceré Eades, Natural Resource Planner/Project Manager
Phone: 720-913-0655; cincere.eades@denvergov.org

Cherry Creek Restoration Project – East Iliff Avenue to Quebec Street

Nearest Town or City	City of Denver
County	Denver and Arapahoe
Latitude/Longitude	39.682346, -104.898594
Stream Name and Watershed	South Platte River, Middle South Platte River-Cherry Creek Watershed

Figure 1 in Appendix A is a vicinity map for the project area.

Project Description

The Cherry Creek Restoration Project has been initiated to restore a one-mile reach of the Cherry Creek Corridor located approximately 2.5 miles downstream of Cherry Creek Reservoir between Quebec Street and Iliff Avenue. The project spans between City and County of Denver on the downstream side and Arapahoe County on the upstream side. Within the project reach, the Cherry Creek channel consists of a 30-foot wide active sand bed channel with a perennial base flow. The channel invert drops 30 feet and runs at approximately a 0.6% slope.

Currently, the active channel is experiencing severe downcutting, leaving a 10 to 20-foot deep eroded/incised channel with vertical banks. The stream channel improvements will raise the channel bed and associated water table. An extensive planting effort is included with the project to encourage the return of native vegetation and wildlife habitat. CWCB funding is integral to the success of this project. Without CWCB's support, the project partners will have to value engineer out critical restoration components.

Watershed/Stream Restoration Grant Request

Total Project Cost	$15,321,000
Grant Request	$500,000
Funding Sources:	
Project Sponsors Trust/Project Account	$4,041,000
City and County of Denver 2018/2019 Budget	$2,500,000
Denver Water (Land Contribution)	$1,000,000
Arapahoe County 2018/2019 Budget	$2,000,000
SEMSWA 2018/2019 Budget	$700,000
UDFCD 2018/2019/2020 Budget	$4,580,000
Total Budgeted	$15,321,000

PROJECT PROPOSAL SUMMARY SHEET

Project title: Fish passage and monitoring of fish movement on the Cache la Poudre River
Project location: The Cache la Poudre River through Fort Collins
Grant type: Restoration/Stream Management Planning/Monitoring
Grant Request/Amount: $200,000
Cash match funding: $200,000
In-kind match funding: 0
Project sponsor: City of Fort Collins (sponsor and fiscal agent)
Contact: Jennifer Shanahan, Natural Areas Department, jshanahan@fcogov.com, 970-221-6281

Project summary description: The purpose of this grant is to fund two initiatives directly related to the collaborators' goal of enhancing the health of the Cache la Poudre River (Poudre) by supporting the vulnerable populations of native plains fish and the valued recreational trout fishery. This will be accomplished through improvement of aquatic habitat connectivity and with enhanced understanding of fish movement using two distinct yet interrelated projects:

Grant project #1: Fish passage installation in the Timnath Inlet Ditch diversion dam
The Timnath Reservoir Inlet Ditch (a.k.a. Cache la Poudre Reservoir Inlet Ditch, WDID 0300924), owned by the Cache la Poudre Reservoir Company (CLPRC), is a major barrier to aquatic habitat connectivity on the Poudre. The structure is impassable many months of the year due to the structure's size and the timing and type of CLPRC's water right. The City has been working in collaboration with CLPRC for the past two years to design fish passage for this structure, which is now complete, presenting a shovel ready project (pending permits). With this grant proposal the **City seeks to secure sufficient funding for the construction/installation of fish passage in the Timnath Reservoir Inlet diversion** (Timnath Inlet) in the fall/winter of 2018/2019.

Grant project #2: Evaluating effectiveness of fish passage – a fish movement monitoring program
A recent river health assessment for the Poudre, in the vicinity of Fort Collins, identified native plains fishes and aquatic habitat fragmentation as two of the most impaired elements of the system. Diversion structures impede upstream movements of fish and flow fluctuations are sometimes extreme, especially in base flow periods such as November to March. Fish movements may be restricted by numerous in-channel diversion structures that prevent fish passage most months of the year, which ultimately, may affect population health of the fish community.

With significant investments going into numerous structures on the Poudre and around the state, the City seeks to better understand the effectiveness of these costly infrastructure investments within the context of movement patterns and stressors on the fishery. To that end, **we propose a three-year monitoring program with a set of integrated objectives to monitor fine-scale fish community composition, background fish movement rates in reaches with complex and simple habitat and passage rates of fish over existing diversion dams via fish passage devices.** Results of this evaluation will allow the City to not only determine the efficacy of existing structures but the best placement of new ones moving forward.

Project Location: The Timnath Inlet is located on the Poudre between Lemay Avenue and Timberline Road (N=453789.5180, E = 126496.6480). The Timnath Inlet represents approximately the midpoint of the monitoring program study area which would extend on the Poudre from Overland Road downstream to Interstate 25. A map is provided in **Attachment A**.

Project Proposal Summary Sheet

Project Title: Building a Legacy in Left Hand Creek Watershed

Project Location (include map and/or latitude/longitude if applicable): Longmont, CO (See Attachment 1)

Grant Type (see guidance document for grant types): Multiple objectives (Watershed/Stream Restoration and/or Protection Grants, Flood Mitigation Grants)

Grant Request/Amount: $176,085

Cash Match Funding: $178,185

In-kind Match Funding: $30,000

Project Sponsor(s) (identify the fiscal agent if different from the project sponsor): Lefthand Watershed Oversight Group

Contact person name, email address, and phone number: Jessie Olson; jolson@lwog.org; 303.746.7937

Brief description of the project:

The Lefthand Watershed Oversight Group (LWOG) recently completed ten river restoration projects in the Left Hand Creek Watershed, and currently has an additional ten projects in progress. Each of these project sites sustained significant damage during the 2013 floods. Upon completion, each of these project sites directly improve the ecology, health, safety, and quality of life for landowners within the project areas. To ensure the long-term success of these watershed restoration projects, LWOG is implementing a new multi-objective project that combines adaptive management and stewardship. To implement this project, LWOG is leveraging our recently completed stewardship handbook project and new adaptive management framework project, both funded by the Colorado Division of Local Affairs CDBG-DR program. Our goal is to engage our community in the long term management of restored project areas using quantifiable methods that are well suited for dynamic watershed processes. The outcome will be a long standing legacy of resilience and recovery throughout the watershed.

Project Title: Plumb Ditch Planning Effort
Project Location: Project area is located on the South Platte River near the municipal area of Kersey, Colorado in Weld County and identified in Middle South Platte River Restoration Master Plan as Reaches 16 & 17. Specifically, this Plumb Ditch Planning effort focuses on the reach of river between Highway 34 Business Route and the Weld County Parkway.

Figure 1 Vicinity Map Identifying proposed project area.

Grant Type: Watershed/Stream Restoration and Protection Grant
Grant Request/Amount: $150,000
Cash Match Funding: $110,000
In-kind Match Funding: $40,000
Project Sponsor: Middle South Platte River Alliance
Contact person name, email address, and phone number:
Chloe Lewis, clewis.mspra@gmail.com, 970-313-8235
Amanda Brooks, abrooks.mspra@gmail.com, 970-347-0968
Brief description of the project:
The Plumb Ditch reach of the South Platte near Kersey, Colorado has excellent potential for a multi-objective approach to river restoration that does not yet exist in the area. A project designed in this reach will combine the restoration of stream channels and riparian areas, erosion control, and the creation of habitat for both aquatic and terrestrial species as well as recreation and public safety enhancements. This project can serve as a demonstration area illustrating a collaborative approach that combines agricultural uses with recreational benefits.

Colorado Water Conservation Board
Colorado Watershed Restoration Program
Project Proposal Summary Sheet

Project Title:
Emergency Watershed Protection (EWP) Project Maintenance & Monitoring

Project Location:
Locations within Boulder County, CO: McConnell, Apple Valley North and South project areas.

Grant Type:
Watershed/Stream Restoration

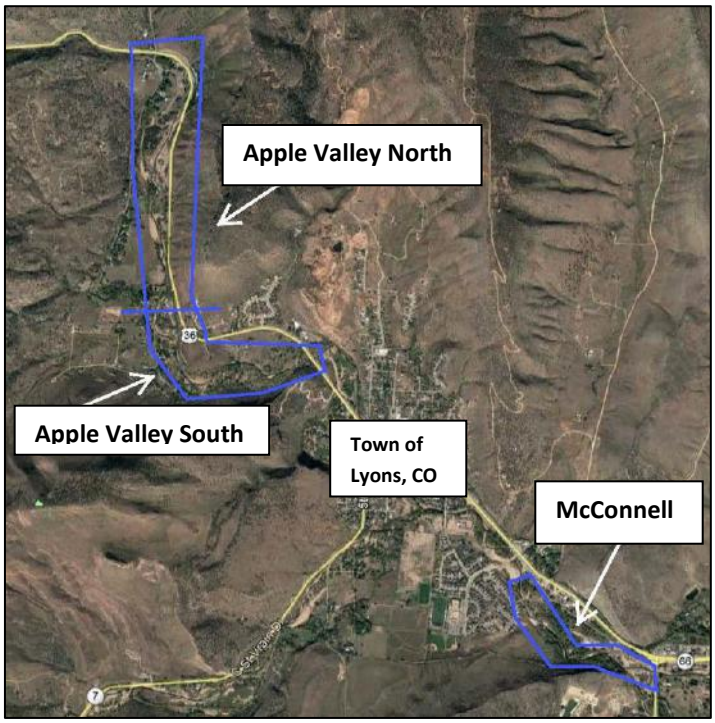
Grant Request/Amount:
$133,120

Cash Match Funding:
$66,560

In-kind Match Funding:
$176,384

Project Sponsor:
Saint Vrain Creek Coalition (SVCC)

Contact:
Cecily Mui, SVCC Watershed Coordinator
cecilym@saintvraincreekcoalition.org
303-774-4514



Brief project description:
By March 2018, the Saint Vrain Creek Coalition (SVCC) will have completed three flood recovery projects in the St. Vrain Creek Watershed: Apple Valley North, Apple Valley South, and McConnell. These three projects were identified by the Natural Resources Conservation Service (NRCS) Emergency Watershed Protection (EWP) Program as being high-priority projects, and in 2017 received funding from the program to complete restoration design and construction. As local sponsors and project managers for these three projects, the SVCC has accepted the responsibility of maintenance and monitoring for three years beyond construction completion. We recognize that once installed, these projects require maintenance and monitoring support to successfully achieve flood recovery and restoration goals.

The SVCC is seeking funds from the Colorado Water Conservation Board (CWCB) to ensure that the responsibilities it has taken on as local sponsors will be fulfilled and that these projects will continue to function as intended for years to come. Along with our funding request from the CWCB, we are working closely with our partners and stakeholders to realize this important aspect of these projects, with cash and in-kind match.

COLORADO WATER CONSERVATION BOARD
Colorado Watershed Restoration Program – Grant Application

1.0 PROJECT PROPOSAL SUMMARY SHEET

Project Title: Dolores River Restoration Partnership (DRRP) – Ensuring Riparian Restoration following 8 years of accomplishments in Southwestern Colorado.

Project Location: The project is located in the Dolores River watershed, encompassing the riparian corridor between the Dove Creek pump station (RM 18) and the Colorado-Utah state line (RM 148), as well as along 15 miles of Disappointment Creek, a major tributary within the Dolores River HUC-8. Project work spans four counties (Dolores, San Miguel, Montrose, Mesa) and several communities (Bedrock, Paradox, and Gateway) in southwestern Colorado.

Grant Type: Watershed/Stream Restoration and/or Protection (Restoration) Grants
Grant Request/Amount: **$281,300**
Cash Match Funding: $*237,055*
In-kind Match Funding: *$205,329*

Project Sponsor: Conservation Legacy – Southwest Conservation Corps
Contact Persons: Mike Wight, mike@conservationlegacy.org, (970)749-2796
Emily Kasyon, ekasyon@conservationlegacy.org, (719)930-0377

Brief Description of Project: The DRRP is requesting CWCB funding to support five specific activities across 100 miles of the Dolores River in Southwestern Colorado for over a 2 year period:
(1) 20 acres of initial riparian tamarisk treatments on public and private lands within the greater boundaries of the Uncompahgre Field Office will be completed by conservation corps crews; **(2)** 800 acres of restoration site monitoring per year; **(3)** 350 acres of restoration maintenance per year; follow-up riparian weed treatments (e.g. Russian knapweed, tamarisk resprouts) and monitoring within Tres Rios, Grand Junction, and Uncompahgre BLM field offices by conservation corps strike teams; **(4)** 30 acres of active revegetation at sites with low potential for native revegetation or high potential for secondary weed infestation; **(5)** education and outreach including 6 volunteer projects and public education with community members and school groups within the three BLM field offices.

These activities will enhance habitat for aquatic and terrestrial species (including ESA-listed and sensitive species), entail intensive restoration of riparian areas, enhance recreational access, improve water quality, and reduce groundwater consumption by invasive tamarisk while advancing towards the DRRP's long-term vision of a Dolores River riparian corridor that is more naturally functioning, self-sustaining, diverse, and resilient over time.

2.0 PROJECT OVERVIEW

On behalf of the Dolores River Restoration Partnership (DRRP), Conservation Legacy's Southwest Conservation Corps (SCC) is requesting $281,300 to ensure riparian restoration success across 145 miles of the Dolores River and its tributaries in southwest Colorado. Since

Project Proposal Summary Sheet

Project Title:	Eagle River Integrated Water Management Plan (ER-IWMP)
Project Location:	Eagle River, Eagle County, Colorado
Grant Type:	Watershed Restoration Program: Stream Management Planning
Grant Request Amount:	$181,445
Cash Match Funding:	$181,500
In-Kind Match Funding:	$27,000
Project Sponsor:	Eagle River Watershed Council (ERWC)
Contact:	Holly Loff, Executive Director Email: loff@erwc.org Phone: 970-827-5406 PO Box 5740 Eagle, CO 81631 www.erwc.org

Brief Project Description:

The Eagle River Integrated Water Management Plan (ER-IWMP) intends to develop proactive water management recommendations that anticipate changes to local hydrology due to 1) population growth and increasing municipal demand for water in Eagle County, 2) climate change, and 3) projects related to the Eagle River MOU (ERMOU), an intergovernmental agreement for developing municipal water supplies in the upper Eagle River watershed.

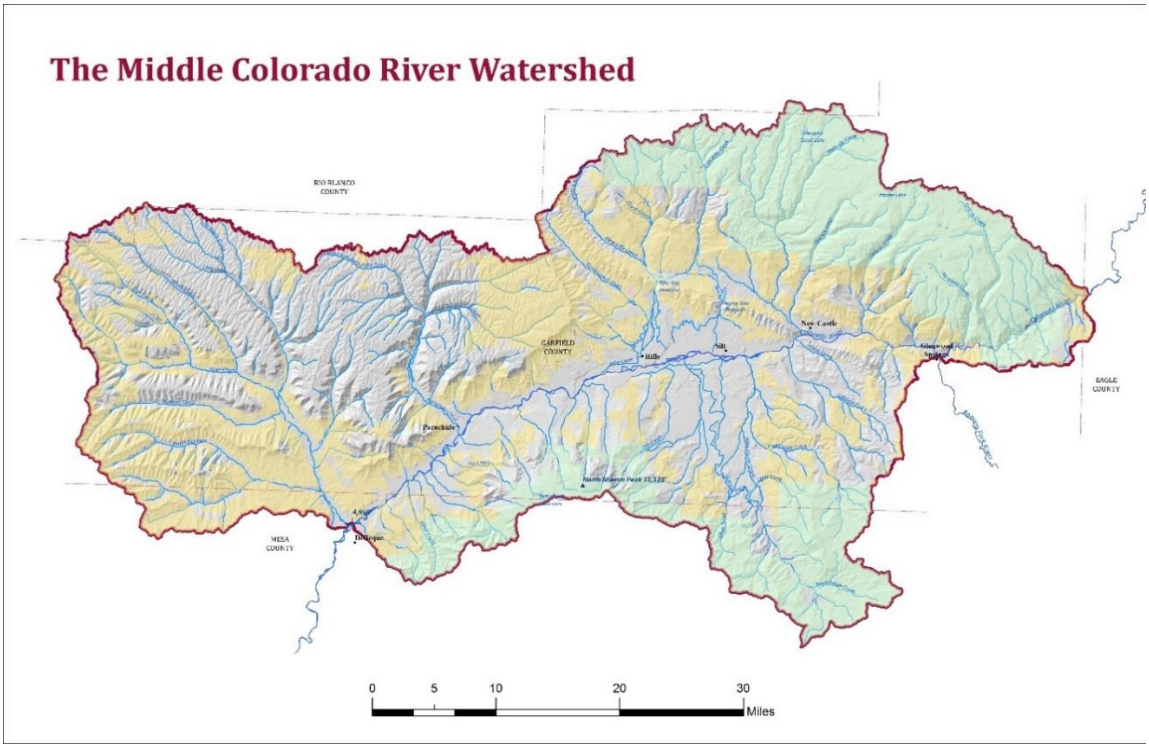
The ER-IWMP will be developed through a stakeholder process with local conservation organizations, state and federal agencies, recreational users, ERMOU partners, commercial fishing/rafting guides, local municipalities, agricultural, and other local stakeholders to develop strategies that can respond to these changes in a way that helps meet municipal demands, while maintaining and improving ecological attributes in the Eagle River watershed. For example, the ER-IWMP will look at how the Western Slope's appropriated portion of the ERMOU waters can best be managed for the protection of Eagle County's water-dependent recreation-based economy (fishing, rafting, skiing, etc.) and ecosystem function.

Eagle River Watershed Council (ERWC) has a tradition of coordinating collaborative stakeholder processes. The Integrated Water Management Planning process will draw upon our extensive experience managing these types of projects. Although the IWMP process will not officially be underway until early 2018, ERWC has already initiated conversations with stakeholders. By meeting with the stakeholders early we have a strong understanding of the individual objectives of each. This understanding guided the goals, objectives and overall scope of work presented for this Colorado Watershed Restoration Program Grant Application.

While this ER-IWMP will be grounded in the complex interplay of biology, hydrology, channel morphology, and alternative water use and management strategies, it foresees the integration of both consumptive and non-consumptive uses to ensure that all existing and future uses are considered. The ER-IWMP will safeguard the interests of the community and extended stakeholders, which include the environmental and recreational use needs. ERWC will provide the opportunity for all interested parties to participate. Additionally, ERWC will educate the community so that the results of this plan are accepted as a fair and reasonable approach to managing our precious water resource.

Colorado Water Conservation Board
Colorado Watershed Restoration Program
Grant Application – Summary Sheet

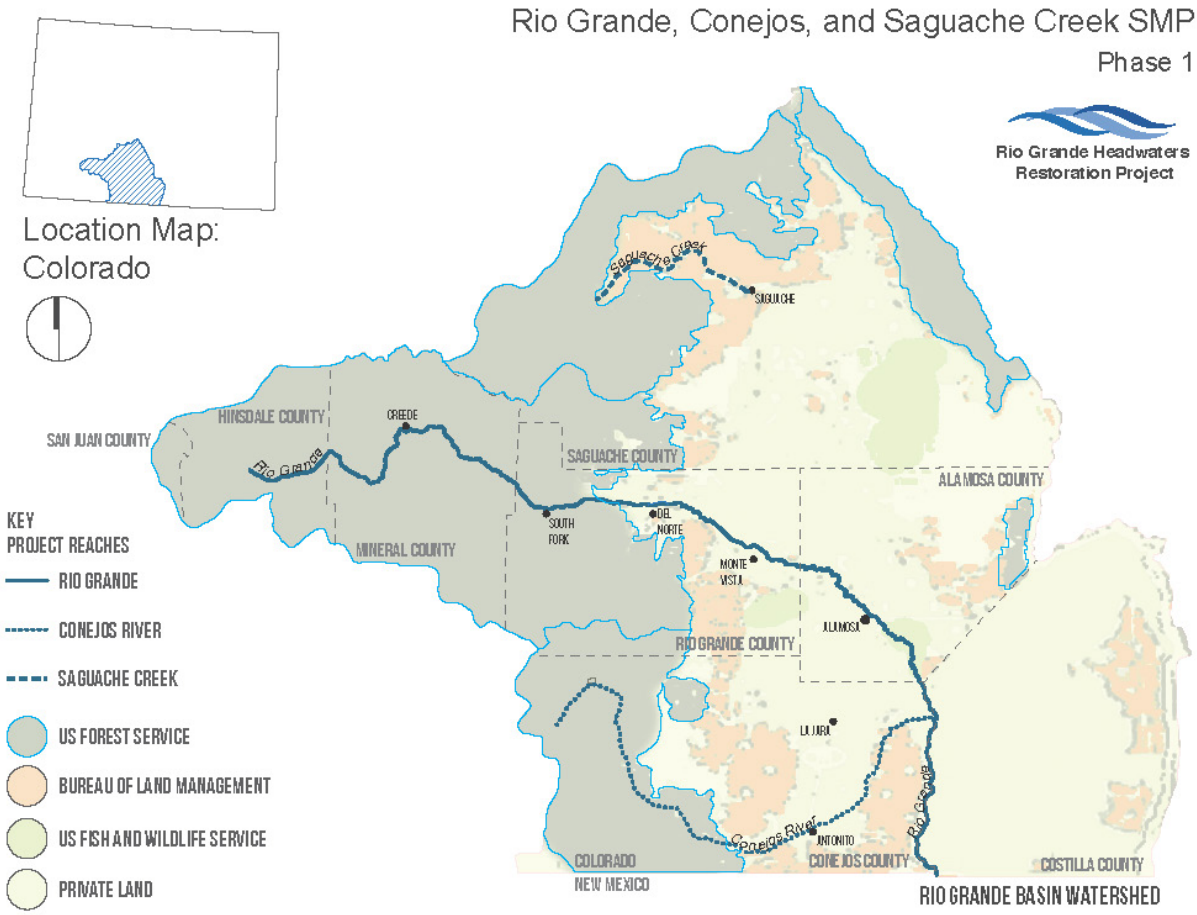
Project Title: Middle Colorado Integrated Water Management Plan
Project Location: Middle Colorado River Watershed (see map below)
Grant Type: Stream Management Plan Grant
Grant Request/Amount: $ 207,600
Cash Match Funding: $ 141,400
In-kind Match Funding: $ 66,200
Project Sponsor: Middle Colorado Watershed Council
Contact Information: Laurie Rink, Executive Director, laurie@midcowatershed.org, 303-204-4164
Project Description: The long-term goal of the IWMP project is to improve security for all water uses in the planning area by understanding and protecting existing uses, meeting shortages, and maintaining healthy riverine ecosystems in the face of increased future demand and climate uncertainty. The planning and implementation effort will be conducted in a series of phases as stakeholder interest and funding allows. The first phase initiates a process of identifying water needs for environmental and recreational uses, determining if gaps exist and, if so, finding voluntary-based solutions for filling the gaps in conjunction with the needs of agricultural, domestic and industrial water users. The geographic focus in phase one is on the "middle" section of the Colorado River, an area that includes 75 miles of the mainstem. CWCB funds will be used to conduct technical assessments, develop a hydrology model, and support a robust stakeholder engagement process that will help inform the investigation of, selection, and prioritization of projects, processes and/or management actions that further the long-term project objective. Outcomes from phase one will chart the course for a subsequent phase of planning work in a subset of tributaries to the middle Colorado, and will likely include recommendations for implementation projects on the mainstem.



Colorado Watershed Restoration Grant Proposal

Project Title: Rio Grande, Conejos River, and Saguache Creek Stream Management Plan – Phase 1

Project Location: Rio Grande from Rio Grande Reservoir to the State Line; Conejos River from Platoro Reservoir to the confluence with the Rio Grande; Saguache Creek from the United States Forest Service (USFS) Boundary to the Town of Saguache.



Grant Type: Stream Management Plan Grant
Grant Request: $118,000
Cash Match Funding: $99,660
In-kind Match Funding: $20,600
Project Sponsor: Colorado Rio Grande Restoration Foundation, fiscal agent for the Rio Grande Headwaters Restoration Project
Contact Person: Emma Reesor, Executive Director, emma@riograndeheadwaters.org, (719) 589-2230

The project will capitalize on the community's momentum toward the effort to create stream management plans (SMPs) for portions of the Rio Grande, Conejos River, and Saguache Creek. The SMPs will utilize existing data regarding the physical condition of reaches and data collected through targeted sampling. The collection, summary, and application of the data will be completed with ongoing stakeholder participation. The goals identified in the SMPs will further the efforts of the communities of the San Luis Valley to improve flows and physical conditions of priority streams for environmental, recreational, and community benefits.

1. PROJECT PROPOSAL SUMMARY SHEET

Project Title: St. Vrain & Left Hand Stream Management Plan

Project Location: South St. Vrain Creek, Middle St. Vrain Creek, North St. Vrain Creek, and the main stem of St. Vrain Creek to the confluence of the South Platte River, also including the tributary of Left Hand Creek upstream and including its tributaries James Creek and Little James Creek. (See Attachment A)

Grant Type: Watershed Restoration Program: Stream Management Planning

Grant Request: $150,000

Cash Match Funding: $57,500
WSRF Grant Match: $50,000 (Pending Approval)
In-Kind Match Funding: $7,000
Cash Match Funding: $35,500 (Request and Approval Necessary)

Project Sponsor: St. Vrain and Left Hand Water Conservancy District

Contact: Sean Cronin, Executive Director, 303-772-4060, sean.cronin@svlhwcd.org

Project description:
The St. Vrain Creek watershed (which includes Left Hand Creek) is critical to maintaining the health, biodiversity, character, and economy of communities within the region, including Lyons and Longmont. The creek is home to a diverse population of native fish, receives Colorado River transmountain water, hosts one of the country's largest outdoor games, has its headwaters in Rocky Mountain National Park and the Indian Peaks Wilderness, and its confluence in a county that is the largest agricultural economic producing county in Colorado. Further, the watershed has a diverse array of stakeholders that use and derive value from the waters including agricultural users, domestic water providers, and recreational users.

Colorado's Water Plan (CWP) sets a measurable objective to cover 80 percent of the locally prioritized lists of rivers with stream management plans. CWP used the South Platte Basin Implementation Plan (BIP) to help inform this measurable objective. The South Platte BIP studied a reach of St. Vrain Creek for environmental and recreational opportunities and concluded streamflows may be present to achieve environmental and recreational outcomes. However, the BIP further concluded "studies that relate the channel form and function to the streamflows can make assessment of flows in the area more robust". Moreover the BIP further states, in recognition of the significant post-flood stream restoration activities "assessments should be made regarding the requirements of aquatic and riparian ecosystems in the area…".

The BIP also concluded for the St. Vrain that "streamflows necessary for recreational needs should be assessed". Opportunities for flow improvements may be available. For example, the BIP referenced the St. Vrain as one of two tributaries to the South Platte River that have the largest annual potential for water availability, furthermore the St. Vrain and Left Hand Water Conservancy District (District) owns a relatively senior water right, not currently in use, decreed for uses that include environmental and recreation.

With such a wide range of uses and intense focus of study, the St. Vrain poses an excellent opportunity to balance river health with water users' needs through completion of a stream management plan (SMP).

The overall goal of the SMP is to collaboratively identify projects and management strategies in both St. Vrain and Left Hand Creeks that transition stakeholders from flood recovery to stream health projects that improve environmental conditions in the river while also meeting water users' current and future needs and are aligned with private property rights, public land and resource management plans, and the prior appropriation system. The District will lead the development of a SMP that will take place in two phases over approximately five years.

Colorado Watershed Restoration Program
PROJECT PROPOSAL SUMMARY SHEET
Project Title: Arkansas River Basin Watershed Restoration: 2018 ARWC Initiatives

Project Locations: Arkansas River Basin Watershed - Hayden Pass, Lower Arkansas River Valley and Purgatoire watershed
Grant Category: Watershed Restoration and Protection
Grant Request: $588,000

Cash Match Funding: Matching funds exist through diverse stakeholders and agencies: NRCS Emergency Watershed Protection funding (for a match of 75%); the U.S Geological Survey, Fremont County, and the City of Trinidad. ARWC and the CO Department of Health & Environment are actively committed to additional funding sources.

In-kind Match Funding: The Lower Arkansas Water Quality Work Group is providing in kind match of staff, as is ARWC. Commitments of in-kind volunteer assistance exist through ARWC and partnering agencies.

Project Sponsor: Arkansas River Watershed Collaborative (ARWC)
Primary Contact: Carol Ekarius
PO Box 726, Lake George, CO 80827
Carol@co-co.org 719-748-0033

Grantee and Fiscal Agent:
Coalitions & Collaboratives, Inc.
Primary Contact: Carol Ekarius
PO Box 726, Lake George, CO 80827
Carol@co-co.org 719-748-0033

Brief Project Description(s):
This is a three-part initiative that continues collaborative efforts by the Arkansas River Watershed Collaborative (ARWC). The work has multiple benefits, diverse stakeholders, and works across key geographic areas in the Arkansas watershed. The projects protect water, lands and natural resources and address long-term needs. All work includes the task of project management and oversight, utilizing stakeholder involvement and outreach.

1. The **Hayden Pass Fire** recovery work in the upper Arkansas watershed is imperative to protect infrastructure, habitats and to prevent on immediate and downstream water quality issues. This addresses ongoing urgent needs and provides critical cash match for Emergency Watershed Protection funds.
2. A **Lower Arkansas Valley Selenium Science Plan** is identified in the Colorado Water Plan as a significant gap in the Arkansas Basin Project Database. The project will provide a sound scientific basis for mitigating water-quality impacts on municipal, agricultural and rural communities, and help prioritize future projects. In addition, the project provides an opportunity for constructive dialogue with downstream interests, and reducing the risks of non-compliance with Clean Water Act.
3. Establish organizational and project-building capacity for the **Purgatoire Watershed Partnership (PWP)** to strategically build partnerships supporting long-term watershed health initiatives. Work includes monitoring and a hydrology assessment to determine status and needs, and to be used as guidance in future stream management.

TASK 1. The Hayden Pass Fire, Fremont County: Multiple flood events have occurred post-fire. The site has two major ephemeral drainages that contribute to the flooding and deposit large amounts of debris. Runoff flows through Harry Walker Dam appx. ¼ mile before it enters the Arkansas River. The dam historically held several feet of water with large trout living in a healthy ecosystem prior to the first flood in 2016. Debris now accumulates against the dam wall; flanks the dam and runs down Fremont CR 39 to Highway 50 to the river. Estimates are that during a 25-year storm event overflow will occur at the dam. Overflow will then overcome CR 39, and enter U.S. Highway 50 and the river, which parallels the highway. Recent flooding issues black water into the river, impacting fisheries, recreation and water supplies, including Penrose Municipal Water and Pueblo Reservoir. Fremont County has contracted with NRCS for EWP funds. This funding, and any future funding, will be applied as 25% cash match for EWP and may be modified to address additional priority needs, (see attached DSR).

Objectives:

1. Provide matching funds for federal EWP funds.
2. Reduce flooding; debris flows, and sediment in the burn scar and the Arkansas River.
3. Enable floodplains to become usable areas of debris deposition during storm events.
4. Protect: infrastructure, water quality, human life and safety, and public health.
5. Protect watershed health and habitat for fisheries and wildlife.

TASK 1 A - Build one off-channel sediment detention basin on State Trust Lands: Build a cleanable, off-channel sediment detention basin. Establish access for heavy equipment to construct the basin (washed away in recent floods).

Method/Procedure

Engineer an off-channel cleanable sediment detention basin with concrete headwall and outlet. Create channel stabilization and grade control along the basin with heavy equipment to prevent lateral cutting.

Deliverables

1. (1) off-channel cleanable sediment detention basin, appx. (5) acre feet, with drain pipes that will slowly release the water within 72 hours of a storm event.
2. A detailed plan on how to access and to clean the basin, in order to preserve functionality.
3. Capturing of debris and sediment off of the burn scar before it impacts infrastructure.
4. Rebuild .36 miles of road, creating access for vehicles and heavy equipment.

Task 1 B - Bank stabilization and grade control from the burn scar to the Little Cottonwood confluence (including Bitter/Butter).

Methods /Procedures

Use heavy equipment to build rock grade control and channel stabilization where floods directly threaten CR 40 and along Bitter/Butter drainage, and its aligned irrigation pipes. Engineers will be utilized for the no rise certificate and basic channel typicals.

Deliverables

1. A minimum of (10) grade control structures, such as cross vanes and sills.
2. A minimum of 2,000 feet of bank stabilization and/or reconstruction.
3. Mitigate head cutting on Bitter/Butter and redirect storm flow impacts where possible.
4. Create one (1) emergency for basin-one time.
5. Enhanced floodplains; lower the level of the floodplain, and encourage the stream to redistribute sediment load in rebuilding historical stream banks.

Task 1 C – Drop pools, channel restoration and grade control from below Bitter/Butter through Little Cottonwood, to the Harry Walker Dam.

Methods/Procedures

Engineered design along Big Cottonwood to protect CR 40; heavy equipment will create grade control, drop pools and channel stabilization. Grade control structures will protect (2) head gates.

Deliverables

1. At least two (2) series of drop pools, containing 3 to 5 pools each.
2. A minimum of four (4) grade control structures such as vanes and sills.
3. Redesign of the existing pond outlet at Little Cottonwood, including: grade control and establishing a channel from Little to Big Cottonwood drainages.
4. Clean debris out of floodplain, making them accessible to flood waters.
5. At least one (1) grade control structure at the top of Harry Walker Dam: ~ 3 acres.
6. If possible, continue lowering sediment, while equally lower the Harry Walker Dam wall.

Task	Description	Start Date	Completion Date	CWCB Funds	Funding Cash	Funding In-Kind	Total
1 A	Detention Basin	Upon contract	Prior to Dec.2018	$87,000	EWP: $261,000	TBD	$348,000
2 B	Stabilization, grade control	Upon contract	Prior to Dec. 2018	$130,000	EWP: $390,000	TBD	$520,000
3 C	Drop pools, channel restoration	Upon contract	Prior to Dec. 2018	$133,000	EWP: $399,000	TBD	$532,000
	Totals:			**$350,000**	**$1,050,000**		**$1,400,000**

TASK 2. Selenium Science Plan, Lower Arkansas River Valley (LARV) Pueblo, Otero, Bent, Crowley, and Prowers Counties: CWCB's former staff member on the Lower Ark Water Quality Work Group (LAWQWG), Steve Miller, originally proposed this concept based on work done in the Gunnison. LAWQWG includes EPA, CDPHE, and other agencies seeking an improved understanding of the water quality sources, transport and mitigation in the LARV. This reach of the Arkansas River has concentrations of selenium, uranium, dissolved solids and nutrients that increase downstream and, in some places, exceed various environmental standards. The U.S. Geological Survey (USGS), Colorado Water Science Center will develop a science-planning document (Plan) to aid in that understanding. Dissolved selenium concentrations in many areas exceed the Colorado chronic aquatic-life standard of 4.6 micrograms per liter, and groundwater exceeds drinking and livestock standards of 0.05 mg/L. The Arkansas River as well as many of its tributaries between John Martin Reservoir and the Colorado – Kansas state line is listed as 'impaired' for selenium as well as uranium under the Clean Water Act, Section 303(d). Dissolved solids (salt) concentrations in irrigation water diverted from the river drive yield reductions in irrigated crops, both within Colorado and downstream. Nutrients (nitrogen and phosphorus) are being monitored in the Arkansas River to assess the environmental impact these chemicals may have, and promote their reduction in the environment in anticipation of statewide nutrient standards to be promulgated in 2022. Contributions of all these constituents to the river arise from anthropogenic activity, as well as complex interactions between Cretaceous marine sedimentary rocks present in the valley and 400,000 acres of irrigated agriculture and associated water infrastructure. The challenges of radionucleotides in municipal drinking water, along with high salinity for agricultural water, combine to make this Plan a fundamental step in addressing regional water resource efficiency. The Plan supports the work of multiple Federal, State, and local agencies.

Objectives:

1. Develop an overarching plan for scientific study and monitoring to better understand the effects of selenium, uranium, nutrient and dissolved solid sources, transport, receptors, and on-going or planned mitigation projects in the basin.
2. Provide an improved understanding of the sources, transport, and potential mitigation strategies for selenium, uranium, dissolved solids, and nutrients.
3. Identify past and present data gaps and direct future monitoring and research efforts.
4. Describe and evaluate ongoing projects and studies that seek to understand and reduce the constituents of interest in order to reduce redundant research.

Method/Procedure

As a component of the 2017 ARWC strategic plan, the LAWQWG was formed and will help with facilitation to develop a comprehensive long-term plan. Consultations with stakeholders will continue throughout the Plan's development. USGS will use standard scientific investigations.

Deliverables

A peer reviewed, published USGS Water Resources Investigations report, providing:

1. Sound scientific basis for developing strategies and mitigating water quality impacts on agriculture and rural communities in the LARV, Pueblo to state line.
2. Data for constructive dialogue with downstream interests, including the State of Kansas.
3. Scientific basis toward maximized use of water resources: reuse, water sharing and improved infrastructure.
4. Scientific data to stimulate investment by entities in local water quality initiatives, building upon two years of substantial local investment by municipal and agricultural interests.

Task	Description	Start Date	Completion Date	CWCB Funds	Funding Cash	Funding In-Kind	Total
2	Se Science Plan	Upon contract	By Dec. 2018	$95,000	USGS: $30,000 CDPHE: $15,000	LARVQWWG Staffing: $50,000	$190,000
	Totals:			**$95,000**	**$45,000**	**$50,000**	**$190,000**

TASK 3. Purgatoire Watershed Organizational Capacity Building, Monitoring and Hydrology/Hydraulics Assessment, Las Animas County: The Purgatoire Watershed Partnership (PWP) seeks to build organizational capacity, strengthen funding and hire a full time coordinator in order to move partnerships toward project implementation. Funding will support monitoring and an assessment report of work to date. Long-term work planning needs include stream protection through restoration and erosion reduction projects including: improved aquatic habit, treatment of invasive species; increased channel capacity for storm water releases; stream bank stabilization and fuels reduction projects. The City of Trinidad has committed $50,000 to meet these goals and ARWC and CDPHE will contribute funding sources to make a 1:1 match. Ongoing commitments of funds are expected through the city, private funders and CDPHE.

TASK 3 A – Organizational Capacity

Implement strategic planning and strengthen governance through board trainings. A watershed coordinator position will enable administrative, fiscal, and grant writing management.

Method/Procedure

Under COCO/ARWC guidance, PWP will strengthen board guidance and fiscal support; develop a long-range work plan, and master plan for the Trinidad Riverwalk Project.

Deliverables

1. Board of Directors training and governance.
2. Update strategic and master plans.
3. Fund a full time watershed coordinator position for two (2) years.

TASK 3 B – Monitoring: Prior and ongoing monitoring data for the river corridor will be assimilated to provide a science based report used to identify future data gaps and project needs.

Method/Procedure

In 2011, an Assessment of Current River Condition & Fisheries Enhancement potential report for the Purgatoire River was created, representing appx. five miles of river. In-stream habitat structures: cross-vanes, J-hooks, and boulder clusters have been installed in approximately 1.5 miles of the river. Extensive monitoring has not been completed to evaluate the effectiveness of the structures on improving fish habitat, stabilization of the stream channel, and overall condition of the river. Monitoring will be conducted in order to determine trends and needs. The data will help determine if the work is achieving goals and will be used to complete a future stream management plan and master planning.

Deliverables

A peer reviewed monitoring assessment that includes: photos, cross section and longitudinal profiles and water quality monitoring data. The report may include available data on benthic organisms, macro-invertebrates, or fish shocking studies.

TASK 3 C – Hydrology/Hydraulics Assessment: Assessment of the river corridor will evaluate work completed and identify future needs. The purpose of is two-fold: determine how to best manage winter flows to create a self-sustaining fishery; and determine how to best manage controlled released of storm water from Trinidad Reservoir with the goal of preparing for the potential maximum release of 5,000 cfs as is required under the Kansas Colorado Arkansas River Compact.

Method/Procedure:

Utilizing contractors/engineers experienced in hydrology/hydraulics analysis of streams to perform an assessment from Trinidad Reservoir to the end of the project reach (appx. 5 miles).

Deliverables:

A comprehensive assessment of the work to date providing future direction to improve flow management, bank stabilization and aquatic habitat.

Task	Description	Start Date	Completion Date	CWCB Funds	Funding Cash	Funding In-Kind	Total
3 A	Org Capacity	Upon contract	By Dec. 2019	$40,000	City of Trinidad: $15,000	PWP Staff: $10,700 WSRF: $14,300	$80,000
3 B	Monitoring	Upon contract	By Dec. 2019	$25,000	City of Trinidad: $17,500	CDPHE: $5,000	$47,500
3 C	Hydrology/Hydraulics Assessment	Upon contract	By Dec. 2019	$25,000	City of Trinidad: $17,500	CDPHE: $10,000	$52,500
	Totals:			**$90,000**	**$50,000**	**$40,000**	**$180,000**

TASK 4 – Project Management: landowner coordination, oversight, reporting, and outreach (for Objectives 1 – 3): Oversight and reporting of project activities and outcomes, and stakeholder coordination and outreach.

Method/Procedures

ARWC is experienced in on-the-ground projects and active in collaborating with partners and contractors in post-fire restoration, flood mitigation, monitoring and stream analysis. ARWC is also active in public outreach and coordination with landowners and stakeholders.

Deliverables

1. Facilitate stakeholder and landowner coordination and public meetings.
2. Acquire and manage additional funding.
3. Contracting and management of consultants, heavy equipment crews, and agreements with other service providers (other NGOs, hand crews, etc.).
4. Follow CWCB reporting as described below, including: providing as-built drawings, GIS data and mapping, with pre and post photo points to document work completed.

Task	Description	Start Date	Completion Date	CWCB Funds	Funding Cash	Funding In-Kind	Total
4	Project Management: (Tasks 1-3)	Upon contract	By Dec. 2019	$53,000			$53,000
	Totals:			**$53,000**			**$53,000**

Reporting: The applicant shall provide the CWCB a progress report every 6 months, beginning from the date of the executed contract. The progress report shall describe the completion or partial completion of the tasks identified in the statement of work including a description of any major issues that have occurred and any corrective action taken to address these issues.

Final Deliverable: At completion of the project, the applicant shall provide the CWCB a final report that summarizes the project and documents how the project was completed. This report may contain photographs, summaries of meetings, science plans and engineering reports/designs.

Budget Narrative & Timeline: Long-term funds are being sought all projects. BOCCs, state representatives, land managers and the public have made strong commitments. CO State Department of Homeland Security & Emergency Management has also committing funding for Hayden Pass Fire recovery. Work will begin spring of 2018, upon contract, and completed before December 31, 2019. Hayden Fire projects, under EWP contract, will be completed prior to the end of 2018, as will the Selenium Science Plan.

Budget Overview:

Task	Description	Start Date	Completion Date	CWCB Funds	Funding Cash	Funding In-Kind	Project Total
1	Hayden Pass Fire	March, 2018	Dec. 2018	$350,000	$1,050,000	TBD	$1,400,000
2	Science Plan	March, 2018	By Dec. 2018	$ 95,000	$ 45,000	$50,000	$ 190,000
3	Purgatoire Watershed	March, 2018	Dec. 2019	$ 90,000	$ 50,000	$40,000	$ 180,000
4	Project Management	March, 2018	Dec. 2019	$ 53,000			$ 53,000
	Totals			**$588,000**	**$1,145,000**	**$90,000**	**$1,823,000**

PROJECT PROPOSAL SUMMARY SHEET

Project Title: *Fountain Creek Channel Restoration Design in Pueblo, CO*

Project Location: *Fountain Creek between 8th Street and 13th Street in Pueblo, CO. See Attachment II for project map.*

Grant Type: *Watershed/Stream Restoration and /or Protection (Restoration) Grants*

Grant Request/Amount: *$190,000 (CWCB)*

Cash Match Funding: *$200,000 (District)*

In-Kind Match Funding: *$45,000 (Stakeholder labor from Pueblo, Pueblo County, District Technical Advisory Committee and District Citizens Advisory Group)*

Project Sponsor(s): *Fountain Creek Watershed, Flood Control and Greenway District*

Contact Person: *Name: Mr. Larry Small, Executive Director*
E-mail Address: lsmall42@comcast.net or Fountainckdist@aol.com
Phone Number: (719) 447-5012

Brief description of the project: *The District-funded Fountain Creek Corridor Restoration Master Plan, published in October 2011 (the Planning Phase), identified as one of its goals to improve watershed health by reducing erosion, sedimentation and flooding within the 50 mile mainstem of Fountain Creek from Colorado Springs, CO to the confluence with the Arkansas River in Pueblo, CO (referred to as the Corridor). The goal of the jointly funded District and CWCB (Grant PDAA5000) Fountain Creek Corridor WARSSS Study, published in March 2017 (the Analysis Phase), was to analyze the contributing factors that lead to sedimentation pollution, sediment yield, and channel stability and instability factors within the 50 mile mainstem of Fountain Creek in the Corridor; with the overall goal of creating a priority list of sites to direct future efforts aiming to reduce sediment sources and improve water quality and channel stability within the Corridor and reduce flooding. The created priority list identified and prioritized 215 sites that require attention. The project funded by this Grant starts the Design Phase for five adjacent sites, PC053, PC054, PC055, PC115 and PC116 (as shown on the project map at Attachment II) combined into a single project. The work to be performed under this Grant, in cooperation with our in-kind funding Stakeholders, will complete a resilient design to reduce erosion and sedimentation; correct channel instability; restore and protect wetlands; restore and protect riparian habitat; protect recreational assets; protect transportation infrastructure; and mitigate future impacts from storm-induced flooding along the reach of Fountain Creek associated with this Grant activity. Completion of the design will immediately lead to start of the Construction Phase that will be performed under separate funding designated for this project area.*

2.0 QUALIFICATIONS EVALUATION (Maximum of 20 points)

2.1 Identify the lead project sponsor and describe the other stakeholders' level of participation and involvement. 10 points

The lead project sponsor will be the Fountain Creek Watershed, Flood Control and Greenway District. The District encompasses El Paso and Pueblo Counties. Political leaders and government staff of these counties will serve as stakeholders to provide a review of the project and design solutions.

2.2 Specify in-kind services and cash contributions (match) amount for the proposed activities. The applicant must provide at least 50% match of the project's total cost. Discuss whether other funding sources are secured or pending. 10 points

- ***In-kind -$45,000:*** *(secured)*
  Labor from the District TAC and CAG staff from the City of Pueblo, Colorado Springs and the City of Fountain, El Paso and Pueblo Counties to provide technical review of the project and design solutions at monthly Stakeholder meetings - $45,000
- ***Cash Contribution*** *– The District - $200,000 (secured)*
- ***Grant Request from CWCB*** *- $190,000 (requested)*
- *The project proposed in this application is not eligible for funding under any other federal or state programs associated with Emergency Watershed Protection or Disaster Recovery. The issues studied by this project are not a direct result of natural disasters but are a result of both storm flows and base flows in the project area over time.*

3.0 ORGANIZATIONAL CAPABILITY (Maximum of 30 points)

3.1 What is the applicant organization's history of accomplishments in the watershed? Provide several past project examples. List partner organizations and agencies with which the applicant worked to implement past projects. 10 points

The District has made it a priority to participate in and in many cases has provided leadership, expertise and funding for the research, development and implementation of potential solutions for the problems in the Fountain Creek Watershed. The following is a brief recap of the cooperative efforts between The District and others for improving the watershed health of Fountain Creek:

- *The District worked with USGS on a Post Burn Water Quality Sampling of Monument and Fountain Creek in which the District provided $12,000 in funding and USGS provided $6,000. The purpose of this project was to determine the impact of water quality in Monument and Fountain Creeks from the Waldo Canyon and Black Forest fires.*
- *The District worked with the USGS Colorado Water Science Center to assess the effectiveness of various management strategies for attenuating peak flows and reducing erosion and depositional side effects of anthropogenic-induced sediment transport. The District provided $313,610 and USGS provided $256,590 to fund the study. The final report, Remediation Scenarios for Attenuating Flows and Reducing Sediment Transport in Fountain Creek, Colorado was published in March 2014 as USGS Scientific Investigations Report 2014-5019.*
- *The District provided $240,000 funding and was instrumental in working with Colorado Springs Utilities as well as the governmental staff and volunteers within Pueblo and El*

Paso Counties to facilitate and complete The Fountain Creek Corridor Restoration Master Plan published in December 2011.

- *The District, City of Pueblo and NRCS, provided nearly $2 million funding and project management services for the design and implementation of the Side Detention and Sediment Collector projects located along Fountain Creek in Pueblo, CO in 2011.*
- *The District, Colorado Springs Utilities, Pueblo Board of Water Works, City of Fountain Utilities, Pueblo West, Security Water and Sanitation District and the Southeastern Colorado Water Conservancy District jointly funded a $26,500 project in January 2015, led by the District, for the analysis of water rights and administrative Issues associated with the operation of a proposed Flood Remediation Project on Fountain Creek and recommending provisions for use in operating the project to insure that downstream water users on the Arkansas River were not injured. This study was completed, published and briefed to the water users and the Arkansas River Basin Roundtable in October 2015.*
- *In December 2016, the District awarded and managed a $5.25 million construction contract, funded by the District, the City of Pueblo, Pueblo County and Colorado Springs Utilities, for a flood control project on Fountain Creek between 8th Street in the City of Pueblo and the confluence of Fountain Creek with the Arkansas River (1.6 miles) to remove vegetation from the east and west banks of Fountain Creek and dredge Fountain Creek an average depth of three (3) feet; remove two (2) in-stream columns to the riverbed level (left from the demolition of an old railroad trestle); and dispose of removed vegetation and sediment from dredging. The purpose of this project was to restore the East Side Levee to its design capacity. This project was completed in October 2017.* ***It is immediately downstream of the project proposed in this grant application.***
- *The District was instrumental in securing funding, providing funding, serving in a leadership role and/or serving as applicant for the following grant applications:*
  1. *Colorado State Parks – Non-motorized Recreational Trails Grant 2010 - Fountain: Clear Spring Connector. The District provided leadership and financial support of $5,000.*
  2. *CWCB - Water Supply Reserve Account 2011- Fountain Creek Bank Restoration at the Frost Ranch. The District provided $45,300 in cash funds and served as applicant and Project Manager. The project restored 400 feet of eroded creek bank, replaced the riparian vegetation that was lost to erosion, cleared deposited sediment from the stream reach and demonstrated many of the remedial methods that will be used on this grant project. The project was completed by the District and the report was delivered to CWCB in May 2014.*
  3. *CWCB - The District was awarded a $35,000 grant from CWCB in December 2011matched by $10,000 cash from the District to perform a Fountain Creek Fish Marking and Monitoring Study to capture and tag fish and track fish migration from the Arkansas River north on Fountain Creek. The study was completed by the District and delivered to CWCB in April 2012.*
  4. *CWCB - The District was awarded a $25,000 grant from CWCB in January 2012 matched by $10,000 cash from the District to perform a Fountain Creek Policy Evaluation Study to encourage the implementation of regional drainage and flood control regulations that consider regional consistency across the 11 government jurisdictions in the Fountain Creek Watershed. The study was completed by the District*

and delivered to CWCB in August 2012.

5. *Great Outdoors Colorado - River Corridors Initiative Grant 2012– The Fountain Creek Watershed Trails and Recreation Projects. The District created the coalition of Colorado Springs, El Paso County and Pueblo, served as one of the applicants, led the development of the grant application, and provided $25,000 and assistance in the preparation and submission of the application and award of the grant.*
6. *CWCB - The District organized the Upper Fountain Creek/Cheyenne Creek Coalition that developed the Upper Fountain Creek/Cheyenne Creek Flood Restoration Master Plan under a CWCB Watershed Restoration Grant Special Release in October 2013. The District provided $25,000 in cash funds and served as the applicant and Project Manager. Coalition members provided $150,000 in cash funds and $87,500 in-kind to match the $175,000 CWCB Grant. The master plan was completed by the District and delivered to CWCB in June 2015.*
7. *DOLA - The District, again leading the Upper Fountain Creek/Cheyenne Creek Coalition, was awarded a $300,000 DOLA CDBG-DR grant in April 2015 matched by $300,000 cash and $50,000 in-kind from coalition members to develop the Monument Creek Watershed Restoration Master Plan. The master plan was completed by the District and delivered to DOLA in November 2016.*
8. *CWCB - The District was awarded a $30,000 grant from CWCB in May 2016 matched by $30,000 cash from the District for development of a Fountain Creek Corridor WARSSS Study. The study identified 215 areas of bank erosion that will need to be addressed to achieve a stable Fountain Creek Corridor. Five of those areas are being addressed by this grant project. Two areas, the Masciantonio Trust and Highway 47, are being address by ongoing District projects. The study was completed by the District and delivered to CWCB in March 2017.*
9. *CWCB - The District was awarded a $41,800 grant from CWCB in May 2016 matched by $25,500 cash from the District for development of an Appraisal-Level Evaluation of Flood Control Options on Fountain Creek to evaluate alternative methods for controlling flooding in Pueblo, CO resulting from storms in the Fountain Creek Watershed. The study was completed by the District and delivered to CWCB in February 2017.*
10. *CWCB - The District was awarded a $93,300 grant from CWCB in January 2017 matched by $40,000 cash from the District for development of a Needs Assessment of Flood Control Alternatives for the Fountain Creek Corridor to assess the development requirements for the alternatives identified in the Appraisal-Level Evaluation of Flood Control Options on Fountain Creek (item 9. Above) and determine the preferred alternative. The Needs Assessment will be completed by the District and delivered to CWCB in January 2018.*
11. *CDOT - The District entered into a contract with CDOT, under the District's lead, for the construction of a stream restoration and bridge protection project at Highway 47 in Pueblo, Co. in June 2017. CDOT will provide $1.5 million in cash funding and the District will provide $4.5 million in cash funding to perform this project. The objective of the project is to protect the HY 47 Bridge from storm flows on Fountain Creek and restore and stabilize 3000 feet of Fountain Creek north of the highway. The District completed a 60% design and awarded a Design/Build Construction Contract in November 2017. The project is anticipated to complete in May 2018.* ***This project is upstream of the project proposed in this grant application and will significantly reduce sediment transported into the proposed project area shown in Attachment II.***

All of the projects identified above were successfully completed on schedule and within budget meeting the requirements of the grant with the exception of 10 and 11, which are currently on schedule and within budget.

3.2 What level of staffing will be directed toward the implementation of the proposed project/planning effort? Discuss the number of staff and amount of time dedicated for the project? Will volunteers be utilized, and if so, how? Include brief resumes for each member of the active project team. 10 points

***Mr. Larry Small, Executive Director of the District**, will serve as project manager and provide 15% of his time to this project. Matrix Design Group and THK Associates, Inc., under an existing Technical Services Contract with the District, will provide one senior level staff person from each office as well as support staff. Senior level staff will dedicate approximately 20% of their time, while support staff will spend approximately 40% of their time working on this project. In addition, The District Technical Advisory Committee and Citizens Advisory Group, with representatives from Colorado Springs, Pueblo, Fountain, El Paso and Pueblo Counties will provide time to serve on a Stakeholder group and perform a technical review of the project and the evolving and final design at monthly Stakeholder meetings during the completion of the work effort.*

***Graham Thompson PE, Matrix Design Group** brings more than 20 years of experience to the water resources team at Matrix Design Group, Inc. with responsibilities in personnel and project management, planning, modeling, design, and regulatory compliance. He has completed numerous watershed and stream corridor planning projects, including the high-profile U.S. Army Corps of Engineers Fountain Creek Watershed Study, and the Fountain Creek Corridor Restoration Master Plan. Graham has led the design and construction of stream restoration and stormwater infrastructure projects for federal, municipal, and industrial clients. Graham is a professional engineer and a professional soil classifier. He holds a Master of Science in Environmental Engineering from New Mexico State University. He also has advanced training in applied river morphology and river restoration, having completed over 300 class and field hours (through the Level IV course) taught by Dave Rosgen of Wildland Hydrology.*

***Kevin Shanks RLA, THK Associates, Inc.** has over 32 years' experience as a Landscape Architect and his work efforts include land use planning, project master planning, preliminary and detailed site design, construction documentation, specification writing, irrigation design and construction administration. Mr. Shanks has extensive greenway and river restoration experience. He has led large multi-discipline planning and design teams to develop regional, community and local greenways.*

3.3 Demonstrate that the project budget and schedule are realistic. Please use the attached budget/timeline spreadsheet. 10 points

Please see Attachment III for the project budget and schedule. The project area as shown in Attachment II encompasses approximately two thousand sixty (2060) feet of creek channel and three thousand six hundred sixty six (3666) bank-feet divided nearly equally on both sides of Fountain Creek in Pueblo. The project area extends north from the 8th Street Bridge over Fountain Creek to just past 13th Street. The project will take eight months to complete using the staff identified in 3.2, above. The first two months will be allocated to project kickoff and data gathering and analysis associated with Phase 1 - Engineering Analysis (see Attachment I, Scope of Work). The result of Phase 1 will be the determination of a preferred

design concept to carry forward into design. The next four months will be used to perform Phase 2 - Draft Design. Phase 2 will determine preliminary permitting requirements, complete 60% design plans and preliminary construction specifications and develop a 60% Opinion of Probable Construction Cost. The final two months will perform Phase 3 - Final Design and Construction Specifications. Phase 3 will produce the 100% design drawings, final Construction Specifications, final permitting requirements and develop a 100% Opinion of Probable Construction Cost. Completion of Phase 3 will lead to the immediate start of the Construction Phase that will be performed under separate funding.

We have based our cost and schedule for this project on prior experience designing similar projects; specifically the Highway 47 Bridge Protection, Bank Restoration and Channel Realignment Project (now under construction) that is on Fountain Creek one mile north of this project and the Masciantonio Trust Bank Stabilization Project (now under construction) that is 10 miles north of Pueblo on Fountain Creek.

4.0 PROPOSAL EFFECTIVENESS (Maximum of 50 points)

4.1 What information is the project sponsor using to develop the proposed plan or project? Include any relevant information regarding existing watershed plans, stream management plans, geomorphic assessments, flood studies, fire protection plans, riparian conditions assessments, aquatic/terrestrial habitat conditions, wildlife studies, and/or river restoration reports. 10 points

The District has played a significant role in the evolution of plans and studies to define stream restoration techniques and requirements for successful development of these type projects. These plans, studies and associated data have developed into a data base of information that will help jump-start the design of this project. *The District will rely on the following documents as a source of information to develop the design:*

- *Strategic Plan, Fountain Creek Vision Task Force, 2011*
- *The Fountain Creek Corridor Restoration Master Plan, December 2011*
- *U.S. Army Corps of Engineers (USACE) - Fountain Creek Watershed Study - Watershed Management Plan, January 2009*
- *U.S. Geological Survey – Remediation Scenarios for Attenuating Peak Flows & Reducing Sediment Transport in Ft. Creek Colorado, March 2014 and other U.S. Geological Survey scientific reports*
- *Bureau of Reclamation Conceptual Geomorphology Mitigation Plan – Southern Delivery System Environmental Impact Statement, February 2008*
- *Fountain Creek Corridor WARSSS Study , March 2017*
- *Appraisal-Level Evaluation of Flood Control Options on Fountain Creek* , December 2017
- *Work products from the on-going Needs Assessment of Flood Control Alternatives for the Fountain Creek Corridor project.*
- *Diversion Structures, Colorado Division of Water Resources, January 2014*
- *100-year Effective Floodplain, FEMA, 2016*
- *100 Year Preliminary Floodplain, FEMA, 2016*
- *2015 Aerial Photography (1 meter resolution), National Agriculture Imagery Program, 2015*
- *2013 Aerial Photography (9 inch resolution), Pueblo County GIS, 2013*
- *City of Pueblo Zoning, Pueblo County GIS, June 2016*

- *Pueblo County Conservation Easements, Pueblo County GIS, June 2016*
- *Pueblo County Boundary, Pueblo County GIS, June 2016*
- *Pueblo County LIDAR, Pueblo County GIS, 2013*
- *Pueblo County Municipal Boundary, Pueblo County GIS, June 2016*
- *Pueblo County Parcels, Pueblo County GIS, June 2016*
- *Pueblo County Parks, Pueblo County GIS, June 2016*
- *Pueblo County Railroads, Pueblo County GIS, June 2016*
- *Pueblo County Roads, Pueblo County GIS, June 2016*
- *Pueblo County Trails, Pueblo County GIS, June 2016*
- *Pueblo County Zoning, Pueblo County GIS, June 2016*
- *Land Cover, USGS National Gap Analysis Program, November 2013*
- *Geomorphology of Fountain Creek, US Army Corps of Engineers (USACE), 2007*
- *Soils, USACE, 2006*
- *USACE 1 foot Contours, USACE, 22014*
- *Threatened and Endangered Species Habitat, Appraisal-Level Evaluation of Flood Control Options on Fountain Creek* , December 2017
- *Wetlands and Riparian Areas, Appraisal-Level Evaluation of Flood Control Options on Fountain Creek* , December 2017

4.2 Discuss the multi-objective aspects of the project and how they relate to each other. Describe similar activities in the watershed and how this project complements but does not duplicate those activities. Multi objectives may include (but are not limited to) channel stabilization, riparian re- vegetation, habitat improvement, recreation opportunity enhancement, natural hazard reduction, flood mitigation, water supply delivery improvement, fish migration improvement, ephemeral/intermittent channel stabilization and upland erosion mitigation. 30 points

Fountain Creek in Pueblo exists in a human altered state. Past failures in streamside design are seen in the loss of valuable site amenities including significant natural features, wetlands, wildlife habitat, water quality, natural vegetation and community visual resources and recreational assets and provide evidence that the local streamscape requires greater attention. There is no single recipe for improving stream reaches. Rather, each reach should be evaluated against its associated opportunities and constraints. The design of the creek channel is critical to flood mitigation, water quality and wildlife habitat. The first step is to establish the width of the channel. Fountain Creek in this project segment has adjacent reaches, both above and below the site, of 160 feet in bankfull width. This site exhibits a typical width of 250 feet so efforts must be taken in the design to conform the width to the adjacent areas to achieve a stream velocity to effectively move sediment and discourage deposition that results in a reduction of channel capacity to carry storm flows. Effectively retaining and utilizing existing stands of natural vegetation is an important design consideration. Existing vegetation provides an association with the creek and a context to lend the stream character and connectivity to adjacent uses such as trails, parks and transportation infrastructure. In the case of this project site, much of the vegetation has been destroyed by flooding and sediment deposition. The design of this project must have a robust revegetation design to restore the lost riparian areas which supports approximately 70% of all vertebrate wildlife species in the area. In conjunction with revegetation, restoring wildlife habitat is a key design consideration. Careful design of areas adjacent to the creek can minimize the disruption of wildlife access. Although this project is in an

urban setting, a great deal of wildlife has been observed including deer, turkey, fox, rabbit, squirrel, hawks and eagle. Attention must be paid to determining if any rare and endangered species are in the project area. This creek reach represents an important framework and valuable resource for the East Side Community's open space system. The Front Range Trail runs along the east bank of this project and a City park is located along the east bank, as well. Both have been damaged by flood flows. The design must consider restoration of the trail and park to achieve multiple objectives for improving recreation and access . The existing floodplain in this area performs an important flood control purpose, but the purpose has been diminished by the shallow channel width to depth ratio and the diminished effect achieved by buffer zones between the channel and the stream banks. The banks in this reach are not high, the highest being eight feet, so sufficient buffer areas or benches must be included in the design between the channel and the banks to allow for storm flows without creating bank erosion. Sinuosity must be restored in the channel and the abrasion must be eliminated. The channel must be realigned with the 8th Street bridge to allow a smooth transition of flow to the channel below the bridge and eliminate backup of storm flows that are eroding the west bank of the creek. Upstream and downstream conditions are important to the effectiveness of the design to function in the entire creek system. The District has several other project efforts that share objectives with this proposed design project. The District has already significantly improved the 1.6 mile reach downstream of this project site to the confluence with the Arkansas River by dredging the channel and removing invasive vegetation from the stream banks that degraded the creek from performing its flood control function along the East Side Levee. Removal of the vegetation also provided better visual connectivity between the trail and the creek. The reach of Fountain Creek covered by this grant application is a major source of sediment for the dredged reach, and if not corrected, will have serious impact on the work accomplished by that $5.25 million project. The District has designed and contracted a $6 million project in partnership with CDOT for the stream restoration of 3000 feet of Fountain Creek north from the Highway 47 Bridge over Fountain Creek that will eliminate much of the upstream sediment being transported into the project area covered by this grant application. Between this project, the Highway 47 project and the completed dredging/vegetation removal project, nearly all of Fountain Creek from the north city limits of Pueblo to the Arkansas River will be significantly improved. The design developed under this grant will build on the District's efforts to improve watershed health in the Fountain Creek Corridor between the southern city limits of Colorado Springs and the confluence with the Arkansas River in Pueblo. The 2011 Fountain Creek Corridor Restoration Master Plan, which can be found on the District's website (www.fountain_crk.org), in conjunction with the Fountain Creek Corridor WARSSS Study will serve as the basis for the project and identifies an overall revitalization concept vision for the corridor and a tool box of restoration techniques to be used. The revitalization concept and restoration techniques focus on reducing erosion, sedimentation and flooding, while improving water quality, riparian and aquatic habitats. The District completed the Fountain Creek Bank Restoration at Frost Ranch in early 2014 with funding from CWCB to demonstrate the revitalization techniques proposed in the Fountain Creek Corridor Restoration Master Plan that will be utilized in this design effort. Design for the Masciantonio Trust project and the Highway 47 project, both very similar to this grant project, took advantage of the lessons learned from the Frost Ranch project and their design will further benefit the design of this grant project.

4.3 Describe, the proposed monitoring plan. How will the project measure success of its objectives?

10 points

The design developed under this grant will be evaluated using the following criteria outlined in the District's Strategic Plan:

1) Does the design incorporate the creek ecosystem into the design and complement the natural creek setting?

2) Does the design increase the effectiveness of and minimize impact upon wildlife habitat and the riparian ecosystem adjacent to the creek?

3) Have existing or potential community trail networks and other recreational opportunities been identified and incorporated into the design?

4) Does the design help protect the adjacent property and infrastructure from potential flood damage and accommodate flood conveyance needs?

5) Have all the significant natural features within the project area been identified, and does the design minimize the impact on these features?

6) Does the design identify and implement the needs of any adjacent projects?

7) Does the design implement a riparian buffer area of specified width between the adjacent property and the creek to assist in preventing point and non-point sources of pollutants and sediment from entering the project site?

8) Have disturbed areas been revegetated to minimize erosion and stabilize landscape areas and does the landscape design specify plants selected from the riparian plant communities for soil conditions determined for the project site?

8) Have stream bank and slope areas been identified that would require grade control?

9) Does the design provide for the suitable revegetation and stabilization of any disturbed areas?

10) Does the design emphasize use of natural channel design techniques?

11) Does the design identify and prioritize issues using technical analysis? This will help the District meet the sediment control and habitat restoration objectives established in both the Fountain Creek Vision Task Force Strategic Plan and the Fountain Creek Corridor Restoration Master Plan.

Attachment I
SCOPE OF WORK

GRANTEE and FISCAL AGENT (if different):
Fountain Creek Watershed Flood Control and Greenway District

PRIMARY CONTACT:
Fountain Creek Watershed Flood Control and Greenway District, Mr. Larry Small, Executive Director

ADDRESS: *P.O. Box 26373, Colorado Springs, CO 80936-6373*

PHONE: *(719) 447-5012*

PROJECT NAME: *Fountain Creek Channel Restoration Design in Pueblo, CO*

GRANT AMOUNT: *$190,000*

INTRODUCTION AND BACKGROUND
Provide a brief description of the project. (Please limit to half a page)
The District-funded Fountain Creek Corridor Restoration Master Plan, published in October 2011(the Planning Phase), identified as one of its goals to improve watershed health by reducing erosion, sedimentation and flooding within the 50 mile mainstem of Fountain Creek from Colorado Springs, CO to the confluence with the Arkansas River in Pueblo, CO (referred to as the Corridor). The goal of the jointly funded District and CWCB (Grant PDAA5000) Fountain Creek Corridor WARSSS Study, published in March 2017 (the Analysis Phase), was to analyze the contributing factors that lead to sedimentation pollution, sediment yield, and channel stability and instability factors that lead to sediment pollution, sediment yield, and channel stability and instability within the 50 mile mainstem of Fountain Creek in the Corridor; with the overall goal of creating a priority list of sites to direct future efforts aiming to reduce sediment sources and improve water quality and channel stability within the Corridor and reduce flooding. The created priority list identified and prioritized 215 sites that require attention. The project funded by this Grant starts the Design Phase for five adjacent sites, PC053, PC054, PC055, PC115 and PC116 (as shown on the project map at Attachment II) combined into a single project.

OBJECTIVES
List the objectives of the project. Please include objectives for all aspects of the project whether funded by the CWCB or not.
The work to be performed under this Grant, in cooperation with our in-kind funding Stakeholders, will complete a resilient design to reduce erosion and sedimentation; correct channel instability; restore and protect wetlands; restore and protect riparian habitat; protect recreational assets; protect transportation infrastructure; and mitigate future impacts from storm-induced flows along the reach of Fountain Creek associated with this Grant activity. Completion of the design will immediately lead to start of the Construction Phase.

TASKS

Provide a detailed description of each task using the following format. Detailed descriptions are only required for CWCB funded tasks. Other tasks should be identified but do not require details beyond a brief description.

1.0 PHASE 1 – ENGINEERING ANALYSIS

Task 1.1 – Data Collection

Description:

The District will gather and review available and relevant hydrologic, hydraulic, geomorphic and environmental documents including reports and project designs related to the design of the Fountain Creek Channel Restoration reach.

Method/Procedure:

- *Assess the impaired reach representative channel profile, cross sections, geomorphic planform, and existing bed material*
- *Identify and assess a healthy "reference" reach profile, cross sections, geomorphic planform, and existing bed material*
- *Collect detailed topographic and bathymetric survey data*
- *Use existing information to identify general existing property boundaries and any associated project constraints*
- *Geotechnical investigations to determine existing bank and bed material strata*
- *Riparian assessment, wetland identifications and other ecological characterizations.*
- *Soil testing to determine soil conditions for revegetation effort*

Deliverable:

A technical memorandum describing data sets associated with impaired reach and reference reach characteristics, property boundaries and associated project constraints, and geotechnical, soil, and riparian and ecological conditions.

Task 1.2 – Comparative/Departure Analysis

Description:

A departure analysis will be produced, comparing reference reach data to existing, impaired reach data to identify the degree of impairment, potential causes of instability, and opportunities for mitigation.

Method/Procedure:

Tabular comparisons of impaired and reference channel profile, cross sections, geomorphic planform, existing bed material, and riparian conditions will be developed to compare and contrast parameters and quantitatively define the degree of departure for the impaired reach.

Deliverable:

An addendum to the Task 1.1 technical memorandum will be prepared to provide summary tables of departure analysis and findings.

Task 1.3 – Hydraulic Analysis

Description:
The District will develop a detailed HEC-RAS hydraulic model for channel/floodplain design and evaluation of scour within the reach and at the 8th Street Bridge.

Method/Procedure: *Using U.S. Army Corp of Engineers HEC-RAS 2D software, create profile and cross sections representative of the design reach to evaluate hydraulic parameters such as depth, width, velocity, and sheer stress for a range of flow events from baseflow and bankfull flow to 100-year flood flows.*

Deliverable:
A completed HEC-RAS 2D model to be used and modified for later design tasks.

Task 1.4 – Alternatives Analysis

Description:
The District will prepare an analysis of conceptual alternatives for and stabilization design options in the project area. This analysis will be based on available information.
Method/Procedure:
The District will compare and evaluate alternative configurations and materials for four primary project components:

1. *Floodplain grading (cut/fill balance),*
2. *Hydraulic structure types,*
3 *Bank protection methods, and*
4 *Revegetation approaches.*

Deliverable:
An alternatives analysis memorandum and a recommendation of a preferred design concept to carry forward into draft design.

2.0 PHASE 2 – DRAFT DESIGN

Task 2.1 – Preliminary Design

Description:
The District will develop a preliminary design and develop 30% plans, specifications, and cost for the project reach.

Method/Procedure:
The District will develop channel cross sections, geomorphic planform and longitudinal profile within the project reach, and complete hydraulic analyses. The District will also prepare sediment competence and capacity calculations along with stable slope analyses. Preliminary floodplain grading, hydraulic structures types and locations and, bank protection measures, and revegetation approaches will be identified.
Deliverable:
Complete 30% design plans and construction specifications along with a preliminary Opinion of Probable Construction Cost.

Task 2.2 – Preliminary Permitting

Description:
The District will coordinate preliminary permitting meetings with regulatory agencies to determine project permit requirements.

Method/Procedure:
The District will coordinate preliminary permit meetings including Corps of Engineers 404, Pueblo County Floodplain, Pueblo County Erosion and Sediment Control, and Colorado Parks and Wildlife. It is assumed as part of this scope that a Nationwide or Regional General permit will be adequate to satisfy the Corps of Engineers 404 process. It is also assumed that the project will result in a "no-rise" hydraulic condition, and that the floodplain or floodway boundaries will not be affected, therefore a CLOMR/LOMR will not be required.

Deliverable:
Email correspondence between the District and regulatory agencies documenting preliminary discussions and approaches to project permitting.

Task 2.3 – Draft Design

Description:
The District will develop a draft design and develop 60% plans, specifications, and cost for the project reach.

Method/Procedure:
The District will refine the hydraulic and sediment analysis and develop channel/floodplain grading and revegetation plans. The District will follow up on preliminary permit coordination. In addition to preparation of design plans, the design effort shall include, as necessary, geotechnical explorations in the construction area in addition to those performed in Task 2, and supplemental surveying of critical features within the construction area.

Deliverable:
Complete 60% design plans and construction specifications, and a 60% Opinion of Probable Construction Cost.

3.0 PHASE 3 – FINAL DESIGN AND CONSTRUCTION SPECIFICATIONS

Task 3.1 – Final Draft 90% Design

Description:
The District will develop a final draft design and develop 90% plans, specifications, and cost for the project reach.

Method/Procedure:
The District will complete 90% design plans and construction specifications, and will develop a 90% Opinion of Probable Construction Cost. Hydraulic structures, bank protection/stabilization, and revegetation details will be finalized and included with the 90% design plans.

Deliverable:
Complete 90% design plans and construction specifications, and a 90% Opinion of Probable Construction Cost.

Task 3.2 – Value Engineering

Description:
The District will work with Stakeholders to review the 90% design and identify and discuss constructability issues and consider methods and materials for potential cost savings.

Method/Procedure:
The District will complete a desk-top review of the design documents and construction specifications to evaluate materials, methods and processes for alternative considerations.

Deliverable:
Revised 90% design documents and construction specifications.

Task 3.3 – Final Permitting

Description:
The District will provide support for final permitting of the project. This may include agency coordination beyond that required in Task 2.2, preparation of permit applications and post submittal support in response to agency requests for information.

Method/Procedure:
Coordinate with permitting agencies to establish final permit requirements.

Deliverable:
Final permit applications.

Task 3.4 – Final 100% Design

Description:
The District will complete 100% design plans and construction specifications, and will develop a 100% Opinion of Probable Construction Cost. The District will also prepare conformed documents to incorporate permitting requirements.

Method/Procedure:
The District will complete 100% design plans and construction specifications, and will develop a 100% Opinion of Probable Construction Cost.

Deliverable:
Final 100% design documents and construction specifications and 100% Opinion of Probable Construction Cost that will support issuance of Request for Construction Proposals.

4.0 PROJECT MANAGEMENT AND MEETINGS

Description:
The District will oversee and direct project development and coordination between stakeholders,

agency personnel, county and municipal staff, consultants and private interests throughout the planning, implementation and delivery of products or services. The District will provide on-going project management through the life of the project and will use accepted project management tools to manage project scope, schedule and budget. The District will prepare monthly invoices along with a summary of work progress. The District will be responsible for managing the activities of any subconsultants. The District will be responsible for assuring the quality of all work products of its team. Unless otherwise directed by the CWCB, all in-process work products will be submitted to CWCB in electronic format as draft and subject to review by CWCB. Final deliverables will be fully responsive to comments provided on the corresponding draft work products, and will be submitted in electronic (pdf, dwg, shp, etc.) format on a CD or selected document management system (e.g. FTP or Box®) with one (1) accompanying hardcopy.

Method/Procedure:
The District will host a monthly meeting of Stakeholders to review progress, maintain program goals and objectives, and address topics of concern. Considerable effort will be made to maintain cohesion and continuity between Stakeholders throughout the life of the project.

Deliverable:
Meeting agenda and summaries.
Draft in-process work products
Final Deliverables

Attachment III

Budget and Timeline Table

TASK	DESCRIPTION	TARGET START DATE	TARGET COMPLETION DATE	CWCB FUNDS	OTHER CASH FUNDING	OTHER IN-KIND FUNDING	TOTAL FUNDING
1.0	**PHASE 1 - ENGINEERING ANALYSIS**	**4/2/2018**	**6/1/2018**				
1.1	Data Collection	4/2/2018	4/20/2018	$8,500	$9,000		$17,500
1.2	Comparative/Depature Analysis	4/23/2018	4/27/2018	$10,500	$12,500		$23,000
1.3	Hydraulic Analysis	4/30/2018	5/4/2018	$9,000	$9,000		$18,000
1.4	Alternatives Analysis	5/7/2018	6/1/2018	$15,125	$17,000		$32,125
2.0	**PHASE 2 - DRAFT DESIGN**	**6/4/2018**	**9/28/2018**				
2.1	Preliminary Design	6/4/2018	7/13/2018	$35,500	$37,500		$73,000
2.2	Preliminary Permitting	7/16/2018	7/27/2018	$10,500	$11,000		$21,500
2.3	Draft Design	7/30/2018	9/28/2018	$44,000	$46,500		$90,500
3.0	**PHASE 3 - FINAL DESIGN AND CONSTRUCTION SPECIFICATIONS**	**10/1/2018**	**11/30/2018**				
3.1	Final Draft 90% Design	10/1/2018	10/19/2018	$14,000	$16,000		$30,000
3.2	Value Engineering	10/22/2018	11/2/2018	$8,500	$9,000		$17,500
3.3	Final Permitting	10/22/2018	11/2/2018	$7,500	$8,500		$16,000
3.4	Final 100% Design	11/5/2018	11/30/2018	$17,375	$14,000		$31,375
4.0	**PROJECT MANAGEMENT AND MEETINGS**	**4/2/2018**	**11/30/2018**	$9,500	$10,000	$45,000	$64,500
	TOTALS			**$190,000**	**$200,000**	**$45,000**	**$435,000**

Colorado Water Conservation Board
Colorado Watershed Restoration Program Grant

Grant Application	
Date:	**11/3/2017**
Grantee & Fiscal Agent:	**Town of Carbondale**
Project Name:	**Carbondale Crystal River Restoration and Weaver Ditch Efficiency Project**
Project Location:	**Riverfront Park, Carbondale, CO (between Carbondale Fish Hatchery and Crystal Bridge Drive along the Crystal River)**
Primary Contact:	**Mark O'Meara** **Utility Director** **Town of Carbondale** **511 Colorado Avenue** **Carbondale, CO 81623** **(970) 963-3140, c. (970) 319-6259** **momeara@carbondaleco.net**
Grant Amount Requested:	**$100,000**
Cash Match Funding:	**$20,000 (Town of Carbondale)**
In-Kind Funding:	**$0**
Other Grant Funding:	**$80,000 (pending, see 'Exhibit B - Budget & Schedule')**

Project Overview: Provide a brief description of the project. (Please limit to half a page)

The Town of Carbondale, with partners Aspen Valley Land Trust, Roaring Fork Conservancy, American Rivers, Trout Unlimited, Colorado Parks and Wildlife and Public Counsel of the Rockies is proposing to restore and enhance a one-half mile, 18-acre reach of the Crystal River as it flows through the town of Carbondale, AND improve the efficiency of the town-owned Weaver Ditch head gate and diversion. The project goals are as follows:

1) Restore the ecological integrity of the riparian zone through streambank stabilization, reconnection of the floodplain, and replace invasive weed communities and plant monocultures with healthy and diverse riparian plant regimes, while preserving healthy bird and wildlife habitat.
2) Develop a long term, self-sustaining solution to improve river channel stability, fish habitat and spawning areas by promoting conditions that support and enhance instream biotic structure and diversity.
3) Create a self-sustaining diversion and head gate structure for the Weaver Ditch to function as part of the river system while improving the water delivery for the Town of Carbondale and consistent with future ditch improvements and efficiencies
4) Enhance passive user experiences of Riverfront Park through interpretive signs, trails, gathering spaces, and educational programs.

The requested grant monies will be used to fund the planning, design, and permitting for the project.

Identify the lead project sponsor and describe the other stakeholders' level of participation and involvement. (10 points)

The Town of Carbondale is the lead project sponsor. The Town owns Riverfront Park (the project site) and all the land on both sides of the Crystal River and within 5-feet of the ordinary high water mark as the river passes 1.5 miles through Carbondale (see attached Map and Site Photos). The Town has collaborated with several stakeholder organizations to move this project forward:

- Aspen Valley Land Trust (AVLT) has relationships with adjacent landowners and has worked to facilitate this project since 2013. AVLT has already secured over $50,000 in funding for implementation of the project.
- Roaring Fork Conservancy (RFC) is the Roaring Fork and Crystal River valley's river conservation organization with a strong interest in leveraging the river stewardship and educational opportunities this project presents.
- RFC and Public Counsel of the Rockies commissioned the 2016 ***Crystal River Management Plan (CRMP)***, which identified the project reach as "severely to unsustainably impaired." Both organizations have a stake in seeing master planning outcomes through to solution and creating a model for future restoration projects to follow.
- American Rivers is simultaneously working on efforts aimed at improving the efficiencies of the Crystal River's various ditch systems with the long-term goal of keeping more water in the Crystal River.
- Colorado Parks and Wildlife (CPW) owns the Fish Hatchery property immediately upstream and adjacent to the proposed project reach. CPW is considering extending complementary improvements through their property in the future.
- CPW and Trout Unlimited have a broad interest in restoring healthy stream and riparian habitat to support fish and wildlife populations.
- The River Valley Ranch Homeowner Association represents the adjacent neighborhood.

In September 2017, the stakeholder group coordinated an RFP and selected a consultant team to lead us through the planning, design and permitting process. The stakeholder group is committed to guiding the project by making, and supporting, consensus decisions based on public input and on data collected and analyzed by the consultant team.

Specify in-kind services and cash contributions (match) amount for the proposed activities. See section B.2 of the grant program guidance to determine match funding requirements. Discuss whether other funding sources are secured or pending. (10 points)

The total planning, design, and permitting budget for the project is estimated at $199,300 (see 'Exhibit B – Budget & Schedule'). We are requesting $100,000 (50%) of these funds from the Colorado Water Conservation Board (CWCB) Watershed Restoration Program. The Town of Carbondale will match $20,000 (10%) in cash. We are currently (Nov. 2017) seeking a $50,000 (25%) local government planning grant from Great Outdoors Colorado, a $9,300 (5%) grant from the Aspen SkiCo Environment Foundation, and the remaining $20,700 (10%) from the CWCB's Water Supply Reserve Fund. All funding sources are currently pending approval (notification by Feb. 2018).

What is the applicant organization's history of accomplishments in the watershed? Provide several past project or planning examples. List partner organizations and agencies with whom applicant worked to implement past projects or planning efforts. (10 points)

In 2015, the Town of Carbondale developed and adopted the Great Outdoors Colorado (GOCO) funded ***Carbondale Parks, Recreation & Trails Master Plan*** to address services, management, maintenance, facilities and policies regarding its parks, recreation and trails over the next ten years. The master plan states that "The Roaring Fork and the Crystal River are two unique assets to Carbondale that can be better highlighted and connected to in years to come and promoted as community assets and recreational amenities." The plan goes on to recommend, "better visual and physical accessibility, increased river trail opportunities for everyone and encouraging conservation and restoration projects within the riparian corridors." A survey administered as part of the master planning process indicates that Carbondale citizen's support "improving the Crystal River corridor for trail users and fishing access" as well as "creating places for nature observation and exploration" and a desire to "create a native birding trail and preserve….along the Crystal River and Riverfront Park."

The Town of Carbondale has completed several water infrastructure projects in the watershed. This work includes the installation of the stream gauging station at the County Rd. 188 Bridge to monitor the flow regime during the irrigation season. The town has also replaced two flumes on irrigation ditches for more accurate diversion recordation along the Carbondale and Weaver Ditches.

The project consultant team has decades of experience planning and implementing collaborative river restoration projects throughout Colorado and the Rocky Mountain West. Please see pages 40-51 of the attached 'Proposal for Crystal River Restoration and Weaver Ditch Efficiency Project' for examples of their work. Locally speaking, River Restoration recently completed the Pitkin County Whitewater Park in Basalt, DHM Design did the design and planning behind the Basalt River Restoration Project and Lotic Hydrological collaborated with the Roaring Fork Conservancy and Public Counsel of the Rockies to create the 2016 ***Crystal River Management Plan (CRMP).***

The project partner/stakeholder group often works together as part of the Roaring Fork Valley's Watershed Collaborative and has completed several management plans and other initiatives within the watershed. Most pertinent is the 2016 CRMP whose stakeholder driven process included local agricultural producers, state water administrators, local municipalities, natural resource agencies, as well as local and national environmental groups.

What level of staffing will be directed toward the implementation of the proposed project/planning effort? Discuss the number of staff and amount of time dedicated for the project. Will volunteers be utilized, and if so, how? Include brief resumes for each member of the active project team. (10 points)

The vast majority of the project management, planning, design and permitting work will be performed by a highly qualified consultant team comprised of River Restoration (4 engineering, analysis, and survey staff), DHM Design (2 landscape architecture & planning staff), and Lotic Hydrological (1 hydrologic consultant staff), all from Carbondale, Colorado. For complete consultant team resumes please see pages 52-68 of the attached 'Proposal for Crystal River Restoration and Weaver Ditch Efficiency Project.'

The consultant team has broken up the project planning into three phases and estimated hours for each associated task. Their proposal estimates 1,658 person hours to complete the planning, design, and permitting for the project. Please see pages 29-31 of the attached 'Proposal for Crystal River Restoration and Weaver Ditch Efficiency Project' for a detailed breakout of estimated project hours.

Mark O'Meara, the Utility Director for the Town of Carbondale will oversee the project for the town. Mark has a BS in Fishery Science and spent 3 years of his early career working for the BLM performing inventories and writing the fishery's sections of resource and stream management plans. He has spent the past 36 years in the water and wastewater disciplines as an operator, working his way up to his current position as Utility Director.

Jay Harrington, the Carbondale Town Manager oversaw successful river restoration projects during his tenure as Town Manager of Pagosa Springs, CO and Telluride, CO.

Demonstrate that the project budget and schedule are realistic. Please use the budget/timeline spreadsheet attached to the application. Please note that the start date will take place after funding awards are announced and grants are contracted. (10 points)

Please see the attached 'Exhibit B – Budget & Schedule' as well as the attached 'Preliminary Timeline Estimate.' To summarize, a consultant team has already been selected for the planning, design, and permitting phase of the project. If our pending planning grant requests are successful, the consultant team will be contracted in February 2018 and begin work in March 2018. Three phases of planning, design, and permitting would continue through early summer 2019 (see attached 'Exhibit A – SOW'). Fundraising for implementation would occur in late 2018. Construction would occur in late 2019 with a goal of completing the project by the end of 2019.

What information is the project sponsor using to develop the proposed plan or project? Include any relevant information regarding existing watershed plans, stream management plans, geomorphic assessments, flood studies, fire protection plans, riparian conditions assessments, aquatic/terrestrial habitat conditions, wildlife studies, and/or river restoration reports. (10 points)

In 2016, Roaring Fork Conservancy, Public Counsel of the Rockies and Lotic Hydrological published the ***Crystal River Management Plan (CRMP)*** a comprehensive tool for identifying, prioritizing, and guiding management actions that honor local agricultural production, preserve existing water uses, and enhance the ecological integrity of the river. That study identified this project reach as severely to unsustainably degraded, and a priority for restoration (see attached 'Functional Conditions of the Proposed Project Reach'). The planning process was science-based and stakeholder centered. Stakeholder meetings held throughout the planning process served to clarify outstanding questions, summarize results from previous studies, refine planning goals and objectives, and evaluated the feasibility of various management alternatives. The Crystal River Restoration and Weaver Ditch Efficiency Project will directly address the recommendations of the CRMP.

Furthermore, Phase 1 of the project planning will focus on collecting and analyzing site-specific data. Our consultant team is scoped to do a full field inventory and analysis of river and riparian conditions at the project site. This work will include the following surveys, assessments and analyses:

- Rapid Wetland Community Survey and Assessment
- Riparian Systems and Habitat Survey and Assessment
- Environmentally Sensitive Lands Survey and Assessment
- Wildlife and Plant Species Survey and Assessment
- Fisheries Habitat Survey and Assessment
- Restoration Opportunities Survey and Assessment
- Recreation, Education & Interpretation Opportunities Survey
- Hydrologic and Hydraulic Analysis

Discuss the multiple objective aspects of the project and how they relate to each other. Describe similar activities in the watershed and how this project or plan complements but does not duplicate those activities. Multiple objectives may include (but are not limited to) channel stabilization, riparian re-vegetation, habitat improvement, recreation opportunity enhancement, natural hazard reduction, flood mitigation, water supply delivery improvement, fish migration improvement, ephemeral/intermittent channel stabilization, and upland erosion mitigation. (30 points)

The Crystal River Restoration and Weaver Ditch Efficiency Project is a comprehensive river systems project with both ecological and community goals. The project will tackle a severely impaired reach of the Crystal River while improving the user experience of Carbondale's Riverfront Park.

This project supports several key goals and objectives of both the Colorado Water Plan (CWP) and the Colorado Basin Implementation Plan (CBIP). One of the primary goals of both plans is the development of Stream Management Plans that will facilitate environmental and recreational projects. In a sense the Crystal River Restoration and Weaver Ditch Efficiency Project is a step ahead, coming as it does from the findings and recommendations of the already completed 2016 ***Crystal River Management Plan (CRMP)*** and the 2015 ***Carbondale Parks and Recreation Master Plan***. This project is an opportunity for the Town of Carbondale, and the entire project team to execute on priorities identified through our previous investments in master planning efforts.

From an ecological standpoint, the first objective of this project is to restore the integrity of the riparian zone through streambank stabilization, reconnection of the floodplain, and replacement of invasive weed communities and plant monocultures with healthy and diverse native riparian plant regimes, while preserving healthy bird and wildlife habitat. The second ecological objective is to develop a long term, self-sustaining solution that improves river channel stability as well as fish habitat and spawning areas by promoting conditions that support and enhance instream biotic structure and diversity. The third ecological objective is to improve the efficiency and operation of the Weaver Ditch diversion and headgate, which pull water out of the river in the middle of the project reach. Restructuring this diversion will be done in a way that both improves the efficiency of the diversion while improving in-stream habitat conditions near the diversion.

Another significant goal of the CBIP is to strengthen the knowledge and understanding of water issues and needs among the general population of the basin. Carbondale's Riverfront Park is in the heart of the Roaring Fork Valley and within easy reach by thousands of school age children as well as classes from Colorado Mountain College. The proposed project is very much in line with this CBIP goal and will help facilitate the stated objective of "Enhancing K-12 water education opportunities, both inside and beyond the classroom" and "Enhancing water education opportunities in higher education." This project will not only enhance the quality of instream and riparian habitat at Riverfront Park, it will also

turn our community's eyes towards its river. We are poised to leverage that attention to increase passive recreational access, nature exploration, educational opportunities, and our community's general awareness and connection to the Crystal River as it flows through the Town of Carbondale.

The education potential of this project is huge. There are five Carbondale schools within walking distance of the site. Our goal is to re-design the experience of the park to include an engaging educational trail and thoughtfully designed gathering places that explore the project's restorative elements and natural assets without comprising the wildland nature of the park.

This project will serve our community as both an ecological and experiential model for future restoration and irrigation improvement projects within our watershed.

Describe the proposed monitoring or implementation plan. How will the project or plan measure success of its objectives? (10 points)

A monitoring plan will be determined as part of the planning process. The details must be specific to the final plans, however, we anticipate monitoring will include the following metrics to assess the stream health condition and qualify improvements gained through implementation of this project:

- ***Photographic Monitoring:*** Photographs taken at referenced locations that show changes over time; the impacts from recreation users, accumulation of sediment, and the stability and function of restoration treatments and structures.
- ***Channel and Bank Surveys:*** Topographic surveys of the channel, banks and floodplain for pre-restoration conditions will be collected for baseline cross section and longitudinal profiles. As-built surveys shall be conducted to evaluate post project conditions. Channel surveys will determine the stability of in-channel structures, and the formation of a thalweg. Functional attributes of the channel will be monitored by the structures' ability to scour and deposit sediments, provide low-flow habitat for fish. Bank surveys will monitor the stability of the bank and how the newly excavated floodplains connect with the channel for overbank processes and convey flood flows.
- ***Riparian Surveys:*** Vegetation transect surveys will validate whether restoration treatments were effective at diversifying the age and species in the riparian corridor. In addition, these surveys will help determine if birding food sources and perching stands are maintained in the riparian corridor. Pedestrian patterns should also be inventoried for erosion and trampling.
- ***Riparian Invasive Species Inventory:*** An annual inventory of the approximate cover and location of weed species and competitive non-native trees. This inventory will aid in determining control treatments and adaptive management of the riparian corridor.
- ***Aquatic Surveys:*** The objective of restoring the physical changes to the channel is to create a positive biological response in the aquatic community. Monitoring the macroinvertebrate community composition and abundance is a good metric for stream health. Fish population surveys show the abundance, age, and type of fish present in the Crystal River. Fish passage inspection by a qualified biologist during storm flow, low-flow, and flood flow will help with management decisions and the assessment of the biotic integrity of the River.

Results may show trends toward continued improvement, or uncover recommendations for adaptive management including BMPs, operational practices, and other restoration needs.

Colorado Water Conservation Board

Colorado Watershed Restoration Program Grant - Exhibit B

Budget and Schedule

Date: 11/3/2017

Name of Applicant: Town of Carbondale

Name of Water Project: Crystal River Restoration and Weaver Ditch Efficiency Project

Task No.	Task Description	Target Start Date	Target End Date	CWCB Watershed Restoration Funds	Town of Carbondale Cash Match Funding	GOCO Grant Funding	Environment Foundation Funding	CWCB Water Supply Reserve Funding	Total
1	Design & Planning - Phase 1 (see SOW)	3/1/2018	9/1/2018	$44,243	$8,849	$22,122	$4,115	$9,158	$88,486
2	Design & Planning - Phase 2 (see SOW)	9/1/2018	2/1/2019	$24,887	$4,977	$12,444	$2,314	$5,152	$49,774
3	Design & Planning - Phase 3 (see SOW)	2/1/2019	8/1/2019	$30,870	$6,174	$15,435	$2,870	$6,390	$61,740
			Total	$100,000	$20,000	$50,000	$9,300	$20,700	$200,000

PRELIMINARY TIMELINE ESTIMATE

Crystal River Restoration & Weaver Ditch Efficiency Project

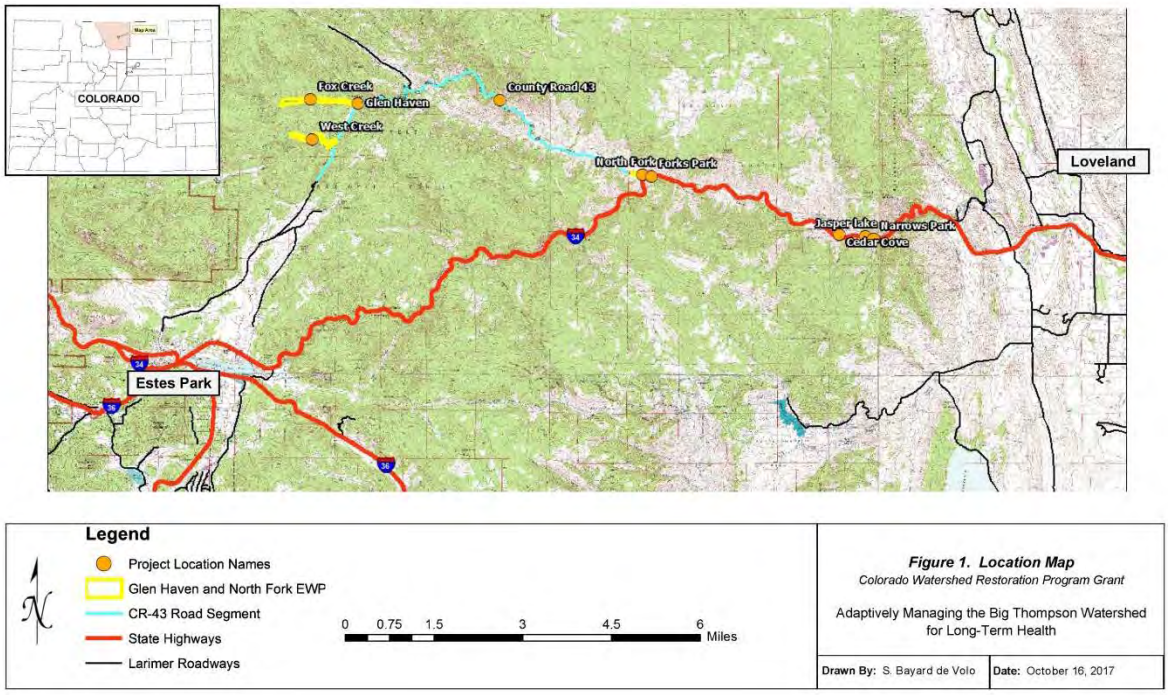
TASK	Sept '17	Oct '17 - Feb '18	Mar '18	Apr '18	May '18	Jun '18	Jul '18	Aug '18	Sept '18	Oct '18	Nov '18	Dec '18	Jan '19	Feb '19 - May '19	Jun '19	Jul '19	Aug '19 - Nov '19	Dec '19	May '20
RFP for Planning & Design																			
Award Planning & Design Bid																			
Fundraising for Planning & Design																			
Site Inventory & Assessment																			
Hydrologic & Hydraulic Analysis																			
Public Meetings & Stakeholder Involvement																			
Conceptual Alternative Development																			
Preliminary Design																			
Permitting																			
Fundraising Support for Implementation																			
Final Design																			
Construction Bidding																			
Award Construction Bid																			
Construction																			
Construction Completed																			
Grand Opening																			

2017 CWCB Grant Application

Project Proposal Summary Sheet – Big Thompson Watershed Coalition

Project Title: Adaptively Managing the Big Thompson Watershed for Long-Term Health

Project Location: Additional maps included in the Attachments Section



Grant Type: Watershed/Stream Restoration Grants

Grant Request Amount: $175,343

Cash Match Funding: $102,047

In-kind Match Funding: $73,337

Project Sponsors:

Shayna Jones
Big Thompson Watershed Coalition
Shayna.jones@bigthompson.co
970-800-1126

Rusty McDaniel
Larimer County Engineering
rmcdaniel@larimer.org
970-498-5730

Brief description of the project: Since the floods of 2013, multiple organizations across the Big Thompson Watershed have been hard at work and have invested millions of dollars in federal, state and local funds to improve the resiliency of the watershed and health of the river corridor and ecosystem. As of November 2017 the Big Thompson Watershed Coalition and Larimer County have completed projects along ~15 miles of the Big Thompson River and the North Fork of the Big Thompson River. While these initial projects were critical to jump-start the recovery of the Big Thompson River ecosystem, ongoing monitoring, adaptive management, maintenance and stewardship is needed to ensure that the systems continue on a trajectory for long-term watershed health, resiliency and ecosystem function. The proposed project will focus on these critical elements, and is a partnership will continue the cyclical process of Coalition-building, data collection, planning prioritization, implementation and monitoring, which requires collaboration across political boundaries and requires continued efforts.

2017 CWCB Grant Application

Adaptively Managing the Big Thompson Watershed for Long-term Health

The Big Thompson Watershed Coalition (BTWC) is partnering with Larimer County on a proposed project that will focus on adaptive management, ongoing maintenance and stewardship of over 15 miles of recently restored river and adjacent uplands along the river corridor in the Big Thompson Watershed. Adaptive management is the use of a systematic approach for improving how we manage natural resources by learning from outcomes of previous actions and applying those lessons learned to future actions. Although practitioners have noted the importance of this type of management for decades, funding for this critically important component is typically non-existent. We believe that it is a critical gap that projects must incorporate in order to achieve success. The proposed project will build on the initial successes, and the ~$45 million investment of projects implemented by the BTWC and Larimer County, who partnered with federal, state and local groups to restore 15 miles of river corridor.

Through monitoring, continued stewardship, and maintenance, the proposed project will facilitate the development of a restored ecosystem, both in terms of its structure and function, which is resilient to impacts from future flooding. By engaging the local community, the proposed project will foster partnerships, which in turn will support long-term stewardship within the watershed. The proposed project aligns with the recommendations of the Colorado Water Plan, as it will continue the cyclical process of Coalition-building, data collection, planning prioritization, implementation and monitoring, which requires collaboration across political boundaries and continued efforts. The partnership will allow best practices for long-term stewardship to be performed across both public and private lands.

The proposed project focuses on adaptive management of four key portions of the Big Thompson Watershed, where previous river corridor improvements were completed. These include: 1) the Glen Haven Emergency Watershed Protection (EWP) projects along West and Fox Creeks; 2) The CR 43/ North Fork of the Big Thompson River Corridor, starting below Glen Haven and continuing downstream through the North Fork EWP project at the confluence with the main-stem of the Big Thompson River; and 3) The Jasper Lake and Cedar Cove reaches of the Big Thompson River; and 4) The Drake/ Forks Park area that is being restored in 2017-2018 by CDOT and its partners. These areas are shown in the maps included in the Proposal Summary and Attachments portions of the grant application.

Project Team Qualifications

The direct project team is a partnership that consists of the project sponsor (BTWC), and Larimer County staff. Larimer County departments that will be directly involved in the project include: Engineering, Natural Resources, and the Larimer County Conservation Corps (LCCC). In addition to the two project leads, other stakeholders that will participate in the project include: Colorado Parks and Wildlife (CPW), US Forest Service (USFS), non-profit groups involved in leading volunteer planting days, and private property owners located in the project areas. The role of the other agency groups will be to provide technical assistance and data, as available and needed, to support the development of the monitoring protocol and adaptive management program. The BTWC will also lead coordination with private property owners and volunteer groups, who will be active partners for volunteer planting days and citizen science monitoring efforts. Engaging the local community in the stewardship efforts and long-term monitoring will help promote the ongoing effectiveness of the completed river improvements.

Funding Breakdown

Project partners are contributing significant in-kind services and cash contributions, as shown in the table below. More information about these contributions can be found in the *Budget Table and Schedule* section in the Scope of Work Attachment.

Type of funding	Source	Amount	Status
In-Kind Services	Larimer County	$23,490	Secured
In-Kind Services	BTWC (Jan – June 2018) via the DOLA Capacity Grant	$19,720	Secured
In-Kind Services	Volunteer Groups AloTerra/ WRV/ RMF/ LCCC	$30,127	Pending
Cash contributions	Patagonia Store Grant	$5,250	Pending
Cash contributions	Trout and Salmon Foundation/ RMF	$2,000	Secured
Cash contributions	Larimer County	$94,797	Pending
TOTAL		$175,384	

Organizational Capability

Past Team Accomplishments

Over the past three years, the BTWC and Larimer County worked on a variety of projects in the Big Thompson watershed that were focused on long-term improvements to the resiliency of the river corridor. Accomplishments from key projects are summarized below.

1) **CR 43 Long-term Repairs -** Larimer County worked with Central Federal Lands and the USFS to conduct long-term repairs to approximately 10 miles of road and river along CR 43 and the North Fork of the Big Thompson River. The project utilizes innovative features, including several sections where the road and river were flipped so that shear stresses from the outside bend of the North Fork River would not continue to have erosive and destructive force on the road in subsequent high water events. The construction team included several members with expertise in river restoration, and the project innovatively incorporated long-term improvements to floodplain access and capacity, and channel geomorphology into the overall project. This project contributed an investment of approximately $40 million dollars into the river and road corridor and was completed in Dec 2016. Since completion, Larimer County staff has been monitoring vegetation establishment and erosion and sediment stability.

2) **Glen Haven and North Fork EWP Projects –** Larimer County served as the local sponsor for three NRCS Emergency Watershed Protection (EWP) projects on West Creek, Fox Creek and the North Fork. All three projects are located on the North Fork of the Big Thompson river corridor or its tributaries. These projects, along with the CR 43 project, created a segment of over 13 miles of improvements, which adds to the long-term resiliency of the watershed. Larimer County worked closely with the BTWC on all three projects. The BTWC led a collaborative design process that included over 100 private properties along approximately 3.5 miles of the river collectively. In addition to working with private property owners, Larimer County and BTWC worked with designers

from the NRCS, the CWCB, the Colorado State Forest Service, and two contractor teams, to complete the three river restoration projects. Key features of these projects include: improved floodplain access and capacity, installation of in-stream structures and features to improve the channel geomorphology, enhancement of a secondary channel on the North Fork project to provide additional capacity during high water events, as well as improvements to riparian and aquatic habitat. Federal, state and local funds invested on the three projects approximated $2.6 million. Construction and revegetation for all three projects were completed in May 2017. Since that time, the BTWC has been monitoring the three project sites using the NRCS' Stream Visual Assessment Protocol (SVAP), and in the future, will be monitoring for erosion and sediment control in compliance with the CDPHE's Construction Stormwater Permit. CWCB also has a consultant group conducting additional long-term monitoring of these projects.

3) **BTWC Jasper Lake and Cedar Cove EWP Projects –** The BTWC spearheaded two EWP projects along the main-stem of the Big Thompson River at the Jasper Lake and Cedar Cove reaches. BTWC worked closely with CDOT, Larimer County, City of Loveland, Colorado Parks and Wildlife, and approximately 25 private property owners to collaboratively design and implement river improvements along ~1 mile of river on a section of the Big Thompson that was heavily damaged during the 2013 flood. Key features of the projects include: improved floodplain access and capacity, installation of in-stream structures and features to improve the channel geomorphology, as well as improvements to riparian and aquatic habitat. Federal, state and local funds invested on the two projects approximated $2.8 million. Jasper Lake construction and revegetation was completed in May 2017. The Cedar Cove project will be completed in November 2017. Since the completion of the Jasper Lake project, the BTWC has hosted a volunteer planting day in partnership with AloTerra Restoration Services with volunteers from Rocky Mountain Flycasters (RMF)/Trout Unlimited working to help maintain and establish some additional native riparian vegetation. Additionally, the BTWC and the design team for the project have been conducting ongoing monitoring of river conditions.

In addition to the projects highlighted above, the BTWC has led several successful planning projects that have produced the Big Thompson River Restoration Master Plan and conceptual designs for 9 additional river reaches within the Big Thompson River and its tributaries. In October 2017, the BTWC began construction on a large-scale project in the Waltonia and Mountain Shadows areas of the Big Thompson River, where improvements will be conducted along approximately 3 miles of river.

<u>Organizational Staffing</u>

BTWC will contribute time from both of its staff members to the project. Larimer County will also contribute staff time from their Engineering and Natural Resources Departments. An estimate of each organization's staff time committed to the project is found in the *Budget Table and Schedule* section in the Scope of Work Attachment.

BTWC plans to implement six volunteer projects to help maintain healthy, native riparian vegetation in the proposed project areas. BTWC will work with volunteer groups active in the area, such as AloTerra Restoration Services, Wildland Restoration Volunteers (WRV), LCCC, and RMF, who can assist with

technical oversight, equipment and convening volunteers. BTWC will also leverage these groups and other potential volunteers from its network of over 400 property owners and interested stakeholders to develop and pilot test a citizen-science based "Adopt a Reach" program to help with ongoing monitoring and stewardship of the river corridor. Brief resumes/ bios of each of the primary project team members are included below.

Shayna Jones, BTWC Director, has experience managing natural resource and sustainability projects, leading stakeholder groups, and guiding decision-making processes among diverse groups. She has a MS in the Human Dimensions of Natural Resources Conservation Leadership from Colorado State University.

Tracy Wendt, BTWC Project Manager, has a background in river restoration, inter-agency collaboration, and public outreach. She previously managed river restoration projects for the Wyoming Game and Fish Department (WGFD), and has a MS from the University of Montana in Resource Conservation.

Shelley Bayard de Volo, Larimer County Environmental Coordinator, has a background in wildlife ecology and environmental regulatory compliance, including water quality permitting, endangered and threatened species, and erosion and sediment control. She previously worked for the USFS Rocky Mountain Research Station, and has a PhD in Ecology from Colorado State University.

Casey Cisneros, Larimer County Land Stewardship Manager, has a background in open space vegetation management focused on revegetation and weed control. He acts as Larimer County's noxious weed manager and collaborates with a wide range of stakeholders. He has a MS in Natural Resources Stewardship with a focus in ecological restoration.

William Pawleshyn, Larimer County Weed Control Technician, is the crew supervisor that conducts weed management for agency partners and private landowners. He already is managing weeds and monitoring several flood recovery sites within the county.

Project Budget & Schedule

The project budget is believed to be a realistic estimate of cost, as it is based on the costs incurred during construction and initial revegetation of the projects in the river corridor. Cost estimates are also based on Larimer County's past experience in maintaining projects with similar components, as well as initial monitoring conducted on the projects to determine the extent of need for certain types of adaptive management. The budget included in the Scope of Work contains additional detail regarding the estimated budget and line items needed for this project.

The proposed time frame for the project is two years, as the project team believes that this duration is necessary to ensure that the recently completed improvements along the river corridor are stable and on the trajectory towards long-term health and resiliency. However, the project team recognizes that monitoring, stewardship and restoration of some areas may need to continue for an additional year term. This can be assessed and planned for during the first 12-18 months of the proposed project. The timeline used in the *Budget and Timeline* portion of the *Scope of Work* takes into account the expected CWCB timeline for announcing grant awards and contracting with grantees.

Proposal Effectiveness

Data and Reports Informing Project Work

The following data and reports will be used to inform the proposed project work:

- Project-specific design and as-built construction plans, erosion control plans and stormwater management plans, and planting plans, that guided initial construction and revegetation;
- Project-specific Operations and Maintenance plans, if available;
- NRCS SVAP, which the BTWC uses pre and post construction to monitor the following attributes of river health: channel and bank condition, riparian area quantity and quality, canopy cover, water appearance, barriers to aquatic species movement, fish habitat and aquatic habitat complexity, and other elements;
- CDPHE Stormwater Associated with Construction Activities Permit Field Inspection/Monitoring protocols, which include implementing and maintaining erosion and sediment control best management practices. Urban Storm Drainage Criteria Manual: Volume 3 best management practices will be used as a resource.

Multiple Objectivity of Project

This project is focused on meeting multiple objectives, many of which are interrelated. Specific objectives include the following: 1) Formalize a Monitoring and Adaptive Management Protocol that builds from existing efforts and guides ongoing maintenance and stewardship work; 2) Promote the continued establishment of riparian vegetation; 3) Continue enhancement of aquatic habitats through sufficient establishment of vegetation and ensuring that in-stream structures are continuing to function appropriately; 4) Manage erosion issues in the river corridor and maintain channel stability and floodplain capacity; 5) Control noxious weeds to meet compliance of the Colorado Noxious Weed Act (C.R.S. 35-5.5-104); and 6) Engage community members in the ongoing stewardship of the river ecosystem. The proposed monitoring conducted through this project will help inform the other objectives. Stability of the river corridor and management of erosion are intricately linked to the establishment of riparian and aquatic habitats. Furthermore, the long-term success of the projects is heavily dependent on community engagement to help steward the river corridor through time. The proposed project will build on the initial work and investment and successes of multiple large-scale river restoration projects. It will also build on and incorporate existing monitoring efforts. The proposed project provides a critical link to build on these previous efforts, and it will help ensure the long-term success of these efforts.

Proposed Monitoring Plan

Finalizing an effective and feasible monitoring plan is one of the first proposed tasks of this project. The monitoring plan and protocol will build on existing efforts of the BTWC, Larimer County, the CWCB state consultant conducting monitoring on several EWP projects, and other similar efforts currently underway by other Coalitions. Key river attributes will be periodically and regularly monitored and documented, and these results will drive additional adaptive management actions taken by the project team to meet the stated project objectives.

2017 CWCB Grant Application

Proposal Attachments– Big Thompson Watershed Coalition

The following attachments are provided to support the Big Thompson Watershed Coalition and Larimer County grant application for the proposed project "Adaptively Managing the Big Thompson Watershed for Long-term Health".

1. **Scope of Work**

2. **Design Plans** – Due to file size, these files can be found on the following dropbox folder. Design plans or as-built construction plans are included for the following projects:
    a. CR 43
    b. Glen Haven
    c. North Fork
    d. Cedar Cove
    e. Jasper Lake
    f. Drake/Forks Park

3. **Letters of Support**

    The following letters of support are attached and include letters from the following organizations:

    a. Larimer County
    b. US Forest Service
    c. Colorado Parks and Wildlife
    d. City of Loveland
    e. Rocky Mountain Flycasters
    f. AloTerra Restoration Services
    g. Wildlands Restoration Volunteers
    h. South Platte Basin Roundtable

4. **Pertinent still photos**

5. **Maps**

2017 CWCB Grant Application
Big Thompson Watershed - Scope of Work

Grantee: Big Thompson Watershed Coalition, in partnership with Larimer County

Primary Contact

Shayna Jones
Shayna.jones@bigthompson.co
970-800-1126

Project Name: Adaptively Managing the Big Thompson Watershed for Long-Term Health

Grant Amount: $175,343

Introduction and Background

Since the floods of 2013, multiple organizations across the Big Thompson Watershed have been hard at work and have invested millions of dollars in federal, state and local funds to improve the resiliency of the watershed and health of the river corridor and ecosystem. As of November 2017 the two lead entities on the proposed project, the Big Thompson Watershed Coalition (BTWC) and Larimer County, have completed projects along 15 miles of the Big Thompson River and the North Fork of the Big Thompson River, an investment of nearly $45 million dollars. While these initial projects and investments were critical to jump-start the recovery of the Big Thompson River ecosystem, ongoing monitoring, adaptive management, maintenance and stewardship is needed to ensure that the systems continue on a trajectory for long-term watershed health, resiliency and ecosystem function. The proposed project is a partnership that aligns with the recommendations of the Colorado Water Plan, as it will continue the cyclical process of Coalition-building, data collection, planning prioritization, implementation and monitoring, which requires collaboration across political boundaries and requires continued efforts. Goals of the proposed project include collecting additional data to help inform future planning efforts, adaptive management to ensure the establishment of native vegetation, the control of noxious weed species, and proactive maintenance of erosion and sediment issues that have the potential to pollute and/or destabilize the river corridor. The proposed project will also develop a citizen-science based "Adopt a Reach" program that engages community members in the ongoing stewardship of the river. Areas of focus include recently restored creeks in Glen Haven and along the CR 43/ North Fork of the Big Thompson River corridor, as well as the Cedar Cove, Jasper Lake, and Drake/Forks Park areas along the main stem of the Big Thompson River. The holistic approach to the project, as described further in the Scope of Work, will provide the "most technically sound and economically efficient means of addressing watershed health concerns"[1] that span political boundaries, and help ensure the ongoing success of the nearly $45 million investment in the watershed spent over the past four years.

[1] Colorado's Water Plan (2015). Chapter 7: Water Resource Management and Protection. Section 7.1 Watershed Health and Management, Pages 7-5 – 7-7.

Objectives

1. **Formalize a Monitoring and Adaptive Management Protocol**, that builds from existing, similar efforts in the region, and guides additional management work to be completed by the project partners;
2. **Minimize the presence of noxious weeds**[2] and other undesirable plant species that will hinder establishment of desirable native species;
3. **Plant supplemental revegetation treatments** to overcome site mortality that occurs following initial project implementation. This will also help further enhance aquatic habitat within the corridor, which is linked to riparian habitat;
4. **Proactively manage potential erosion issues,** by strengthening best management practices focused on preventing excess sediment from entering the river system as pollutants and destabilization of the river banks and channel;
5. **Continue to enhance aquatic habitat,** by promoting the establishment of native vegetation and managing erosion and other significant instabilities in the river channel and banks;
6. **Engage community members in the ongoing stewardship of the river ecosystem,** by establishing a citizen science program to assist with monitoring and hosting volunteer planting and weeding days for community groups.

TASKS

TASK 1 – Formalize Monitoring and Adaptive Management Protocol & Conduct Periodic Monitoring of River Conditions.

Description of Task

Project partners will work together collaboratively to compile stream monitoring protocols and processes currently being executed in the watershed. Project partners will confer with the design teams that led initial restoration of the areas regarding expected river channel evolution, and potential future adaptive management actions that may be needed. Project partners will also reach out to neighboring watersheds such as the Cache la Poudre and Lefthand Watershed Oversight Group, who we understand are also currently formulating adaptive management and monitoring protocols. This will ensure that best practices are consistent among watersheds and practices can be shared across watersheds. The project team will formulate a monitoring protocol that builds upon existing efforts and provides a consistent approach that can be carried out by project team staff. The monitoring protocols will identify the attributes to be collected, frequency of collection, and the entity responsible for collection. Project staff will carry out the protocols and analyze the collected data, which will inform subsequent actions. The project team will also review the goals of each

[2] Please see https://www.colorado.gov/agconservation/noxiousweeds for more information on legal responsibilities under the Colorado Noxious Weed Act

project to develop appropriate targets for adaptive management action that can help evaluate progress toward goals.

Method/Procedure

The project team will assess the following current monitoring efforts in the watershed, in order to build a consistent protocol, forms, and file sharing system for monitoring data:

- Monitoring conducted by the BTWC and Emergency Watershed Protection team, which includes photopoints and assessments within the Natural Resources Conservation Service (NRCS) Stream Visual Assessment Protocol (SVAP)[3].
- Monitoring conducted by the BTWC and Larimer County to satisfy ongoing requirements of the Colorado Department of Health and Environment's (CDPHE) Stormwater Associated with Construction Activities Permit (COR-30000);
- Monitoring conducted by a team recently hired by the Colorado Water Conservation Board (CWCB) on select river restoration projects across the state. The CWCB hired team is currently expected to monitor consistent geomorphic cross sections, including banks, toe of slope and channel thalweg. They will also sample vegetation characteristics along the streambanks, and map pool areas within the channel; The project team will also review the Colorado Stream Health Assessment Framework to see how it compares to the information the CWCB consultant team is collecting on several of the BTWC EWP projects.
- Additional monitoring work completed by CPW; The project team will investigate the rapid assessment monitoring protocols that CPW has used to evaluate the success and failure of in-stream structures in other areas of the state to see if this is applicable for use in the Big Thompson focal areas[4].

Coordination of existing monitoring efforts is critical to ensure feasible data collection while minimizing duplication of efforts. The project partners will build from current monitoring protocols, incorporate existing efforts, and formalize a consistent protocol and data forms to be used for periodic monitoring of river corridor conditions. Project partners will also develop a file sharing mechanism where data can be shared among partner entities.

Deliverable

- Monitoring protocol that incorporates and builds from existing efforts, and can be used to consistently and effectively guide project partners to conduct periodic monitoring over the grant

[3] For more information on the Stream Visual Assessment Protocol and its multiple criteria assessment, please see https://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/stelprdb1044776.pdf
[4] For more information, see http://www.coloradowater.org/2017-scw-conference-presentations/, Let's Try That Again: Adaptive Mgt. Moderator: Rachel Williams, Eric Richer, CWP Presentation

period[5].

- Periodic monitoring documented via monitoring forms, which can be accessed through a file sharing system by project partners. To avoid duplication of efforts, monitoring conducted by other partners will not be duplicated by the project team, but reports and data from these entities will be reviewed and shared on a regular basis.

TASK 2 – Manage vegetation to encourage desirable vegetation establishment

Description of Task

The project team will use the results of the monitoring protocol related to noxious weeds and troublesome plant species to guide treatment throughout the proposed project areas. State listed noxious weeds must be managed in these areas in accordance with Colorado Noxious Weed Act. Both, state listed noxious weeds and troublesome weeds, can prevent establishment of desirable vegetation by competing for resources. The project team will work primarily with Larimer County staff to guide treatment and management to meet legal compliance and encourage desirable vegetative establishment. Larimer County staff will provide technical oversight on specific methods and timing to treat for noxious/troublesome weeds found within the project sites in the most effective way possible. Larimer County staff, via their Enterprise Program, will also conduct the vegetation and weed management itself. The project team will also look to partner with volunteer groups such as Larimer County Conservation Corps (LCCC), AloTerra Restoration Services, Wildland Restoration Volunteers (WRV), and Rocky Mountain Flycasters (RMF) Chapter of Trout Unlimited to have volunteers participate in noxious/troublesome weed management. Focusing on the management of noxious/troublesome weeds is critical. Active vegetation is vital to the establishment and growth of native species.

Method/Procedure

- Identification of state listed noxious weeds will be produced from the monitoring efforts described under Task 1.
- Control of noxious/troublesome species will utilize integrated management techniques such as mechanical removal and herbicide applications to reduce populations; methods will be tailored to the specific weedy plant species found within the project area, and treatments will be conducted in a way to minimize harm to native plants establishing in the area. The Larimer County Enterprise Program will lead the weed management work primarily using mechanical and hand labor techniques.

[5] The project team recognizes that monitoring, stewardship and restoration of some areas may need to continue beyond the initial two year term. This can be assessed and planned for during the first 12-18 months of the proposed project.

Deliverable

- Reports documenting 70% canopy cover of desirable native plant species after two years of vegetation management.
- Inventory of state listed noxious weeds throughout project areas included in the proposed project.
- Noxious Weed Act compliance within the project areas.
- Estimated treatment of ~50 acres along the river corridor for noxious species that will inhibit and outcompete the establishment of native riparian species.

TASK 3– Vegetation Management – Establishing and Maintaining Native Plants

Description of Task

Project partners will use existing resources to guide efforts to establish native riparian vegetation in the focal areas. Resources include: CWCB Living Streambanks Manual and Revegetation Matrix Database[6], Planting Guides established via the Regional Stream Stewardship & Recovery Handbook[7], and planting plans that guided initial planting efforts in the river restoration project areas. Areas that require additional maintenance to help native plants establish and thrive will be identified via Task 1 Monitoring efforts described previously. Project partners will work with a mix of contractors and volunteer groups to establish and maintain a diverse mix of native riparian species within the identified priority areas.

Method/Procedure

- Identify priority areas for treatment via Task 1 Monitoring efforts, and coordinate with noxious species management tasks to ensure proper sequencing of treatment for noxious species and native riparian plantings.
- Develop a list of plant species and conceptual planting plan for each area identified in Task 1 as needing further planting work.
- Plan and implement an estimated 6 volunteer planting days in the project areas of the watershed included in the proposed project.

Deliverable

- Documented species list and conceptual planting plans to guide volunteer planting days or contractor planting efforts.

[6] See https://coloradoewp.com/sites/coloradoewp.com/files/document/pdf/Biostabilization_Manual_072416.pdf and http://cwcb.state.co.us/environment/watershed-protection-restoration/Pages/main.aspx for more information.
[7] See https://lwog.org/programs/stewardship/

- Reports per project area that describe species and quantities installed, number of volunteer hours (if applicable) and photos of installation.

TASK 4– Erosion and Sediment Management

Description of Task

Project partners will use the monitoring protocol and results from Task 1 to identify potential areas of concern related to excessive erosion of stream banks and upland areas. The project team will consult established and existing resources to identify appropriate and proactive treatments for these priority areas of concern. Depending on the specific issue identified, and the best management practice or treatment selected to best alleviate the issue, the project team will use either in-house staff or work with outside consultants to install the selected treatment. For any treatments installed, the project team will document suggested future maintenance for the installed feature or best management practice.

Method/Procedure

The project team will utilize the following resources and methods to evaluate, select and install erosion control and other stabilization features for areas identified to have emerging stability and erosion issues:

- Original project design plans, as-built plans, Stormwater Erosion Control Plans, as well as best management practices from Urban Drainage and Flood Control, and NRCS Operations and Maintenance Plans; These plans will help determine if minor maintenance is required or if something more in-depth is needed to manage the issues identified.
- CWCB Living Streambanks Manual and Revegetation Matrix Database will serve a resource to explore appropriate bioengineering treatments that can be used to proactively manage emerging issues.

Deliverable

- Updated Operations and Maintenance plans for priority areas where additional treatments are needed.
- Reports per priority area that describe the areas disturbed by construction activities that had been successfully stabilized.

TASK 5– Maintenance of In-stream Structures

Description of Task

The project team will use geomorphic cross sections and other monitoring of in-stream structures conducted or collected as part of Task 1 to determine if structures are performing as expected. For any in-stream structure that is determined to have failed, the project team will work with the original design

team of the specific area to gain input on potential adaptive management steps, as well as an experienced contractor to manually correct issues identified.

Method/Procedure

- The project team will use the monitoring protocol and results collected from Task 1, and discussions with the original design teams to guide any appropriate in-stream structure repair work.
- Any repairs identified will be performed using contractors who are qualified and knowledgeable in river restoration implementation,

Deliverable

- Reports for areas determined to have structure failure that summarize the issues and determination of failure and a summary of actions taken to repair and resolve the issue.

TASK 6– Identify key next steps for long-term efforts

Description of Task

In this task, the project team will execute the following tasks that are critical to assessing and planning for the long-term needs of the watershed:

1) Update the monitoring protocol to take into account lessons learned, best management practices, and other modifications made throughout the project.
2) BTWC will lead synthesis of existing information and develop a report with current data, recently completed projects, and potential future needs and issues for project areas in the proposed project. This information can be used to update the Big Thompson River Restoration Plan, or as the baseline to start larger watershed planning efforts.
3) BTWC will also research citizen-science based Adopt-a-Reach Programs that have been successful elsewhere in the state and country, and create a pilot program with interested property owners, stakeholders and others active in the watershed.

Method/Procedure

- The project team will update the monitoring protocols and repository of data shared with project partners. The project team will create reach reports that provide a summary of data and projects completed in each of the project areas, similar to efforts recently completed by the City of Loveland through their City River Master Planning effort[8]. Data incorporated into summary reports will be limited to that made available to the project team and available via stakeholder discussions and interviews.
- The project team will also work with stakeholders such as the Big Thompson Watershed Forum,

[8] https://www.abetterbigt.com/baseline-resiliency-assessment

USFS, and Colorado Parks and Wildlife to ensure that data collection and monitoring related to aquatic habitat, water quality, etc spearheaded by these entities feed into the larger adaptive management protocol, shared data, and project area reports.

- BTWC will research existing citizen-science based Adopt-a-Reach programs, including the Adopt a Waterway program at the City of Loveland, as well as other similar neighboring watershed monitoring efforts in the Lefthand and Cache la Poudre. BTWC will look to partner with similar programs in the watershed and build on existing efforts, if feasible. BTWC will identify those components in the monitoring protocol that could be led by citizen science volunteers, and will create a pilot program with interested stakeholders.

Deliverable

- Updated monitoring protocol and system for sharing collected data and other relevant watershed data and reports.
- Reach summary reports, that contain an overview of work completed in the reach as well as potential future needs linked to multiple environmental and community sectors.
- Materials to support a pilot citizen science based Adopt-a-Reach program, including an appropriate protocol for use by volunteers, data sheets, and other documents that explain how the program will work. A report describing the pilot test of this effort will also be included.

TASK 6– Capacity Building

Description of Task

The Big Thompson Watershed Coalition has been a 501c3 nonprofit with two staff members for just over two years. The organization has accomplished a lot in a short time through its emphasis on project management, education and outreach efforts. However, additional organizational growth is needed to ensure an effective and financially stable organization that is able to continue to provide high-quality programs and thrive over the long-term. A key part of capacity building is fundraising and grant-writing to diversify the portfolio of project and organizational funds.

Method

- Continued refinement and implementation of the organization's fundraising plan.
- Identification and development of 3-4 collaborative watershed grant applications from federal, state, local foundation grants, corporate giving, and private sources.
- Identification, development and execution of 2-3 fundraising campaigns that increase awareness of the organization with the public and result in unrestricted funds to further the mission of the organization.

Deliverable

- Timesheets, payroll records and reimbursement requests to CWCB demonstrating time fundraising.
- Periodic reports detailing fundraising efforts and accomplishments.

TASK 7– Overall Project Management

Description of Task

BTWC will take the lead role of coordinating among project partners for all tasks outlined above, overseeing day to day operations and progress related to the project. BTWC will also be the lead on invoicing and reporting to CWCB. Some subtasks, such as overseeing noxious weed management and treatment will be overseen directly by Larimer County given the direct link to its staff, departments and other contractors performing the work.

Method

BTWC will work closely with Larimer County to select and hire contractors to complete the necessary tasks related to the project. For volunteer-led tasks, BTWC will work closely with volunteer or volunteer groups to complete the necessary tasks.

Deliverable

BTWC will provide CWCB with status and final reports that documents findings from monitoring and adaptive management actions taken.

2017 CWCB Grant Application
Big Thompson Watershed - Scope of Work

Budget & Timeline Table

Task	Description	Target Start Date	Target End Date	Qty	Units	Unit Cost/Rate	CWCB Funds	Other Fund Cash	Other In-Kind	Source of Funds	Total
1a	**Formalize Protocol & Conduct Periodic Monitoring** - BTWC Staff	3/1/18	12/31/19	360	Hrs	$ 40.00	$ 6,400	$ -	$ 8,000	BTWC - DOLA Capacity Funds	$ 14,400
1b	Formalize Protocol & Conduct Periodic Monitoring - LC Staff Time	3/1/18	12/31/19	240	Hrs	$ 54.00	$ -	$ -	$ 12,960	Larimer County	$ 12,960
2a	**Vegetation Mgmt/Noxious Weeds** - Labor	4/15/18	12/31/19	200	Hrs	$ 280.00	$ 56,000	$ -	$ -		$ 56,000
2b	Vegetation Mgmt/Noxious Weeds - Materials	4/15/18	12/31/19	2	Ea	$ 2,000.00	$ 2,000	$ 2,000	$ -	Larimer County	$ 4,000
3a	**Vegetation Management/ Native Plants** - LC Staff time	4/15/18	12/31/19	50	Hrs	$ 54.00	$ -	$ -	$ 2,700	Larimer County	$ 2,700
3b	Staff Time - BTWC	4/15/18	12/31/19	40	Hrs	$ 40.00	$ 1,280	$ -	$ 320	BTWC - DOLA Capacity Funds	$ 1,600
3c	Contractor Time - Mobilization & Labor	4/15/18	12/31/19	17.5	Acres	$ 617.86	$ 10,813	$ -	$ -		$ 10,813
3d	Volunteer Group Costs	4/15/18	10/15/19	1	LS	$ 12,750.00	$ 6,125	$ 6,625	$ -	Trout & Salmon Foundation; Patagonia	$ 12,750
3e	Volunteer Labor	4/15/18	10/15/19	840	Hrs	$ 24.14	$ -	$ -	$ 20,278	WRV, AloTerra, LCCC, & RMF Volunteers	$ 20,278
3f	Materials - Seed	4/15/18	11/30/19	18.85	Acre	$ 125.00	$ 2,356	$ -	$ -		$ 2,356
3g	Materials - Organic Fertilizer	4/15/18	11/30/19	17.5	Acre	$ 370.00	$ 6,475	$ -	$ -		$ 6,475
3h	Materials Biotic Earth	4/15/18	11/30/19	17.5	Acre	$ 2,502.00	$ 4,815	$ 38,970	$ -	Larimer County	$ 43,785
3i	Materials - Tracking Agent 3 Guar	4/15/18	11/30/19	17.5	Acre	$ 131.80	$ -	$ 2,307	$ -	Larimer County	$ 2,307
3j	Materials - Humic Acid	4/15/18	11/30/19	17.5	Acre	$ 96.00	$ -	$ 1,680	$ -	Larimer County	$ 1,680
3k	Materials- Quantum Growth VSC	4/15/18	11/30/19	17.5	Acre	$ 75.00	$ 1,313	$ -	$ -		$ 1,313
3l	Materials - Hydromulch	4/15/18	11/30/19	17.5	Acre	$ 2,337.00	$ -	$ 40,898	$ -	Larimer County	$ 40,898
3m	Materials - Wood Straw Mulch	4/15/18	11/30/19	5.7	Acre	$ 4,000.00	$ 22,800	$ -	$ -		$ 22,800

2017 CWCB Grant Application

Big Thompson Watershed - Scope of Work

Task	Description	Target Start Date	Target End Date	Qty	Units	Unit Cost/Rate	CWCB Funds	Other Fund Cash	Other In-Kind	Source of Funds	Total
3n	Materials - Willow Stakes	4/15/18	11/30/19	600	EA	$ 2.50	$ 1,375	$ 125	$ -	Trout and Salmon Foundation	$ 1,500
3o	Materials - Trees/Shrubs	4/15/18	11/30/19	630	EA	$ 10.00	$ 5,800	$ 500	$ -	Trout and Salmon Foundation	$ 6,300
4a	**Erosion & Sediment Management** -LC Staff time	4/15/18	12/31/19	30	Hrs	$ 54.00	$ -	$ -	$ 1,620	Larimer County	$ 1,620
4b	Erosion & Sediment Management -BTWC Staff	4/15/18	6/30/18	15	Hrs	$ 40.00	$ -	$ -	$ 600	BTWC - DOLA Capacity Funds	$ 600
4c	Contractor Labor	4/15/18	12/31/19	2055	LF	$ 1.65	$ 3,391	$ -	$ -		$ 3,391
4d	Volunteer Labor	6/1/18	9/30/18	408	Hrs	$ 24.14	$ -	$ -	$ 9,849	LCCC and RMF Volunteers	$ 9,849
4e	Materials - Sediment Control Logs	4/15/18	12/31/19	2555	LF	$ 3.00	$ -	$ 7,665	$ -	Larimer County	$ 7,665
4f	Materials - Sediment Control Stakes	4/15/18	12/31/19	2554	LF	$ 0.50	$ -	$ 1,277	$ -	Larimer County	$ 1,277
5	**In-stream Structure Maintenance** - Contractor Labor	10/15/18	12/31/19	1	LS	$ 10,000.00	$ 10,000	$ -	$ -		$ 10,000
6a	**Identify Long-Term Needs** - Update Monitoring Protocol - LC Staff Time	8/1/18	12/31/19	55	Hrs	$ 54.00	$ -	$ -	$ 2,970	Larimer County	$ 2,970
6b	**Identify Long-Term Needs** - Update Monitoring Protocol - BTWC	8/1/18	12/31/19	60	Hrs	$ 40.00	$ 2,400	$ -	$ -		$ 2,400
6c	Create Reach Summary Reports - LC Staff Time	5/1/18	12/31/19	60	Hrs	$ 54.00	$ -	$ -	$ 3,240	Larimer County	$ 3,240
6d	Create Reach Summary Reports -BTWC	6/1/18	12/31/19	120	Hrs	$ 40.00	$ 4,000	$ -	$ 800	BTWC - DOLA Capacity Funds	$ 4,800
6e	Draft Citizen Science Adopt a Reach Program	7/1/18	10/1/18	100	Hrs	$ 40.00	$ 4,000	$ -	$ -		$ 4,000
6f	Run pilot test of Adopt a Reach Program	10/1/18	12/31/19	100	Hrs	$ 40.00	$ 4,000	$ -	$ -		$ 4,000
7	**Capacity Building - BTWC Staff**	3/1/18	12/31/19	500	Hrs	$ 40.00	$ 10,000	$ -	$ 10,000		$ 20,000
8	**Project Management**	3/1/18	12/31/19	250	Hrs	$ 40.00	$ 10,000	$ -	$ -		$ 10,000
	TOTALS						**$ 175,343**	**$ 102,047**	**$ 73,337**		$ 350,727

Colorado Watershed Restoration Program
Watershed/Stream Restoration Grant Application

Applicant Contact Information:

Cinceré Eades, Natural Resource Planner/Project Manager
Phone: 720-913-0655; cincere.eades@denvergov.org

Cherry Creek Restoration Project – East Iliff Avenue to Quebec Street

Nearest Town or City	City of Denver
County	Denver and Arapahoe
Latitude/Longitude	39.682346, -104.898594
Stream Name and Watershed	South Platte River, Middle South Platte River-Cherry Creek Watershed

Figure 1 in Appendix A is a vicinity map for the project area.

Project Description

The Cherry Creek Restoration Project has been initiated to restore a one-mile reach of the Cherry Creek Corridor located approximately 2.5 miles downstream of Cherry Creek Reservoir between Quebec Street and Iliff Avenue. The project spans between City and County of Denver on the downstream side and Arapahoe County on the upstream side. Within the project reach, the Cherry Creek channel consists of a 30-foot wide active sand bed channel with a perennial base flow. The channel invert drops 30 feet and runs at approximately a 0.6% slope.

Currently, the active channel is experiencing severe downcutting, leaving a 10 to 20-foot deep eroded/incised channel with vertical banks. The stream channel improvements will raise the channel bed and associated water table. An extensive planting effort is included with the project to encourage the return of native vegetation and wildlife habitat. CWCB funding is integral to the success of this project. Without CWCB's support, the project partners will have to value engineer out critical restoration components.

Watershed/Stream Restoration Grant Request

Total Project Cost	$15,321,000
Grant Request	$500,000
Funding Sources:	
Project Sponsors Trust/Project Account	$4,041,000
City and County of Denver 2018/2019 Budget	$2,500,000
Denver Water (Land Contribution)	$1,000,000
Arapahoe County 2018/2019 Budget	$2,000,000
SEMSWA 2018/2019 Budget	$700,000
UDFCD 2018/2019/2020 Budget	$4,580,000
Total Budgeted	$15,321,000

Technical Feasibility of the Project

Project Need/Definition of the Problem

Cherry Creek is experiencing severe degradation leaving a 10 to 20-foot deep eroded/incised channel with vertical banks that is not connected to the floodplain. Cherry Creek also contains the Denver metro area's most heavily used regional trail that connects Douglas, Arapahoe, and Denver Counties to the South Platte River. As such, the degradation imposes a significant safety and passage barrier for trail users. The degradation has resulted in these impairments to the stream corridor:

- lack of floodplain connection
- lowering groundwater table
- loss of a riparian habitat
- diminishing wetlands
- diminishing aquatic and terrestrial habitat
- diminishing water quality with bank erosion
- eroding banks
- potential loss of utilities and storm outfalls,
- potential loss of residential lots, roads, and trails
- unsafe open space and park for users.

Multi-objective Aspects of Project

The purpose of the Cherry Creek Restoration Project is to improve aquatic, wetland, and riparian habitat, restore ecologic function and maintain flood conveyance and grade control.

Following are the identified objectives of the project:

- restore ecologic process
- connect the stream and its floodplain
- protect people, property, and the environment from flood hazard
- protect the watershed
- provide for local pedestrian connectivity from the adjacent community to the stream corridor
- provide for regional pedestrian mobility between Denver, Arapahoe County, and Douglas County
- enhance instream water quality and water quality for existing tributary areas
- enhance water quality for proposed roadway project at Iliff
- restore the stream ecology
- create an open space for passive and active recreation

Floodplain benches will be created adjacent to the active channel to expand the riparian corridor and improve flood capacity. Other improvements will include approximately 10,000 feet of bank protection, 150,000 cubic yards of grading, planting of trees, shrubs, willow stakes, wetland plugs, and 30 acres of

native seeding. With healthier stands of vegetation resulting from the raised water table, the project will provide a much stronger flood corridor with improved conveyance that will increase safety for the surrounding public and infrastructure, while keeping 100-year flood flows within the open space corridor.

The stabilized channel will also improve water quality by reducing the heavy sediment loads being transported by the existing channel. Early Cherry Creek watershed plans recognized stream stabilization and reclamation as a watershed-wide control method to control sediment, phosphorus and other nutrients being transported to downstream waters. Rich riparian ecosystem vegetation will be achieved as illustrated in Figure 2 in Appendix A.

Technical Feasibility of the Project

Aquatic Resources

Riffle structures will be constructed with only one foot drop heights and only 2.5% downstream drop faces. In addition, the riffles will be constructed with loose rock (void-filled riprap) to simulate natural river bed material, all of which is very conducive to fish passage. Similarly, sculpted concrete grade control structures will be designed with a series of step/pool sequences to allow for fish passage and provide a home for aquatic organisms.

Terrestrial Resources

The upper banks of the creek are currently dominated by non-native and invasive species including: Smooth brome, Cheatgrass, Canada thistle, Marestail, Russian olive, and Siberian Elm. Due to the project reach's eroded condition, little to no riparian or wetland vegetation is present along the creek banks.

The project includes creating more floodplain benches to provide riparian habitat and re-stabilize the banks with native riparian and upland seed. The areas with 10-12-foot eroded banks will be regraded and restored as native uplands. Creating wetland/riparian benches and burying exposed concrete will enhance the wildlife habitat along this reach of the river. Mile High Youth Corps will be utilized to install trees, shrubs, willow stakes, and grass plugs to help supplement the planting contractor's overall effort.

Recreation and Education

The Cherry Creek Regional Trail runs along the south bank of the creek through the project reach. This trail is a heavily used pedestrian and cycling trail within an urban corridor. Due to the steep banks and active erosion, the trail has been undermined in areas and recently repaired. Many other areas of the trail could experience failure if the creek channel is not stabilized and restored. Several recreational components will be improved throughout the project area. By re-grading the banks to a gentler slope, the regional trail will be reconstructed to the updated Denver Park standard with a 12-ft concrete trail with 4-ft recovery zones on each side. Access points to the creek will concentrate access without compromising the success of the surrounding wetland and riparian areas.

Project Implementation

Schedule

A project schedule has been completed for design and construction of the improvements. Design is already well underway and is scheduled to be completed in January 2019. This will provide adequate time to complete environmental clearances and CLOMR approval from FEMA. Construction will start in the spring of 2019 and is anticipated to take 12 to 18 months to complete.

Partners will achieve the multi-objective aspects of the project simultaneously. Planning and 30% level designs are complete. Permitting and Final Design shall be complete by January 2019. A contractor will be selected by January 2018. Construction, Final Implementation Plan, will be as follows:

- Install temporary construction erosion- and sediment-control best management practices (BMPs).
- Dewater Cherry Creek around the work area to allow creek work to be completed in a dry condition for best results and to minimize sediment discharges. Sheet pile will be used as the primary dewatering material. Seepage and subsurface water will be pumped to a settlement basin.
- Grade bankfull channel, floodplain/vegetation benches, flood terraces and install bank stabilization installed on a portion of the creek.
- Install post-construction erosion control using coconut erosion-control blankets on all slopes at 4:1 and steeper and all banks that could experience active river flow.
- Plant vegetation and provide temporary watering until established.
- Remove temporary construction erosion-control BMPs once vegetation is established.

Monitoring Plan

The UDFCD will be responsible for monitoring the project. The UDFCD is financially supported by a property tax mill levy specifically collected for Denver and Arapahoe County. UDFCD annually inspects and performs river management services five times a year that consist of a crew walking the reach to provide vegetation management, removing debris and trash, and identifying any potential problem areas. In addition to the above maintenance, the Section 404 permit for the Cherry Creek Restoration requires annual monitoring for a period of at least 5 years after construction has been completed. The monitoring report documents the conditions of the project area, including the establishment of wetland

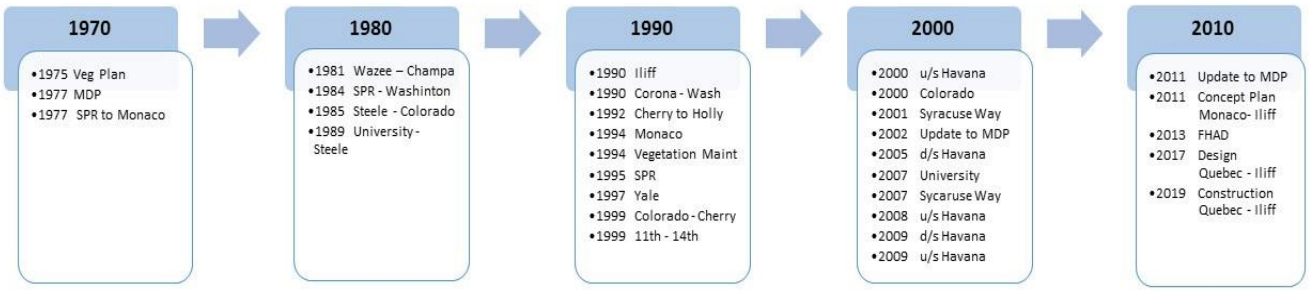
Cherry Creek Restoration Monitoring Plan

Functional Category	Function-Based Parameters	Existing Parameter	Proposed Parameter	As-Built 2019	Monitoring Year				
					2020	2021	2022	2023	2024
Hydrology	Catchment Hydrology								
	Reach Runoff								
Hydraulics	Floodplain Connectivity								
	Lateral Stability								
	Riparian Vegetation								
	Bed Material								
	Bed Form Diversity								
	Plan Form								
Physicochemical	Temperature								
Biology	Macros								

and riparian habitat, and if the project was constructed as planned. A sample monitoring plan is provided. The partners will monitor the project and determine how it is performing relative to hydraulics, geomorphic, physiochemical, and biologic parameters. If it is not performing as expected, the partners will implement restorative projects to get the project back on a stable trajectory.

Qualifications of the Applicant

The City and County of Denver and Arapahoe County along with the UDFCD have been working together as project partners for more than four decades master planning, designing, building, and maintaining projects along Cherry Creek in the Denver metro area. The restoration effort started with a vegetation and watershed master plan of Cherry Creek in 1975 led by Denver, Arapahoe County and UDFCD. Since the completion of the 1977 watershed masterplan, the project partners have built several projects along Cherry Creek leading up to this project. A timeline is provided below summarizing the collective efforts of the project partners over the four decades.



Project Staffing

A talented and diverse team has been assembled to plan and implement this project. Resumes of *key* project team members are included in Appendix G. This team provides expertise for all aspects of the project and has direct experience with completing similar successful past projects. The following is a list agency staff commitments and level of effort:

- UDFCD – 3 staff, 1200 hours
- SEMSWA – 2 staff, 400 hours
- Arapahoe County – 4 staff, 800 hours
- Denver – 2 staff, 800 hours
- Denver Water – 2 staff, 300 hours
- Muller Engineering – 6 staff, 5,600 hours
- Stream Design – 3 staff, 2,800 hours
- Corvus – 1 staff, 200 hours
- Pinyon – 2 staff, 120 hours

Volunteers will be used for most planting efforts immediately following heavy construction. Mile High Youth Corps will be utilized to install trees, shrubs, willow stakes, and wetland plugs to help supplement the contractor's overall effort.

Collaborative Approach and Partnerships

The City and County of Denver (Denver), Arapahoe County, Southeast Metropolitan Stormwater Authority (SEMSWA), Denver Water, and the UDFCD are the major funding sponsors of the Cherry Creek

Restoration Project. The Cherry Creek Stewardship Partners and CDOT are also collaborating on the project and have been involved in developing the project concepts. See Appendix F for support letters. At the onset of the Cherry Creek Restoration Project, the partners recognized the need to update the watershed masterplan that was developed in 1977 and amended in 2002. In 2011 and 2013, an update to the watershed master plan and Flood Hazard Area Delineation (FHAD) was completed that laid the foundation for the project.

A conceptual plan, Cherry Creek Corridor Improvements Plan, was completed in 2015 and reflects a collaborative local, regional and multi-agency approach to meeting multi-objective aspects of the project. Other plans were referenced during the conceptual design in 2015 to guide the multi-objective aspects of the project including Denver's Cherry Creek Greenway Corridor Master Plan (2000); Denver's Master Plan for Managing Solid Waste (2010); Arapahoe County's Iliff Avenue Corridor Study (2015); Be Healthy Denver: Denver's Community Health Improvement Plan (2013).

Public Outreach

In 2011 – a collaboration between Denver, Arapahoe County, SEMSWA and UDFCD - completed and published Cherry Creek Stabilization Plan Update, Cherry Creek Dam to South Platte River. During the master planning effort, the partners met with community members including elected officials.

In 2013 – a collaboration between Denver, Arapahoe County, SEMSWA and UDFCD - completed and published Cherry Creek (Cherry Creek Dam to South Platte River) Flood Hazard Area Delineation to delineate the flood hazards along Cherry Creek.

In 2015 – a collaboration between Denver, Arapahoe County, SEMSWA, Cherry Creek Stewardship Partners, UDFCD and Denver Water completed and published Cherry Creek Restoration Concept Design. The partners presented the conceptual design at the Cherry Creek Stewardship Partners meeting in September 2015. In November 2016, the project was presented at the Cherry Creek Stewardship Partners Annual Conference to solicit comments from the community.

In 2017 – a collaboration between the partners, Arapahoe County Public Works and CDOT – completed and published a Water Quality Concept Design for the Iliff Avenue Widening Project (Iliff Roadway Project). The Cherry Creek Restoration project was presented to the Iliff Roadway project team as an alternative best management practice to enhancing water quality. CDOT and Arapahoe County Public Works pledge their partnership and support of the Cherry Creek Restoration project as a water quality BMP for the roadway project.

In 2018 – the project partners will conduct additional stakeholder and public outreach to help inform the design and additional recreation amenities. A range of methods will be utilized including, public meetings/events, tours, and online surveys.

Appendix C – Scope of Work & Budget

Scope of Work

GRANTEE and FISCAL AGENT (if different)
City and County of Denver and Arapahoe County; UDFCD

PRIMARY CONTACT
Cinceré Eades

ADDRESS
201 W Colfax Ave #601, Denver, CO 80202

PHONE
(720) 913-0655

PROJECT NAME
Cherry Creek Restoration Project – Quebec to Iliff

GRANT AMOUNT
$500,000

INTRODUCTION AND BACKGROUND
The project partners will restore a one-mile reach of the Cherry Creek Corridor located approximately 2.5 miles downstream of Cherry Creek Reservoir between Quebec Street and Iliff Avenue. The project spans between City and County of Denver on the downstream side and Arapahoe County on the upstream side. Since this reach is located downstream of the Cherry Creek Dam, flows are controlled at a 100-year flow rate of 5,000 cfs. Within the project reach, the Cherry Creek channel consists of a 30-foot wide active sand bed channel with a perennial base flow. The channel invert drops 30 feet between the upstream and downstream project limits and runs at approximately a 0.6% slope. Currently, the active channel is experiencing severe downcutting resulting from increased flow rates caused by urbanization in the upstream watershed. This downcutting has left a 10 to 20-foot deep eroded/incised channel with vertical banks. The downcutting is preventing flow from spreading into riparian terraces, exposing utilities crossing the creek, threatening adjacent residential lots, roads, and trails, creating unsafe conditions for park users, degrading water quality, and lowering the groundwater table. The consequence of the

lowered groundwater table caused by channel downcutting is stressed and dying riparian vegetation, leaving fragile sandy banks and overbanks subject to additional erosion.

The restoration project was initiated by the City and County of Denver, Arapahoe County, Urban Drainage and Flood Control District (UDFCD), Southeast Stormwater Authority (SEMSWA, and Denver Water. The proposed restoration will use a wide range of innovative technical expertise complemented by traditional stream stabilization design with blended techniques from natural stream restoration, geomorphic approaches, and bio-engineering. CLOMR and LOMR submittals will be completed to document the changed floodplain condition before and after construction and environmental permitting through an individual 404 permit will be completed as well to attain all necessary environmental clearances to construct the project.

The project was initiated in 2016. Preliminary and Final Design Phases will be completed in January 2019 and construction will start in the spring of 2019.

OBJECTIVES

The following objectives have been defined for this project:

- Improve the quality of water flowing through the project and being received by downstream waters.
- Create a stable storm flow corridor that maintains/improves the current flood capacity and protects life and property.
- Protect existing infrastructure from stream erosion.
- Preserve where appropriate, restore where needed, and enhance the overall wildlife habitat and ecological function in the Cherry Creek channel and overbank areas.
- Enhance educational and recreational amenities.
- Create a sustainable stream system that requires minimal maintenance.

TASKS

The following tasks are to be carried out to complete construction in accordance with the drawings and specifications. The design and quantities for work items are still in progress. As a result, it should be noted that further refinement of the design and further coordination with the stakeholders and landowners could affect the final quantities discussed below.

TASK 1 – Complete Denver Water Land Transfer

Description of Task

Denver Water is transferring approximately 26-acres to City and County of Denver and Arapahoe County at no charge. The land is assessed at $1M and will be the projects in-kind contribution to the grant. The land is currently being surveyed and will be transferred to each municipality by June 2018.

Method/Procedure

This task involves surveying each parcel to be transferred, title commitments, and rezoning to open space (if applicable).

TASK 2 – Construct channel stabilization improvements

Description of Task

Raise the incised Cherry Creek channel and reshape it to form an appropriate sized bank-full channel geometry and sinuosity. Create floodplain benches adjacent to the active channel to expand the riparian corridor and improve flood capacity. Then stabilize the new channel with grade control structures and bank protection.

Method/Procedure

This task will involve clearing and grubbing, topsoil removal, and over 150,000 cubic yards of earthwork to shape the channel, floodplain benches, and overbanks. Then, grade control structures will be constructed consisting of a combination of 14 low-height/low capacity loose rock riffle structures, two sculpted concrete drop structures, and one loose boulder tie-in structure at the downstream end of the project reach. Concurrently, approximately 10,000 feet of bioengineered bank protection will be constructed consisting of varying combinations of buried loose rock and biodegradable erosion control blanket.

TASK 3 – Construct educational and recreational facilities.

Description of Task

Re-align and construct the regional trail system and open space amenities.

Method/Procedure

This task will include removal of the existing Cherry Creek Regional Trail and replace with a new 12-foot wide concrete trail with attached 4-foot wide crusher fines surface. Also, a series of smaller secondary crusher fines trails will be constructed along with two new trail crossings to provide park users with more access to the creek and riparian areas. Signage, picnic tables, and benches will also be installed.

TASK 4 – Remove, replace, and protect existing utilities and storm sewer outfalls

Description of Task

Throughout the project reach there are several utilities and storm sewer outfalls. Some of these facilities have already been damaged by the eroding channel and some are currently being threatened. Protection of these facilities will partially be achieved with the improvements discussed in Task 1. In addition to the Task 1 improvements, 10 storm sewer outfalls will be renovated to adjust to the proposed grading / channel alignment and water quality improvements will be installed at the downstream end of select outfalls.

Method/Procedure

This task will include removing or abandoning/plugging existing storm sewer pipes, replacing and/or rerouting storm sewers with new pipes and manholes, constructing end treatments and outlet erosion protection, and installing water quality facilities at the downstream end consisting of forebays and/or pre-treatment swales.

TASK 5 – Revegetate the site

Description of Task

All disturbed areas resulting from the work completed in Tasks 1, 2, and 3 will be restored with native riparian and upland vegetation.

Method/Procedure

This task will include placement of topsoil and soil amendments and seeding and mulching all disturbed areas within the work limits (over 30 acres) with a native seed mix specific to the climate and elevation at the project site. Other revegetation methods will include planting thousands of trees, shrubs, live willow stakes/logs, and grass plugs according to the appropriate riparian zone (proximity to creek). Planting and seeding will occur down to the normal water level. As mentioned in Task 1, biodegradable erosion control blanket will be used on select slopes to provide immediate protection until the vegetation can establish.

REPORTING AND FINAL DELIVERABLE

Reporting: The applicant shall provide the CWCB a progress report every six months, beginning from the date of the executed contract. The progress report shall describe the completion or partial completion of the tasks identified in the statement of work including a description of any major issues that have occurred and any corrective action taken to address these issues.

Final Deliverable: At completion of the project, the applicant shall provide the CWCB a final report that summarizes the project and documents how the project was completed. This report may contain photographs, summaries of meetings and engineering reports/designs.

CHERRY CREEK CORRIDOR IMPROVEMENTS - QUEBEC TO ILIFF

Task	Description	Target Start Date	Target Completion Date	CWCB Grant Funding	Stakeholder Funding*	Other Funding In-Kind	Total
1	**Denver Water Land Transfer**	1-Aug-17	1-Jun-18	$0	$0	$1,000,000	$1,000,000.00
2	**Channel Stabilization**	1-Apr-19	31-Mar-20	$350,000	$6,897,427	$0	$7,247,427.26
3	**Education/Recreation**	1-Apr-19	31-Mar-20	$0	$2,702,922	$0	$2,702,921.62
4	**Utility/ Storm Sewer**	1-Apr-19	31-Mar-20	$0	$1,432,084	$0	$1,432,084.08
5	**Revegetation**	1-Feb-20	1-May-20	$150,000	$2,788,567	$0	$2,938,567.04
TOTALS				**$500,000.00**	**$13,821,000**	**$1,000,000**	**$15,321,000**

* Stakeholder Funding consists of combined funds from UDFCD, SEMSWA, City and County of Denver, Arapahoe County, and Denver Water.

PROJECT PROPOSAL SUMMARY SHEET

Project title: Fish passage and monitoring of fish movement on the Cache la Poudre River
Project location: The Cache la Poudre River through Fort Collins
Grant type: Restoration/Stream Management Planning/Monitoring
Grant Request/Amount: $200,000
Cash match funding: $200,000
In-kind match funding: 0
Project sponsor: City of Fort Collins (sponsor and fiscal agent)
Contact: Jennifer Shanahan, Natural Areas Department, jshanahan@fcogov.com, 970-221-6281

Project summary description: The purpose of this grant is to fund two initiatives directly related to the collaborators' goal of enhancing the health of the Cache la Poudre River (Poudre) by supporting the vulnerable populations of native plains fish and the valued recreational trout fishery. This will be accomplished through improvement of aquatic habitat connectivity and with enhanced understanding of fish movement using two distinct yet interrelated projects:

Grant project #1: Fish passage installation in the Timnath Inlet Ditch diversion dam
The Timnath Reservoir Inlet Ditch (a.k.a. Cache la Poudre Reservoir Inlet Ditch, WDID 0300924), owned by the Cache la Poudre Reservoir Company (CLPRC), is a major barrier to aquatic habitat connectivity on the Poudre. The structure is impassable many months of the year due to the structure's size and the timing and type of CLPRC's water right. The City has been working in collaboration with CLPRC for the past two years to design fish passage for this structure, which is now complete, presenting a shovel ready project (pending permits). With this grant proposal the **City seeks to secure sufficient funding for the construction/installation of fish passage in the Timnath Reservoir Inlet diversion** (Timnath Inlet) in the fall/winter of 2018/2019.

Grant project #2: Evaluating effectiveness of fish passage – a fish movement monitoring program
A recent river health assessment for the Poudre, in the vicinity of Fort Collins, identified native plains fishes and aquatic habitat fragmentation as two of the most impaired elements of the system. Diversion structures impede upstream movements of fish and flow fluctuations are sometimes extreme, especially in base flow periods such as November to March. Fish movements may be restricted by numerous in-channel diversion structures that prevent fish passage most months of the year, which ultimately, may affect population health of the fish community.

With significant investments going into numerous structures on the Poudre and around the state, the City seeks to better understand the effectiveness of these costly infrastructure investments within the context of movement patterns and stressors on the fishery. To that end, **we propose a three-year monitoring program with a set of integrated objectives to monitor fine-scale fish community composition, background fish movement rates in reaches with complex and simple habitat and passage rates of fish over existing diversion dams via fish passage devices.** Results of this evaluation will allow the City to not only determine the efficacy of existing structures but the best placement of new ones moving forward.

Project Location: The Timnath Inlet is located on the Poudre between Lemay Avenue and Timberline Road (N=453789.5180, E = 126496.6480). The Timnath Inlet represents approximately the midpoint of the monitoring program study area which would extend on the Poudre from Overland Road downstream to Interstate 25. A map is provided in **Attachment A**.

Applicant: City of Fort Collins
Project: Fish passage and monitoring of fish movement on the Cache la Poudre River

Qualifications Evaluation

Lead Project Sponsor & Additional Stakeholders' level of Participation

The **City of Fort Collins Natural Areas Department** is the lead project sponsor, coordinator and fiscal sponsor for both projects proposed within this grant. Jen Shanahan, Watershed Planner, will be responsible for ensuring successful collaboration, timelines, budgets, project accountability and reporting.

The Timnath Inlet Ditch is owned by the **Cache la Poudre Reservoir Company** (CLPRC) whose board and general manager have been engaged with the City for the past two years in the design process. The design and permitting process thus far has been developed by two local firms, **Anderson Consulting Engineers** and **OneFish,** who collectively have the specific expertise to manage the design and installation of the fish passage coincident with structural improvements. These are consultants, not collaborators, are mentioned here because the working relationships and contracts are already established with these entities which helps ensure a timely and successful project implementation.

The City will be the fiscal sponsor and overall project manager for the fish movement monitoring program. The City will lead the collaborative planning and design process. Project implementation will be overseen by **Dr. Kevin Bestgen**, Director, Larval Fish Larval Laboratory, Colorado State University whose staff will implement the monitoring program. **Colorado Parks and Wildlife,** another key collaborator, has expressed support for this project due to its transferability of best practices for fisheries management and fish passage installation throughout the state.

Two important broader stakeholder groups in the Poudre River basin are the **Poudre Runs Through It** and the **Coalition for the Poudre River Watershed (CPRW).** Our project proposal directly supports the groups' river health goals, as outlined in their respective letters of support. Both groups will engage in communicating project results to their constituencies to foster future support of similar projects. The **South Platte Basin Roundtable** is anticipated to support this project as it aligns closely with the Basin Implementation Plan's Identified Projects and Processes. Their letter of support, if approved, will be arriving separately following their November meeting.

Match Amounts, Type and When Available

Cash match

Fish passage at the Timnath Inlet: The total project cost is $418,073 and the direct costs for just installing fish passage is $220,000. The grant request, for $110,000 is 50% of the costs directly associated with installation of fish passage portion of the project. This is 26% of the total project. The City has funding now (2017) to match the other 50% of the fish passage portion. The City already has secured funds for the pre-construction phase ($46,648). The remainder of the project funds will be resourced through City funds with an intention to try and source other external funding to compliment the remaining needs.

Fish movement monitoring program: The City will match 50% of the funds needed with $90,000. $45,000 is available now (2017), $45,000 will be available Jan 1 2018. The grant request is for 50% or $90,000.

In-kind contributions

Please note that, due to our significant amount of cash match, we are not including an inkind match as a formal match to be tracked with the grant, yet staff time is described to demonstrate availability. Jen Shanahan (Watershed Planner) and Daylan Figgs (Environmental Program Manager) at the City of Fort Collins will contribute **0.2 FTE** over the grant period to oversee collaborations, guide design and outcomes, prepare and manage contracts, oversee deadlines and outcomes, and handle reporting for the fish passage installation.

Organizational Capability

Applicant History of Watershed Accomplishments & Partner Collaborations

Stream management planning (SMP), as described in the Colorado Water Plan, is intrinsically a multifaceted process whose goals are accomplished through independent yet interrelated projects, initiatives, and stakeholder groups. This multi-step approach has led to success and progress in the SMP process for the Poudre River. Over the past decade the City of Fort Collins has put extensive resources towards evaluating, managing, and collaborating with the express purpose of sustaining and improving river health while also working to support recreational, stormwater, municipal and agricultural assets (please see **Attachment B**). Considering the numerous efforts completed or underway, a majority of the steps needed for a complete SMP have been accomplished. This grant, if awarded, would provide information to assist with restoration of one of the weakest aspects of the system- the native plains fishes and their fragmented aquatic habitat.

Staffing Levels (including brief resumes)

Jennifer Shanahan, Natural Areas Watershed Planner, City of Fort Collins – Project Manager, .15 FTE

As Watershed Planner, Mrs. Shanahan supports decision-making for the Poudre's urban corridor by integrating various river science and management disciplines and enhancing communication across river projects. Recent key projects include the *Ecosystem Response Model* (2014), the *River Health Assessment Framework* (2015) and the *State of the Poudre* (2017). She has a master's degree from Colorado State University Department of Forest Rangeland and Watershed Stewardship with a focus on riparian restoration.

Dr. Kevin Bestgen- Director, Larval Fish Laboratory, Senior Research Scientist, Dept. of Fish, Wildlife Conservation Biology, .15 FTE

As a fish ecologist working in arid-land streams of the West, including Colorado, Mr. Bestgen has focused on understanding habitat needs of native fishes and means to restore them in regulated systems where water demands are high. He has worked on Front Range rivers for more than 25 years, collecting extensive data on distribution and status of native fishes in the Cache la Poudre and Big Thompson rivers, as well as development of an Ecological Response Model for native fishes, trout, and other ecosystem attributes. He has Masters and Ph.D. degrees from Colorado State University.

Additional collaborators and their roles include:

- City of Fort Collins Natural Areas, Environmental Program Manager *Daylan Figgs*, will work closely with Mrs. Shanahan to support and ensure success of all aspects of both projects, **.05 FTE**
- Cache la Poudre Reservoir Company *Dale Trowbridge* the general manager is our primary liaison with the board to foster communication, ensure the board approves all phases of the project and a successful outcome of the collaborative process, **.05 FTE**
- Colorado Parks and Wildlife staff: *Boyd Wright*, Native Species Aquatic Biologist, *Kyle Battige*, Area Aquatic Biologist, and *Matt Kondratieff* and *Eric Richer*, Aquatic Research Scientists, will all be involved in the initial phase of refining the program design. Mr. Wright and Mr. Battige will provide field support; Mr. Kondratieff and Mr. Richer will remain closely connected to the monitoring study as they pursue

related inquiries and can contribute practical experience from around the state. **Time will be determined as capacity allows.**
- *Jen Kovecses,* Director of the CPRW will be another important collaborator through all phases and will help link these efforts to closely related basin initiatives, **as needed.**

Budget and Timeline Narrative

Schedule and budget for the installation of fish passage in the Timnath Inlet Ditch:
The evaluation of alternative design options, and selection of a preferred design is complete. From winter 2017 through fall 2018 the project team will finalize construction plans, secure all permits, and agreements and complete the bidding process. Construction is slated to begin in September 2018 and complete by March 2019. While the project is not expected to require this much time to complete, the window is available to accommodate potential weather and flow patterns that may preclude work. Permitting and final design are expected to cost $46,648. Construction is estimated to cost $371,425. The elements of construction required for the installation of fish passage are presented separately in the cost estimate and total $220,800. Please see **Attachment C** for a more detailed project cost estimate. Grant funds would be applied directly to the passageway itself (which is estimated to cost $175,000). Matching funds will be applied to wingwall replacement, concrete footers, reinforcement of walls and a measurement device.

Schedule and budget for the fish movement monitoring program:
This is proposed as a three-year monitoring program, beginning in Spring 2018, and continuing through November 2020, plus a portion of a year for report preparation in spring 2021 (due May 1st). It's important to note that this work is dependent on environmental variables related to flow rates and timing which may alter the project schedule. Any changes will be discussed with the CWCB. We propose a total project budget of $180,000. Funds will be allocated at $48,000, $41,000, and $41,000 for years 2018, 2019, and 2020, respectively, with an additional $23,000 reserved preparation of the final report. A 15% CSU overhead rate will use the final $27,000. Grant funds will be allocated evenly through the project to pay for 50% of the costs for all the tasks such as coordination and planning, fieldwork, data analysis and report development.

Proposal Effectiveness

Project Context and Identification of Need

The projects described in this proposal have been identified as a direct result of the *State of the Poudre*, an integrated, scientifically-based river health assessment and report card (City of Fort Collins, 2017, http://www.fcgov.com/poudrereportcard/pdf/sopr2016.pdf). The report card provided the community and stakeholders an easily understood measure of the Poudre River's current health using "A through F" grades for 24 metrics as grouped into nine indicators. The scores for the metric "native plains fishes" were extremely poor (averaging a "D") because of a rapid decline in diversity and health of the plains fish communities over the past 20 years. It is suspected that these populations are in decline as a result of numerous factors including extremely low base flows, flow fluctuations, predation by non-native species, and degraded habitat quality and fragmentation. Habitat on the Poudre is extremely fragmented both longitudinally and laterally due to land use and water diversion structures, receiving a grade of "D" through Fort Collins. Results from the *State of the Poudre* germane to this proposal are excerpted and presented in **Attachment D**).

Expanded Projects Description and Expected Impacts

Grant project #1: Fish passage constructed into the Timnath Inlet Ditch diversion dam

The Timnath Inlet is a major barrier to aquatic habitat connectivity on the Poudre. The structure is entirely impassable many months of the year due to the structure's size and the timing and type of CLPRC water right. Recognizing the detrimental impact, the City has been working in collaboration with CLPRC for the past two years to design fish passage on this structure.

With a preferred design now selected the project, permitting tasks have been identified and will be complete by summer 2018. This design also includes numerous structural and operational improvements (such as reinforced footing, side walls, and overshot gates for more precise flow management and measurement) to ensure longevity and structural integrity of the existing structure thus increasing return on the City's investment in the fishway construction (**Attachment E**). The design also incorporates the ability to measure water through the fish passageway in anticipation of future environmental flows that will need to pass this structure.

The City has been in close communication with CLPRC throughout the design process. The outcome is a design that is supported by CLPRC and does not harm the company's assets. The City will continue to work closely with CLPRC throughout the construction of the proposed improvements. We also wish to recognize the long-term value in demonstrating a successful collaboration with this project such that other ditch companies may, in the future, feel greater assurance and less risk in allowing fish passages to be installed on their in-channel diversion structures.

The project's expected impact is improved fishery habitat and an increase in report card scores for the metric of aquatic connectivity from a "D" to a "B" for an additional 2.5 miles resulting in more robust, populations of native fishes and assisting to reverse the local trend of declining native fish populations.

Grant project #2: Evaluating effectiveness of fish passage – a fish movement monitoring program
Movement is central for fish to thrive in river systems. Fish are easily transported downstream during early life stages when most are relatively small. As they grow their habitat needs change so they then need to move into habitats best suited for their growth and survival. Also, adult fish often move upstream to spawn. Movements occur throughout the life of individual fish, but the geographic scale of movement varies depending upon species, size, presence of various habitat types within a reach, and flow fluctuations. Movement varies across seasons as well. For example, some fish require spawning gravel of a certain size or specific water temperatures for successful reproduction. In the winter fish may move to find suitable habitats for resting and surviving harsh, typically low flow conditions.

Movement barriers may impede the ability for fish to move to these habitats resulting in reduced fish species richness because key habitat needs are not met in restricted stream reaches. Imbalance in fish community structure may also be a function of inability to move. For example, if adults are unable to move to suitable spawning areas, reaches isolated by diversion dams may support only a single age group, leaving fish in those reaches more susceptible to local extinction in the face of major disturbances.

As previously described, fish communities in the urbanized stream reach in and near Fort Collins may be "movement impaired" and the reasons are likely due to a complex interplay of stressors. To that end, the City is currently involved in design or installation of fish passage on four structures on the Poudre (as noted in the map **Attachment A**). Research has primarily been conducted under highly controlled laboratory conditions or local, small scale and highly controlled field conditions. Furthermore, during the State of the Poudre project, the assessment team had numerous discussions around the concept of longitudinal connectivity. Scores for the upper reaches are poor because of the barriers scattered along

the system. In the lower reaches, however, the ultimate score given to this metric was much higher because of a recent installation of fish passage on the Fossil Creek Reservoir Inlet Ditch. As we continue to invest in fish passageways on the Poudre, and before producing the next iteration of the State of the Poudre assessment (4-5 years), the City would greatly benefit from a better understanding of the effectiveness of these installations to improve and validate the assessment guidelines.

The fish monitoring portion of the grant proposes a set of integrated objectives to assess the fish community, fish passage needs and fish passage efficacy in the Poudre River in and near Fort Collins. These objectives include monitoring of: 1) fine-scale fish community composition; 2) background fish movement rates in reaches with complex and simple habitat; and 3) passage rates of fish over existing diversion dams via fish passage devices. **We anticipate the resulting project findings will inform not only the City but also resource managers throughout the state regarding the value, design criteria, and placement opportunities for fish passage structures.**

Monitoring and Implementation Plan Narrative

For both projects, the project manager will be provided monthly updates from contracted staff as to project implementation. Any adjustments to the implementation timeline will be accounted for at that time to ensure timely progress on project implementation.

The success of installing of fish passage at the Timnath Inlet Ditch will be measured by the timely completion of the project and by the addition of 2.5 miles of river to "B level" grades for habitat connectivity in the subsequent State of the Poudre assessment (slated for 2021). A further measure of success will be detection of tagged fish moving through the passage after its completion. An overview of the implementation timeline is as follows:

1. *February 2018:* Section 404 Permit submitted and approved. CLPRC Agreement finalized Final construction drawings completed, reviewed and approved. Submittal of CLOMR to FEMA for review and approval.
2. *March –June 2018*: Final bid documents completed, reviewed and approved. Acquisition of permanent easements and temporary construction easements. FEMA CLOMR Approval.
3. *June-July 2018:* Project bidding and contracting phase.
4. *September 2018:* Initiation of project construction activities.
5. *March 2019:* Final completion of construction activities.
6. *April 2019:* Completion of as-built drawings and project close-out reporting requirements.
7. *December 2019:* Completion, submittal and approval of a LOMR to FEMA.

Success of the fish movement monitoring program will be measured by the completion of a scientifically-based findings document determining the worth and effectiveness of fish passages. We intend to share this document to not only benefit our local community, but resource stakeholders across the state. An overview of the implementation timeline is as follows:

1. *May 2018*: Collaborators convened and agree on design and implementation details for year one. Permits and agreements necessary for the completion of the project are completed.
2. *March -December 2018:* Year one field work implemented and an interim project report completed.
3. *March 2019*: Year two field season objectives and implementation plan completed.
4. *March-December 2019*: Year two field work implemented and an interim project report completed.
5. *March 2020*: Year three field season objectives and implementation plan completed.
6. *March-December 2020*: Year two field work implemented and preliminary findings are discussed.
7. *May 2021*: Final project report is completed and submitted to CWCB.

The complete project Scope of Work, including implementation plan details, can be found in **Attachment F**.

Attachment C- Budget and Timeline Tables

Please note that, due to our significant amount of cash match, we are not including an in-kind match in the budget tables. However, we want to acknowledge that all City staff time utilized for project management purposes will be provided by the City (as described in the application).

Grant project #1 Installing fish passage on the Timnath Inlet Ditch

Table C1. Overview of budget for fish passage at the Timnath Inlet ditch

Task	Description	Target start date	Target completion date	CWCB funds	Other funding Cash*	Total
Task 1*	Secure all permits, easements agreements, finalize plans, conduct bidding and contracting	November 2017	August 2018	none	$46,648	$46,648
Task 2	Install fish passage structure and construct other structural improvements	September 1. 2018	March 30, 2019	$110,000	$110,000 $151,428*	$371,4258
Total						**$418,073**

* The remainder of the project funds will be resourced through City funds with an intention to try and source other external funding to compliment the remaining needs. Note the city has a biennial budget that currently runs through 2018 and staff intends to seek additional funds in the 2019 cycle if needed. The values in yellow add to $220,000 which corresponds costs most directly associated with the fish passage portion of the project.

Table C2. Cost Estimate for entire project at Timnath Inlet ditch. The lower half, as highlighted in yellow shows the costs required for fish passage aspect of the project.

Project:	**Timnath Reservoir Inlet Ditch Diversion Dam-Fish Passage Structure**				
Date:	**October 2017**				
	Preliminary Engineer's Estimate				
Item Number	**Description**	**Unit**	**Estimated Quantity**	**Unit Cost ($)**	**Item Cost ($)**
	STRUCTURAL INTEGRITY IMPROVEMENTS				
1	Mobilization/Demobilization	LS	1	$ 20,000.00	$ 20,000.00
2	Water Control/Dewatering	LS	1	$ 20,000.00	$ 20,000.00
3	Concrete Demolition, Haul and Disposal (Weir walls and piers)	CY	5	$ 200.00	$ 1,000.00
4	Obermeyer Gates (two 6-ft, two 30-ft)	SF	172.5	$ 450.00	$ 77,625.00
5	Rock Riprap	CY	100	$ 120.00	$ 12,000.00
6	Gate Automation	LS	1	$ 10,000.00	$ 10,000.00
7	Housing for Compressors, electrical, automation)	LS	1	$ 10,000.00	$ 10,000.00
				Subtotal	$ 150,625.00
	FISH PASSAGE STRUCTURE IMPROVEMENTS				
8	Excavation for Structure Improvements	CY	200	$ 4.00	$ 800.00
9	East Wingwall Concrete Replacement/Reinforcement	CY	10	$ 1,000.00	$ 10,000.00
10	Concrete Footers (upstream and downstream)	CY	24	$ 1,000.00	$ 24,000.00
11	Concrete Grout Stabilization (sloping spillway)	CY	5	$ 200.00	$ 1,000.00
12	Reinforced Concrete walls (east bay entrance)	CY	5	$ 1,000.00	$ 5,000.00
13	Fish Passage Installation	LS	1	$ 175,000.00	$ 175,000.00
14	Measurement Device	EA	1	$ 5,000.00	$ 5,000.00
				Subtotal	$ 220,800.00
				TOTAL COST	**$ 371,425.00**

Grant project #2: Fish Movement Monitoring Project

Table C3. Overview of budget for fish passage at the Timnath Inlet ditch

Task	Description	Target start date	Target completion date	CWCB funds	Other Cash funding	Total
Task 3	**Monitoring fine-scale fish community composition**	**January 2018**	**December 2018**	**$24,000**	**$24,000**	**$48,000**
Task 3a	Coordination and planning[1]	February 2018	May 2018			$4,000
Task 3b	Field work + materials [2]	March 2018	October 2018			$40,000
Task 3c	Data analysis and interim report construction	November 2018	December 2018			$4,000
Task 4	**Monitoring background fish movement rates**	**January 2019**	**December 2020**	**$20,500**	**$20,500**	**$41,000**
Task 4a	Coordination and planning	January 2019	March 2019			$3,000
Task 4b	Field work	March 2019	October 2019			$35,000
Task 4c	Data analysis and interim report construction	November 2019	December 2019			$3,000
Task 5	**Evaluating use of fishways by resident fishes**	**January 2019**	**May 2021**	**$20,500**	**$20,500**	**$41,000**
Task 5a	Coordination and planning	January 2020	March 2020			$3,000
Task 5b	Field work	March 2020	October 2020			$35,000
Task 5c	Data analysis	November 2021	April 2021			$3,000
Task 5d	Final report development, project outreach	November 2021	May 2021			**$23,000**
	Subtotal			**$76,500**	**$76,500**	**$153,000**
	15% overhead with CSU [3]			$13,500	$13,500	$27,000
	Total			**$90,000**	**$90,000**	**$180,000**

[1] For coordination and planning, City staff will organize and lead all collaborator meetings, while CSU's Dr. Bestgen will lead project design discussion and field work planning.

[2] If the grant is awarded and this project becomes viable, the collaborators will convene to assess the need for purchase of new materials. Likely a good portion of the materials needed (such as sampling equipment telemetry, detection antennas/tags) are already available between CSU and CPW, but the specifics will be determined in the first year planning phase (spring 2018).

[3] 15% is the negotiated rate between CWCB and CSU and the City will honor this same rate for this grant.

Attachment F- Scope of Work

GRANTEE: City of Fort Collins
PRIMARY CONTACT: Jen Shanahan, Natural Areas Department
ADDRESS: P.O. Box 580, Fort Collins, CO 80522
PHONE: 970-221-6281
PROJECT NAME: Fish passage and monitoring of fish movement on the Cache la Poudre River

INTRODUCTION AND BACKGROUND:
The purpose of this grant is to fund two initiatives directly related to the collaborators' goal of enhancing river health to support the vulnerable populations of native plains fish and the valued recreational trout fishery through improvement of aquatic habitat connectivity and enhanced understanding of fish movement patterns and needs. This will be accomplished through two distinct yet interrelated projects: 1) fish passage installation in the Timnath Inlet Ditch diversion dam; and 2) establishing a fish movement monitoring program to evaluate the effectiveness of fish passage.The reach for this portion of the project would extend from upstream at Overland Road near LaPorte, Colorado, downstream to the I-25 bridge. Specific reaches for monitoring movement and passage rates will depend on findings made in Task 2 monitoring, and also on the presence of actual or proposed fish passage structures in the reach.

OBJECTIVES

1. Complete installation of fish passage at the Timnath Inlet Diversion.
2. Refine our understanding as to which species and life stages currently occupy local habitat niches and reaches on the Poudre to help resource managers identify which stream reaches and habitat are most impaired and may benefit most from fish passage.
3. Understand background levels of fish movement in the Poudre River and how longitudinal location and habitat complexity may affect fish movement patterns.
4. Monitor passage rates of fish over existing diversion dams via fish passage devices with the context contextualized within the findings from the previous two objectives.

Grant project #1: Timnath Inlet Fish Passage Project

TASK 1
Description of Task
Secure all necessary permits and agreements to enable construction to begin by fall 2018.

Method/Procedure
The City will work with Anderson Engineers to secure all permits and agreements to facilitate installation of the proposed fish passage structure improvements. These include submittal and approval of: (a) ESA compliance, (b) Section 404 permit compliance, and (c) FEMA compliance via a CLOMR. In addition, an agreement between the CLPRC and the City will be developed and approved by both parties prior to the completion of the construction plans and bidding documents. Finally, all permanent and temporary construction easements will be developed and secured prior to construction of the improvements.

Deliverable
Copies of all approved permits, agreements and easements will be acquired and distributed to the respective applicant. The City of Fort Collins will obtain the original copy of the ESA compliance document, Section 404 permit approval letter, and FEMA CLOMR approval documentation. An executed

copy of the agreement between the City of Fort Collins and the CLRPC will be provided to each entity. Executed copies of all permanent and temporary construction easements will be compiled and provided to the City of Fort Collins and all property owners identified for easement acquisition.

1. *February 2018:* Section 404 Permit submitted and approved. CLPRC Agreement finalized Final construction drawings completed, reviewed and approved. Submittal of CLOMR to FEMA for review and approval.
2. *March –June 2018*: Final bid documents completed, reviewed and approved. Acquisition of permanent easements and temporary construction easements. FEMA CLOMR Approval.
3. *June-July 2018:* Project bidding and contracting phase.

TASK 2

Description of Task

Construct the improvements to the Timnath Reservoir Inlet Diversion Dam to facilitate the installation of the fish passage structure. This work includes construction necessary to improve the structural stability and integrity of the existing diversion dam and rehabilitation of the structure to promote the integration of the improvements related to the fish ladder.

Method/Procedure

Following completion of the final construction drawings, a bid document will be developed to support the solicitation of bids for construction of the project improvements. An advertisement for bids will be solicited, pre-bid conference conducted, bids received and tabulated, and a recommendation for award of the bid generated. Following approval of the recommendation for the construction contractor, the construction contract will be processed (performance/payment bonds received, contract signatures acquired, etc.). Upon approval of the contract, the Notice to Proceed with construction will be provided and construction initiated soon thereafter. Construction is anticipated to begin in the fall of 2018 with completion in the early spring of 2019. Construction oversight will be provided by both the staff of the City of Fort Collins and the ACE project team. As construction in nearly completion, a Substantial Completion document will be provided which identifies the work necessary to complete the construction of the improvements. A document indicating Final Completion will be issued following approval of the construction work identified in the bid documents. Following construction, as-built drawings will be developed to document the construction.

Deliverable

The deliverables for this task include the following: (a) development and submittal of the final construction drawings; (b) development and submittal of the bid documents; (c) development of the bid tabulations and recommendation for award; (d) contract agreement and related forms regarding administration of the construction agreement; (e) documentation related to construction oversight; (f) Substantial Completion and Final Completion documentation; and (g) as-built construction drawings.

1. *September 2018:* Initiation of project construction activities.
2. *March 2019:* Final completion of construction activities.
3. *April 2019:* Completion of as-built drawings and project close-out reporting requirements.
4. *December 2019:* Completion, submittal and approval of a LOMR to FEMA.

Grant project #2: Fish Movement Monitoring Program

TASK 3

Description of Task

Monitoring fine-scale fish community composition.

The objective for this first phase is to improve our understanding as to what species live where and what life stages occur in what reaches to allow managers to assess which stream reaches and habitat are most impaired and may benefit most from fish passage. This task would be devoted to understanding fish species composition and size structure in each reach of the Poudre River that is segregated by a diversion dam. Fragmented reaches would be identified and several locations in each reach would be chosen for sampling, based on a gradient of habitat, ranging from simple to complex. This would enable the observers to separate effects on the fish community of: 1) diversions up and downstream from the site, from 2) effects of habitat complexity within the reach.

Method/Procedure

We envision the reach for this portion of the project would extend from upstream at Overland Road near LaPorte, Colorado, downstream to the I-25 bridge. Specific reaches for monitoring movement and passage rates will depend on findings made in monitoring during Task 3, and also on the presence of actual or proposed fish passage structures in the reach. Site selection will also be guided by results from annual monitoring samples collected in other locations of the urban Poudre River reach in separate sampling programs. Sampling at each monitoring site would consist of a combination of electrofishing and seining, to get the most robust assessment of fish community composition and size structure possible. Electrofishing would target all habitat types but especially deep pools and areas with complex cover, locations where seines are less efficient. Seines would target open water and shallower habitat, which is less efficiently sampled with electrofishing. Species would be identified for each sampling gear effort, and fish lengths taken to calculate length frequency histograms.

Deliverable

Habitat sampling at each site would assess degree of complexity and include measurements of stream widths, depths, velocities, and substrate types along transects, presence and abundance of cover, maximum depths of pools, and area of each main habitat type: riffles, runs, and pools.

There are two deliverables for Task 3:

1. *May 2018*: Collaborators convened and agree on design and implementation details for year one. Permits and agreements necessary for the completion of the project are completed.
2. *March -December 2018:* Year one field work implemented and an interim project report completed.

TASK 4

Description of Task

Monitoring background fish movement rates in reaches with complex and simple habitat.

A main goal of this portion of the study is to understand background levels of fish movement in the Poudre River, and how longitudinal location and habitat complexity may affect fish movement patterns. We would expect fish movement to be less in reaches with complex habitat because more of their needs are served in such reaches, compared to areas with simpler habitat. Based on results obtained from Task 3, we would choose one or more stream reaches with simple and complex habitat and assess movement rates of fishes within each. This would allow us to disentangle movement rates that may be affected by complexity of habitat from the presence of upstream or downstream diversions which may prevent fish movement.

Method/Procedure

We will use a combination of techniques to accomplish this task. Our first approach would be to use stationary passive integrated transponder (PIT) antennas fixed in the stream to detect fish tagged in the Poudre River. Fish would be collected and tagged in various reaches close to (100-500 m) and longer (0.5=1 km) distances from antennas, to understand how motivated fish are to move in various reaches, and how habitat structure might affect that. We would measure detection efficiency and monitor fish movement through seasons at key locations to understand species-specific and seasonal movement patterns in reaches with complex and simple habitat. Fish could also be detected by use of mobile PIT tag detectors, either floating mats (wide reaches with little cover) or wands (deep pools with complex cover), to determine distances moved and passage among reaches where fish were, or were not released. The Poudre River is a small enough system to allow for such detections, and is a method proven to work in a similar-sized stream, Fountain Creek, near Colorado Springs.

Depending upon the success of the approach described above, we may also utilize radio-telemetry of large-bodied fishes to understand movement rates in reaches with simple and complex habitat. A dozen or so fish (native suckers, brown trout) in each reach would be sampled and implanted with radios and tracked through time over the Poudre River reach. This approach has the advantage to learn on a finer-scale, movement patterns that may be species or season-specific. This approach would also allow us to understand if fish used existing fish passageways, for those in the study area (e.g., Fossil Creek Reservoir Diversion near the Environmental Learning Center and the proposed installation of fishway in the Timnath Inlet Ditch). This would allow understanding of seasonal movement patterns, and also determine if predaceous brown trout were attempting to ascend the Poudre River at certain times of the year to upstream habitat. This would be important data to ascertain if diversion dams are restricting movement of large-bodied fishes like brown trout, which would otherwise trap them downstream. Preventing upstream access would increase the predation pressure on native fishes by resident brown trout if fish exhibited a propensity to move upstream but could not. Stationary antennas below diversion dams would add to that information.

Deliverable

The monitoring efforts for Tasks 4 and 5 may occur both during years 2 and 3 of the program (2019 and 2021), therefore please see deliverables for Task 5.

TASK 5

Description of Task

Monitoring passage rates of fish over existing diversion dams via fish passage devices contextualized within the findings of Tasks 3 and 4.

Fish passage structures are increasingly used to improve downstream to upstream movement of fish among river reaches dissected by diversion dams. However, assessments of fish use of structures are often limited to laboratory testing, inadequate or otherwise lacking, which frustrates the ability of resource managers to evaluate their efficacy and make recommendations for installation of additional passages. Thorough fish monitoring will help to strengthen resource managers ability to advise as to appropriate fish structure.

Method/Procedure

Using some of the same approaches described in Task 4, we propose to evaluate use of fishways by resident fishes in the vicinity of the Fossil Creek Reservoir diversion, or other diversions as they become available. PIT tag antennas installed downstream and upstream of the fish passage structure can detect fish as they move up to and through structures. One approach would be to PIT tag and release large

numbers of fish upstream and especially downstream of the passage structure. The downstream antenna would allow estimation of the likelihood that a fish moved to the passageway, and detection rates at the antenna upstream of the structure would allow estimation of the passage rate.

Another complementary approach would be to release radio-tagged fish upstream and downstream of the passage structure. Seasonal monitoring of radio tags would allow determination of timing of passage and distance moved, if passage occurred.

Deliverables

1. *March 2019*: Year two field season objectives and implementation plan completed.
2. *March-December 2019*: Year two field work implemented and an interim project report completed.
3. *March 2020*: Year three field season objectives and implementation plan completed.
4. *March-December 2020*: Year two field work implemented and preliminary findings are discussed.
5. *May 2021*: Final project report is completed and submitted to CWCB.

COLORADO WATERSHED RESTORATION PROGRAM

GRANT APPLICATION

Project Title:

Building a Legacy in Left Hand Creek Watershed

Submitted by:

LEFTHAND WATERSHED OVERSIGHT GROUP
6800 Nimbus Road, Longmont CO 80503 (office)
P.O. Box 1074, Niwot, CO 80544-0210 (mailing)
303.530.4200 | www.lwog.org

Table of Contents

Project Proposal Summary Sheet

Project Title: Building a Legacy in Left Hand Creek Watershed

Project Location (include map and/or latitude/longitude if applicable): Longmont, CO (See Attachment 1)

Grant Type (see guidance document for grant types): Multiple objectives (Watershed/Stream Restoration and/or Protection Grants, Flood Mitigation Grants)

Grant Request/Amount: $176,085

Cash Match Funding: $178,185

In-kind Match Funding: $30,000

Project Sponsor(s) (identify the fiscal agent if different from the project sponsor): Lefthand Watershed Oversight Group

Contact person name, email address, and phone number: Jessie Olson; jolson@lwog.org; 303.746.7937

Brief description of the project:

The Lefthand Watershed Oversight Group (LWOG) recently completed ten river restoration projects in the Left Hand Creek Watershed, and currently has an additional ten projects in progress. Each of these project sites sustained significant damage during the 2013 floods. Upon completion, each of these project sites directly improve the ecology, health, safety, and quality of life for landowners within the project areas. To ensure the long-term success of these watershed restoration projects, LWOG is implementing a new multi-objective project that combines adaptive management and stewardship. To implement this project, LWOG is leveraging our recently completed stewardship handbook project and new adaptive management framework project, both funded by the Colorado Division of Local Affairs CDBG-DR program. Our goal is to engage our community in the long term management of restored project areas using quantifiable methods that are well suited for dynamic watershed processes. The outcome will be a long standing legacy of resilience and recovery throughout the watershed.

Building a Legacy in Left Hand Creek Watershed

Proposal

The purpose of this project is to apply a holistic approach to building resilience in the Left Hand Creek (LHC) Watershed through implementation of multi-objective adaptive management and stewardship activities in recently restored areas the watershed. The project scope also includes building community engagement through implementation of stewardship activities and using citizen science methods, as appropriate. The outcome will be a long standing legacy of resilience and recovery throughout LHC Watershed. Our proposed approach is the most impactful way to build resiliency in LHC Watershed because it merges three critical requirements for long-term resiliency: (1) restoration projects, (2) monitoring and management of restored areas to ensure long-term success, (3) community participation in the management of restored areas. For the purpose of this proposal, LWOG is applying for match funding for objectives (2) and (3) through spring 2021.

LWOG currently has 20 high priority creek restoration implementation projects sites in various stages of progress (Table 1; Organizational Capacity). To ensure the long term success of these projects, LWOG is seeking funding to implement adaptive management and stewardship activities in these project areas. Our adaptive management approach is needed to ensure the success of our recently restored sites, which face on-going maintenance needs and dynamic watershed processes. Our stewardship approach will be used to engage our community in activities critical for the long-term watershed resiliency. This multi-objective approach will follow on the heels of our recently completed stewardship planning project and a newly funded adaptive management/citizen science planning project.

LWOG recently completed a Stream Stewardship Handbook to educate landowners about stream stewardship using education, simple flow chart-style tools, and workshops. We propose to use the resulting handbook to engage community members in monitoring and maintaining our project sites for success. This will increase the impact of the handbook and will serve as a driver for community engagement in creek resiliency. In addition, it will help build a legacy and foundation for a community-wide stewardship ethic which LWOG will build upon well into the future. Stewardship activities will include working with hired consultants, landowners, stakeholders, citizen scientists, and volunteers to ensure complete restoration projects are successful following implementation. LWOG will lead landowners, stakeholders, citizen scientists, and volunteers in implementing maintenance activities such as weed control, revegetation, and/or grading/repair as necessary.

Also, LWOG has just started a project to frame the adaptive management needs and tools for our watershed restoration projects. Under this newly awarded project with CDBG-DR, we will be hiring consultants to help define an adaptive management framework that can be used by our coalition and will be scalable and repeatable across the state. The framework will define the methods and protocols appropriate for LWOG staff, citizen scientists, and when outside assistance is required. The framework and associated tools will be set up and ready to use by July 2018, which perfectly lines us up to implement our multi-objective approach at our project sites starting in summer/fall of 2018. To develop this comprehensive framework, we will incorporate recommendations from O&M plans developed for our project sites by the project design teams, as well as information collected by LWOG as part of our Watershed Science Program. This includes photo monitoring, water quality monitoring, benthic

macroinvertebrate surveys, and Stream Visual Assessment Protocol, version 2 (SVAP2), developed by the U.S. Natural Resources Conservation Service (https://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs144p2_042678.pdf) that LWOG has already conducted in the watershed and at project sites (https://lwog.org/programs/watershed-science/).

Our adaptive management framework will include performance standards established for the restored areas. Each performance standard will be tied to a monitoring parameter and management trigger. Development of performance standards and management triggers for monitoring parameters such as erosion, vegetation, weed presence, water quality, water levels, and species abundance, among other considerations will be complete as part of our recently funded CDBR-DR project mentioned above. In addition, our plan will use hypothesis-based monitoring to evaluate effectiveness of restoration treatments at difference sites. For example, we will compare how shortened pools with smooth/lower point bars compare to pools without this treatment at our Plains sites, and we will compare differences between wood structures installed at two different Foothills sites. We have already begun some of this monitoring in partnership with graduate students at University of Colorado – Boulder who are testing research hypotheses against three reference sites.

A multi-objective approach is inherent to this project because each of our existing restoration sites were designed to meet multiple objectives. These include directly improving the ecology, health, safety, and quality of life for private landowners within the project areas (e.g. improved protection of homes, improved private landowner access, improved flood protection, and reduction of hazards). Our work included channel grading, floodplain grading, asset protection, and bank protection in various locations. Key work included bank stabilization and protection, establishment of native vegetation, reestablishment of floodplain benches and removal of existing gravel piles, and installation of offset protection adjacent to dwellings. By combining an adaptive management framework with a stewardship activities we will maintain a multi objective approach by combining maintenance and monitoring activities with community engagement and long term investment in restoration. We will also be building on and complementing the monitoring activities that are currently underway at our project sites by CWCB-hired consultants. These activities include benthic macroinvertebrate surveys, water quality samples, robust sampling at all project sites (rather than a subset of sites), and hypothesis-based testing about the effectiveness of specific restoration features.

The success of our project will be measured by our ability to use our adaptive management framework collect sufficient monitoring data and to make recommendations if/when corrective actions are required based. The framework will identify the required frequency that parameters should be measured and our project monitoring plan will reflect these frequencies. The success of our project will also be measured by our ability to implement stewardship activities when they are required with participation from hired consultants, staff, and/or volunteers. The adaptive management framework will include a list of potential management actions/stewardship activities and our project monitoring for this portion of the project will be based on our ability to implement those actions and provide backup documentation explaining each action. Ultimately, the success of our project will be determined by our ability to ensure the long-term success of recently implemented restoration projects that provide multi-objective benefits through maintenance and monitoring of project sites, and engaging the community in these efforts.

Qualifications

The Lefthand Watershed Oversight Group (LWOG) will serve as the lead project sponsor. We are well positioned to meet and exceed the Application Requirements based on our innate mission and goals, strong history successfully implementing numerous restoration projects, and diverse partnerships.

Collaborative Approaches: Our commitment to collaborative and inclusive approaches is demonstrated in our mission statement: "The mission of the Lefthand Watershed Oversight Group is to assess, protect, and restore the quality of our watershed, and to serve as a hub for watershed issues through the fostering of stakeholder collaboration." As a coalition of watershed stakeholders, LWOG partners with many individuals and organizations with an interest in water resources along Left Hand Creek. Some of our most significant relationships are with the landowners and residents that live along the creek, Left Hand Water District (LHWD), Boulder County, City of Longmont, St. Vrain and Left Hand Water Conservancy District, Town of Jamestown, Town of Ward, James Creek Watershed Initiative, U.S. Forest Service, and Left Hand Ditch Company. All of these entities are represented on LWOG's Board and are attending meetings, commenting on plans, and coordinating LWOG's efforts with their own related restoration efforts. LWOG also partners with academic institutions such as CU-Boulder to implement tested monitoring protocols at our project sites.

Restoring/protecting ecological processes that connect land/water, and protect life/property: As previously stated, LWOG intends to use this funding to implement multi-objective adaptive management and stewardship activities in recently restored areas the watershed. These recently restored project areas were funded and administered by the Colorado EWP program and CDBG-DR. Due to the nature of this funding all projects were designed and implemented to provide benefits including improving ecology, health, safety, and quality of life for private landowners within the project area, as well as improved protection of homes, improved private landowner access, and improved flood protection, and reduction of hazards.

Project Purpose: The purpose of this project is to implement a multi-objective approach for long-term flood resiliency and recovery in areas of LHC Watershed where LWOG has already implemented watershed restoration projects. As stated, our approach includes adaptive management combined with stewardship activities to mitigate the impact of future floods and ensure the demonstrated success of recently implemented restoration projects.

Broad based involvement: As stated above, LWOG partners with many other organizations with an interest in water resources along Left Hand Creek. Partners with ownership within the project areas include the US Forest Service, Boulder County, Left Hand Fire Protection District, Left Hand Ditch Company, Left Hand Water District, and private landowners. Landowners in neighborhoods where restoration work is ongoing and stewardship work is proposed have signed Participation Agreements that include three years of access permission for stewardship activities.

Also, through development of the Stewardship Handbook, LWOG established a group of community members committed to participating in creek stewardship activities and trained in stewardship activities through participation in handbook development. Lastly, LWOG is partnering with graduate students at University of Colorado – Boulder who are conducting research projects that involve monitoring the effectiveness of restoration treatments. Several of these partners have also provided support letters (Attachment 4).

Appropriate Match: LWOG has match funding from various sources:

- $98,500 in match funding from an awarded grant by CDBG-DR Implementation Grant program for implementation of stewardship and adaptive management in project areas.
- $46,000 in match funding from a contracted grant by CDBG-DR Planning Grant program for development of an adaptive management framework and Citizen Science pilot program.
- $20,000 in cash match funds secured as part of LWOG's Stewardship Funding Campaign from individual and corporate donations.
- $15,000 in pledged written commitments from the City of Longmont, individuals and corporate donors as part of LWOG's Stewardship Funding Campaign (Documentation available upon request).
- $30,000 in-kind contribution from Lefthand Watershed Group for staff time over a 2.5 year period. This is funded through LWOG's general fund, which comes from contributions from board partners and other donors and typically amounts to a budget of over $40K per year. Contributors to this fund historically include Left Hand Water District, Left Hand Ditch Company, Boulder County, Saint Vrain and Left Hand Water Conservancy District, and others.

Organizational Capability

History of Accomplishments

LWOG was originally formed in 2005 as a watershed protection group in response to the need to clean up abandoned mines in the watershed. In early 2015, LWOG obtained funding from a Colorado Division of Local Affairs Community Development Block Grant for Disaster Recovery (CDBG-DR) to increase staff capacity and engage in restoring Left Hand Creek Watershed, primarily based on the recommendations of the Watershed Master Plan. Since then, LWOG has obtained the funding for numerous river restoration projects. As mentioned in the Qualification section above, LWOG's Board of Directors includes many diverse partners that contribute to all of our projects. Below we highlight some of our ongoing and complete projects including key project-specific partners.

**Completed projects; ** Recently awarded projects*

	Description	**Partners**
Foothills & Plains*	Channel grading, floodplain grading, asset protection, and bank protection at nine project sites (over $8,000,000).	Boulder County, Left Hand Ditch Company, Left Hand Water District, and landowners.
Stewardship Handbook*	Educational resource for private landowners to engage in creek stewardship. ($200,000).	Full list of collaborators in available in the handbook.
Stewardship through Citizen Science**	Define the adaptive management framework, with the support of hired consultants, LWOG staff, and citizen scientists ($46,500).	TBD (Project is in initiation stage)
63rd Street Ext. (Ongoing)	Channel grading, floodplain grading, asset protection, and bank protection at one project site ($450,000).	Boulder County, Left Hand Ditch Company, Left Hand Water District, and landowners.
Upper Left Canyon**	Channel grading, floodplain grading, asset protection, and bank protection at nine project sites ($1,901,500).	US Forest Service, Boulder County, Left Hand Fire Protection District, Left Hand Ditch Company, Left Hand Water District, and landowners.

	Description	Partners
Stewardship**	Stewardship of recently completed creek restoration project areas ($98,500).	Landowners and Citizen Scientists.
Reach 3B*	Channel grading, floodplain grading, asset protection, and bank protection at one project site ($298,739.00).	Boulder County, CDOT, Left Hand Ditch Company, Left Hand Water District, and landowners.

Staffing

LWOG staff will allocate the equivalent of 13% of one person's staff time (0.13 FTE over three years) to this project, including conducting field work, as appropriate, to implement the adaptive management framework and leading implementation of stewardship activities. Currently, all four LWOG staff members will be involved in this project leveraging experience in ecological restoration, watershed science, hydrology, plant ecology, and outreach. Below we provide brief resumes for each member of the active project team.

Jessie Olson, Executive Director: Jessie is a restoration ecologist who has worked professionally in the field of ecological restoration since 2003, overseeing restoration and land management projects with non-profits, land trusts, and in the private sector. She has written and implemented numerous adaptive management and long-term management plans for a variety of ecosystems and at a variety of scales. She holds a Master's degree in Landscape Architecture and Environmental Planning from U.C. Berkeley, where she focused on river and wetland restoration design and planning. Key experience includes non-profit management, ecological restoration, adaptive management, stewardship, and land management.

Yana Sorokin, Project Manager: Yana is an ecosystem ecologist with seven years of experience. She holds a Master's degree in Plant Ecology from the University of Wyoming where she focused on measuring the relationship between climate variables, plant processes, and water fluxes. She is a skilled project manager with background in ecological research, data analysis, and climate change. Key experience includes plant and soil ecology, vegetation surveys, analysis of large datasets

Glenn Patterson, Watershed Scientist: Glenn is LWOG's Watershed Scientist and has been working to track and report trends in water quality and watershed health in Left Hand Creek since 2010. Glenn earned a Ph.D. in Watershed Science from Colorado State University. Prior to joining LWOG he worked as a hydrologist with the U.S. Geological Survey for 30 years. Glenn oversees LWOG's Watershed Science program and ensures all data is collected with high quality and standards. Key experience includes hydrology, geomorphology, water quality, watershed science, monitoring, data analysis.

Meg Parker, Outreach Coordinator: Meg is an Environmental Scientist with experience in watershed related community engagement and outreach. Most recently, Meg worked on the Truckee River in Reno, Nevada engaging the entire community in watershed management. Meg earned her B.S. in Environmental Science and Sustainability from Cornell University. Key experience includes outreach, communication, watershed science and environmental science.

Budget and Schedule

Our project budget and schedule are both provided in Attachment 3. In summary, we expect the project to be complete by spring 2021, and $208,185 match is provided by Colorado Division of Local Affairs CDBG-DR program, cash match from LWOG's Stewardship funding campaign and additional in-kind contributions from LWOG's partners.

Attachment 2: Budget & Timeline Table

Left Hand Creek Stewardship & Adaptive Management Budget Summary

	Total Cost	CWCB (This Request)	DOLA CDBG-DR Grants	LWOG- Local Share (Cash)	
Adaptive Management- Framework Development					**Timeframe**
Subtotal	**$46,500**	**$0**	**$46,500**	**$0**	**November 2017 to July 2018**
3.1 Adaptive Management- Field Work					**Timeframe**
Subtotal	**$139,971**	**$69,985**	**$34,993**	**$34,993**	**Spring/Summer 2018 to 2021**
3.2 Adaptive Management-Reporting & Analysis					
Subtotal	**$30,900**	**$15,450**	**$0**	**$15,450**	**Spring/Summer 2018 to 2021**
4.1 Stewardship Activities- Vegetation Maintenance					
Subtotal	**$55,000**	**$27,500**	**$13,750**	**$13,750**	**Fall 2018 to Fall 2020**
4.2 Stewardship Activities- Corrections/Repairs					
Subtotal	**$97,500**	**$48,750**	**$48,750**	**$0**	**Fall 2018 to Fall 2020**
5 Project Management					
Subtotal	**$14,400**	**$14,400**	**$0**	**$0**	**Spring/Summer 2018 to 2021**
Project Costs Years 1-3	**$384,271**	**$176,085**	**$143,993**	**$64,193**	

Left Hand Creek Stewardship & Adaptive Management Detailed Budget (Years 1-3)

Task 3 – Adaptive Management

3.1 Adaptive Management- Framework

	Specification	Unit	No. Units	Cost/Unit	Freq.	Total Cost	Ave. Annual Cost	Assumptions
Consultant	Funded project through CDBG-DR Planning grant through July 2018	Fixed Fee			1	$46,500	$15,500	Sets up adaptive management and citizen science framework for LWOG and other coalitions to use.

3.2 Adaptive Management- Field Work

	Specification	Unit	No. Units	Cost/Unit	Freq.	Total Cost	Ave. Annual Cost	Assumptions
Consultant	Review site conditions, protocols, data collection methods and provide recommendations.	Labor Hrs	100		3	$48,000	$16,000	Annual review of data and formulation of recommendations with hired consultants.
LWOG Staff	Set up vegetation, topo and photomonitoring sites.	Labor Hrs	176	$50.00	1	$8,800	$2,933	Two people in field for 9 days. Two days of office work.
LWOG Staff & Consultants	Annual watershed-wide monitoring- visual assessment, hazardous debris, erosion, weeds, water quality, benthic macro invertebrate sampling.	Labor Hrs	112	$100.00	3	$33,600	$11,200	Two people in the field for one week. Two days office work. Assume consultant is hired for portion of assessment work.
LWOG Staff	Vegetation Monitoring	Labor Hrs	80	$50.00	3	$12,000	$4,000	Annual monitoring. Two people in field for four days. One day of office work. Additional transects will be set up in management areas as needed.
LWOG Staff	Photomonitoring	Labor Hrs	48	$50.00	3	$7,200	$2,400	Annual monitoring. One person in the field for five days. One day of office work.
LWOG Staff	Streambank stability and topographic complexity (channels)	Labor Hrs	80	$50.00	3	$12,000	$4,000	Annual monitoring. Two people in field for four days. One day of office work.
LWOG Staff	Reference site monitoring	Labor Hrs	100	$50.00	3	$15,000	$5,000	Veg, topo, hydro monitoring at reference sites. Two people in the field for one week, one week of office work. Occurs in years 1, 3. Additional year as contingency if drought conditions occur.
N/A	Mileage	Fixed Fee	60	$0.54	105	$3,371	$1,124	41 trips in year 1, 32 in years 2 and 3
Subtotal						***$139,971***	***$46,657***	

3.3 Adaptive Management-Reporting & Analysis

	Specification	Unit	No. Units	Cost/Unit	Freq.	Total Cost	Ave. Annual Cost	Assumptions
LWOG Staff	Annual maintenance and monitoring plan	Labor Hrs	40	$50.00	3	$6,000	$2,000	Description of management and operating activity during previous reporting period, and summary of management and operating tasks to be implemented during the next reporting period.
Consultant	Annual meeting with stakeholders & contributions to planning & report	Labor Hrs	30	$160.00	3	$14,400	$4,800	To discuss and write sections of annual operating plan; and annual monitoring summary report
LWOG Staff	Annual meeting with stakeholders & funders	Labor Hrs	30	$50.00	3	$4,500	$1,500	To discuss annual operating plan; Time for two people to attend and prep for a 4 hour meeting
LWOG Staff	Annual Monitoring Summary report	Labor Hrs	40	$50.00	3	$6,000	$2,000	Data analysis, development of annual monitoring report- results and trends.
Subtotal						***$30,900***	***$10,300***	

Task 4- Stewardship Activities

4.1 Stewardship Activities- Vegetation Maintenance

	Specification	Unit	No. Units	Cost/Unit	Freq.	Total Cost	Ave. Annual Cost	Assumptions
N/A	Maintenance of riparian vegetation	Acres	30	$450.00	2	$27,000	$13,500	Periodic maintenance of habitat by mechanical or other means as necessary. Assumed weed control and/or replanting would occur on 50% of area on an annual basis. Assume year 1 is paid for under warranty period. Market research conducted to determine per-acre cost weed control and revegetation costs. These typically range between 100-450 per acre depending on methods and vegetation type.
N/A	Maintenance of upland areas	Acres	40	$350.00	2	$28,000	$14,000	Assumed weed control and/or mowing and/or seeding of native species would occur on 60% of habitat acres on an annual basis. Assume year 1 is paid for under warranty period. Used lower per acre unit cost than riparian vegetation.
Subtotal						***$55,000***	***$27,500***	

4.2 Stewardship Activities- Corrections/Repairs

	Specification	Unit	No. Units	Cost/Unit	Freq.	Total Cost	Ave. Annual Cost	Assumptions
Consultant	Design/Permitting					$15,000	$5,000	Considered 20% of construction cost
Consultant	Construction Oversight					$7,500	$2,500	Considered 10% of construction cost
Contractor	Structure repair/Construction	repairs	1	$25,000.00	3	$75,000	$25,000	Estimate of annual repair cost.
Subtotal						***$97,500***	***$32,500***	

Task 5 – Project Management

	Specification	Unit	No. Units	Cost/Unit	Quantity	Total Cost	Ave. Annual Cost	Assumptions
LWOG Staff	Project management	Labor Hrs	96	$50.00	3	$14,400	$4,800	Estimate of seven hours/month coordination and project management time.
Subtotal						***$14,400***	***$4,800***	

Project Costs Years 1-3	**$384,271**	**$121,757**	

Attachment 3: Scope of Work

Scope of Work

GRANTEE: Lefthand Watershed Oversight Group (LWOG)

PRIMARY CONTACT: Jessie Olson

ADDRESS: P.O. Box 1074, Niwot, CO 80544-0210

PHONE: 303.746.7937

PROJECT NAME: Building a Legacy in Left Hand Creek Watershed

GRANT AMOUNT: $384,271

INTRODUCTION AND BACKGROUND:

Lefthand Watershed Oversight Group (LWOG) is applying for match funding to implement multi-objective adaptive management and stewardship activities in restored areas of Left Hand Creek Watershed. This project follows on the heels of LWOG's existing restoration and stewardship work throughout the watershed, summarized below:

1) Since 2016 LWOG has successfully secured 100% of the funds needed to design and implement restoration projects at twenty sites along Left Hand Creek Watershed. Ten projects are complete, and the rest are on-going. These projects are designed to reduce future flood risks, stabilize the streambed and banks, restore the ecological health of the watershed, and improve the human health and safety for landowners living along Left Hand Creek and its tributaries.
2) In November 2017 LWOG led a project to develop a stream stewardship handbook and workshops to help landowners conduct stream stewardship activities. LWOG led this collaborative project with other watershed coalitions. A key aspect is engaging landowners and providing advice, support, and tools required to conduct stewardship activities.
3) In November 2017 LWOG secured additional funding to frame the adaptive management needs and tools for our watershed restoration projects. Under this project, we will be hiring consultants to help define an adaptive management plan that defines methods and protocols for monitoring and maintain restored areas that will be scalable state-wide.

LWOG is seeking match funding to implement our adaptive management plan developed under (3), using a stewardship approach developed under (2), in the areas described under (1). This work is critical for the long-term watershed resiliency. With our adaptive management framework, we are implementing a quantifiable method for monitoring and maintenance that can be modified in response to dynamic watershed processes and can be repeated or scaled in other watersheds as needed. We are also incorporating hypothesis-based testing which will allow us to compare the effectiveness of restoration features. With our community-based stewardship approach, we are engaging our community in watershed management and improving the stewardship ethic of our community. Combined, our approach will ensure the long term success of restoration projects throughout the watershed.

OBJECTIVES

Objective 1: Engage community members in long-term stewardship efforts to support the success of restoration projects and build a community-wide stewardship ethic.

Objective 2: Develop and utilize adaptive management framework to monitor the status of restoration project sites with support from hired consultants, citizen scientists, landowners, volunteers, and/or students.

Objective 3: Work with hired consultants and/or volunteers to implement stewardship projects if/when corrective action are needed as determined by the adaptive management framework.

TASKS

TASK 1 – Stewardship Handbook (Complete – not part of this funding request, Funded through CDBG-DR)

- Developed a resource that provides landowners a compelling reason to learn about stream stewardship using education, simple flow chart-style tools, and workshops.

TASK 2 – Stewardship Handbook Phase 2 (To be complete by July 2018 –, Funded 100% through CDBG-DR)

- Adaptive Management Framework: This task involves refining the hypothesis and variables LWOG should utilize to measure and assess flood recovery and resiliency and what thresholds would trigger the need for a stewardship action. This task will build off of work already started by LWOG, the Colorado EWP team, and other groups. The result of this project will be a repeatable, saleable framework that can be used across the state among other coalitions. The framework will identify which protocols are appropriate for hired consultants, coalition staff, and citizen scientists/volunteers.
- Citizen Science Pilot: This task involves selecting one or two variables to test out utilizing a citizen science framework. Consultant team will develop one or two protocols and tools to collect relevant data in a citizen science context.
- Outreach: This task involves developing an outreach and recruitment strategy that can be implemented to successfully engage citizen scientists.
- Pilot Test: This task involves testing the citizen science plan on a pilot group of individuals and assisting LWOG in processing pilot test results.

TASK 3 – Adaptive Management (Part of this request; partially funded by CDBG-DR and LWOG)

Description of Task – The purpose of this task to is collect ecological data at project sites to monitor the status/success of restoration treatments. Relevant data will be identified by the adaptive management framework developed under Task 2, but include parameters such as erosion, vegetation, weed presence, water quality, water levels, and species abundance. Each parameter will be associated with a monitoring frequency, management trigger, and potential management action.

- Subtask 3.1: Framework (Funded project through CDBG-DR Planning grant through July 2018)
    - Sets up adaptive management and citizen science framework for LWOG and other coalitions to use.
- Subtask 3.2: Field Work
    - Review site conditions, protocols, data collection methods and provide recommendations; set up vegetation, topo, and photomonitoring sites; annual watershed-wide monitoring- visual assessment, hazardous debris, erosion, weeds, water

quality, benthic macro invertebrate sampling; vegetation Monitoring; photomonitoring; streambank stability and topographic complexity (channels); reference site monitoring; and travel to field sites.

- Subtask 3.3: Reporting and Analysis
    - Annual maintenance and monitoring plan; annual meeting with stakeholders & contributions to planning & report; annual meeting with stakeholders & funders; and annual Monitoring Summary report.

Method/Procedure – Using the adaptive management framework, LWOG staff will lead hired consultants, citizen scientists, volunteers, and/or students identified in Task 2 to collect and review data, and decide upon management actions. Data collection methods identified in the adaptive management framework will be used to measure parameters associated with geomorphology, vegetation, weed presence, water quality, and species abundance, among other variables as determined under Task 2. Example methods include cross-sections, percent cover, and collection of soil and water samples. Final methods will be determined under Task 2. Hypothesis-based monitoring will be used to evaluate how different approaches work at different sites and to evaluate future management needs or modifications. Parameters may be removed or added throughout the monitoring timeline based on results of hypothesis-based monitoring.

Deliverable – Deliverables will include:

- A database with all complied data collected according to frequencies established in the adaptive management framework.
- Numerical and graphical summaries of data, when appropriate.
- Analysis and discussion report leading to recommendations for management actions when needed.

TASK 4 – Stewardship Activities (Part of this request; partially funded by CDBG-DR and LWOG)

Description of Task – The purpose of this task is to implement management actions if they are required as determined by Task 1. Example management actions include weed control (spraying, hand pulling, disposal), revegetation (seeding and/or containerized planting and/or bio-stabilization), structure repair or other instream modification, and/or erosion repair/bank stabilization (coir blanket installation).

- Subtask 4.1: Vegetation Maintenance
    - Maintenance of riparian vegetation and maintenance of upland areas
- Subtask 4.2: Corrections/Repairs

Method/Procedure – LWOG staff will implement management actions with help from hired contractors, and/or volunteers as appropriate. Project stakeholders and landowners will also be involved throughout project. Some management actions, such as weed control or seeding will be completed with help from volunteer groups, whereas LWOG will hire contractors for more complex projects involving structure repair or bank stabilization. LWOG will leverage work completed in Tasks 1 and 2 to engage community in projects when needed.

Deliverable – Deliverables will include:

- Reports with photographs describing implemented actions and how need for action was determined based on adaptive management framework.
- As-built documentation (e.g. number of plants planted, acres weeds pulled, etc.)

TASK 5 –Project Management (Part of this request; partially funded by CDBG-DR and LWOG)

Description of Task – The purpose of this task is to track project progress, deliverables, reports, budget, and scope compliance.

Method/Procedure – LWOG staff will implement the tasks identified above by coordinating with project team during regularly scheduled project meetings.

Deliverable – Deliverables will include:

- Invoices and progress reports
- Final Report

Scope of Work

GRANTEE and FISCAL AGENT
Town of Lyons

PRIMARY CONTACT
Tracy Sanders
Richard Markovich

ADDRESS
P.O. Box 49
Lyons, CO 80540

PHONE
303-823-6622

PROJECT NAME
Lyons Valley River Park McConnell Ponds Fuse Plugs

TOTAL ESTIMATED PROJECT COST
$566,168.00

GRANT AMOUNT
$283,084

INTRODUCTION AND BACKGROUND

Town of Lyons staff members in conjunction with consultants have been continuing to work diligently toward flood recovery final design and engineering of Lyons Valley River Park using the 2016 Town of Lyons Parks Flood Recovery Planning Process Final Planning Report, the 2014 Hazard Mitigation Proposal for the McConnell Ponds, and the CWCB funded 2016 Lyons Valley River Park Hydralics Study Report. Part of the project design focuses on flood mitigation and resiliency measures to the ponds.

There are two access points to the Middle/Senior High School and the residential area on the south side of Hwy 66/36, the primary access point is McConnell Bridge and the other access point is the 2nd Ave Bridge. During the flood in 2013 the McConnell Bridge was completely washed out leaving the 2nd Ave Bridge as the only access point of the neighborhood. However, the 2nd Ave was not stable which left residents in a virtual "island" with no way in or out. It is critical to the Town and the community's health and safety to protect the bridge and the primary access in and out of the neighborhood in the case of an emergency.

To mitigate a potential future flood disaster the Town is building a more resilient bridge along with mitigation to the ponds that reside on either side of the bridge. The proposed mitigation would be engineered hardened berms in place of restoring the non-hardened pre-flood berms at the upstream and downstream ends of the ponds and an engineered failure point. The engineered

failure point would be accomplished using an erodible spillway between the two ponds. The benefit of the mitigation would be to maximize conveyance to protect infrastructure and homes. The engineered spillway will provide a more resilient area during another flood event.

The Town will provide a Hazard Mitigation Proposal from our consultant as supporting documentation for this project. In addition, CWBC already generously funded a preliminary hydraulic report that will also be provided.

Qualifications

The lead project sponsor would be the Town of Lyons and the stakeholders would be the Town of Lyons and the community. The Town did conduct public input for the overall Lyons Valley River Park design.

Although the replacement of the ponds is a FEMA funded project, the funding is wrapped into a FEMA pilot program. This program caps the budget for all the projects in the pilot program, thus limiting what can be completed with the funding received. The Town is seeking additional funds to help supplement the pond mitigation effort. The obligated FEMA funding would also act as the match to the CWCB funds received.

Organizational Capability

The Town has successfully utilized funding from CWCB for several recovery projects:

- Lyons Ditch-this project was to help re-establish and repair flood damage to Lyons Ditch
- Lyons Valley River Park-These funds were utilized for hydraulic modeling for the replacement of the McConnell Ponds.
- Fish Habitat Study-The study was conducted for the repairs to the stream and white water features in Meadow Park to ensure healthy stream life.
- South St Vrain Creek 4B Reach 3 Stream Restoration-This was a stream and bank restoration project from CR69 Bridge to Town of Lyons limits.

The Town has a core staff of 4 people dedicated to the implementation of the ponds restoration and mitigation. This will include a project manager, grant coordinator, parks and public works director and the recovery manager. The Town will also have the support of the design and consulting teams of DHM Design and S2O Design and Engineering.

The current project budget for the mitigation is $566,168, the detailed opinion of cost is attached as supplemental documentation to this application. Currently the design is 60% completed. S2O is working on additional modeling to finalize the plan. In addition, S2O is also exploring a possible alternate mitigation option that may be more cost effective. However, this is very preliminary and we will amend the scope and cost estimate as soon as we know which option is the most resilient.

Design for the ponds and mitigation is estimated to be completed in early 2018. The permit application to the Army Corps will be submitted as early as November 10, 2017. The Town is anticipating to start construction in the spring of 2018.

Proposal Effectiveness

The application includes a Hydraulic Study prepared by S2O which details the proposed mitigation and its benefits.

The entire project of restoring the ponds with the combined FEMA funding with the mitigation and CWCB funding would complement the restoration goals by:

- enhance channel stabilization with bank stabilization work to be completed with the pond replacements
- riparian re-vegetation will be completed along the banks
- habitat would be improved with the replacement of the ponds and re-vegetation
- the ponds would promote recreation activities such as fishing, kayaking and other water activities
- this mitigation would minimize impacts of flooding (also see attached mitigation report drafted by S2O)

OBJECTIVES

To allow for mitigation in the case of a large flood event and to protect and minimize damage to infrastructure and to ensure the health and safety of residents.

TASKS

Provide a detailed description of each task using the following format. Detailed descriptions are only required for CWCB funded tasks. Other tasks should be identified but do not require details beyond a brief description.

TASK 1 – Fuse plug

Description of Task:

Construction of an erodible spillway between the two McConnell Ponds. Prior to the flood this area was an earthen berm that was decimated by the flood along with the adjacent areas and downstream road. The proposed berm would provide a controlled embankment failure to protect the homes and infrastructure. This structure is designed to activate is rare flood events so it will have a crusher fines trail for normal access across and park use.

Method/Procedure

To construct the fuse plug in a way that will be resilient and function properly it will be constructed with a concrete floor slab and concrete walls along the lateral limits. A berm will be constructed within the concrete area that will be armored against wave action to prevent premature activation. The material of the berm will be sized and constructed in a manner that will erode the material upon activation providing the necessary flood capacity.

Deliverable

Fuse plug constructed

REPORTING AND FINAL DELIVERABLE

Reporting: The applicant shall provide the CWCB a progress report every 6 months, beginning from the date of the executed contract. The progress report shall describe the completion or partial completion of the tasks identified in the statement of work including a description of any major issues that have occurred and any corrective action taken to address these issues.

Final Deliverable: At completion of the project, the applicant shall provide the CWCB a final report that summarizes the project and documents how the project was completed. This report may contain photographs, summaries of meetings and engineering reports/designs.

ATTACHMENTS

Concept Plans-Sheet L4.02 and RJH Fuseplug concept
LYONS PW20 Hazard Mitigation Proposal for McConnell Ponds
S2O Memo-Explanation of mitigation features for LVRP design
H & H Study

Budget & Timeline Table

Task	Description	Target Start Date	Target Completion Date	CWCB Funds	Other Funding FEMA	Other Funding In-Kind*	Total
1	Fuse Plug Backfill	6/1/2018	8/31/2018	$48,000.00	$48,000.00		$96,000.00
2	Typle L Riprap	6/1/2018	8/31/2018	$9,600.00	$9,600.00		$19,200.00
3	Riprap Bedding	6/1/2018	8/31/2018	$9,300.00	$9,300.00		$18,600.00
4	Grouted Type M RipRap	6/1/2018	8/31/2018	$43,000.00	$43,000.00		$86,000.00
5	Geotextile	6/1/2018	8/31/2018	$465.00	$465.00		$930.00
6	Reinforced Concrete	6/1/2018	8/31/2018	$85,000.00	$85,000.00		$170,000.00
7	Mob/Demob	6/1/2018	8/31/2018	$4,884.00	$4,884.00		$9,768.00
8	Bonds/Insurance	6/1/2018	8/31/2018	$1,953.50	$1,953.50		$3,907.00
9	Construction Contingencies	6/1/2018	8/31/2018	$60,661.00	$60,661.00		$121,322.00
10	Construciton Engineering	6/1/2018	8/31/2018	$20,220.50	$20,220.50		$40,441.00
	TOTALS			**$283,084.00**	**$283,084.00**		**$566,168.00**

This table is a guide. Variations may be submitted. For example, if a task includes purchase of materials, a column that identifes cost per unit should be included.

*Please include new columns for different sources of cash and/or in-kind funding sources. Identify the funding source.

Project Title: Plumb Ditch Planning Effort
Project Location: Project area is located on the South Platte River near the municipal area of Kersey, Colorado in Weld County and identified in Middle South Platte River Restoration Master Plan as Reaches 16 & 17. Specifically, this Plumb Ditch Planning effort focuses on the reach of river between Highway 34 Business Route and the Weld County Parkway.

Figure 1 Vicinity Map Identifying proposed project area.

Grant Type: Watershed/Stream Restoration and Protection Grant
Grant Request/Amount: $150,000
Cash Match Funding: $110,000
In-kind Match Funding: $40,000
Project Sponsor: Middle South Platte River Alliance
Contact person name, email address, and phone number:
Chloe Lewis, clewis.mspra@gmail.com, 970-313-8235
Amanda Brooks, abrooks.mspra@gmail.com, 970-347-0968
Brief description of the project:
The Plumb Ditch reach of the South Platte near Kersey, Colorado has excellent potential for a multi-objective approach to river restoration that does not yet exist in the area. A project designed in this reach will combine the restoration of stream channels and riparian areas, erosion control, and the creation of habitat for both aquatic and terrestrial species as well as recreation and public safety enhancements. This project can serve as a demonstration area illustrating a collaborative approach that combines agricultural uses with recreational benefits.

Colorado Watershed Restoration Program Grant funds will go directly to the design of a plan that will satisfy the following objectives:

1. Design bank stabilization at the area of erosional concern for the Plumb Ditch
2. Incorporation of fish and recreational passage into the existing diversion structure
3. Reduce erosion upstream and downstream of the diversion
4. Wetland habitat improvements on property upstream of diversion structure
5. Public safety improvements including landowner access for camping on acreage that is currently inaccessible as well as covering/planting areas of riprap along river bank areas
6. Limited/Controlled Public access for recreational opportunity enhancement

Background

The project was born from a concern raised by the Plumb Ditch Irrigation Company identifying an area of streambank erosion that poses a risk for long term ditch viability. The area of concern is located upstream of the Weld County Parkway Road. The area was rebuilt following the 2013 flood event on the South Platte River. The flood created a 90-degree bend in the river which is now experiencing rapid erosion and could potentially compromise the ditch if action to secure the bank is not addressed. The Plumb Ditch is concerned that the loss of infrastructure resulting from bank erosion would hinder their ability to deliver water as per their decree. This proposal aims to address these erosion concerns in collaboration with Plumb Ditch Company and ensure the ditch's ability to fulfill their obligations to their water users.

In addressing bank stabilization and infrastructure associated with the Plumb Ditch, we would like to explore the opportunities to enhance recreation within this important reach along the South Platte River. The Plumb Ditch diversion structure is located on a property owned by Carleton & DeJong, LLC doing business as the Platte River Fort, LLC. The Platte River Fort is operated as a special event center that hosts private events as well as a robust educational program. The Platte River Fort also offers recreational use at their facility and provides a campground and beach area for their guests just upstream from the Plumb Ditch Diversion Structure (see photo in appendix 5). As part of their recreational plan, the Platte River Fort would like to increase opportunities for water sports along their property. The Platte River Fort would like to increase recreational access to the river by developing safe access points along the South Platte River in addition to removing potential hazards along the bank such as riprap and rebar that currently pose a risk to public safety. At this time, recreational users have no clearly defined access points along the river. Platte River Fort has also expressed interest in having the plan address other public safety issues, such as the lack of a crossing over the Plumb Ditch to further enhance recreational opportunities on the property. Further, Carleton & DeJong, LLC and the Platte River Fort have developed a partnership with the City of Evans, Town of Kersey, and other private landowners along the South Platte River who are looking to improve safe and legal public access. Please see appendix 2 for the most up to date Platte River Fort planning document.

This proposal also aims to restore and enhance wetlands adjacent to the South Platte River on the Platte River Fort. The enhancement and restoration of wetlands along this reach will improve habitat for migratory birds and assist with attenuation and desynchronization of future floods. The intent of restoration activities is to promote the growth of desirable wetland and riparian vegetation communities that provide the seeds and substrate for invertebrates that will attract and nourish foraging waterfowl species. Shallow water wetlands will deliver habitat where hydrologic manipulation results in stands of

either moist-soil type plant communities or submerged aquatic vegetation preferred by nonbreeding populations of ducks and geese. These wetlands have the potential to also act as sponges by slowing the flow of and acting as conduit for groundwater recharge during flood events. As part of this proposal, we propose to collaborate with Ducks Unlimited, Inc. to identify, survey, and design restoration and enhancement opportunities along this reach. These wetland activities will be developed in conjunction with available water resources and state and federal permits.

Stakeholder Involvement and Support

The Middle South Platte River Alliance (MSPRA) is a local 501 (c)(3) whose focus is on river restoration projects that improve community and ecological function and resiliency. The MSPRA would be the lead project sponsor of the Plumb Ditch Planning Effort from the inception to completion. The MSPRA believes strongly in its vision of a "...healthy resilient river corridor, functional for all stakeholders". One very unique component of this project is that it was initially proposed by a stakeholder - the Plumb Ditch. As an organization that seeks to foster community involvement, this presented an ideal scenario to explore reach specific needs that exemplify the concerns of relevant landowners and stakeholders.

Continued exploration and expanding conversations have fostered significant stakeholder interest and engagement. Please see table below identifying current interest and support. Collaborating stakeholders include the Plumb Ditch, the Platte River Fort, the Town of Kersey, the City of Evans, the City of Greeley, Ducks Unlimited, and Central Colorado Water Conservancy District. Support for the project has also been expressed by the Colorado Department of Transportation Region 4 and Weld County.

Stakeholder	Background	Priorities/Potential	Level of Involvement
Plumb Ditch Co.	Plumb Ditch Comprised of 90 shares. Four main stakeholders- largest CCWCD. Diversion structure and head gate on Carleton & DeJong property.	Streambank stabilization. 90-degree bend directly upstream of bridge (Weld county parkway). Rehabilitate sand valve. Fish passage within the diversion structure.	Active Participant- involved in focus group meetings, see letter of support in Appendix 3.
Platte River Fort, LLC	Dori DeJong landowner-diversion structure property. Uses property for environmental education and special events as well as camping, glamping yurts and tubing.	Public Safety and recreation. Educational uses of property. Agritourism. Access to property downstream of dam.	Active Participant- Landowner involved in focus group meetings and willing to contribute ideas to build upon project, see letter of support in Appendix 3.
Town of Kersey Colorado	Platte River Fort was annexed into Kersey in August, 2017.	Preservation of the area for intrinsic value to the Kersey Town area.	Active Participant-Involvement in focus group meetings, see letter of support in Appendix 3.
Ducks Unlimited	Is a 501(c)(3) nonprofit organization and leader in wetland conservation in North America.	Ducks Unlimited focuses on restoration, enhancement, and conservation of wetlands along the South Platte River in Colorado.	Active Participant- prior interest in project, see letter of support in Appendix 3.
City of Evans Colorado	Working relationship with Platte River Fort, LLC.	Potential for connecting public access upstream.	Existing working relationship with City of Evans.

Table 1. Stakeholder Priorities and Level of Involvement

Match Funding

Source	Match	Type	Thoughts
Landowner	TBD	In- Kind or Monetary	Potential for public access, also certain components (signage, items for a bridge crossing etc.) that could be considered match if the land owner or ditch company was willing to purchase them within our timeline.
Roundtable	TBD – next RT meeting is November 14th	Monetary	Will move forward with discussion
Ducks Unlimited	Wetland Restoration/Design on Platte River Fort Property	In - Kind (design) & Possibility of Monetary	Enhancement and restoration of wetlands. Will move forward with discussion.
Town of Kersey	TBD	TBD	This conversation will be explored in more detail. CWCB sponsorship would allow for more negotiable amounts/value of request
City of Greeley	TBD	TBD	This conversation will be explored in more detail. CWCB sponsorship would allow for more negotiable amounts/value of request
City of Evans Colorado	TBD	TBD	Potential for public access.
Recreation/Tourism Grants	TBD	TBD	As opportunities become available over the next few months different sources can and will be explored

Table 2. Potential Sources of Match Funding

Various avenues for matching funds and in-kind contributions are being explored. Although these conversations are in motion, exact percentages and sources have yet to be finalized.
If given the opportunity to work with the CWCB to explore ways in which to improve this section of river, the MSPRA will become much more attractive to other potential funding partners. Secured funds from a reputable organization such as the CWCB will precipitously increase the level of comfortability that other funding partners require prior to committing involvement.

The organization has the capacity to build consensus and develop collaborative projects with stakeholders along the South Platte. Despite numerous obstacles, the organization successfully managed three planning and design efforts along the river corridor. These projects create a substantive platform to move forward in areas that present concerns for hydrologic conveyance, sediment transport, public health and safety and ecological function.

Since August of 2016, the MSPRA has brought on two full time staff members who exhibit the knowledge and experience to increase organizational capacity while pursuing opportunities for restoration. With two full time staff members, the MSPRA now has the capacity to build stakeholder consensus and increase the exploration and understanding of both quantitative and qualitative concerns within the watershed. As a result of the increased momentum and support, the MSPRA has recently completed an Emergency Watershed Protection (EWP) project at Highway 60 near Milliken, Colorado and has secured approximately $5.2 million dollars in funding for two irrigation diversion projects to be

completed by the end of 2018; both of which incorporate similar objectives to the ones intended to be included in the Plumb Ditch Planning Effort.

MSPRA is committed to supporting the agency in every capacity required. The staff works diligently and right along with stakeholders keeping them involved in every step of the process. Please review our resumes attached in Appendix 4.

Budget/Schedule

Task	Description	Target Start Date	Target Completion Date	CWCB Funds	Other Funding (cash)	DOLA	Other Funding*** (In Kind)	Total
1	Field assessments: Collect survey, morphological and biological data using the COSHAF format	4/1/2018	5/15/2018	$10,000	$10,000		TBD	$20,000
2	Concept Alternatives	5/15/2018	7/31/2018	$15,000	$15,000		TBD	$30,000
3	Public Outreach	8/1/2018	9/30/2018	$5,000	$5,000			$10,000
4	Preliminary Design	10/1/2018	12/15/2018	$80,000	40,000		$40,000	$160,000
5	Monitoring and Assessment	5/01/2018	5/01/2023	$25,000		$25,000		$50,000
6	Project Delivery	4/1/2018	6/30/2018	$15,000		$15,000		$30,000
Total				**$150,000**	**$70,000**	**$40,000**	**$40,000**	**$300,000**

Table 3. Project Budget/Schedule * Potential match from Weld County, Towns of Evans and Kersey, Ducks Unlimited and Carleton & DeJong, LLC/Platte River Fort, LLC

Existing information/Monitoring and Implementation

The project area is identified in Middle South Platte River Restoration Master Plan as Reaches 16 & 17. Both Reaches were given an overall risk score of 12-medium. The Master Plan Recommends Diversion Structure modifications and riparian plantings within reach 16.

We would like to implement the Colorado Stream Health Assessment Framework as our tool for stream management and restoration planning to move toward a more holistic river planning idea. This tool will establish a baseline framework for quantitative analysis and used to define success. Coalition staff will be trained by Brad Johnson and Mark Beardsley in the proper use of this tool for future use on this and other projects.

Scope of Work

GRANTEE and FISCAL AGENT (if different)
Middle South Platte River Alliance
PRIMARY CONTACT
Chloe Lewis: clewis.mspra@gmail.com/Amanda Brooks: abrooks.mspra@gmail.com
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Loveland, Colorado 80539
PHONE
1-970-313-8235/ 1-970-347-0968
PROJECT NAME
Plumb Ditch
GRANT AMOUNT
$150,000
INTRODUCTION AND BACKGROUND
The Plumb Ditch reach of the South Platte near Kersey, Colorado has excellent potential for a multi-objective approach to river restoration that does not yet exist in the area. A project designed in this reach will combine the restoration of stream channels and riparian areas, erosion control, and the creation of habitat for both aquatic and terrestrial species as well as recreation and public safety enhancements. This project can serve as a demonstration area illustrating a collaborative approach that combines agricultural uses with recreational benefits.

OBJECTIVES

1) Design bank stabilization at the area of erosional concern for the Plumb Ditch
2) Incorporation of fish and recreational passage into the existing diversion structure
3) Reduce erosion upstream and downstream of the diversion
4) Wetland habitat improvements on property upstream of diversion structure
5) Public safety improvements including landowner access for camping on acreage that is currently inaccessible as well as covering/planting areas of riprap along river bank areas.
6) Limited/Controlled Public access for recreational opportunity enhancement

TASK 1- Field Assessments

Description of Task

This Task involves the compilation and review of all existing information pertinent to the completion of the alternatives analysis and feasibility assessment. This includes but not limited to all existing topographic mapping, post-flood LiDAR data, survey data, diversion records, digital floodplain mapping and FEMA FIS profiles, hydraulic models, aerial photography, USGS gage data, bed and bank material sampling, and existing diversion plans. In addition, existing information available from the South Platte River Restoration Master Plan will be reviewed and utilized to avoid duplication of previous efforts. This Task will include an inventory of the existing facilities along with a field reconnaissance to identify geomorphic features, areas of aggradation/degradation, bank erosion, and the overall geomorphic and ecologic condition of the river in the vicinity of the structure. The inventory

will include an assessment of the physical condition of the diversion dam, drop structures, head gate structures, measurement structures and upper portions of the ditch.

Method/Procedure

Specific activities that may be undertaken during the fieldwork include:

- collection of all GPS locations;
- assessment of the structural integrity and condition of the existing structure (based on visual observations) with respect to type of materials and associated maintenance costs;
- evaluation of the hydraulic capacity and efficiency of the structures and the potential for blockage due to debris such as rock, trees, dirt, etc.;
- assessment and investigation of past remedial actions;
- photographic documentation of existing structure; and
- conducting interviews with ditch representatives and alliance staff.

This Task also includes the identification of all physical design constraints, as well as identification of additional survey/geotechnical/utility relocation requirements, as necessary. Additional site visits will be conducted, as necessary, to obtain information pertinent to the development and evaluation of alternatives. This Task also includes collection of survey data to support the development and completion of base mapping, alternative improvements, and design concepts, and details. Hydraulic and sediment transport modeling for existing conditions will be completed prior to the commencement of this study.

Deliverable

A) Project Goals Statement:
    - Clear definition of project goals and objectives (developed in collaboration with Ditch Company, Platte River Fort, the MSPRA Steering Committee and other stakeholders).
B) Watershed and Site Assessment:
    - Review of geology, ecology, hydrology, hydraulics, geomorphology, soils, water quality conditions
    - Riparian assessment and wetland delineation
    - Photo documentation (e.g., pre-project, pre-flood, post-flood, historical)
    - Base map development including but not limited to:
        i. Political/property boundaries
        ii. Infrastructure and utility locations
        iii. Topographic survey (1’ contour development from LIDAR and traditional survey methods
        iv. Supporting GIS/CAD layers
        v. Post 2013 flood topographic mapping
        vi. Utilities, infrastructure and potential conflicts located within the study reach

C) Geomorphology
    - Identification of existing and proposed stream style or type, bedform, planform, and channel evolution stage. Discussion of erosive or depositional processes and analysis of cause(s) of instability
    - Channel and floodplain dimensions including low-flow, bankfull, and various flood stages
    - Reference reach data, if applicable
    - Identification of vertical and lateral channel controls
    - Geotechnical analysis
    - Inclusion of Erosion Hazard Zone if mapped during the Master Plan process
D) Hydrology/Hydraulics
    - Watershed hydrology - evaluated for peak, low, and pertinent stage/duration flows as necessitated by the design goals. Data obtained from CWCB, gage data, StreamStats, and/or other appropriate sources.
    - Existing hydraulic capacity
E) Existing Sediment Transport Analysis
    - Shear stress, velocity and stream power as a function of stage and/or discharge
    - Preliminary sediment transport capacity analysis to estimate bed aggradation or degradation over time.
    - Preliminary incipient motion analysis at design flows if designing a threshold channel
    - Preliminary scour depth calculations for design floods
F) Aquatic, and Terrestrial Species Habitat Requirements
    - Fish passage requirements (burst speeds, depth, velocity, cover)
    - Define seasonally appropriate floodplain, lateral and longitudinal connectivity requirements
    - Riparian vegetation target community
    - Evaluation of existing and potential invasive species
    - Consideration of construction windows for sensitive species

TASK 2 – Concept Alternatives

Description of Task

This Task will primarily focus on the formulation and evaluation of up to three (3) alternative improvement concepts for meeting described objectives in the vicinity of the Plumb Ditch diversion, head gate structures and upstream property.

Method/Procedure

The alternative formulation and evaluation will include, but not be limited to, consideration of the following issues:

- Diversion efficiency during periods of low flows
- Hydraulic capacity during periods of high flows
- Floodplain assessment/impact of proposed improvements on adjacent property and structures
- Opportunities for integration of fish passage and passage for recreational users

- Opportunities for habitat enhancement within the reach
- Wetland impacts and other permitting issues
- Property ownership, easements, and rights-of-ways
- Hydraulic model development for proposed alternatives. Water surface elevations, stream velocity, shear stress and stream power shown in relation to stage and discharge through the reach.
- No-rise analysis for work within regulatory floodways or other areas of local applicability.

Deliverable

Hydraulic and sediment transport modeling for proposed conditions will be conducted as necessary to: (a) develop and refine the conceptual improvements in support of the considerations above; and (b) determine the geomorphic compatibility of the alternatives relative to the stream restoration master planning objectives. A range of flows will be hydraulically modeled to provide an assessment based on the probability of occurrence relative to the damages sustained and foregone due to the construction of the improvements. Details associated with each improvement concept will be generated at a conceptual level of design to support the development of conceptual cost estimates.

TASK 3- Public Outreach

Description of Task

The consultant will be required to meet and/or coordinate with representatives of the Alliance, the Plumb Ditch Company, Ducks Unlimited, the Platte River Fort, regulatory agencies, funding agencies, and any other local landowners and stakeholders.

Method/Procedure

At a minimum, the public outreach phase will include:

- an initial project kickoff meeting
- monthly progress reporting
- an alternatives analysis meeting
- and a final project closeout meeting.

Deliverable

The public outreach phase will conclude with property permission forms and consensus to move forward with preliminary design.

Task 4- Preliminary Design

Description of Task

Following the selection of a preferred alternative, conceptual design drawings will be generated.

Method/Procedure

Preliminary design drawings may include but not limited to:

- All structures associated with the diversion

- Typical channel dimensions including low-flow, bankfull, and various flood stages as well as typical floodplain grading/roughness
- Channel alignment and river corridor/floodplain alignment
- Channel profile
- Identification of project limits
- Location of fish passage structures and features
- Other elements as identified in the project goals and multiple objectives, as applicable
- Preliminary engineering typical drawings for all structure types- preliminary size calculations, use, and location explained

Deliverable

The conceptual hydraulic design efforts conducted as part of the alternative development and evaluation Task will be refined and finalized as part of this Task. Once the hydraulic design has been finalized, preliminary concept drawings will be prepared for the preferred alternative. The hydraulic design efforts and preparation of preliminary concept drawings may include the following system improvements: 1) Design bank stabilization at the area of erosional concern for the Plumb Ditch 2) Incorporation of fish and recreational passage into the existing diversion structure 3) Reduce erosion upstream and downstream of the diversion 4) Wetland habitat improvements on property upstream of diversion structure 5) Public safety improvements including landowner access for camping on acreage that is currently inaccessible as well as covering/planting areas of riprap along river bank areas 6) Limited/Controlled Public access for recreational opportunity enhancement

Colorado Water Conservation Board
Colorado Watershed Restoration Program
Project Proposal Summary Sheet

Project Title:
Emergency Watershed Protection (EWP) Project Maintenance & Monitoring

Project Location:
Locations within Boulder County, CO: McConnell, Apple Valley North and South project areas.

Grant Type:
Watershed/Stream Restoration

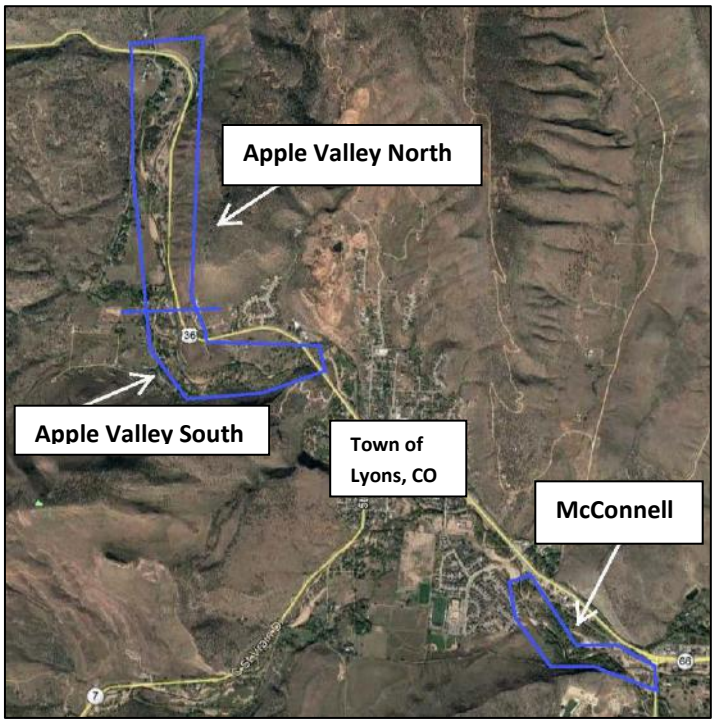
Grant Request/Amount:
$133,120

Cash Match Funding:
$66,560

In-kind Match Funding:
$176,384

Project Sponsor:
Saint Vrain Creek Coalition (SVCC)

Contact:
Cecily Mui, SVCC Watershed Coordinator
cecilym@saintvraincreekcoalition.org
303-774-4514



Brief project description:
By March 2018, the Saint Vrain Creek Coalition (SVCC) will have completed three flood recovery projects in the St. Vrain Creek Watershed: Apple Valley North, Apple Valley South, and McConnell. These three projects were identified by the Natural Resources Conservation Service (NRCS) Emergency Watershed Protection (EWP) Program as being high-priority projects, and in 2017 received funding from the program to complete restoration design and construction. As local sponsors and project managers for these three projects, the SVCC has accepted the responsibility of maintenance and monitoring for three years beyond construction completion. We recognize that once installed, these projects require maintenance and monitoring support to successfully achieve flood recovery and restoration goals.

The SVCC is seeking funds from the Colorado Water Conservation Board (CWCB) to ensure that the responsibilities it has taken on as local sponsors will be fulfilled and that these projects will continue to function as intended for years to come. Along with our funding request from the CWCB, we are working closely with our partners and stakeholders to realize this important aspect of these projects, with cash and in-kind match.

Grant Application

Project Background

The SVCC is seeking $133,120 in funding from the Colorado Water Conservation Board's (CWCB) Colorado Watershed Restoration Program (CWRP) to help support their Emergency Watershed Protection (EWP) project maintenance and monitoring program through the July 2021.

In 2015, the Natural Resources Conservation Service (NRCS) EWP Program identified a number of project areas along the St. Vrain Creek that they considered high-priority flood recovery projects for the protection of life and property. The SVCC took on fiscal sponsorship and management for three of these projects: Apple Valley North, Apple Valley South, and McConnell. Thanks to the many funders, partners, and stakeholders of these projects, all three are scheduled to be completed by the end of 2017 or spring of 2018. Once constructed, the Saint Vrain Creek Coalition will be responsible for three years of maintenance and monitoring of the project sites.

The SVCC looks forward to the increased resiliency to future natural disasters that will result from the completion of these projects. All three projects have been focused on multi-objective solutions and will have addressed the protection of life and property, riparian revegetation, habitat improvement, natural hazard reduction, flood mitigation, debris removal, as well as quality of life improvement for the landowners and businesses in the area. The two Apple Valley projects specifically will include aspects of channel stabilization, fish passage improvements, and indirectly will have improved the recreational opportunity and water supply delivery in the project areas. A large part of the maintenance and monitoring phase will be ensuring that these many improvements will have lasting effects in the watershed. In the event that there is a need for more than just routine maintenance, there may be the opportunity to develop an innovative approach for a more effective solution.

Project Description

Monitoring is incredibly important to the long-term success of these EWP projects and our understanding of what worked and what did not in regards to flood recovery in our watershed. It will not only tell us a great deal about the creek and the projects we are installing now, but will provide important data for future stream restoration projects in the St. Vrain and beyond. The SVCC will refer to the maintenance and monitoring guidance resources provided by the EWP program (EWP O&M Fact Sheet, 05/16/2016: see Attachment D) and the Operations, Inspection, and Management (OIM) Plans developed for each project (included in Attachment D) while monitoring projects.

Monitoring will be completed in a number of ways, listed below and further discussed in the Scope of Work, Attachment A:

- **NRCS Stream Visual Assessment Protocol (SVAP):** To be completed by SVCC staff, trained by a CWCB-NRCS TA team member.
- **Photo points surveys**: This task is currently being completed by volunteers, with assistance from SVCC staff and interns, and would likely continue to be completed in this manner in the future.
- **Vegetation surveys**: To be conducted by SVCC staff or intern.
- **Structural functionality**: To be completed by a hired engineer or vendor who has experience evaluating the functionality of engineered river structures.
- **Apple Valley biomonitoring**: GEI Consultants (GEI) and Colorado Parks and Wildlife (CPW) donated a baseline biomonitoring sampling for fish and aquatic invertebrates in Apple Valley in August 2017 prior to construction to preserve the ability to assess aquatic habitat uplifts post-construction. The SVCC believes there is great value in completing another sampling post-

construction, which GEI and CPW would conduct once again for consistency, with the assistance of a volunteer.

- **Apple Valley CSU/TU Study:** A graduate student from Colorado State University (CSU) who is associated with Trout Unlimited (TU) is currently conducting a study on temperature, ground water, and fisheries in Apple Valley, and will continue to do so on a volunteer basis through the maintenance and monitoring period.

Maintenance of these projects will focus on two aspects: vegetation and structures. For vegetation, maintenance will consist of watering, weeding, plant replacement, and fence protection. These items can be completed by volunteers, landowners, vendors, or interns of the SVCC. Structural maintenance, if deemed necessary through monitoring, will require the management of warranties during the first year. In the second and third years, any maintenance that is deemed necessary on structures will require more involvement from SVCC staff in landowner engagement, permitting, contractor procurement and project management, and potential reporting to the funders of the initial flood recovery project. We will work with the designers of our projects or other engineers when a structure's functionality comes into question to determine whether or not further measures will need to be undertaken, and if so, what those might be for the long-term benefit of the creek and those nearby. We are not asking the CWCB for potential structural failure contingency at this time. The goal will be to repair failures that do not withstand typical high flow events within warranty during the first year. Should there be an atypical high flow event that significantly damages newly installed features that have not achieved their full engineered potential, the SVCC will assess the need to seek additional grant funding for these repairs through future CWCB or other grant funding and from local contributions.

The Budget and Timeline Table is provided in Attachment B.

The goal of this project is to not only provide a service that the SVCC is required to fulfill, but to ensure the long-term success of the flood recovery projects sponsored by the SVCC, and to provide much needed data on what works when it comes to flood recovery stream restoration and what doesn't. These experiences we are learning from will help our watershed become more resilient while also providing resources to future flood recovery efforts. Though other entities in our watershed will be completing similar tasks for the EWP projects they are managing, our project is unlikely to overlap with theirs, other than to share lessons learned.

Please review the Scope of Work in Attachment A for more information on the tasks and methods associated with this project.

Funding and Partnerships

The Saint Vrain Creek Coalition will remain the project sponsor for the three EWP projects it is managing through the maintenance and monitoring period and will be completing a majority of the on-the-ground duties. The total cost of this three-year project is $376,064, and includes funds for staff time, a consultant to monitor the functionality of structures installed during construction, Apple Valley biomonitoring, weed control, watering, and revegetation supplies (plants, cages, seed, etc.). This estimate also includes the value of in-kind volunteer hours.

The SVCC believes that the best projects are completed through collaboration and the leveraging of resources for better outcomes, and we have been working with our partners since taking on these EWP projects to determine how we will provide the required three years of maintenance and monitoring. Our possible project partners include: Boulder County, the Town of Lyons, City of Longmont, Trout Unlimited, Colorado Parks and Wildlife, Colorado State University, landowners and asset owners within

the three project areas, and volunteers who have already committed and will commit to providing needed services for proper maintenance and monitoring. Project partners will help support the SVCC in our maintenance and monitoring activities in a variety of ways.

The SVCC is working towards raising at least $66,560 in cash match, $27,000 of which has already been secured from the Town of Lyons and project area landowners. The SVCC will be working with our partners and fundraising to secure the remaining cash match. We have been successful at raising funds for projects from landowners and asset owners within project areas in the past, and believe that attaining this level of cash match will not be an issue. Landowners have approached the SVCC to discuss strategies for how to raise some of the maintenance and monitoring costs, and how they and their neighbors may assist in the process. For example, the idea of distributing some of the costs between neighbors in a project area based on the number of linear feet of creek they own has been expressed, though there will undoubtedly be landowners who cannot contribute financially. The SVCC is also working with its Fundraising Committee to identify and approach corporate sponsors to assist in the needed funding for maintenance and monitoring.

Other partners will be providing in-kind match by assisting the SVCC to take on tasks associated with the project and through volunteer hours or supplies. For example, there will be a number of volunteer hours associated with photo point surveys, the Apple Valley CSU/TU Study, and vegetation maintenance, such as noxious weed control or watering. The SVCC plans to attain at least $176,000 of in-kind match for this project.

Please find letters of support from our some of our partners in Attachment C.

Organizational Information & Capacity

The Saint Vrain Creek Coalition (SVCC) is a 501(c)3 nonprofit that formed in response to the 2013 floods that devastated much of the Front Range in Colorado. Our mission is to implement the Saint Vrain Creek Master Plan and pursue recovery from flood impacts, resiliency to natural hazards, and protection of the natural character and multiple uses of the Saint Vrain watershed, through broad stakeholder engagement and collaboration.

The SVCC currently has two full time staff members, a Board of Directors comprised of 13 individuals with various interests in the watershed (recreation, conservation, education, local government representation, etc.), and a growing membership that represents our broad base of stakeholder interests. Our core priorities encompass the main values of the coalition:

1. **Watershed Health and Resiliency** – Watershed Health and Resiliency includes ongoing flood recovery and stream restoration efforts, but also ties in other aspects critical to watershed health beyond the disaster experienced in 2013.
2. **Facilitation** – The SVCC works hard to collaborate with our partners on projects to leverage resources, but also to find common ground on complex issues. As a neutral third party, the SVCC can help facilitate difficult conversations in an effort to find solutions that benefit all involved.
3. **Financial Sustainability** – Without adequate funding, the SVCC would not exist in order to address our first two core priorities. Working towards financial sustainability to continue our work is an ongoing process that evolves as we grow.
4. **Capacity** – As with any organization, the SVCC has to balance available capacity with the amount of work that is undertaken. We have a limited Board and Staff, but are always seeking ways to increase our organizational capacity through volunteers, interns, and other efficiencies.

The SVCC employs two full time staff and periodically recruits capable interns to assist in fundraising and project-based work. For this three year maintenance and monitoring project, we estimate that the two full time staff will collectively dedicate approximately 300 hours per year to the project and an intern will dedicate approximately 230 hours per year. A majority of these hours will be utilized for monitoring and routine project maintenance, though there will be the potential larger maintenance needs.

Cecily Mui is the Watershed Coordinator and Executive Director of the Saint Vrain Creek Coalition. She has over 20 years of professional experience in natural resources management and community outreach. Prior to the Coalition, she was a Land Manager with South Suburban Park and Recreation District and managed the day-to-day operations, budget, grants, and stewardship volunteer programs at South Platte Park. While working for the Colorado Department of Agriculture, she developed the State's new List B noxious weed program, administered grants, and provided education and outreach to county weed managers and the general public.

Erika Shioya is the Assistant Watershed Coordinator of the Saint Vrain Creek Coalition. She manages day to day program tasks, budgeting, grant applications, outreach efforts, and volunteer programs. She has over 9 years' experience working for environmental nonprofits, wearing many hats. Prior to the Coalition, she was the Communications Coordinator for the Colorado Watershed Assembly, where she assisted in implementing state-wide volunteer programs, assisted federal and state contracted programs, and organized and executed far-reaching education, outreach, and fundraising efforts.

The SVCC plans to utilize volunteers for a number of tasks associated with the project, such as:

- **Photo points surveying** – the SVCC currently has 3 volunteers collecting photo points at this time, though there may be the need for more in the future.
- **Vegetation maintenance** – the SVCC and our partners have hosted a number of landowners and other volunteer groups for noxious weed control and revegetation events to date, and will continue to do so through the maintenance and monitoring period. Types of vegetation maintenance include:
    - Watering
    - Noxious weed control
    - Replanting/seeding
    - Fencing/caging trees and shrub to prevent loss to herbivory
- **Apple Valley CSU/TU Study** – an SVCC volunteer initiated this study and will continue to collect data over the maintenance and monitoring period.

Previous and Current Projects of the SVCC

Since its inception in mid-2015, the Saint Vrain Creek Coalition has managed four federal and state grant-funded projects (approximately $4.3M total), partnered in two projects with other watershed coalitions, and has facilitated a number of conversations surrounding complex issues.

- The Creek Rehabilitation Plan for Apple Valley, funded by the Colorado Department of Local Affairs (DOLA), included community planning and the development of a 30% design for a neighborhood that experienced extensive damage by the 2013 floods. Apple Valley is located on the North St. Vrain Creek, directly west of the Town of Lyons. The SVCC and their hired consulting team worked with the landowners of Apple Valley in a seven month process that included multiple stakeholder meetings, numerous one-on-one landowner meetings, and extensive communication to develop a conceptual stream restoration design intended to be carried out to implementation. The SVCC's many partners on this project included the

landowners and asset owners within Apple Valley, Boulder County, the Town of Lyons, the City of Longmont, Trout Unlimited, and those with recreational and environmental interests.

- The SVCC is currently working on three implementation projects: Apple Valley North, Apple Valley South, and McConnell. We are working with three separate design and contracting teams to complete final designs and construction for each of these distinct projects. Funding for the projects has been provided by DOLA, CWCB, NRCS, the Town of Lyons, and Trout Unlimited. In the case of Apple Valley South, landowners and Boulder County came together to raise nearly $50,000 in match funding to complete the project. Partners for the projects include landowners and asset owners within each of the project areas, Boulder County, the Town of Lyons, the City of Longmont, Trout Unlimited, Northern Water Conservancy District, Colorado Parks and Wildlife, Colorado State University, and those with recreational and environmental interests. Construction of Apple Valley South has begun, with both Apple Valley North and McConnell expected to start later in November.
- The SVCC is partnering with other coalitions on the development of two grant-funded handbooks: the Resilient Crossings Handbook and the Regional Stream Stewardship & Recovery Handbook. Both handbooks have been finalized, with electronic versions available online and printed versions to be available very soon. These projects included a number of workshops for outreach and information gathering. We believe these resources will empower landowners by providing resources and information on technical and potentially daunting tasks that they may want to explore to improve their property's resiliency to future disasters. Partners for these handbooks included the partner coalitions (Regional Stream Stewardship & Recovery Handbook (2017): Lefthand Watershed Oversight Group, Big Thompson Watershed Coalition, and Little Thompson Watershed Coalition; Resilient Crossings (2017): Fourmile Watershed Coalition, Coal Creek Canyon Watershed Partnership, Coalition for the Poudre River Watershed), local, state, and federal government agencies, landowners, local businesses, and a number of individuals recognized as experts in their fields related to stream restoration or stream crossings.
- The SVCC has assisted in the facilitation of conversations on complex topics throughout the watershed in an effort to find solutions that benefit all parties. Some examples include the Niwot/S.Flat Diversion and fish passage design, the South Saint Vrain Working Group dedicated to finding solutions for issues and managing conversations between projects in the area, and the Highland Ditch Company drop structure conversations with the Town of Lyons.

Attachments

A. Scope of Work (p. 7)
B. Budget and Timeline (p. 11)
C. Letters of Support (p. 14)
D. Referenced Documents (p. 19)

Attachment A: Scope of Work

GRANTEE and FISCAL AGENT
Saint Vrain Creek Coalition (SVCC)

PRIMARY CONTACT
Cecily Mui, Watershed Coordinator/Executive Director

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PO Box 706, Longmont, CO 80502

PHONE
303-774-4514

PROJECT NAME
Emergency Watershed Protection (EWP) Project Maintenance and Monitoring

GRANT AMOUNT
$133,120

INTRODUCTION AND BACKGROUND
The Saint Vrain Creek Coalition (SVCC), a 501c3 nonprofit that formed in response to the devastating 2013 flood of Colorado, is currently the local sponsor and project manager of three EWP stream restoration flood recovery projects in the St. Vrain Creek Watershed: Apple Valley North, Apple Valley South, and McConnell. Once these projects are complete in spring 2018, the SVCC will be responsible for the maintenance and monitoring of these projects for three years. This maintenance and monitoring phase is integral to the long-term success of these projects and will provide important information for future flood recovery efforts in the St. Vrain and beyond.

The SVCC is seeking funds from the Colorado Water Conservation Board (CWCB) to ensure that the responsibilities it has taken on as local sponsors will be fulfilled and that these projects will continue to function as intended for years to come. Along with our funding request from the CWCB, we are working closely with our partners and stakeholders to realize this important aspect of these projects with cash and in-kind match.

OBJECTIVES
The SVCC is seeking funds from the CWCB to conduct maintenance and monitoring on three Emergency Watershed Protection (EWP) projects from spring 2018 to July 2021. Maintenance and monitoring will promote long-term success of these flood recovery projects over time while also collecting data to assess their effectiveness.

TASKS
Detailed description of each task for CWCB funded tasks. Other tasks are identified but do not include details beyond a brief description.

Task 1 – Monitoring

Description of Task
Monitoring will consist of a number of methods which will be completed by a combination of SVCC staff, interns, volunteers, and hired consultants/vendors. The SVCC will reference each project's Operations, Inspection, and Monitoring (OIM) Plans that were developed prior to

construction during this monitoring period and will follow the general recommendations listed in that document (Attachment D), as well as in the EWP O&M Fact Sheet (05/16/2016, Attachment D). Monitoring will allow the SVCC to track project performance and will aid in the determination as to whether or not maintenance will be needed on each of the projects.

Method/Procedure

The SVCC has identified a number of methods necessary for successful project monitoring:

a. **Natural Resources Conservation Service (NRCS) Stream Visual Assessment Protocol (SVAP)**: This method for monitoring is required by the project funders and provides a basic level of stream health evaluation by assessing numerous visual aspects of a stream. An SVAP was completed for all project areas prior to construction, and will be completed once a year during the three year maintenance and monitoring period. This method will be undertaken by SVCC staff. For more information on the NRCS SVAP, please review the National Water and Climate Center Technical Note 99-1 Stream Visual Assessment Protocol, December 1998 at: https://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/stelprdb1044776.pdf
b. **Photo Points Survey:** The SVCC implemented a photo points volunteer program in summer 2017. Volunteers and an SVCC intern take photo points two to three times a year: once at high flow, once at low flow, and if possible, during winter when there are no leaves on the trees. Volunteers have established photo point locations in Apple Valley North and South, and have marked those locations. At each location, a volunteer will take a photo of the creek, using landmarks they noted previously as guides on what to take photos of. Once they are back at a computer, the volunteer will upload and catalog their photos, which are shared with the SVCC staff. More information on the SVCC photo points protocol can be found in Attachment E.
c. **Vegetation Survey:** Vegetation surveys will take place monthly during the first growing season after installation, and then less frequently during the first and second years. An example protocol can be found in Attachment D.
d. **Structural Functionality**: The SVCC will hire a consultant to analyze the functionality of structures installed in all three projects on an annual basis, after high flow. The consultant will provide a report on their findings. In the case that the functionality of a structure changes, the SVCC will also consult with the originial engineer of the project to determine if the functionality has been altered enough from the original design intent to require a repair.
e. **Apple Valley Biomonitoring**: GEI Consultants and Colorado Parks and Wildlife (CPW) will complete one post-construction biomonitoring survey and analysis. They will recruit one volunteer to assist with the task. GEI and CPW donated the work needed to collect samples in Apple Valley prior to construction. For this post-flood survey, the SVCC plans to provide funding for the following tasks:
    a. A survey of habitat, fish, and macroninvertebrates,
    b. Processing of four macroninvertebrate samples, and
    c. A report on the survey results, which will include information on project effects/success by comparing pre-construction data with post-construction data.
f. **Apple Valley CSU/TU Study:** A CSU graduate student will place in Apple Valley sensors that detect conductivity, temperature, and depth. For the post-flood survey, we will place these sensors after construction to collect data. Sensors will be removed after

sufficient data has been collected. The data will be analyzed to produce a report to assess longitudinal changes in conductivity before and after stream restoration construction.

Deliverable

The SVCC will document all monitoring efforts (all results, photos, reports, and all other documentation developed by the methods listed above) and maintain records for 5 years after the maintenance and monitoring period is complete. Documentation will be available electronically.

Documentation of volunteer hours associated with any of the above methods will also be developed by the method's responsible parties (with assistance from the SVCC) and retained by the SVCC.

Task 2 - Maintenance

Description of Task

In the case that the monitoring efforts listed above indicate that first year warranty and revegetation efforts during construction did not meet standards listed in the project's Operation, Inspection and Maintenance (OIM) Plan (Attachment D), the SVCC will work with contractors, staff, interns, and volunteers to determine the best course of action for remediating the situation.

Maintenance will also include tasks that are not tied to the OIM Plans, but are best practice for ensuring revegetation success, such as weeding and watering of plants.

Method/Procedure

The SVCC plans to utilize the following methods in maintenance:

a. **Watering**: Watering will be necessary for upland plants that do not have access to ground water. The SVCC intends this duty to be completed via the installation of drip irrigation, or by landowners or the SVCC intern, but may utilize a vendor, if necessary.
b. **Weeding:** Controlling noxious weeds that may outcompete the native plants/seed installed during construction is an important task, to be completed by landowners, volunteers, and potentially vendors when there is a need for applying herbicides. The SVCC staff and intern will assist in the planning and managing large volunteer events each spring and fall. These volunteer events can also serve the dual purpose of being outreach and education events.
c. **Plant replacement**: When needed, plant replacement will take place (container plants, cuttings, seeds) through landowner or volunteer efforts, depending on the scale of planting needs. Along with this plant replacement will be caging or other activities that will help in transplanting success. During the first year after construction, revegetation efforts that do not meet the required standards set forth in the project OIM plan may be covered under a project's warranty with the contractor.
d. **Plant caging/fencing:** Container plants will be caged/fenced to protect them from being eaten by animals and driven over by humans. This will help in their establishment and prevent the need for further plant replacement. Volunteers will assist staff and interns in this process.

e. **Warranty maintenance**: Through the first year post-construction, if it is determined that a structure will need repair based on analysis showing it is no longer functioning in the manner intended by the original design, the SVCC will manage the warranty provided by the contractor of the project. The SVCC will complete any reporting and communication required by the original project funders (the NRCS, CWCB, and/or DOLA).

Deliverable
Documentation of volunteer hours and events, vendor services obtained, and any replanting/seeding/weeding/plant cage/fencing efforts will be developed and retained by the SVCC. The SVCC will also track those responsible (landowners or intern) for watering specific upland plantings. All documentation will be retained electronically.

Task 3 – General

Description of Task
Travel to the project areas is necessary for project monitoring and maintenance.

Method/Procedure
Mileage will be tracked by staff and calculated at the federal mileage reimbursement rate per the IRS: https://www.irs.gov/tax-professionals/standard-mileage-rates

Deliverable
Documentation associated with reason, date, employee, and miles traveled.

REPORTING AND FINAL DELIVERABLE
Reporting: The applicant shall provide the CWCB a progress report every 6 months, beginning from the date of the executed contract. The progress report shall describe the completion or partial completion of the tasks identified in the statement of work including a description of any major issues that have occurred and any corrective action taken to address these issues.

Final Deliverable: At completion of the project, the applicant shall provide the CWCB a final report that summarizes the project and documents how the project was completed. This report may contain photographs, summaries of meetings and engineering reports/designs.

Attachment B: Budget and Timeline

Task/ Subtask	Description	Target Start Date	Target Completion Date	CWCB Funds	Other Cash Funding **	Other Funding: In-Kind	Total
1	**Monitoring**						
1a	SVAP	6/1/2018	6/30/2021	$2,160.00			$2,160.00
1b	Photo points survey	6/1/2018	6/30/2021	$1,740.00	$840.00	$2,337.30	$4,917.30
1c	Vegetation survey	6/1/2018	6/30/2021	$3,000.00	$3,000.00		$6,000.00
1d	Structural functionality monitoring	6/1/2018	6/30/2021	$1,200.00	$10,500.00		$11,700.00
1e	Apple Valley Biomonitoring	6/1/2018	6/30/2021	$6,500.00	$2,000.00	$207.76	$8,707.76
2	**Maintenance**						
2a	Watering	6/1/2018	6/30/2021	$54,730.00	$24,220.00	$11,232.80	$90,182.80
2b	Weed control	6/1/2018	6/30/2021	$37,320.00	$10,000.00	$109,151.91	$156,471.91
2c	Plant replacement	6/1/2018	6/30/2021	$14,620.00	$7,000.00	$37,864.26	$59,484.26
2d	Plant caging/fencing	6/1/2018	6/30/2021	$7,250.00	$7,000.00	$13,985.00	$28,235.00
2e	Warranty maintenance=	6/1/2018	6/1/2019	$2,100.00	$2,000.00		$4,100.00
3	**General**						
3a	Mileage	6/1/2018	6/30/2021	$2,500.000		$1,605.000	$4,105.000
			TOTALS:	**$133,120.00**	**$66,560.00**	**$176,384.03**	**$376,064.03**

Notes:

- Volunteer rates in Colorado = $25.97 in 2016: https://www.independentsector.org/resource/the-value-of-volunteer-time
- Assumes 3 replanting events per year and 9 weeding control events, with 20 people at each 8 hour event
- Apple Valley CSU/TU Study volunteer time not included, but it will be a volunteer match

**Other cash match funding sources include Town of Lyons and Apple Valley South Landowners (combined totalling $27,000 already committed), with further funds to be raised via fundraising efforts targeting project area landowners, other grant opportunities, and corporations.

SVCC EWP Project Monitoring and Maintenance Project

Total cash match needed: $66,500

Secured Funding	Pending Funding	To be raised	Funding Source
$20,000			Town of Lyons
$7,000			Apple Valley South Landowners
		$39,500	Potential funding sources to be explored include project area landowners, Boulder County, City of Longmont, corporate funding
$27,000	$0	$39,500	

The SVCC is working towards raising at least $66,560 in cash match, $27,000 of which has already been secured from the Town of Lyons and project area landowners. The SVCC will be working with our partners and fundraising to secure the remaining cash match. We have been successful at raising funds for projects from landowners and asset owners within project areas in the past, and believe that attaining this level of cash match will not be an issue. Landowners have approached the SVCC to discuss strategies for how to raise some of the maintenance and monitoring costs, and how they and their neighbors may assist in the process. For example, the idea of distributing some of the costs between neighbors in a project area based on the number of linear feet of creek they own has been expressed, though there will undoubtedly be landowners who cannot contribute financially. The SVCC is also working with its Fundraising Committee to identify and approach corporate sponsors to assist in the needed funding for maintenance and monitoring.

COLORADO WATER CONSERVATION BOARD
Colorado Watershed Restoration Program – Grant Application

1.0 PROJECT PROPOSAL SUMMARY SHEET

Project Title: Dolores River Restoration Partnership (DRRP) – Ensuring Riparian Restoration following 8 years of accomplishments in Southwestern Colorado.

Project Location: The project is located in the Dolores River watershed, encompassing the riparian corridor between the Dove Creek pump station (RM 18) and the Colorado-Utah state line (RM 148), as well as along 15 miles of Disappointment Creek, a major tributary within the Dolores River HUC-8. Project work spans four counties (Dolores, San Miguel, Montrose, Mesa) and several communities (Bedrock, Paradox, and Gateway) in southwestern Colorado.

Grant Type: Watershed/Stream Restoration and/or Protection (Restoration) Grants
Grant Request/Amount: **$281,300**
Cash Match Funding: $*237,055*
In-kind Match Funding: *$205,329*

Project Sponsor: Conservation Legacy – Southwest Conservation Corps
Contact Persons: Mike Wight, mike@conservationlegacy.org, (970)749-2796
Emily Kasyon, ekasyon@conservationlegacy.org, (719)930-0377

Brief Description of Project: The DRRP is requesting CWCB funding to support five specific activities across 100 miles of the Dolores River in Southwestern Colorado for over a 2 year period:
(1) 20 acres of initial riparian tamarisk treatments on public and private lands within the greater boundaries of the Uncompahgre Field Office will be completed by conservation corps crews; **(2)** 800 acres of restoration site monitoring per year; **(3)** 350 acres of restoration maintenance per year; follow-up riparian weed treatments (e.g. Russian knapweed, tamarisk resprouts) and monitoring within Tres Rios, Grand Junction, and Uncompahgre BLM field offices by conservation corps strike teams; **(4)** 30 acres of active revegetation at sites with low potential for native revegetation or high potential for secondary weed infestation; **(5)** education and outreach including 6 volunteer projects and public education with community members and school groups within the three BLM field offices.

These activities will enhance habitat for aquatic and terrestrial species (including ESA-listed and sensitive species), entail intensive restoration of riparian areas, enhance recreational access, improve water quality, and reduce groundwater consumption by invasive tamarisk while advancing towards the DRRP's long-term vision of a Dolores River riparian corridor that is more naturally functioning, self-sustaining, diverse, and resilient over time.

2.0 PROJECT OVERVIEW

On behalf of the Dolores River Restoration Partnership (DRRP), Conservation Legacy's Southwest Conservation Corps (SCC) is requesting $281,300 to ensure riparian restoration success across 145 miles of the Dolores River and its tributaries in southwest Colorado. Since

2009, the DRRP has worked to remove invasive plants, whose extensive growth has displaced native plant communities, impaired wildlife habitat and forage, hindered access to campsites and other recreational opportunities, and increased risks associated with wildfire in the riparian corridor. The work is guided by tamarisk mapping completed by the Tamarisk Coalition (TC) in 2006, the 2010 Dolores River Riparian Action Plan (DR-RAP), the 2014 DRRP Transition Plan to Monitoring and Maintenance (M&M), and rapid monitoring assessments conducted by SCC crews since 2014. Together, these guiding plans and assessments outline the DRRP's shared goals (e.g. ecological, social, economic, and management), associated measurable objectives (e.g. reducing live tamarisk to less than 5% of the vegetation cover), method for site prioritization (based on ecological, economic, and management criteria), strategies for long-term monitoring and maintenance, and governance structure that supports collaborative project development, implementation of restoration work, and evaluation of work in order to track progress towards ecological goals as well as adapt practices to maximize effectiveness.

3.0 QUALIFICATIONS EVALUATION

3.1 Project Sponsor and Stakeholder Involvement

*****Conservation Legacy's Southwest Conservation Corps (SCC) is a 501(c)(3) non-profit based in Durango, CO. SCC operates conservation service programs across Southern Colorado and Northern New Mexico that "empower individuals to positively impact their lives, their communities and the environment".

*Bureau of Land Management (BLM) manages the majority of the Dolores River. The DRRP works closely with three Colorado BLM field offices to identify, plan, coordinate, and fund project implementation and monitoring.

*Tamarisk Coalition (TC) - TC played a lead role in tamarisk inventory on the Dolores, the development of DR-RAP and the Transition Plan to Monitoring and Maintenance (M&M), and continues to coordinate project planning, monitoring, volunteer projects/education with partners, and fundraising.

*****Private Landowners - The DRRP has worked with over 26 private landowners to conduct restoration on private lands. Outreach to new landowners and follow-up activities with existing partner-landowners continue to be an important aspect of cross-boundary initiatives to treat invasive plants. The DRRP will continue work with at least 2 private landowners as a part of this proposal.

3.2 Match and In Kind Funding

Match:		
Source:	***Amount:***	***Status:***
Southwest Water Conservation District	$12,500.00	Secured
Southwest Conservation Corps BLM Assistance Agreement	$40,000	Secured
Conservation Legacy Cash Match	$ 31655	Secured
Tamarisk Coalition BLM Assistance Agreement	$50,000	Secured

Walton Family Foundation	$15,000	Pending
Tamarisk Coalition Restore our Rivers Funding Campaign	$15,000	Secured
Bureau of Land Management	$29,000	Secured
San Miguel County	$18,900	Pending
Colorado Collaboration Award	$25,000	Secured
Total:	**$** 237,055	
In-Kind:		
Source:	***Amount:***	***Status:***
Volunteer Contributions	$29,354	Secured via collaborative planning and affirmed in landowner agreements, letters of support and/or roles identified in the DRRP MOU
Bureau of Land Management UFO,TR, GJ Field Offices	$119,000	
Conservation Legacy In-Kind	$56,975	
Total:	$ 205,329	
Combined Match + In-Kind Total:	**$ 442,384**	

4.0 ORGANIZATIONAL CAPACITY

4.1 History of Accomplishments in the Watershed

For 8 years, the DRRP has been working collaboratively to restore riparian habitat across two states, four BLM field offices, five counties, and more than 26 engaged private lands. Through the collaborative work of the SCC program and multiple partners, the DRRP has garnered over $6 million from both private and public sources, implemented restoration activities along 1,800 acres of the riparian corridor, and created more than 350 job opportunities for local contractors and young adults. These ecological and social successes, in addition to success of the partnership itself, earned the DRRP the 2014 Colorado Collaboration Award for its work as a model collaborative, and our work continues to this day.

In the last two years, SCC has helped to coordinate, manage, and fund an average of 30 weeks of eight-person corps crew work per-year and 72 weeks of 2 and 3 person “strike team” work per-year to conduct monitoring, secondary weed treatments, and tamarisk re-sprout treatment as outlined in the Transition Plan for Monitoring & Maintenance. SCC has also played a key role in coordinating volunteer efforts with the TC to engage over 400 volunteers and students since 2009.

Partners include the more than 30 signatories to the renewed 2015 five-year DRRP Memorandum of Understanding as well as 80 individuals, funders, private landowners and community members who provide important in-kind services.

4.2 Staffing Roles and Implementation

SCC staff dedicated to support the project include the Regional Director, Program Director, Field Supervisor, Program Coordinators/Recruiter, supported by the Executive Director, CEO and COO. SCC staff is responsible for fundraising, recruitment, hiring, training, mobilization,

project coordination, risk management and logistics for crews and strike-teams. The Field Supervisor assists in training the strike teams in rapid monitoring and annual report development.

Mike Wight is a Regional Director at SCC. Since 2009 he has worked to collaborate with multiple conservation corps in order to fund and implement restoration project work on the Dolores River. Mike is committed part-time to DRRP work.

Emily Kasyon is a Field Supervisor at SCC, where she is responsible for strike team project coordination, field crew training, and rapid monitoring implementation and reporting. Emily works full-time as a Field Supervisor towards DRRP work.

TC staff dedicated to the project include the Restoration Coordinator and Funding Coordinator. The Restoration Coordinator works with partners to develop annual implementation plans, coordinate volunteer efforts, develop contracts, fundraise, and organize biannual DRRP meetings.

David Varner is a full time Restoration Coordinator at the Tamarisk Coalition, where he chairs the DRRP Implementation Subcommittee, provides overall partnership coordination, and is a member of the DRRP Core Team.

Colorado BLM staff from the Tres-Rios(TR), Uncompahgre(UFO) and Grand Junction (GJ) Field offices include Mike Jensen- (TR) Range, Ken Hollingsworth (UFO)- Wildlife, Jedd Sondergast (UFO)- Hydrology, and Mark “Sparkey” Taber(GJ)- Resource Specialist. These staff coordinate with TC to identify annual project priorities based on monitoring information, manage projects on the ground, identify and engage in volunteer efforts, and funding requests to support project work.

Volunteers from local school groups, the Wildlands Restoration Volunteers, and from the surrounding community are utilized to perform active revegetation work such as native grass seeding, planting containerized trees/shrubs, and caging cottonwoods. Volunteers are also an important resource for implementation of maintenance work such as fence building and tamarisk resprout treatment.

4.3 Project Budget and Schedule

All permits for restoration work in the sites planned for this project have been obtained. The DRRP has an excellent track record of success. CWCB funding and proposed match represent only a portion of the yearly implementation planned for 2018/19. See the attached budget/timeline spreadsheet for more information.

5.0 PROPOSAL EFFECTIVENESS

5.1 Integrated Pest Management (IPM)

Utilizing the principles of IPM, DR-RAP defines Criteria for Prioritization to help land managers determine where and how restoration should occur to best meet ecological goals on the Dolores River. Prioritization criteria include presence of hydrologic connectivity, human safety concerns, and critical natural or human resources. Sites that meet the prioritization criteria then are vetted to determine which approach within Integrated Pest Management (biological, mechanical, chemical) is most efficient and appropriate based on site characteristics and land manager considerations. Projects are timed to avoid bird migration and to increase effectiveness of treatment.

At the sites selected, the following methods will be used to meet DR-RAP's ecological goals; tamarisk removal, biomass removal or remediation, non-native woody species control, non-native herbaceous species control, revegetation, short and long-term monitoring and maintenance, and adaptive management.

Eight-person Conservation Corps hand crews cut tamarisk with chainsaws and apply herbicide to stumps in a timely manner (see Nissen et al. 2010, p. 40). Depending on site goals and feasibility, tamarisk slash may be used as mulch, assembled in burn piles, or stacked to create wildlife piles.

The TC BLM Assistance Agreement provides funding for mechanical contractors to complete mulching and other invasive treatments in the riparian corridor.

To date, the DRRP has worked with the Insectary not only to release and monitor the tamarisk beetle, but the Russian knapweed gal midge as well. Midges have been released in sites where knapweed is dense and herbicide treatments are not suitable (e.g. access issues).

Active revegetation will be planned (e.g. in terms of temporal spacing, species selected) to build on herbicide applications to prevent re-encroachment of weeds such as Russian knapweed.

5.2 Project Planning Documents

The DR-RAP was developed in 2010 to articulate the science-driven, tamarisk related vision, goals, and site selection criteria common to Dolores River stakeholders in both Colorado and Utah to facilitate a consistent approach throughout the watershed.

The Transition Plan for M&M was developed and approved in 2014 in order to strategize the transition from intensive restoration efforts to follow-up monitoring and maintenance at a site-by-site level in order to assure ecological restoration success throughout the watershed. The partnership has predicted through long-term project planning that by 2019, more than 75 percent of restoration sites are anticipated to have transitioned from active, high-intensity implementation to less intensive M&M. The activities conducted under the DR-RAP and the M&M are identified as priorities in the BLM's National Healthy Lands, Resilient Landscapes,; BLM Field Offices' Resource Management Plans; Utah and Colorado State Wildlife Action Plans; Counties' Noxious Weed Management Plans; Unaweep-Tabeguache Scenic and Historic Byway

Corridor Management Plan; Middle Colorado River Watershed CWMA Cooperative Agreement; and Intermountain West Joint Venture Implementation Plan.

5.3 Multi-Objective Approach

The DRRP is completing intensive restoration of riparian areas that will achieve the following objectives: improved habitat for aquatic and terrestrial species, enhanced recreational access, improved water quality, and reduced groundwater consumption by invasive phreatophytes.

Improved habitat: This restoration work is replacing invasive phreatophytes with riparian plant communities that are more structurally diverse (i.e. multiple layers) and have greater temporal variety in food sources for wildlife. A variety of migratory species (e.g. Western Yellow Billed Cuckoo, Southwest Willow Flycatcher) and non-migratory terrestrial species (mule deer, wild turkey) are expected to benefit from this work. Bird Conservancy of the Rockies is continuing to monitor avian populations at multiple sites in the watershed to compile a complete multi-year picture of population response at treated and untreated sites. Additionally, this work will improve in-stream habitat complexity (e.g. islands, secondary channels, backwaters) with reduced channelization imposed by tamarisk and improved natural meandering.

Enhanced recreation: Sites with heavy recreation use are a key consideration for prioritizing restoration work along the Dolores River. Boat-ramps in Bedrock and Big Gypsum Valley, the confluence of the Dolores and San Miguel Rivers, and the Gateway interpretative trail will be improved by continued control of noxious weeds through this grant proposal. The partnership has improved over 25 riverside campsites since inception and will continue this important work.

Water quality: Large-scale removal of tamarisk is expected to reduce soil-surface salinity.

Groundwater consumption: It is expected that groundwater consumption will also be reduced through removal of dense tamarisk monocultures in the upper terraces of the historic floodplain. In these dryer areas, planting focuses on mesic and xeric species of native grasses and shrubs.

5.4 Monitoring Plan

Since 2014, the DRRP has conducted yearly Rapid Monitoring on all sites throughout the watershed that have undergone primary tamarisk treatment. Sites that undergo primary treatment in 2018/2019 will be assessed through rapid monitoring in the following seasons. Each year, a team is trained according to the DRRP's specific monitoring protocol and then spend 8 weeks collecting site-based data that includes an assessment of tamarisk and native plant cover, mapping of noxious weed infestations, documentation of passive recruitment of native species, and photo-points to visually assess progress over time. Monitoring data is compiled into a formal report and given to land managers and partners to inform future restoration activities on a site-by-site basis. The 2014 DRRP Transition Plan for M&M outlines in great detail the collaborative strategies for governance, fundraising, on-the ground project implementation and monitoring, and communications to protect the shared investment in the Dolores River Basin through long-term monitoring.

SCOPE OF WORK

GRANTEE and FISCAL AGENT (if different): Conservation Legacy

PRIMARY CONTACT: Mike Wight

ADDRESS: 701 Camino Del Rio Suite 101, Durango, CO 81301

PHONE: 970-749-2796

PROJECT NAME: Dolores River Restoration Partnership (DRRP) – Ensuring Riparian Restoration following 8 years of accomplishments in Southwestern Colorado

GRANT AMOUNT: $281,300

INTRODUCTION AND BACKGROUND

The DRRP is requesting funding for four specific activities: (1) initial riparian tamarisk treatments on public and private lands within the greater boundaries of the Uncompahgre BLM Field Office that will be completed by conservation corps crews; (2) follow-up riparian weed treatments (e.g. Russian knapweed, tamarisk resprouts) and monitoring within Tres Rios, Grand Junction, and Uncompahgre BLM field offices by conservation corps strike teams; (3) active revegetation; (4) public education and outreach with volunteers and school groups within the three BLM field offices.

OBJECTIVES Intensive restoration work, with multiple treatments occurring on a given site, will occur throughout the riparian corridor. Treatments are listed below, with totals for each restoration treatment listed. Project implementation objectives are as follows:

- Initial tamarisk treatments: 20 acres of initial treatments
- Secondary weed and tamarisk re-sprout treatments: 350 acres
- Active revegetation: 27 acres
- Rapid Monitoring: 800 acres

These implementation objectives are enhanced by community engagement objectives achieving 1215 hours of volunteer service with at least 80 volunteers to build one fence to protect active revegetation; educate the public by creating at least 1 interpretive sign, 2 school groups per year in active revegetation activities, holding one community workshop per year, teaching one plant ID field class per year; and an recreation enhancement objective; improving access to at least three Dolores River boat ramps and one riverside interpretative trail.

Cumulatively, this work will achieve other objectives, ranging from enhanced habitat and water quality, to improved groundwater consumption and creation of local jobs. To learn more about the DRRP's shared goals, please see page 3 of the Transition Plan for M&M, attached with our proposal.

TASKS

Task 1 - Secondary Weed and Tamarisk Resprout Treatments - Corps Strike Teams

Description of Task

Sites that have undergone primary tamarisk removal are in need of tamarisk resprout and secondary weed treatment. Russian knapweed is the primary secondary weed targeted, but teams will also treat for musk thistle, Canada thistle, hoary cress, and purple loostrife among other noxious weeds. These treatments ensure that sites move along a projection towards native species dominance.

Method/Procedure

Corps will recruit three-person roving teams and train teams with BLM and TC support, after which the strike teams will conduct follow-up treatments with backpack sprayers and wheeled equipment, targeting Russian knapweed, hoary cress, thistle and tamarisk resprouts. Strike teams are managed by the conservation corps and are supervised by BLM field staff. Herbicide costs (Task 7) are included in the budget. This task will take place between the Dove Creek Pump Station and Gypsum Creek, between sites about 2 miles upstream from the Bedrock boatramp and Roc Creek, and between Roc Creek and the State Line (Locations B, C, and D in the project work map).

Deliverable

350 acres of riparian corridor treated for tamarisk resprouts and secondary weeds

Task 2 – Active Revegetation – Corps Strike Teams

Description of Task

In sites where there is a low potential for passive recruitment of native species and/or where there is concern about re-encroachment of secondary weeds, the DRRP conducts active revegetation.

Method/Procedure

Strike teams will broadcast native grass seed throughout the riparian corridor at priority sites that have previously undergone noxious weed treatments (Location E in the project work map). Revegetation materials (Task 8) are included in the budget.

Deliverable

15 acres seeded with native grass

Task 3 – Rapid Monitoring – DRRP Rapid Monitoring Team

Description of Task

Rapid Monitoring was developed specifically for the needs of the DRRP and includes collection of cover-class data, tamarisk cover, noxious weed invasions, presence of the tamarisk leaf beetle,

passive recruitment of native vegetation, and photos to document progress. Rapid monitoring teams will spend a total of 8 weeks over two years collecting rapid monitoring data.

Method/Procedure

Conservation corps recruit and select two-person roving teams to conduct vegetation and weed monitoring utilizing ArcGIS on tablets and compile annual reports for land managers. Training and oversight is co-managed between SCC and TC. Rapid Monitoring will take place throughout the three partner BLM field offices.

Deliverable

800 acres monitored, two rapid-monitoring reports, two photo-point reports

Task 4 – Initial Tamarisk Treatment – Conservation Corps 8 person crew

Description of Task

8-person conservation corps crews with perform cut stump treatment of dense tamarisk in the Uncompahgre Field Office.

Method/Procedure

Conservation corps programs recruit, hire, and train young adults. Crews are comprised of 2 leaders and 6 members and are trained in chainsaw and pesticide application to conduct cut-stump treatments at several locations within the Uncompahgre Field Office (Location A in the project work map).

Deliverable

20 acres cleared of tamarisk

Task 5 – Volunteer Projects

Description of Task

Volunteer groups from the Paradox Valley Charter School, the Gateway School, the Wildlands Restoration Volunteers (WRV), and from surrounding communities will plant or seed native vegetation, build a fence to help protect revegetation efforts, and help treat small tamarisk resprouts using loppers. These volunteer events are designed to be service learning projects where volunteers perform valuable work while learning about their local river ecosystem, impacts of invasive species, and restoration processes.

Method/Procedure

The DRRP outreaches to school contacts and plans education/service projects and dates. There will be one volunteer event with the Wildlands Restoration Volunteers per year (2 events total). The locations of tamarisk resprout treatments with the Wildlands Restoration Volunteers are near Bedrock, CO and within the Tres Rios Field Office (Locations F and G in the project work map). The fencing project and Paradox Valley Charter School activities will be conducted near the boatramp in Bedrock, CO (Location F in the project work map). Two volunteer events (1 per

year) with the Paradox Valley Charter School are planned. Two events, one educational/monitoring event and one planting event, are also planned for the Gateway school and will take place near Gateway, CO.

Deliverable

80 students and volunteers engaged, (40 (WRV) + 10 (fencing project) + 30 student volunteers engaged, 20 acres of tamarisk resprouts treated, 1 fence built, 2 acres of planting, 20 plants

Task 6 – Education and Outreach - Community Workshops and Interpretative Sign

Description of Task

One community workshop will be held per year for professionals and the public to build restoration capacity. Additionally, an annual plant field ID class that is open to the public will be held in the spring. The DRRP UFO BLM Field Office have plans to install at least one interpretive sign to educate user groups about the adverse impacts of invasive tamarisk and other noxious weeds and the importance of healthy riparian habitat.

Method/Procedure

The Tamarisk Coalition will schedule, organize, and hold 2 community workshops over 2 years. Funds will be used for staff to coordinate and host the community workshop, as well as pay for refreshments and workshop supplies. Funds may also be used to provide stipends to workshop speakers who would otherwise be volunteering their time. The plant ID class will be planned and hosted by TC as well as BLM staff. Funds will be used for education materials and by staff for class planning and preparation. The interpretative sign will be installed at a highly trafficked area at the confluence of the Dolores and San Miguel Rivers.

Deliverable

2 workshops, 2 plant ID field classes, 1 interpretative sign installed, 3 boat ramps enhanced, Gateway Canyons Resort DRRP interpretive trail maintained.

Task 7 – Materials – Herbicide and Personal Protective Equipment

Description of Task

Cut stump, basal bark resprouts, and secondary weed treatments require herbicide and personal protective equipment for crews and strike teams.

Method/Procedure

Retail Purchase

Deliverable

Treatment initiation by corps crews and strike teams

Task 8 – Materials – Revegetation

Description of Task

Planting materials include plant stock, seed, root stimulant, mycorrhizal inoculant, and a water pump.

Method/Procedure

Retail Purchase

Deliverable

Revegetation initiation by corps strike teams and volunteers

Task 9 – Project Coordination

Description of Task

Project coordination through staff at TC and SCC includes project planning for crews and volunteer groups, acquiring funding, managing crew and volunteer work logistics, training for monitoring crews and strike teams, scheduling project work, reporting, coordinating with pertinent BLM land managers and private landowners, and field support.

Method/Procedure

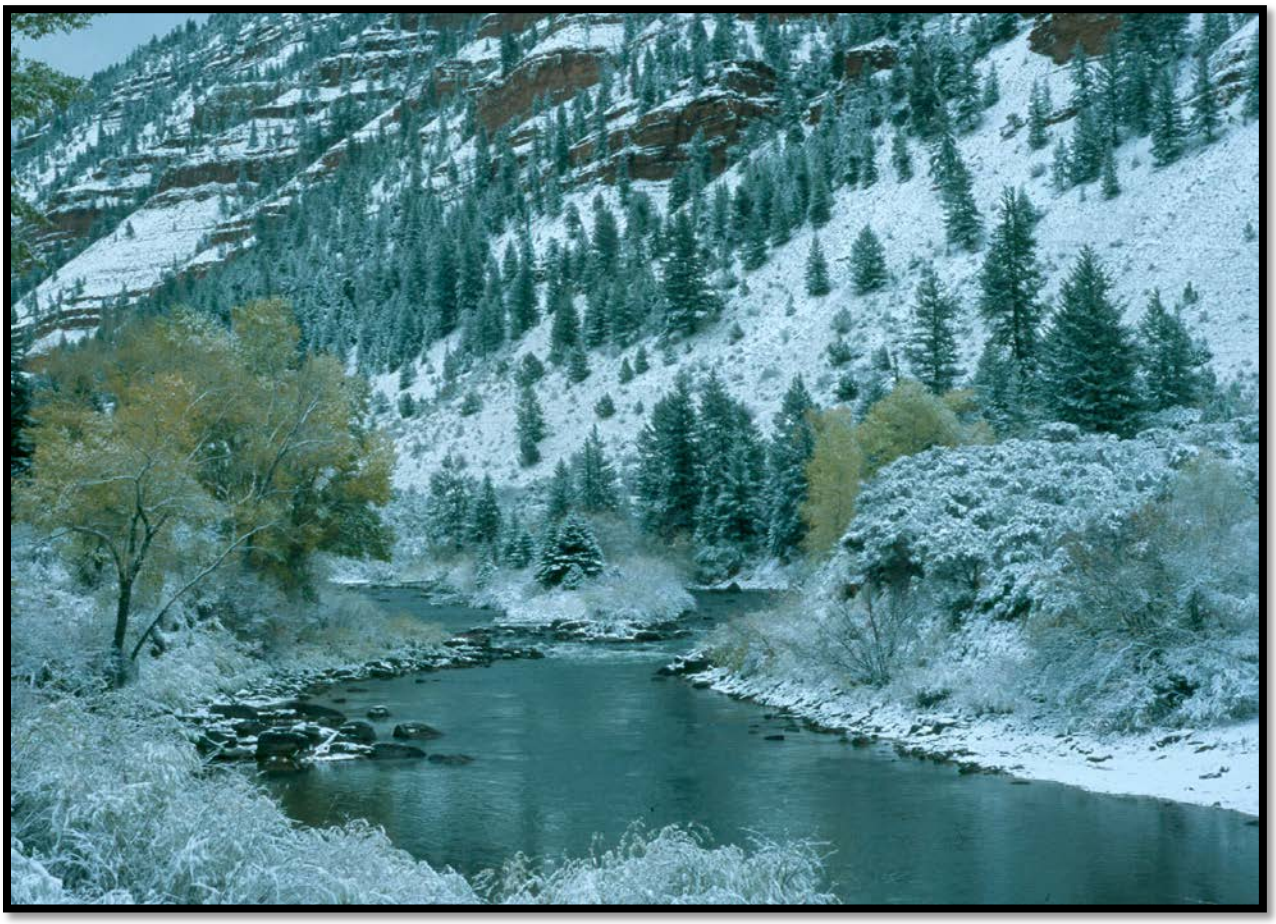
The Restoration Coordinator from TC works specifically to coordinate and oversee all project work for the DRRP. Additionally, SCC will hire a Project Coordinator to help with monitoring, volunteer, and strike team work.

Deliverable

Project work development and support for corps crews, strike teams, monitoring crews, and volunteer groups. Rapid monitoring and annual reports developed printed and distributed

Task	Description	Target Start Date	Target Completion Date	CWCB Funds	Other Funding Cash	Source and Status of Cash Match	Other Funding In-Kind	Source and Status of in-kind	Total
1	Secondary Weeds and Tamarisk Resprout Treatment- Maintenance-Corps Strike Teams	9/1/2018	4/1/2020	**$130,000.00**					$130,000.00
					$6,400.00	Southwest Water Conservation District, Secured			$6,400.00
					$12,159.00	Conservation Legacy Match, Pledged	$27,709.00	Conservation Legacy In-Kind, Pledged	$39,868.00
					$29,000.00	Bureau of Land Management Field Offices, Secured	$59,000.00	Bureau of Land Management Field Offices, Pledged	$88,000.00
					$10,000.00	SCC BLM Assistance Agreement, Secured			$10,000.00
					$40,000.00	Tamarisk Coalition BLM Assistance Agreement, Secured			$40,000.00
2	Active Revegetation -Corps Strike Teams	9/1/2018	4/1/2020	**$3,200.00**					$3,200.00
					$6,100.00	Southwest Water Conservation District, Secured			$6,100.00
3	Rapid Monitoring-Conservation Legacy DRRP monitoring Team	6/1/2018	10/1/2019	**$17,600.00**					$17,600.00
					$5,000.00	Walton Family Foundation, Pending			$5,000.00
					$10,000.00	SCC BLM Assistance Agreement, Secured			$10,000.00
					$2,753.00	Conservation Legacy Match, Pledged	$3,813.00	Conservation Legacy In kind, Pledged	$6,566.00
4	Initial Tamarisk Treatment, 8 person Corps Crew	8/1/2018	11/15/2019	**$72,000.00**					$72,000.00
					$20,000.00	SCC BLM Assistance Agreement			$20,000.00
					$10,043.00	Conservation Legacy Match, Pledged	$25,453.00	Conservation Legacy In kind, Pledged	$35,496.00
					$18,900.00	San Miguel County, Pending			$18,900.00
5	Revegetation-Volunteers	6/1/2018	4/1/2020	**$22,000.00**					$22,000.00
							$19,312.00	Wildlands Restoration Volunteers Pledged 40 volunteers,800 hours total @24.14/hr	$19,312.00
							$10,042.00	Gateway and Paradox Valley School Volunteers, pledged, 66 volunteers,616 hrs total @ 24.14/hour,	$10,042.00
6	Education and Outreach, Community Workshops and Interpretavie Signage	6/1/2018	4/1/2020	**$1,500.00**					$1,500.00
							$5,000.00	Bureau of Land Management Field Offices, Pledged	$5,000.00
7	Herbicide, Training, Personal Protective Equipment- Crews and Strike Teams	6/1/2018	4/1/2020	**$9,000.00**					$9,000.00
8	Plant materials and Seed- Revegetation	6/1/2018	4/1/2020	**$4,000.00**					$4,000.00
					$10,000.00	Tamarisk Coalition BLM Assistance Agreement, Secured			$10,000.00
9	Project Coordination, Crew, Strike Team and Volunteers	6/1/2018	4/1/2020	**$22,000.00**					$22,000.00
					$6,700.00	Conservation Legacy Match, Pledged			$6,700.00
					$10,000.00	Walton Family foundation, Pending			$10,000.00
					$15,000.00	Tamarisk coalition Restore our Rivers Campaign, Secured			$15,000.00
					$25,000.00	DRRP Colorado Collaboration Award, Secured			$25,000.00
							$55,000.00	Bureau of Land Management Field Offices, Pledged	$55,000.00
ALL TASKS	TOTALS			**$281,300.00**	$237,055.00		$205,329.00		$723,684.00
				CWCB	Cash Match		In Kind		**Grand Total**

Eagle River Integrated Water Management Plan
(ER-IWMP)



Prepared by:

Eagle River Watershed Council
PO Box 5740, Eagle, CO 81631

Submitted to:

Colorado Water Conservation Board
ATTN: Chris Sturm, 1313 Sherman St, Room 72, Denver, CO 80203
Chris.sturm@state.co.us

Project Proposal Summary Sheet

Project Title:	Eagle River Integrated Water Management Plan (ER-IWMP)
Project Location:	Eagle River, Eagle County, Colorado
Grant Type:	Watershed Restoration Program: Stream Management Planning
Grant Request Amount:	$181,445
Cash Match Funding:	$181,500
In-Kind Match Funding:	$27,000
Project Sponsor:	Eagle River Watershed Council (ERWC)
Contact:	Holly Loff, Executive Director Email: loff@erwc.org Phone: 970-827-5406 PO Box 5740 Eagle, CO 81631 www.erwc.org

Brief Project Description:

The Eagle River Integrated Water Management Plan (ER-IWMP) intends to develop proactive water management recommendations that anticipate changes to local hydrology due to 1) population growth and increasing municipal demand for water in Eagle County, 2) climate change, and 3) projects related to the Eagle River MOU (ERMOU), an intergovernmental agreement for developing municipal water supplies in the upper Eagle River watershed.

The ER-IWMP will be developed through a stakeholder process with local conservation organizations, state and federal agencies, recreational users, ERMOU partners, commercial fishing/rafting guides, local municipalities, agricultural, and other local stakeholders to develop strategies that can respond to these changes in a way that helps meet municipal demands, while maintaining and improving ecological attributes in the Eagle River watershed. For example, the ER-IWMP will look at how the Western Slope's appropriated portion of the ERMOU waters can best be managed for the protection of Eagle County's water-dependent recreation-based economy (fishing, rafting, skiing, etc.) and ecosystem function.

Eagle River Watershed Council (ERWC) has a tradition of coordinating collaborative stakeholder processes. The Integrated Water Management Planning process will draw upon our extensive experience managing these types of projects. Although the IWMP process will not officially be underway until early 2018, ERWC has already initiated conversations with stakeholders. By meeting with the stakeholders early we have a strong understanding of the individual objectives of each. This understanding guided the goals, objectives and overall scope of work presented for this Colorado Watershed Restoration Program Grant Application.

While this ER-IWMP will be grounded in the complex interplay of biology, hydrology, channel morphology, and alternative water use and management strategies, it foresees the integration of both consumptive and non-consumptive uses to ensure that all existing and future uses are considered. The ER-IWMP will safeguard the interests of the community and extended stakeholders, which include the environmental and recreational use needs. ERWC will provide the opportunity for all interested parties to participate. Additionally, ERWC will educate the community so that the results of this plan are accepted as a fair and reasonable approach to managing our precious water resource.

1. Background and Statement of Need

The Eagle River watershed is a network of clear mountain streams that cover a drainage area of approximately 960 square miles. It has an average annual water flow of roughly 414,000 acre feet. Elevations in the watershed range from 6,100 feet at Dotsero to 14,003 feet at Mount of the Holy Cross. Fed by numerous ephemeral, intermittent and perennial streams, springs and seeps, the Eagle River originates near the eastern border of Eagle County at Tennessee Pass and flows west for about 77 miles to its confluence with the Colorado River at Dotsero. Unique among Colorado watersheds, approximately 98% of the drainage is located in a single jurisdictional boundary - Eagle County. Nearly 75% of the watershed is on public land managed by the US Forest Service and the Bureau of Land Management.

Although the natural flow regime of the main stem of the Eagle River is more intact than other Colorado rivers of comparable size, human settlement has influenced and impacted the natural cycle of the river. Roughly 75% of the average annual flow of the Eagle River occurs during the months of May, June and July, yet a minimum amount of water is necessary year round to support aquatic and other wildlife as well as community demands for affordable, clean and reliable water supplies during times of the year when natural water supply is the lowest (ERWP, 1996). The greatest consumptive use in the basin is transmountain diversion, which currently exports approximately 34,000 acre feet to the Front Range communities of Aurora and Colorado Springs annually. This water is never returned to the watershed and is therefore considered totally consumed. While these exports account for only 8% percent of the annual yield of the Eagle River, impacts on streamflows at the actual points of diversion in the headwaters are far greater. Transmountain diversions are taken in the headwaters during May-June peak flows, significantly reducing the annual peak and 'flushing flows' important to maintain the ecological and geomorphic health of the Upper Eagle.

The Colorado Water Plan (CWP) seeks to understand the state's water needs, identify gaps and promote projects and processes to meet those needs. The Colorado Basin Roundtable (CBRT) identified basin-wide integrated water management planning (IWMP) as a top priority in its Basin Implementation Plan (BIP). Planning is a vital part of providing sufficient water for environmental and recreational needs in addition to satisfying the many other uses and demands for water. The CBRT planning goal articulates restoring and protecting ecological processes that connect land and water while ensuring that our rivers also serve the needs of human populations. Implementation of plan recommendations is intended to be voluntary and will only be successful with collaboration and cooperation among affected stakeholders and water rights holders.

The Colorado Basin Roundtable's Basin Implementation Plan identifies the projects envisioned under the Eagle River MOU as important components of a secure water future for Colorado. Eagle River Watershed Council (ERWC) and other stakeholders in the Eagle River watershed recognize that the information necessary to understand environmental and recreational water needs and how these needs may be impacted by water development projects is lacking. This is highlighted in the Eagle River Watershed Plan, drafted by Eagle River Watershed Council in 2013, which states "where individual reaches of rivers or streams are identified as impaired or having inadequate flows, craft and implement Streamflow Management Plans that offer creative and cost effective strategies to address ecological, domestic, recreational and agricultural water needs."

ERWC is keenly interested in developing a better understanding of river health and environmental and recreational (E&R) water needs within the Eagle River Basin and, subsequently, in assessing future water development and protection in the watershed. ERWC's experience, knowledge, and proven track record will ensure that the ER-IWMP promotes projects envisioned by the CWP and the Colorado BIP.

2. Geographic Scope and Existing Information

The Eagle River Integrated Water Management Plan (ER-IWMP) will consider the Eagle River mainstem

from its headwaters to the confluence with the Colorado River. The effort will additionally include assessment of the East Fork of the Eagle River, Gore Creek from Black Lakes to the confluence with the Eagle River, and Homestake Creek from Homestake Reservoir to the confluence with the Eagle River. (See Attachment A: Project Area Map) Other tributaries to the Eagle River will not be explicitly assessed, but their impact on the hydrology of the Eagle River will be evaluated. The majority of the effort will be focused on the reaches of the Eagle River between its confluence with Homestake Creek and the Colorado River.

ERWC has begun its development of the ER-IWMP with a comprehensive search of literature specific to the Eagle River watershed. This information has informed stakeholder engagement and provides context for understanding multiple objective aspects of the watershed and how they relate. Sources of relevant information that will help to develop the ER-IWMP are not limited to, but include:

- Colorado Water Plan: serves as the foundation of the ER-IWMP by providing initiatives, connections, and values to meet Colorado's current and future consumptive, recreational, and environmental water needs. Section 7.1 recommends a collaborative approach to watershed planning; one that includes stakeholder involvement and management actions supported by sound science and it applies equally to stream management plans. An inclusive stakeholder approach expedites cooperative and integrated project planning, which leads to successful implementation of measures that will meet the needs the stream management plan identifies.
- Colorado Basin Roundtable Basin Implementation Plan (BIP): identifies a basin-wide stream management plan as a top priority in its BIP. The CBRT states that such planning is vital to providing sufficient water for environmental needs among the many competing uses and demands for water, thereby restoring and protecting ecological processes that connect land and water while ensuring that streams also serve the needs of human populations.
- Eagle River Watershed Council's Eagle River Watershed Plan (ERWP) (2013): provides information, goals, strategies and action items related to water and land management practices in the Eagle River basin. The 2013 document updates and replaces the 1996 version and includes significant new information and the vision for watersheds in Eagle County. Several issues and recommendations are discussed which provide relevant background to the development of an IWMP. The ERWP is organized around five water related topics (Quantity, Quality, Land Use, Wildlife and Recreation) all of which provide direction and insights for the ER-IWMP.
- The Eagle River Assembly Report (1994): The Eagle River Assembly (a group comprised of representatives from the County, Towns, water districts and the holders of out-of-basin water rights) was tasked with evaluating local water issues and identifying potential strategies that would 1) improve the condition of the river, and 2) assure adequate water supplies for future needs. The resulting assessment concluded that flows in the Eagle River were inadequate to meet existing environmental and water supply demands in average years and dryer than average years, principally in late summer and winter months. Environmental concerns were based on identified "stream flow deficits" where the amount of water in the stream was not adequate to meet recommended instream flow rights that had been implemented years earlier for the protection of fish. The ER-IWMP would complement this report by identifying the flow deficit, which the Assembly Report did not attempt to identify, but is an objective of the CWP.
- Eagle River Inventory and Assessment (ERIA) (2005): an inclusive, scientific baseline inventory and assessment of the Eagle River with a prioritized list of restoration and conservation projects, which ERWC has used to successfully complete numerous projects for over a decade. The nearly $4million project along the Eagle River in Edwards was one such project, which was funded in part with CWCB grant dollars. The ERIA also measures public support for various prospective projects and other recommended actions. A very comprehensive list of ten watershed restoration principles from scientific literature and case studies to improve the likelihood of success was included for reference and subsequent work plans.

- Eagle River Memorandum of Understanding Project Alternatives Study (2016): provides evaluations of project alternatives to develop water storage and conveyance projects in the Eagle River basin for West Slope and East Slope interests. The ERMOU, executed in 1998, is comprised of cooperative partners and signatories. Numerous development alternatives are currently being considered and will have a bearing on water quantity in the Eagle River. For instance, trans-basin diversions can reduce the intensity of spring runoff flows that are important in the maintenance of aquatic habitat. Spring flows flush fine sediments from the channel substrate and provide the high-quality gravel beds needed by aquatic insects and fish for reproduction. High flows also maintain riparian communities through flooding of the banks and riparian zones adjacent to the river. Studies to determine how much of a "flushing" flow is actually needed on the Eagle River to maintain optimal habitat for aquatic life and bank recharge have not been conducted. The ER-IWMP would take this next step.

3. Goals and Objectives

ERWC, in partnership with River Network, began to engage the ER-IWMP stakeholders in the fall of 2017 to better understand their concerns, constraints and individual objectives. The intent was to build stakeholder engagement and buy-in for the planning effort and to create ER-IWMP goals that truly reflect the interests and concerns of the stakeholders and that of the broader community.

The ER-IWMPs goals are to build consensus about stakeholders' needs and desires for the Eagle River, assess the current impairments and shortages on the Eagle River, and identify how those may change with future water supply development plans. The ER-IWMP will identify projects or management options that both protect existing water rights and provide opportunities to better balance river management for the mutual benefit of all stakeholders. The ER-IWMP does not intend, nor does it have the power, to impact water rights. The ER-IWMP will also increase community understanding of river health and current operations while providing the technical backbone needed to guide future river management decisions.

When the full ER-IWMP effort launches in the spring of 2018, it will further refine the purpose and scope detailed in this document and will conclude with the evaluation and prioritization of alternative actions. At a minimum, the objectives will include: 1) engage stakeholders and assess ecosystem conditions, developing environmental flow needs, and evaluating recreational use preferences, 2) characterizing the type and location of environmental and recreational attributes at risk and working with stakeholders to identify specific planning goals around them, 3) working with stakeholders to identify collaborative opportunities for projects and processes that may help meet the diversity of needs present in the basin, 4) evaluating the relative effectiveness and feasibility of each identified opportunity to prioritize them according to their anticipated implementation success, and 5) develop and implement a community engagement plan to raise community understanding surrounding river health. Implementation, monitoring, and adaptive management of planning recommendations are expected to occur after this effort is completed.

The objectives and tasks are further described in the attached Scope of Work (SOW).

4. Monitoring and Implementation

The project team will develop a conceptual level implementation plan for each of the high-priority actions. The implementation plan will identify project champions, affected stakeholders, recommendations for overcoming technical, financial, or legal constraints, anticipated outcomes, and a monitoring plan for assessing long-term effectiveness.

5. Organizational Capacity

The mission of ERWC is to advocate for the health and conservation of the Upper Colorado and Eagle River basins through education, research and projects. ERWC has a 13-year history of tackling complex

issues through consensus-building stakeholder processes and has coordinated numerous large-scale projects, such as the drafting of the Eagle River Watershed Plan and the Colorado River Inventory & Assessment, oversight of the Eagle Mine Committee (for technical review and oversight of the Eagle Mine Superfund Site cleanup), and coordination of the Urban Runoff Group (which was instrumental in drafting the Gore Creek Water Quality Improvement Plan, Eagle County Water Quality Action Plan and the current drafting of the Town of Avon Water Quality Action Plan).

ERWC will manage the project and provide fiscal oversight throughout the project period. Primary staff at ERWC working on the ER-IWMP are Holly Loff, executive director, and contract employee, Tim Thompson, PE. ERWC is committed to protecting ecological and environmental processes and recreational uses of land and water and intends to develop a plan using a multi-objective approach that protects all natural resources. As project manager, ERWC will incorporate broad-based involvement of diverse local and regional interests within the watershed, including relevant local, state, and federal governmental agencies. ERWC will ensure that the recommendations in this plan are data-driven with a high probability of protecting and enhancing environmental and recreational values in the Eagle River watershed.

ERWC will utilize Lotic Hydrological, LLC for technical expertise, water resource engineering services, field data collection, and quantitative analysis. Lotic Hydrological has a range of relevant experience, including: Yampa River Stream Management Plan, Upper Colorado River Basin Resource Guide, Upper Roaring Fork Management Plan, San Miguel Pilot Project, Crystal River Stream Management Plan, and more. Heather Bergman from Peak Facilitation will be contracted to support ERWC in stakeholder outreach, coordination, and meeting facilitation.

The ER-IWMP advisory committee is made up of major water rights owners, environmental interest groups, recreational user groups, local government, and state/federal agencies. The Advisory Committee's role will be to provide input on the goals, technical methodologies, and identification of high-priority planning issues and project/management options. The advisory committee will play a crucial role in the development of an effective plan. The advisory committee has already participated by assisting in crafting the plan's objectives. Through the expert assistance of River Network, ERWC took the first steps in engaging the stakeholders in initial advisory committee meetings by dividing them into six groups: transmountain diverters, Western Slope water interests, conservation groups and federal/state agencies, river guides, local government, and agriculture/private landowners. Each group had a separate initial meeting with Peak Facilitation to help the project team understand and identify concerns, opportunities and priorities for each group as it relates to flow and stream management planning.

The small group meetings were followed by a half-day meeting with all six groups to review what was learned in the initial meetings and establish overarching objectives for the groups as a whole. The participants in the before-mentioned meetings included representatives from: Colorado Springs Utilities, Aurora Water, Climax Mine, Eagle River Water & Sanitation District, Upper Eagle Regional Water Authority, Vail Resorts, Colorado River District, Eagle River Watershed Council, American Rivers, US Forest Service, Colorado Parks & Wildlife, Bureau of Land Management, local commercial fishing guides, local commercial raft, kayak, paddleboard guides, Eagle County, North West Colorado Council of Governments (NWCCOG), Towns of Vail, Avon, Minturn, Red Cliff, Eagle, and Gypsum, local ranchers and agricultural interests, private land owners, and the Eagle River Water Commissioner.

The goals and objectives outlined above were developed from these meetings. As members of the advisory committee, these stakeholders will be invited to continue participating in the process to develop the ER-IWMP and all have expressed interest in remaining engaged in the process as they see value in the goals and objectives they helped to develop. ERWC will work continuously to inform all of the interested parties of developments and progress so that they will remain engaged throughout the entire project.

6. Budget, Match and Schedule

Development of the ER-IWMP is projected to cost $389,945 as outlined in the attached scope of work (Attachment B) and budget and timeline table (Attachment C).

ERWC has received commitments for cash and in-kind support from a number of the ER-IWMP advisory committee members. The cash support committed from the advisory committee totals $106,500. Additionally, ERWC is applying for funding from the Colorado Basin Roundtable WSRF state funds in the amount of $75,000.

In-kind support in the amount of $27,000 is provided by the following:

- $10,000 from Eagle River Water & Sanitation District for consultant time in running their StateMod hydrologic model
- $5,000 from Eagle River Water & Sanitation District for staff time in presenting to the advisory committee and, as necessary, to the greater community on their StateMod hydrologic model
- $12,000 from ERWC for staff time in developing the community engagement plan and tools

Work on this project is expected to commence in the spring of 2018 and continue for a period of approximately 36 months.

As is typical of successful projects, this IWMP will also be evaluated by whether it meets the fundamental criteria of quality, schedule and budget. With so many stakeholders involved, the leadership and management must be the responsibility of a single entity, ERWC knows the participants, has demonstrated ability to execute projects, and is respected within the community for successful projects and programs that protect and restore the Colorado River, the Eagle River and their tributaries. For these reasons, the ER-IWMP will be developed under the management of ERWC.

Successful completion of several of the tasks outlined in the SOW depends upon timely and continuous coordination, collaboration, and provision of in-kind services by local stakeholders. Therefore, the ability to meet the anticipated dates of completion associated with many of the deliverables is partially dictated by the stakeholders.

7. Attachment Overview

- Attachment A: Project Area Map
- Attachment B: Scope of Work
- Attachment C: Budget & Timeline Table
- Attachment D: Project Team Resumes
    1. Seth Mason, Lotic Hydrological
    2. Jessica Mason, Lotic Hydrological
    3. Heather Bergman, Peak Facilitation
    4. Holly Loff, ERWC
    5. Tim Thompson, PE, contractor
- Attachment E: Letters of Support
    1. Bureau of Land Management
    2. Climax Mine/Freeport McMoRan
    3. Colorado Basin Roundtable
    4. Colorado Parks & Wildlife
    5. Colorado River District
    6. Eagle County Board of Commissioners
    7. Eagle River Water and Sanitation District
    8. Fly Fishing Outfitters
    9. Homestake Water Project Partners
    10. Middle Colorado Watershed Council
    11. Town of Avon
    12. Town of Gypsum
    13. Town of Minturn
    14. Town of Vail
    15. Trout Unlimited
    16. US Forest Service
    17. Vail Valley Anglers
    18. Vail Resorts
    19. Water Center at Colorado Mesa University

Eagle River Integrated Water Management Plan (ER-IWMP)
Attachment B: Scope of Work

GRANTEE and FISCAL AGENT
Eagle River Watershed Council

PRIMARY CONTACT
Holly Loff

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PROJECT NAME
Eagle River Integrated Water Management Plan (ER-IWMP)

GRANT AMOUNT
$181,500

INTRODUCTION AND BACKGROUND
The ER-IWMP's goal is to build consensus about stakeholders' needs and desires for the Eagle River, assess the current impairments and shortages on the Eagle River and how those may change with future water supply development plans. The ER-IWMP will identify projects or management options that both protect existing water rights and provide opportunities to better balance river management for the mutual benefit of all stakeholders. The ER-IWMP does not intend, nor does it have the power, to impact water rights. The ER-IWMP will also increase community understanding of river health and current operations while providing the technical backbone needed to guide future river management decisions.

ERWC has a tradition of coordinating collaborative stakeholder processes. The Integrated Water Management Planning process will be no different. Although the IWMP process will not officially be underway until early 2018, ERWC has already initiated conversations with key stakeholders, such as Eagle River Water & Sanitation District, Upper Eagle Regional Water Authority, Aurora Water, Colorado Springs Utilities, and Eagle County. By meeting with these entities early we have a primary understanding of the individual objectives of each. This understanding guided the scope of work and provided an opportunity to build consensus around the overall objectives of the IWMP.

The ER-IWMP intends to develop proactive water management recommendations that anticipate changes to local hydrology due to 1) population growth and increasing municipal demand for water in Eagle County, 2) climate change, and 3) projects related to the Eagle River MOU (ERMOU), an intergovernmental agreement for developing municipal water supplies in the upper Eagle River watershed. The ER-IWMP will work with local conservation organizations, state and federal agencies, recreational users, ERMOU partners, and other local stakeholders to develop strategies that can respond to these changes in a way that helps meet municipal demands, while maintaining and even improving ecological attributes in the Eagle River watershed. For example, the ER-IWMP will look at how the Western Slope's appropriated portion of the ERMOU waters can best be managed for the protection of Eagle County's water-dependent recreation-based economy (fishing, rafting, skiing, etc.) and environment.

OBJECTIVES

Planning activities will focus on the mainstem Eagle River from its source on the East Fork Eagle River below Eagle Park Reservoir to the confluence with the Colorado River. Homestake Creek and Gore Creek will also be included in the assessment effort. The anticipated tasks associated with this project are summarized through extension of the Rational Planning Model (Taylor, 1998) This effort will begin with refinement of the purpose and scope detailed in this document and will conclude with the evaluation and prioritization of alternative actions. Peak Facilitation and ERWC will be responsible for convening and managing the stakeholder group that will help inform and guide the process. At a minimum, the remaining tasks and objectives will include: 1) assessing ecosystem condition, developing environmental flow needs, and evaluating recreational use preferences, 2) characterizing the type and location of environmental and recreational attributes at risk and working with stakeholders to identify specific planning goals around them, 3) working with stakeholders to identify collaborative opportunities for projects and processes that may help meet the diversity of use needs present in the basin, 4) evaluating the relative effectiveness and feasibility of each identified opportunity to prioritize them according to their anticipated implementation success, and 5) develop and implement a community engagement plan to raise community understanding surrounding river health. The specific tasks associated with each planning phase listed above may require supplementation, modification or removal prior to completion of the proposed work. Implementation, monitoring, and adaptive management of planning recommendations are expected to occur after this effort is completed.

TASKS

TASK 1: Engaging Stakeholders

Subtask 1.1 Advisory Committee

ERWC will work with Lotic and Peak Facilitation to engage key stakeholders in an Advisory Committee to develop the ER-IWMP. Key stakeholders include major water rights owners, environmental interest groups, recreational user groups local government, and state/federal agencies. The Advisory Committee's role will be to provide input on the goals, technical methodologies, and identification of high-priority planning issues and project/management options. At the first Kickoff Meeting, the Advisory Committee will have an opportunity to refine the scope and help shape the timeline and guiding principles for the project.

Deliverables:

- Coordinate and provide minutes for 10 meetings throughout the 36 month ER-IWMP planning process
- Memorandum defining the collective, purpose statement and guiding principles for the planning effort, including roles and responsibilities of each member.

Subtask 1.2 Community Engagement Plan

Peak Facilitation and ERWC will develop a community engagement plan for keeping members of the general public informed on ER-IWMP processes and outcomes and on opportunities and concerns for protecting/improving river health. Additionally the community engagement plan will outline activities for increasing community understanding of how the current (and potential) water system of the Eagle River watershed is operated. This plan will include a timeline for community engagement, the topics to be covered at key points in the process, needed supporting documentation or educational material, and strategies for soliciting public comment/feedback and using it to inform the ER-IWMP effort. The ER-IWMP Advisory Committee will be engaged in developing the community engagement plan, and ERWC will implement its recommendations during the project timeline. ERWC's education and outreach coordinator will assist in the development of the community engagement plan as well as the engagement tools, which is an in-kind match by ERWC.

Deliverables:

- A community engagement plan with timeline for implementation by ERWC

- Community engagement tools (to be determined in subtask 1.2, but may include (but not be limited to) videos, a website or webpage, flyers, posters, articles or advertisements, public meetings)

TASK 2: Assess Conditions & Identify Risks

Subtask 2.1 Review Existing Data and Information

Local organizations, federal and state agencies, the CBRT and others have produced information and data relevant to characterizing ecological integrity and the delivery of ecosystem goods and services on streams and rivers throughout the Eagle River watershed. Some need exists to aggregate this information for the planning reaches to ensure that planning activities are informed by and grounded in the rich historical context of assessment activities.

Deliverables:

- Technical report summarizing the availability of data relevant to environmental and recreational needs assessments. Report will also summarize findings of existing reports or studies that relate land and water use activities to conditions of ecological or recreational attributes on stream reaches in the planning area

Subtask 2.2 Characterize Hydrological Regimes

River systems subject to hydrological change under human management are vulnerable to shifts in the composition and resiliency of both structural and biological components of the ecosystem. The Natural Flow Paradigm (Poff et al., 1997) postulates that streamflows represent the key driver of riverine structure and function. Changes in the timing and magnitude of various elements of the hydrological regime can produce cascading effects (or positive feedback loops) between: 1) the availability and quality of aquatic habitat, 2) the condition and extent of riparian zones, and 3) the dynamics and evolutionary trajectory of channel structure. Therefore, a detailed understanding of the hydrological regime at various locations throughout a watershed provides important context for understanding changes to other ecosystem components. Critically, in order to provide this understanding in Colorado, it is necessary to characterize the administrative and operational conditions that govern the way that water is stored, diverted, consumed, and returned to river systems in time and place. Lotic will utilize results from a StateMod simulation model developed by the Eagle River Water and Sanitation District for the Eagle River watershed to characterize daily streamflow behavior at all major tributary confluences and surface water diversion points in the project area.

Deliverables:

- Data tables containing statistical characterizations of hydrological regime behavior at major tributary junctions and surface water diversions throughout the study area. Simulated conditions may include:
    1) natural conditions,
    2) existing conditions,
    3) maximum in-basin demand projections (no change in climate),
    4) moderate-dry climate change future conditions (no change in demand),
    5) maximum in-basin demand and moderate-dry climate change future conditions,
    6) ERMOU project development (no change in climate or demand),
    7) ERMOU development with maximum in-basin demand (no change in climate),
    8) ERMOU development with maximum in-basin demand and moderate-dry climate change future conditions
- Graphics characterizing typical hydrographs under wet, average, and dry conditions at major tributary junctions, reservoirs, and surface water diversions throughout the study area for the selected scenarios.
- Technical memorandum describing the hydrological simulation results and characterizing the scenarios producing the greatest changes in hydrological regime behavior.

Subtask 2.3 Classify Fluvial Geomorphological Forms and Processes

Classifying river channel types provides a useful framework to understand the dominant physical

processes at a position in the stream network. This process based understanding of channel form is useful for contextualizing historical impacts to riverine ecosystem function or for anticipating future shifts in ecosystem function following some altered condition. In this way, river classification not only simplifies communication about the ways that dynamic physical processes manifest themselves across the landscape, but also aids in natural resource use decision-making. The River Styles framework is an example of an appropriate approach for channel classification in the project area, as it encourages process level understanding of channel forms. River Styles or a similar framework could be used for Task 2.3 of the ER-IWMP. Rapid field assessment methodologies will be applied to assess the geomorphic condition of each channel segment and the natural recovery potential of impaired segments will be characterized.

Deliverables:

- Map of channels classified down to the level of the floodplain and instream geomorphic features for reaches in the study area.
- Map of geomorphic condition assessment results for reaches in the study area.
- Technical report discussing the geomorphic condition and natural recovery potential of segments for reaches in the study area.

Subtask 2.4 Characterize Water Quality

Lotic will evaluate historical stream temperature and water chemistry data against State of Colorado water quality standards for streams and rivers in the project area to develop an index of water quality concern. This index will be based on nonparametric statistical characterizations that identify multiple impairment thresholds (e.g., satisfactory, concern, poor, impaired) for each water quality parameter relevant to aquatic life or recreational use. Particular attention will be paid to water quality parameters that are somewhat controlled by use and management of water (e.g. water temperature, suspended sediment, selenium). Results from this assessment will provide important context for understanding the dominant climatic, land cover, and land use controls on a suite of water quality parameters that constrain ecological function or recreational use opportunities.

Deliverables:

- Table of water quality impairment thresholds for all historical water quality data collection locations throughout the project area.

Subtask 2.5 Characterize Ecological Integrity

Lotic will apply desktop assessment methods (e.g. GIS and aerial photography analysis, hydrological time series evaluation, etc.) and rapid assessment field techniques to corroborate and supplement existing information regarding the hydrological conditions necessary for supporting resilient ecological systems. Lotic anticipates data reviews and field assessments in the summer of 2018 will allow for adequate characterization of aquatic habitat quality, stream network connectivity for aquatic organism passage, floodplain inundation and riparian recruitment, channel maintenance and flushing flows, and other ecosystem attributes. A significant focus of this planning effort will be on water management and use. Therefore, Lotic will use the hydrological assessment performed in Task 2.2 to understand relationships between changes in the flow regime and other components of the ecosystem. Assessment results will inform the selection of specific management goals and objectives. The specific type and number of methods applied will be based on data availability, refinement of project geographic scope and scale (see Task 1), and preferences expressed by stakeholders. In addition to characterizing ecological integrity on each stream reach in the project area, Lotic will map the type and location of ecological attributes with particularly high ecological value and Lotic will evaluate the natural recovery potential of ecologically impaired reaches. Mapped attributes may include, but will not be limited to, Colorado Natural Heritage Program (CNHP) Potential Conservation Areas, native trout and non-native sport fish ranges, presence of threatened and endangered species, location of rare or significant plant communities, etc.

Deliverables:

- Technical report summarizing ecological integrity assessment methodologies and results.
- Map of known high-value aquatic biota attributes throughout the project area.

- Map of known high-value riparian attributes throughout the project area.

Subtask 2.6 Characterize Ecosystem Services Delivery

Lotic will work with local stakeholders to characterize and prioritize the ecosystem goods and services that local communities derive from the riverine landscape. Relevant categories of ecosystem services include regulating services (e.g. flood abatement, groundwater recharge, water purification), provisioning services (e.g. agricultural production, drinking water supply, capture fisheries), and cultural services (e.g. boating recreation, angling recreation, aesthetic values). Lotic will evaluate qualitative information (e.g. local perceptions and anecdotal evidence) in addition to quantitative data (e.g. StateMOD hydrological simulation results, proximity of infrastructure to floodplains) to characterize the relative demand for ecosystem goods and services on stream reaches throughout the project area. American Whitewater (AW) will be contracted to conduct recreational use and flow preference surveys for stream segments in the planning area. Lotic will work with USFS, BLM and CPW to aggregate similar information describing preferred conditions for anglers. Lotic will subsequently work with stakeholders to characterize perceptions about the primary constraints on recreational use opportunity on each reach. Identified constraints may include: streamflow variability, access, structural impediments, etc.

Deliverables:

- Tables indicating the type and relative demand for ecosystem goods and services on stream segments throughout the project area.
- Map of known high-value recreational attributes on the priority stream reaches.
- Map of existing and contemplated river access points and other recreational features.
- Memorandum detailing the results from whitewater boating surveys and the "boatable days" assessment.
- Memorandum detailing the results from angler surveys and the "fishable days" assessment and discussing the primary constraint(s) on recreational use on various reaches.

Subtask 2.7 Develop Conceptual Models

Lotic will use the assessment results produced above to develop conceptual models that describe the bio-physical setting and the primary direction and strength of bi-directional interactions between different ecosystem components (e.g. hydrology and riparian recruitment, sediment transport and aquatic habitat quality, etc.) that contribute to overall ecosystem integrity, the ecosystem services that local communities receive from riverine landscapes, and the capacity for stream reaches in the project area to deliver these services. Lotic will, additionally, identify the primary anthropogenic and/or natural sources for degraded ecological integrity or constraints on delivery of ecosystem services on a given stream reach. Finally, Lotic will consider the potential vulnerability of ecological integrity or delivery of ecosystem services to changes in hydrology contemplated in Subtask 2.2. These conceptual models will help inform subsequent discussions regarding specific planning goals and objectives and identification of collaborative projects and processes to help meet those goals. Output from this assessment effort will be compiled in color-coded ranking tables that promote discussion about critical relationships between ecological integrity and the high-value ecosystem services that local communities derive from rivers and riparian areas. This output may be organized around the FACStream framework or a similar framework under development by Colorado Mesa University and the CBRT.

Deliverables:

- Color-coded ranking tables illustrating the relationships between concepts like ecosystem integrity, the capacity for delivering ecosystem services, and the demand for those services on stream segments in the project area.
- Map of at-risk riparian and aquatic biota attributes.
- Map of at-risk recreational attributes.
- Technical report detailing conceptual models developed for stream reaches with at-risk environmental and/or recreational attributes.

TASK 3: Articulate Planning Objectives and Measureable Results

Subtask 3.1 Identify High-Priority Management Issues and Locations

Lotic will work with stakeholders to prioritize river segments and management issues for subsequent planning steps. Lotic will rely heavily on the deliverables produced in Subtask 2.7 to support these conversations. Lotic will consider management issues that anticipate some altered future hydrological condition brought about by climate change, in-basin demand growth, development of water storage projects under the ERMOU, or some combination of the three. Throughout the issue identification process, Lotic and Peak Facilitation will work with stakeholders to refine and/or expand the planning considerations listed above to ensure they sufficiently reflect local concerns and perspectives.

Deliverables:

- Memorandum detailing high-priority planning issues identified by stakeholders.
- Map of high-priority stream reaches.

Subtask 3.2 Select Objectives and Measureable Results

Lotic will work with stakeholders to select specific management objectives and describe measureable results that respond to the high-priority issues identified previously. This effort will include discussions of morphologically-based, biologically-based, or flow-based management targets used as a direct or indirect measure of riparian area health, health of aquatic biota recreational use opportunity, or receipt of ecosystem services. Management targets may focus on a specific component of the aquatic or riparian ecosystem (e.g. trout biomass), a measure/indicator of whole ecosystem integrity (e.g. Multi-Metric scores for aquatic macroinvertebrates), or on the quality and quantity of ecosystem goods and services received by local communities (e.g. number of "boatable days" available to recreational users). The characterization of planning objectives is necessary to identify and evaluate the feasibility and effectiveness of alternative management actions or projects.

Deliverables:

- Memorandum detailing planning objectives and measureable results identified by stakeholders.

TASK 4: Identify Potential Alternatives

Lotic will identify several candidate structural projects, collaborative processes or management actions that respond to the planning objectives. Candidate actions will be drawn from several sources. Lotic will initially identify alternatives through internal assessment of hydrological conditions, water use and administration, and ecological needs. Discussions with local stakeholders may also point to some unique local opportunities not apparent to us. While there may be significantly more than ten candidate projects suggested or identified, Lotic will use a high-level, expert assessment of feasibility and effectiveness to limit the list to only those actions that have the greatest chance of occurring and/or succeeding.

Deliverables:

- Table identifying candidate structural projects, collaborative processes or management actions that respond to the planning goals and objectives. Table will reference candidate actions against high-priority planning reaches and the management issues present on those reaches.

TASK 5: Evaluate & Prioritize Actions

Subtask 5.1 Identify and assemble relevant stakeholders

It is important to identify stakeholders with the greatest ability to exert control on outcomes or who are likely to be impacted by the direct or indirect effects of the proposed alternatives. Peak Facilitation will work with Lotic and ERWC to ensure that the assembled stakeholder group includes all parties that should be engaged in discussions about the relative merits of the identified alternatives. In cases where all stakeholders are not appropriately engaged, Peak Facilitation will conduct outreach and engagement activities.

Deliverables:

- Memorandum listing the stakeholders critical to successful evaluation of effectiveness and feasibility of each alternative action.

Subtask 5.2 Characterize Effectiveness

Lotic will utilize process-based conceptual models (see Subtask 2.7) to predict ecological and recreational use outcomes of each candidate alternative action. Where identified alternatives are expected to impact hydrology (e.g. reservoir release schedules), Lotic will use the hydrological simulation tools developed in Subtask 2.2 to assess the likely hydrological effects. For structural projects (e.g. diversion structure improvements), Lotic will use conceptual level engineering assessments and/or 1D hydraulic models to evaluate effects. Predicted outcomes will be assessed against stakeholder-identified management objectives. Actions will then be ranked against each other based on their predicted ability to meet those objectives.

Deliverables:

- Expansion of the table developed in TASK 4 to include the relative effectiveness rank assigned to each alternative.
- Technical report discussing the employed methodologies and assessment results characterizing the effectiveness of each proposed alternative.

Subtask 5.3 Characterize Feasibility

The characterization of feasibility for each alternative is a social exercise that requires careful evaluation of administrative, legal, financial, and institutional constraints. Lotic will initially utilize streamflow records, hydrological simulation products, records from the Colorado Department of Water Resources, existing engineering reports, and/or discussions with local water users to characterize the demands, efficiencies, and use shortages associated with various uses of water from the high-priority reaches. Lotic will utilize available engineering assessments or secure new conceptual level assessments to provide important information about the costs of structural projects. Lotic will work with the local Water Commissioner to identify critical administrative constraints on water management alternatives. Lotic will also work with stakeholders to further characterize land ownership and institutional constraints and understand local perceptions of equitable cost allocation for E&R use projects. Through this process, we hope to identify likely proponents/champions for specific issues and areas of broad stakeholder interest and support. Lotic will subsequently work with the stakeholders to rank alternatives according to their relative feasibility.

Deliverables:

- Expansion of the table developed in Subtask 5.2 to include the relative feasibility rank assigned to each alternative.
- Technical report discussing the employed methodologies and stakeholder discussions characterizing the feasibility of each proposed alternative.

Subtask 5.4 Prioritize Actions

Lotic will integrate the results from the effectiveness and feasibility assessments above to identify high-priority actions for protecting or improving environmental and/or recreational flows. Lotic will identify a conceptual level implementation plan for each action. The implementation plan will identify project champions, affected stakeholders, recommendations for overcoming technical, financial, or legal constraints, anticipated outcomes, and a monitoring plan for assessing long-term effectiveness.

Deliverables:

- Technical report integrating all previous maps, graphics, memoranda, and technical reports. Report will additionally include identification of high-priority management recommendations and corresponding discussions for implementation and monitoring of each.

REFERENCES

Mahoney and Rood, 1998. A device for studying the influence of declining water table on poplar growth and survival. Tree Physiology 8:305–314.

Poff, N.L., J.D. Allan, M. B. Bain, J.R. Karr, K.L. Prestegaard, B. Richter, R. Sparks, and J. Stromberg. 1997. The natural flow regime: a new paradigm for riverine conservation and restoration. BioScience 47:769-784.

Schmidt, L.J. and J.P. Potyondy, 2004, Quantifying channel maintenance instream flows: An approach for gravel-bed streams in the western United States, General Technical Report RMRS-GTR-128, Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, pp. 33

Taylor, N., 1998. *Urban Planning Theory since 1945*. London: Sage Publications. pp. 67–68.

REPORTING AND FINAL DELIVERABLE

ERWC will provide the CWCB with brief progress reports every 6 months, beginning from the date of the executed contract. The progress reports will describe the completion or partial completion of the tasks identified above, including a description of any major issues that have occurred and any corrective action taken to address these issues as well as any adjustment to the tasks that must occur to address those corrective actions.

At completion of the project, ERWC will provide the CWCB with a final report summarizing the project. Additionally, the final report will briefly document how the project was completed.

Eagle River Integrated Water Management Plan (ER-IWMP)

Attachment C: Budget & Timeline Table

Task	Sub-Task	Description	Month Following Contract Initiation: Target Start Date	Target Completion Date	CWCB Funds	WSRF- cash (projected)	Stakeholders- cash (committed)	ERWC- In-Kind	Eagle Park Reservoir Co.- In-Kind	Total
Engaging Stakeholders	1.1	Advisory Committee	Month 1	Month 36	**$ 24,078.00**	$ 9,000.00	$ 12,780.00	$12,000.00		$ 57,858.00
	1.2	Community Engagement Plan	Month 1	Month 36						
Assess Conditions & Identify Risks	2.1	Review Existing Data and Information	Month 2	Month 3	**$ 90,318.00**	$ 39,750.00	$ 56,445.00		$ 15,000.00	$ 201,513.00
	2.2	Characterize Hydrological Regimes	Month 2	Month 4						
	2.3	Classify Fluvial Geomorphological Forms and Processes	Month 4	Month 7						
	2.4	Characterize Water Quality	Month 6	Month 6						
	2.5	Characterize Ecological Integrity	Month 5	Month 11						
	2.6	Characterize Ecosystem Services Delivery	Month 8	Month 12						
	2.7	Develop Conceptual Models	Month 12	Month 16						
Articulate Planning Objectives & Measurable Results	3.1	Identify High-Priority Management Issues and Locations	Month 17	Month 19	**$ 19,008.00**	$ 6,750.00	$ 9,585.00			$ 35,343.00
	3.2	Select Objectives and Measureable Results	Month 19	Month 21						
Identify Potential Alternatives	4.1	Identify Potential Alternatives	Month 21	Month 23	**$ 16,233.00**	$ 6,750.00	$ 9,585.00			$ 32,568.00
Evaluate & Prioritize Actions	5.1	Identify and assemble relevant stakeholders	Month 24	Month 25	**$ 31,808.00**	$ 12,750.00	$ 18,105.00			$ 62,663.00
	5.2	Characterize Effectiveness	Month 25	Month 28						
	5.3	Characterize Feasibility	Month 27	Month 31						
	5.4	Prioritize Actions	Month 31	Month 36						
					$ 181,445.00	**$ 75,000.00**	**$ 106,500.00**	**$ 12,000.00**	**$ 15,000.00**	**$ 389,945.00**

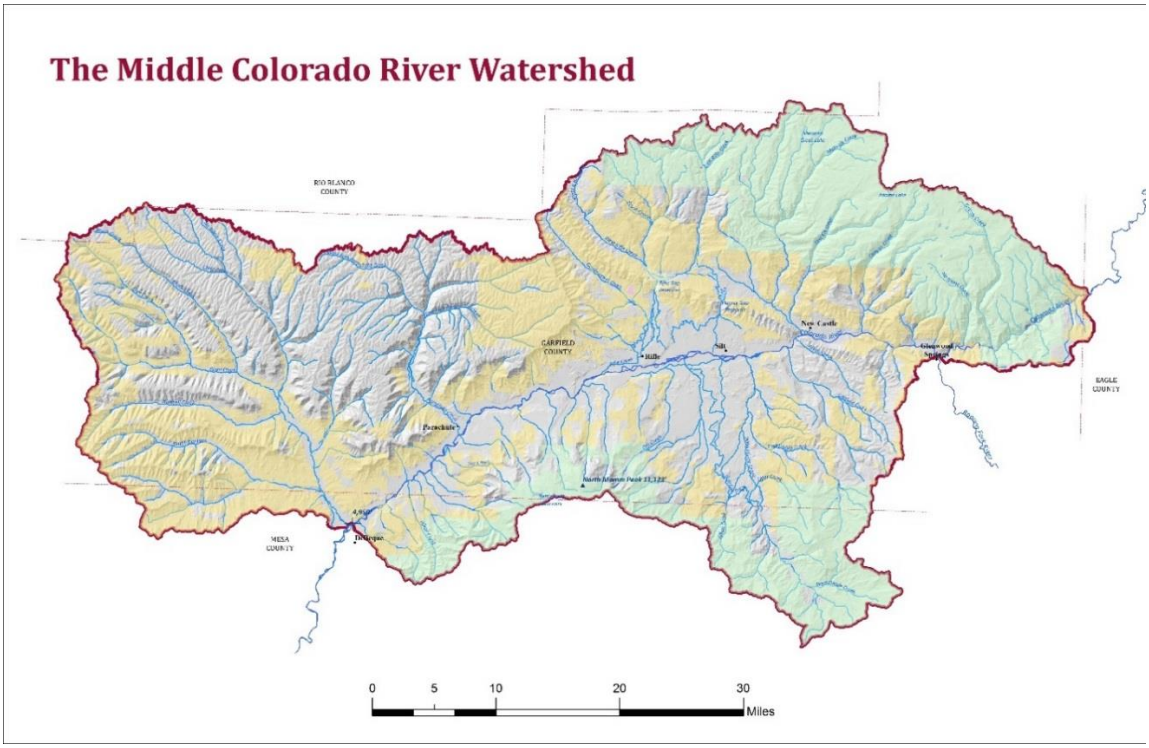
Stakeholders did not stipulate which tasks their cash support could be spent on. Stakeholder funds were totaled and spread throughout the tasks as necessary.
The actual funding provided by each stakeholder is presented below.

Stakeholder	Level of support
Homestake Water Project Partners	$ 20,000
Eagle Park Reservoir Company	$ 15,000
Vail Resorts (pending)	$ 15,000
Climax Mine (Freeport McMoRan)	$ 11,000
Colorado River District	$ 10,000
Eagle County (pending)	$ 10,000
Town of Vail	$ 10,000
Town of Avon	$ 10,000
Town of Gypsum	$ 5,000
Town of Minturn	$ 500
Total Stakeholder cash support	$ 106,500

Homestake Water Project Partners includes Aurora Water and Colorado Springs Utilities
Eagle Park Reservoir Co. includes Eagle River Water & Sanitation District & Upper Eagle Regional Water Authority

Colorado Water Conservation Board
Colorado Watershed Restoration Program
Grant Application – Summary Sheet

Project Title: Middle Colorado Integrated Water Management Plan
Project Location: Middle Colorado River Watershed (see map below)
Grant Type: Stream Management Plan Grant
Grant Request/Amount: $ 207,600
Cash Match Funding: $ 141,400
In-kind Match Funding: $ 66,200
Project Sponsor: Middle Colorado Watershed Council
Contact Information: Laurie Rink, Executive Director, laurie@midcowatershed.org, 303-204-4164
Project Description: The long-term goal of the IWMP project is to improve security for all water uses in the planning area by understanding and protecting existing uses, meeting shortages, and maintaining healthy riverine ecosystems in the face of increased future demand and climate uncertainty. The planning and implementation effort will be conducted in a series of phases as stakeholder interest and funding allows. The first phase initiates a process of identifying water needs for environmental and recreational uses, determining if gaps exist and, if so, finding voluntary-based solutions for filling the gaps in conjunction with the needs of agricultural, domestic and industrial water users. The geographic focus in phase one is on the "middle" section of the Colorado River, an area that includes 75 miles of the mainstem. CWCB funds will be used to conduct technical assessments, develop a hydrology model, and support a robust stakeholder engagement process that will help inform the investigation of, selection, and prioritization of projects, processes and/or management actions that further the long-term project objective. Outcomes from phase one will chart the course for a subsequent phase of planning work in a subset of tributaries to the middle Colorado, and will likely include recommendations for implementation projects on the mainstem.



Colorado Watershed Restoration Program
Grant Application – Narrative

Background

The Colorado Basin Roundtable (CBRT) identified basin-wide integrated water management planning (IWMP) as a top priority in its Basin Implementation Plan (BIP). The middle Colorado River, extending from the top of Glenwood Canyon downstream to the head of De Beque Canyon, is a critical section to consider as part of the CBRT's comprehensive strategy. This 75-mile stretch of the mainstem of the Colorado River supports the six communities of Glenwood Springs, New Castle, Silt, Rifle, Parachute/Battlement Mesa, and De Beque that each rely on Colorado River water in a variety of ways (see map Attachment A). These uses include primary or secondary drinking water supply, the economics of recreational tourism (fishing, boating, hunting, biking, walking, hot springing, bird-watching), and the quality of life enjoyed having access to the river and its resources.

The tributaries to the middle Colorado River also play an important role in meeting both consumptive and non-consumptive water supply needs. Several municipalities derive their primary or secondary drinking water from the tributaries and count on these as high-quality sources. Most agricultural diversions are situated on the tributaries and are dependent on sufficient water yield for crop production. Oil and gas operations withdraw surface water for production purposes. All warm and cold water native fish species rely on the tributaries as critical spawning and/or rearing habitat, thus flows and quality habitat are vital for reproductive success. And, as our communities are undergoing economic diversification, all appear to be turning to the local stream and river corridors as prime opportunities for recreational development.

As water management in the tributary basins operates largely independent from the mainstem of the Colorado, many have lost the functional ecological connection they once provided. The IWMP process affords the opportunity to reintegrate the tributaries with the mainstem and to understand how the system functions as a whole. It also offers the opportunity for our communities and their various economic sectors to come together to identify the collective water needs necessary to continue to improve and grow our communities.

The approach contemplated in this IWMP proposal is two-fold. One, initiate work to understand the environmental and recreational flow needs associated with the mainstem of the Colorado River. Two, in a phased sequence, evaluate the tributaries and their potential for contributing to overall community and watershed health. Where opportunities for integration exist, and as community stakeholders and water right owners are willing to participate on a voluntary basis, tributary management plans will be crafted and brought into the fold of a watershed-wide IWMP.

Statement of Need

The CRBT's BIP begins with the following vision statement:

> *"… a Colorado River basin that is home to thriving communities benefiting from vibrant, healthy rivers and outstanding water quality that provides for all of the Colorado Basin's needs."*

As an outgrowth of this vision, six themes were developed as guiding principles for the BIP. Each of the themes are relevant to IWMP work in the middle Colorado, as described below.

Theme 1 – Ecosystem Health – Protect and Restore Streams, Rivers, Lakes and Riparian Areas.
The BIP establishes that "biologically healthy rivers form the basis of a thriving Colorado Basin." And "this is not only reflected in stream flows but also in how those stream flows are managed." As a first step in this direction, the CBRT initiated an "Integrated Water Management Planning Framework Project" which seeks to build a foundation for conducting comprehensive integrated water management plans in the mainstem Colorado River Basin.

Environmental issues of concern for the middle Colorado, as highlighted in the BIP, include:

- High concentrations of salinity, selenium, hardness, total dissolved solids, iron and manganese that could be exacerbated with reduced flows.
- Designation of critical habitat for two federally threatened or endangered listed fish species that extends upstream on the Colorado River mainstem from the 15-Mile Reach in Mesa County to the main Rifle I-70 Bridge and providing for their recovery needs.
- Three native fish species of concern (roundtail chub, bluehead sucker, and flannelmouth sucker) that require management actions to ensure that populations do not decline to the point requiring a T&E listing.
- Aquatic habitat degradation and the resulting need to protect water quality and riparian habitat along the Colorado River.
- Possible impacts to tourism and the recreational economy.

Additional environmental and recreational concerns and vulnerabilities for the middle Colorado were identified in the 2011 Colorado Basin Needs Assessment Report (which includes a non-consumptive needs assessment and results from application of the Watershed Flow Evaluation Tool).

Theme 2 – Agriculture – Sustain, Protect and Promote Agriculture.
According to the BIP, of the seven regions within the Colorado Basin, the middle Colorado supports the second highest number of irrigated acres at over 52,000, much of which is irrigated with water from the smaller tributaries. Water management in the middle Colorado is provided by the Silt, Bluestone, and West Divide Water Conservancy Districts and the Bureau of Reclamation Silt Project. Local water managers report irrigation water shortages for some of the tributary sub-basin, although a collective quantification of the shortfalls has not been completed. One of the specific goals identified in the BIP is to reduce agricultural water shortages. As agricultural producers are interested and willing, the IWMP process can assist in defining shortages and evaluating alternatives for meeting deficits through optimization of water management or infrastructure upgrades.

Theme 3 – Safe Drinking Water – Secure and Protect Safe Drinking Water for Today and Tomorrow.
Based upon interviews with drinking water providers, the BIP concluded that it is imperative to secure the needs of growing domestic water demands by developing in-basin supplies, expanding current raw water storage supplies and developing new small-scale multi-use storage. In the middle Colorado, a lack of redundancy in municipal supplies puts users at risk, in addition to water supply contamination risks associated with expanding energy extraction activities in the region. The IWMP affords the opportunity to coordinate with local drinking water providers in evaluating opportunities for expanded supplies, storage, and source water protection in the context of achieving benefits that could also be realized by agriculture, environmental and recreational interests.

Theme 4 – Encourage a High Level of Basinwide Conservation.
The CBRT BIP states "in order to meet the Basin and state goals, concerted conservation efforts have to be made". While conservation and efficiency practices are currently being implemented to varying

degrees by agriculture and the local municipalities within the middle Colorado, additional opportunities for investigation can be discussed through the IWMP process with willing stakeholders.

Theme 5 – Land use – Develop Local Water Conscious Land Use Strategies.
Citing the need for making the connection between land use and water supply, the BIP strongly urges local and regional land use authorities to take on water management as an issue when planning for the future. While the IWMP does not contemplate recommending changes in regulation or policy, it can serve as a forum for exploring the nexus between land use planning and water supply in the middle Colorado and educating, through outreach to the public, the implications of land use decisions on the future of local water supply.

Theme 6 – Basin Administration – Assure Dependable Basin Administration
As articulated in the BIP, protecting the senior Shoshone Hydroelectric water right, Grand Valley irrigators' water rights (Cameo Call), and critical flows in the 15-Mile Reach are vital to both instream flows and Basin water users. While there are processes either in place or underway by a collective of water managers to secure these rights in perpetuity, the IWMP process will assist with educating the public on the importance of these rights to garner public approval for any needed short- or long-term financial investments.

Long-Term Goal, Objectives and Phasing

The long-term goal of this project is to improve security for all water uses in the middle Colorado River Watershed planning area by understanding and protecting existing uses, meeting shortages, and maintaining healthy riverine ecosystems in the face of increased future demand and climate uncertainty. The broad objectives associated with meeting the long-term goal are as follows:

1. Assess and quantify environmental and recreational flow-related needs/uses, and determine where and when those needs are unmet under current and future conditions.
2. Understand, and where needed and desired by stakeholders, assess and refine consumptive uses need quantifications, and determine where and when those needs are unmet under current and future conditions.
3. Identify projects, processes and management actions that can fill or mitigate identified needs and use gaps.
4. Implement high priority projects, processes and management actions that are consistent with the values of the communities, water users, and participating water rights owners.

Planning and implementation required to meet the long-term project goal will be conducted in a series of phases as stakeholder interest and funding allows. Planning and implementing in a phased fashion employs a learning-by-doing approach, allows for earlier and phased implementation of management recommendations, and can accommodate adaptive management principles.

The geographic focus in phase one is on the middle section of the Colorado River, an area that includes 75 miles of the mainstem. Outcomes from phase one will chart the course for a second phase of planning work in a subset of tributaries to the middle Colorado where stakeholders and water rights owners have indicated an interest and willingness to work towards meeting project goals.
It is expected that phase one will also yield recommendations for projects, processes, and management actions on the mainstem, allowing for some implementation to begin in phase two. Subsequent phases will continue in succession as described, integrating more tributary sub-basins into the planning process while implementing activities identified in previous phases.

The long-term planning effort has the potential to result in the following benefits as it evolves:

1. A better understanding of spatial and temporal flow gaps that will serve to influence water management decisions both locally and in the upstream contributing watershed.
2. An identification of who is needed and willing to work towards effecting positive change when considering how to fill consumptive and non-consumptive use need gaps.
3. A better understanding of the structural needs for providing water security for agricultural, municipal, and industrial users and a set of identified projects for future funding requests.
4. Creation of models for the middle Colorado River and its tributaries, both mechanistic and organizational, that can be used into the future to evaluate the successes of implementation activities and to inform adaptive management actions moving forward.
5. A greater public understanding around the value of water as it relates to all uses and the importance of local control and cooperation in water management planning.
6. Answering questions about riverine flows, how they relate to the long-term trajectory of riparian ecosystem health, and identifying other mechanisms and priority locations for protecting and promoting highly functioning riparian areas composed of naturally reproducing and regenerating native plant communities that support wildlife and waterfowl.
7. Understanding current water quality impairments and relationship to flow, ways to mitigate impairments to meet state standards, and flows needed to offset future impairment listings.
8. Understanding what is required by way of improvements in habitat and flow to support naturally reproducing populations of native fishes, further the recovery of threatened and endangered fish species, and avoid additional future threatened and endangered listings for natives.
9. Identifying increased opportunities for diversified river-related recreational opportunities that can boost local economies while protecting riverine ecosystem function.
10. Identifying opportunities for habitat improvements/modifications to improve trout reproductive and recruitment success, translating to enhanced angler experience and the opportunity for related economic benefits for local communities.
11. Planning for healthy riverine systems that supports a variety of ecosystem goods and services.

See the Scope of Work for Phase I specific objectives.

Existing Information

Three key bodies of work contain information that establish a baseline for the IWMP process to build upon.

Middle Colorado Watershed Plan. This Plan, published in 2016, was crafted to promote and facilitate partnerships that lead to increased capacity at the local level to protect and enhance water quality, to promote smart and efficient water use and conservation, and to sustain and improve the health of the watershed. As one of its priority strategies, the Plan describes the intent to "participate in a Colorado Basin Roundtable planning process to develop an Integrated Water Management Plan for the mainstem of the Colorado River." Technical baseline information available in the plan includes sections on: 1) physical characteristics of the watershed, 2) water quantity management, controls and uses; 3) demographics and economic activity; 4) land uses that affect water quality; 5) wildlife, 6) recreation, and 7) a surface water quality data analysis.

Colorado Roundtable BIP and Support Documents. The BIP reports on both consumptive and non-consumptive use gaps in the basin to the extent that these are known. It pulls on data from a variety of supporting studies including the State Water Supply Initiative (SWSI 2010), the Non-Consumptive Needs Assessment (2010), and application of the Watershed Flow Evaluation Tool. As stated in the BIP "…while

these studies provide an insightful, big picture look at reaches of concern due to changes in flows, it is not focused on how to best address these vulnerabilities from a site-specific perspective." The IWMP work will pick up where these previous analyses left off. The BIP also provides a list of priority projects and processes for the middle Colorado River, as identified by local stakeholders, that will be used when engaging key stakeholders in initial discussions, particularly those related to consumptive use needs. Updated SWSI 2017 findings will be incorporated into the IWMP work as appropriate.

Colorado Roundtable Integrated Water Management Plan Framework. Work products that result from this effort including literature compilations, databases, analysis tools, and recommended methodologies will be used and/or considered in support of the IWMP effort.

Organizational Capacity

MCWC is the project sponsor and will assume responsibility as project manager. Examples of similar planning projects undertaken by the organization include: 1) the 2016 Watershed Plan (and companion document "Analysis of Surface Water Quality Data" (2015)) funded by the Colorado Nonpoint Source Pollution Control program, 2) Expansion of the MCWC (completed 2017) which included several deliverables that refined elements of the Watershed Plan, as funded by the Bureau of Reclamation Cooperative Watershed Management Program, and 3) a Watershed Assessment of the Rifle Creek Basin (completion date early 2018) as funded jointly by the Bureau of Land Management and the Colorado Nonpoint Source Pollution Control Program. Guidance for these projects was provided by MCWC advisory committees as listed in Attachment B.

Laurie Rink, Executive Director, will act as Project Manager. Laurie is currently engaged as a contractor to the organization and will be allocating a one-third FTE equivalent to the project. Educated as a scientist, Laurie has worked in the field of aquatic ecology and restoration for over thirty years with specific expertise in watershed management, wetland ecology, water quality assessment, and regulatory compliance. Other MCWC contract staff include a watershed specialist and a community outreach coordinator who will each contribute to the project at less than 5% FTE. Jim Pokrandt, Director of Community Affairs for the Colorado River District, will be providing facilitation services as part of Task 2. Jim is currently the Chair for the Colorado Roundtable. See Attachment C for short resumes. MCWC will contract with one or more specialty consultants to conduct the technical work associated with planning.

Monitoring and Implementation Plan

In terms of monitoring for and evaluating success of the planning efforts, the project will reflect on the original objectives and evaluate whether: 1) quality data was collected at the level needed to drive the planning process and set a baseline for monitoring and evaluating future implementation activities, 2) the plan articulates clearly defined, actionable strategies and projects that fulfill the project objectives, and 3) stakeholders have been engaged to the degree needed to select a priority set of projects or strategies for near-term implementation and/or identify additional planning needs that moves the ball closer to implementation.

Budget, Match and Schedule

The full project worth is valued at $415,200. A request of 50% of the cash funding in the amount of $207,600 is being requested through this grant program with matching cash of just under 20%, or $73,400 from the Colorado Basin Roundtable WSRF. Local government has pledged $28,000 in cash. The remaining $66,200 of in-kind funding is provided from a variety of sources. Detail on match and project schedule are provided in the Scope of Work.

Scope of Work

Grantee and Fiscal Agent: Middle Colorado Watershed Council
Address: 200 Lions Park Circle, Rifle, CO 81650
Phone: 970-625-1829
Project Name: Middle Colorado Integrated Water Management Plan
Grant Amount: $ 207,600

Introduction and Background

The long-term goal of the IWMP project is to improve security for all water uses in the planning area by understanding and protecting existing uses, meeting shortages, and maintaining healthy riverine ecosystems in the face of increased future demand and climate uncertainty. The planning and implementation effort will be conducted in a series of phases as stakeholder interest and funding allows. The first phase initiates a process of identifying water needs for environmental and recreational uses, determining if gaps exist and, if so, finding voluntary-based solutions for filling the gaps in conjunction with the needs of agricultural, domestic and industrial water users. The geographic focus in phase one is on the "middle" section of the Colorado River, an area that includes 75 miles of the mainstem (see map Attachment A). Funding will be used to conduct technical assessments, develop a hydrology model, and support a robust stakeholder engagement process that will help inform the investigation of, selection, and prioritization of projects, processes and/or management actions that further the long-term planning goal. Outcomes from phase one will chart the course for a subsequent phase of planning work in a subset of tributaries to the middle Colorado, and will likely include recommendations for implementation projects on the mainstem.

Objectives for Phase I Funding Request

Please see the proposal narrative for a discussion of the long-term project goal and objectives. Specific objectives for this phase I funding request are as follows:

- Engage key stakeholders in the planning process to understand local values around water uses and the desire to balance non-consumptive and consumptive use needs, to identify opportunities for collaboration in problem solving to fill need gaps, and to establish goals and priorities for project and program implementation.
- Understand the hydrology of the mainstem and its interplay with environmental and recreational attributes and consumptive use demands under existing conditions and with the ability to analyze a variety of future forecasted scenarios.
- Assess the current ecological health, integrity and function of the mainstem in order to determine areas of impairment and relation to flow.
- Characterize the environmental and recreational needs in terms of ecosystem goods and services to understand where modification or improvement may return the highest value, and to provide a framework for developing implementation goals and priorities.
- Identify, evaluate, and prioritize a set of projects, processes, and/or or management actions that addresses non-consumptive use need gaps while integrating, to the extent possible, actions that address consumptive use shortages and needs.
- Develop a strategy for phase II planning and project implementation based upon outcomes of phase I.

Activities and Tasks

Activity 1. Project Management

Task 1.1. Project Management, Reporting and Expenses

Description
MCWC will coordinate efforts between project consultants, organize and submit project deliverables, account for in-kind project contributions, communicate regularly with CWCB staff on progress made, and prepare and submit semi-annual and final project reports. Included in this task are costs associated with travel (mileage reimbursement, lodging), public meeting expenses (facilities and materials), and reporting related expenses.

Deliverables
1. Quarterly invoices with requested accounting detail (8).
2. Semi-annual project reports (3), final project report (1).

Activity 2. Engaging Stakeholders

Task 2.1. Project Advisory Committee

Description
MCWC will form a project-specific advisory committee with representatives from each water use/management sector to guide the IWMP process.

Methods/Procedure
This group will meet regularly throughout the two-year planning process for an estimated total of ten meetings and provide input on stakeholder engagement strategies, technical and organizational methodologies, the evolution of project goals and objectives, and the selection of focus areas for subsequent planning phases. Group discussions will be facilitated. MCWC intends to also utilize its existing Technical Advisory Committee and Riparian Restoration Advisory Group for topic-specific input, as appropriate (see committee rosters Attachment B).

Deliverables
1. Advisory Committee meeting minutes (10).

Task 2.2. Stakeholder Outreach and Engagement Plan

Description
MCWC will develop a Stakeholder Outreach and Engagement Plan that articulates a strategy for engaging and soliciting input from stakeholders who have a vested interest in the outcome of the planning work and future implementation of planning recommendations.

Methods/Procedure
The plan will: 1) contain a list of key stakeholders from the following sectors: agriculture, environment (wildlife and riparian ecology), recreation and tourism, water management, and government related to land use planning and management/utilities/public health; 2) detail why and how each of these groups

will be involved along with desired outcomes, and 3) outline a general schedule for stakeholder meetings over the life of the planning process. The plan will also address the need for additional outreach and education to generally inform key stakeholders and the public about the study need and purpose, share study findings, solicit meaningful input as the project proceeds, and set the stage for successful IWMP implementation.

Deliverables

1. Stakeholder Outreach and Engagement Plan.

Task 2.3. Implementing Outreach and Engagement

Description

MCWC will implement the various elements outlined in the Stakeholder Outreach and Engagement Plan.

Methods/Procedure

A series of public meetings will be planned and executed by MCWC utilizing the services of an experienced facilitator. A total of five are currently contemplated and will be scheduled to coincide with the availability of results from the various technical studies and analyses. These meetings will serve as a structured outlet for disseminating information generated through the term of the planning process.

It is also anticipated that a significant portion of targeted public outreach, as conducted by MCWC staff, will occur through periodic meetings with City and Town Councils, boards of the local conservation and water conservancy districts, oil and gas industry representatives, irrigation ditch company boards, individual land owners and water rights holders, the Garfield County Water Forum, and the Colorado Basin Roundtable.

The MCWC will utilize its established network of community outreach outlets (e.g., newspaper, social media, public radio, website, etc.) to further disseminate project-related information community-wide.

Deliverables

1. Minutes from public meetings.
2. Log of meetings, attendees, discussion topics, and summarized outcomes.
3. Various outreach and education resources (e.g., op-eds, radio interviews, print materials, etc.).

Activity 3. Assessing Conditions

Task 3.1. Refine Hydrological Simulation Modelling Tools

Description

River systems subject to hydrological change under human management are vulnerable to shifts in the composition and resiliency of both structural and biological components of the ecosystem. The Natural Flow Paradigm (Poff et al., 1997) postulates that streamflows represent the key driver of riverine structure and function. Changes in the timing and magnitude of various elements of the hydrological regime can produce cascading effects (or positive feedback loops) between: 1) the availability and quality of aquatic habitat, 2) the condition and extent of riparian zones, and 3) the dynamics and evolutionary trajectory of channel structure. Therefore, a detailed understanding of the hydrological

regime at various locations throughout a watershed provides important context for understanding changes to other ecosystem components.

Methods/Procedure
In order to provide this understanding in Colorado, it is necessary to characterize the administrative and operational conditions that govern the way that water is stored, diverted, consumed, and returned to river systems in time and place. MCWC's consultant will refine the Colorado River Basin daily StateMod simulation model developed for the Hutchin's Water Center to enable daily streamflow simulations at all major tributary confluences and surface water diversion points along the mainstem Colorado River between Dotsero and DeBeque Canyon. The simulation model will be used to understand differences between hydrological regime behavior under natural conditions, existing conditions, and several future climate-change and/or demand scenarios as described by the Colorado River Water Availability Study. The specific scenarios evaluated will be selected by local stakeholders.

Deliverables:

1. Command files for the refined hydrological simulation model published to a public repository.
2. Data tables containing statistical characterizations of natural, existing, and future hydrological regime behavior at major tributary junctions and surface water diversions throughout the study area.
3. Graphics characterizing typical hydrographs under wet, average, and dry conditions at major tributary junctions, reservoirs, and surface water diversions throughout the study area.

Task 3.2. Characterize Ecological Health, Integrity and Delivery of Ecosystem Goods and Services

Description
Landscape and channel scale processes play a significant role in driving the condition of ecological resources that local communities typically derive value from. Interactions between hydrology, channel morphology, water quality, and sediment transport mediate riparian conditions, aquatic habitat quality and availability, assimilation of pollutants, and the ability of local residents to recreate on streams and rivers. Some of the key attributes for the middle Colorado that will be evaluated in determining ecological health, integrity and ability to deliver ecosystem goods and services include:

- Current functioning of riparian ecosystems – how does the presence of invasives influence function and how is existing habitat structure related to flow management.
- Currently identified water quality impairments – how are these impairments related to flow and are there any flow-related water quality impairments that may be foreseen in the future.
- Habitat needs for fish with a specific focus on threatened and endangered (T&E) warm water fish and the three fish species of special concern - are there current or future foreseeable flow impairments that have or may in the future trigger regulatory action.
- Habitat needs for trout – are there sufficient flows connecting the tributaries to the mainstem at the right time of year to support robust and natural reproduction of trout populations that in turn support the economies of angler use.
- Current and contemplated recreational development – where is this occurring and are river flows sufficient to support the uses.

Method/Procedure

MCWC will contract with a consultant to complete literature reviews, desktop assessments (e.g. GIS and aerial photography analysis, hydrological time series evaluation, etc.) and rapid field assessments to characterize the existing condition of riverine systems. At a minimum, literature reviews will consider the 2010 SWSI Non-Consumptive Needs Assessment, the Middle Colorado River Watershed Plan, the Middle Colorado Surface Water Data Analysis, the Middle Colorado Riparian Restoration Action Plan, Colorado Headwaters Invasives Partnership's Consolidated Species Management Plan, the Colorado Natural Heritage Program Survey of Critical Biological Resources of Garfield County, newly available riparian habitat mapping through the Tamarisk Coalition and Colorado State University, and other reports, studies, and data sets made available on the Hutchin's Water Center's Upper Colorado River Resource Guide. Data collection and analysis activities will, at a minimum, include characterization of stream geomorphology, riparian health and biodiversity, aquatic biodiversity, and hydrological regime behavior in a way that facilitates understanding key relationships between hydrology and other elements of ecosystem structure and function. This assessment will also include an identification of areas of high biodiversity value (e.g. rare and significant plant communities). Output will be organized around the FACStream framework, the Colorado Stream Health Assessment Framework or a similar framework under development by Colorado Mesa University and the CBRT. Use of one of these frameworks will facilitate communication with stakeholders regarding existing ecosystem conditions.

Subsequently, MCWC and its consultant will work with local stakeholders to characterize and prioritize the ecosystem goods and services that local communities derive from the riverine landscape. Relevant categories of ecosystem services include *regulating services* (e.g. flood abatement, groundwater recharge, water purification), *provisioning services* (e.g. agricultural production, drinking water supply, capture fisheries), and *cultural services* (e.g. boating recreation, angling recreation, aesthetic values). This assessment will evaluate qualitative information (e.g. local perceptions and anecdotal evidence) in addition to quantitative data (e.g. hydrological time series, consumptive use water demands, proximity of infrastructure to floodplains, recreational use surveys, etc.) to characterize the relative demand for ecosystem goods and services on stream reaches throughout the project area and the ability of the system to meet those demands.

MCWC and its consultant will consider hydrological modeling and ecological integrity assessment results to identify the primary drivers of and greatest risks to unsatisfied demand for ecosystem goods and services. Drivers may include hydrological regime modification, land use activities and infrastructure development in floodplains, non-point source pollution, invasive species, or lack of recreational access points. The specific type and number of methods applied to complete this analysis will be based on data availability, refinement of project geographic scope and scale, and preferences expressed by stakeholders.

Deliverables

1. Report and accompanying maps and graphics summarizing results of the ecological integrity assessment.
2. Report and accompanying maps and graphics summarizing the relative priorities that local communities assign to the delivery of ecosystem goods and services from streams and rivers in the project area.
3. Report identifying the primary drivers of and greatest risks, including flow needs, to unsatisfied demand for ecosystem goods and services across the project area.

Activity 4. Articulating Planning Goals and Objectives

Task 4.1. Identify High-Priority Management Issues and Locations

Description
Stakeholders will prioritize river segments and management issues for subsequent planning steps. This task will require consideration of management issues that respond to existing conditions or anticipate some altered future condition.

Method/Procedure
MCWC and its consultant will summarize assessment results produced by Task 3.2 to guide discussions with local stakeholders about high priority management issues in the project area. Identified management issues may include invasive riparian species management, existing water quality impairments, important migration or spawning areas for trout and native fish, anticipated impacts to non-consumptive uses that result from water (or land) development projects or changes in climate. Throughout the issue identification process, MCWC will work with stakeholders to refine and/or expand the planning considerations listed above to ensure they sufficiently reflect local concerns and perspectives regarding the delivery of ecosystem goods and services.

Deliverables
1. Report summarizing stakeholder preferences and priorities for addressing issues in specific geographic areas.
2. Map of high priority management areas.

Task 4.2. Select Management Goals and Objectives

Description
Stakeholders will articulate specific management goals and objectives that respond to the high-priority issues identified previously.

Method/Procedure
MCWC and its consultant will guide discussion with local stakeholders to identify specific management objectives that respond to the issues identified in Task 4.1. This effort will include discussions of morphologically-based, biologically-based, or flow-based management targets used as a direct or indirect measure of riparian area health, health of aquatic biota, recreational use opportunity, or receipt of ecosystem services. Management targets may focus on a specific component of the aquatic or riparian ecosystem (e.g. trout biomass), a measure/indicator of whole ecosystem integrity (e.g. Multi-Metric scores for aquatic macroinvertebrates), or on the quality and quantity of ecosystem goods and services received by local communities (e.g. number of “boatable days” available to recreational users).

Deliverables
1. Report summarizing management goals and objectives that respond to the issues identified in Task 4.1.

Activity 5. Identifying Alternatives

Task 5.1. Identify Alternatives that Meet Planning Goals and Objectives

Description
MCWC will work with stakeholders to identify several candidate structural projects, collaborative processes or management actions that respond to the previously-identified management issues and objectives.

Methods/Procedures
Candidate actions will be drawn from several sources. Initially alternatives will be identified through internal assessment of hydrological conditions, water use and administration, and ecological needs. Discussions with stakeholders and reference to the Colorado Roundtable's BIP list of Identified Projects and Processes (IPPs) may additionally provide candidate actions for implementation in the project area. Structural projects, collaborative processes or management actions may include, but will not be limited to, protection measures for high-value attributes, diversion structure improvements, agricultural efficiency improvements, in-channel habitat restoration, invasive species control and riparian habitat restoration, reservoir development and release schedule recommendations, and water leasing programs.

Deliverables
1. Table listing the identified alternatives, the issue(s) each responds to, the primary stakeholder(s) implicated, and a high-level evaluation of expected costs and benefits associated with each.

Activity 6. Identifying Next Steps

Task 6.1. Characterize Effectiveness and Feasibility of Alternatives

Description
Prioritization of alternative actions requires a robust approach for describing the relative effectiveness and feasibility of each.

Method/Procedure
MCWC will identify the stakeholders that should be primarily engaged in discussions about the relative merits of the identified alternatives. Stakeholder identification requires careful consideration of organizational missions, jurisdictional boundaries, personalities, and existing patterns of land and water use.

MCWC's consultant will utilize conceptual models, weight of evidence approaches, or numerical simulations to predict ecological and recreational use outcomes of each candidate alternative action. Predicted outcomes will be assessed against stakeholder-identified management objectives. Actions will then be ranked against each other based on their predicted ability to meet stated objectives.

The characterization of feasibility for each alternative requires careful evaluation of administrative, legal, financial, and institutional constraints. MCWC's consultant will aggregate streamflow records, hydrological simulation products, records from the Colorado Department of Water Resources, land ownership and cadastral data, and existing engineering reports to support discussions with local water

users about the demands, efficiencies, and use shortages associated with various uses of water from the high-priority reaches. This effort may also utilize available engineering assessments or secure new conceptual level assessments to provide important information about the costs of structural projects. Conversations with the local Water Commissioner will help identify critical administrative constraints on water management alternatives. Through this process, MCWC hopes to simultaneously characterize project feasibility and identify likely proponents/champions for specific issues. At the conclusion of this effort, all alternatives will be ranked according to their relative feasibility.

Finally, MCWC and its consultant will integrate the results from the effectiveness and feasibility assessments to identify high-priority actions for protecting or improving ecological integrity and the delivery of ecosystem goods and services to local communities. Conceptual level implementation plans for each action will be developed. Implementation plans will identify project champions, affected stakeholders, recommendations for overcoming technical, financial, or legal constraints, anticipated outcomes, and a monitoring plan for assessing long-term effectiveness.

Deliverables

1. Report summarizing the relative effectiveness and perceived feasibility of each alternative action and identifying high-priority actions, accordingly.
2. Conceptual implementation plan for high-priority actions.

Task 6.2. Develop Strategy for Phase II Efforts

Description

Completion of Phase I of this multi-year project will provide evidence, experience, and a history of stakeholder engagement that will allow MCWC to develop a refined strategy for conducting similar efforts on tributaries to the Colorado River between Glenwood Springs and De Beque. It may also yield implementation plans that are ripe for funding consideration as part of a phase II effort.

Method/Procedure

MCWC will work with its consultant to reflect on geographic areas within the Middle Colorado watershed, experiences with stakeholders, and high-priority issues identified by the local community to determine which sub-basins in the watershed are good candidates for continued integrated water management planning and/or specific project or program implementation. In relation to future planning opportunities, MCWC will evaluate the relative successes and merits of the planning process used in phase I to identify elements that require modification to ensure adequate alignment with local priorities or common lines of questioning.

Deliverables

1. Strategy that can be used to develop future grant requests for Phase II implementation and continued planning.

Budget

Task No.	Description		CWCB Funds	Other Funding Cash	Other Funding Cash WSRF CoRT	Other Funding In-Kind	Total
1.1	Project Management, Reporting, Expenses		$17,000	$5,500	$700	$0	$23,200
2.1	Project Advisory Committee		$0	$0	$8,200	$38,000	$46,200
2.2	Staeholder Outreach/Engagement Plan		$0	$0	$6,600		$6,600
2.3	Implementing Outreach and Engagement		$0	$0	$49,900	$24,000	$73,900
3.1	Refine Hydrological Simulation Modelling Tools		$11,400	$3,700	$500	$0	$15,600
3.2	Characterize Ecological Integrity/Delivery of Ecosystem Goods and Services		$97,300	$32,000	$4,000	$4,200	$137,500
4.1	Identify High Priority Management Issues and Locations		$6,000	$2,000	$200	$0	$8,200
4.2	Select Management Goals and Objectives		$16,700	$5,400	$700	$0	$22,800
5	IdentifyAlternatives that Meeting Planning Goals and Objectives		$2,900	$1,000	$200	$0	$4,100
6.1	Characterize Effectiveness and Feasibility of Alternatives		$37,600	$12,300	$1,600	$0	$51,500
6.2	Develop Strategy for Phase II Efforts		$18,700	$6,100	$800	$0	$25,600
		Total	**$207,600**	**$68,000**	**$73,400**	**$66,200**	**$415,200**

Cash and Non-Cash Match

Contributing Entity	Amount and Form of Match
Colorado Roundtable (pending approval November 2018)	$73,400 cash
Garfield County (pending 2018 budget approval)	$25,000 cash
City of Rifle (pending 2018 budget approval)	$1,000 cash
City of Glenwood Springs (pending 2018 budget approval)	$2,000 cash
Colorado River District	$12,000 In-kind for facilitation services

Technical Advisors	$30,000 in-kind for technical assistance from the to-be-formed planning Advisory Committee, and the existing MCWC Technical Advisory Committee and Riparian Restoration Advisory Group
Tamarisk Coalition	$4,200 in-kind for TC staff working on detailed riparian vegetation mapping and characterization for the mainstem Colorado
Community Stakeholders	$20,000 in-kind for community members who participate in outreach and engagement efforts
Gates Family Foundation (not secured)	$40,000 cash
Total Match	**$207,600**

Timeline Table

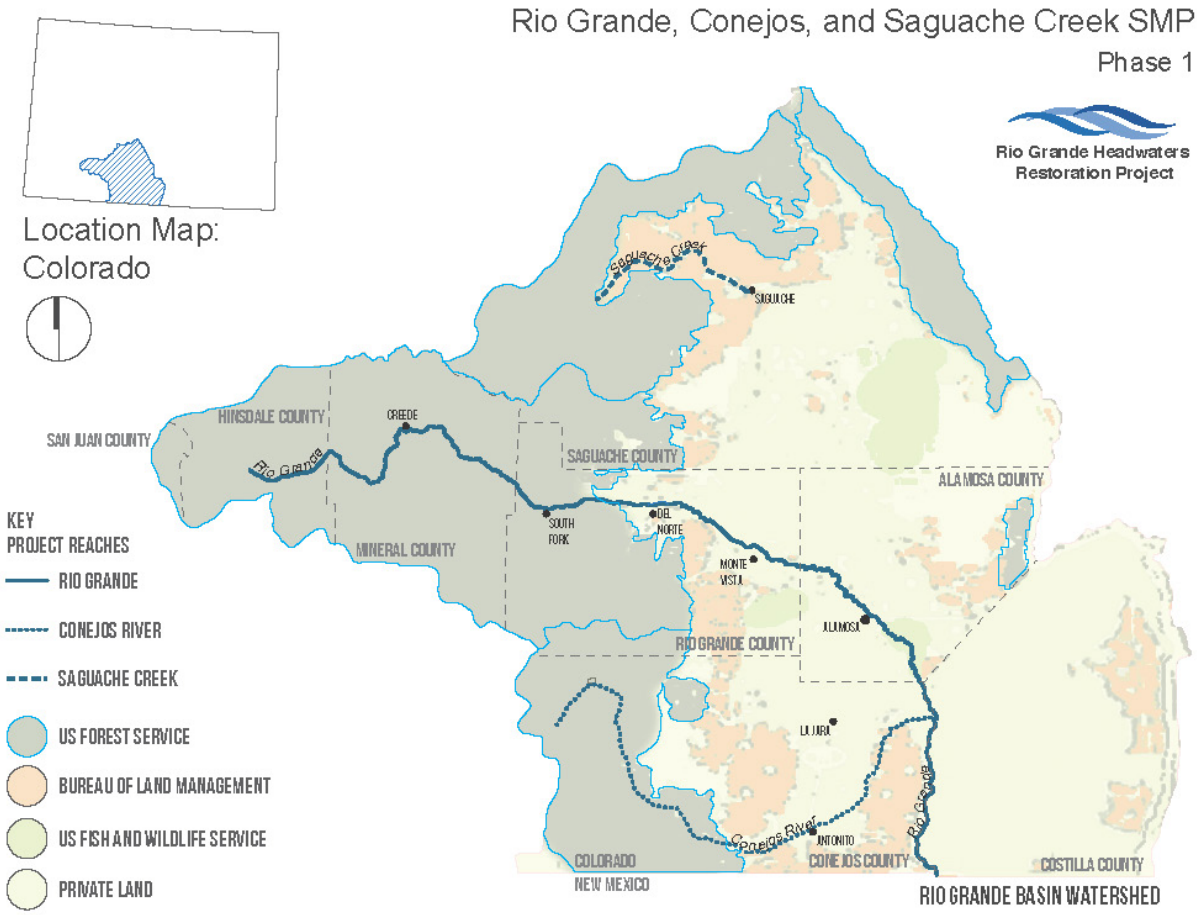
Phase I will be initiated in May 2018 and continue for 24 months through April 2019.

Activity	Task	Description	2018								2019												2020			
			May	June	July	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr
Project Management	1.1	Project Management, Reporting, Expenses																								
Engaging Stakeholders	2.1	Project Advisory Committee																								
	2.2	Stakeholder Outreach and Engagement Plan																								
	2.3	Implementing Outreach and Engagement																								
Assess Existing Conditions	3.1	Refine Hydrological Simulation Modelling Tools																								
	3.2	Characterize Ecological Integrity/Delivery of Ecosystem Goods and Services																								
Articulate Goals and Objectives	4.1	Identify High Priority Management Issues and Locations																								
	4.2	Select Management Goals and Objectives																								
Identify Alternatives	5.1	IdentifyAlternatives that Meeting Planning Goals and Objectives																								
Identify Next Steps	6.1	Characterize Effectiveness and Feasibility of Alternatives																								
	6.2	Develop Strategy for Phase II Efforts																								

Colorado Watershed Restoration Grant Proposal

Project Title: Rio Grande, Conejos River, and Saguache Creek Stream Management Plan – Phase 1

Project Location: Rio Grande from Rio Grande Reservoir to the State Line; Conejos River from Platoro Reservoir to the confluence with the Rio Grande; Saguache Creek from the United States Forest Service (USFS) Boundary to the Town of Saguache.



Grant Type: Stream Management Plan Grant
Grant Request: $118,000
Cash Match Funding: $99,660
In-kind Match Funding: $20,600
Project Sponsor: Colorado Rio Grande Restoration Foundation, fiscal agent for the Rio Grande Headwaters Restoration Project
Contact Person: Emma Reesor, Executive Director, emma@riograndeheadwaters.org, (719) 589-2230

The project will capitalize on the community's momentum toward the effort to create stream management plans (SMPs) for portions of the Rio Grande, Conejos River, and Saguache Creek. The SMPs will utilize existing data regarding the physical condition of reaches and data collected through targeted sampling. The collection, summary, and application of the data will be completed with ongoing stakeholder participation. The goals identified in the SMPs will further the efforts of the communities of the San Luis Valley to improve flows and physical conditions of priority streams for environmental, recreational, and community benefits.

Scope of Work
Grantee and Fiscal Agent: Colorado Rio Grande Restoration Foundation, fiscal agent for the Rio Grande Headwaters Restoration Project (RGHRP)
Primary Contact: Emma Reesor, Executive Director
Address: 623 Fourth Street, Alamosa, CO 81101
Phone: (719) 589-2230
Project Name: Rio Grande, Conejos River, and Saguache Creek Stream Management Plan – Phase 1
Grant Amount: $118,000

Introduction and Background (Please limit to half a page)
The Rio Grande, Conejos River, and Saguache Creek Stream Management Plan – Phase 1 (Project) will result in the development of stream management plans (SMPs) for the following reaches of priority streams in the Rio Grande Basin: Rio Grande from Rio Grande Reservoir to the State Line, Conejos River from Platoro Reservoir to the confluence with the Rio Grande, and Saguache Creek from the USFS Boundary to the Town of Saguache. The Rio Grande Interbasin Roundtable's SMP Committee prioritized the project reaches, developed the project scope of work, and is committed to assisting in the project by participating in the technical advisory group. The technical advisory group will include partners from water user groups, local environmental and recreation interests, and state and federal agencies.

The creation of the SMPs will include robust community and partner engagement, characterization of the physical condition of the streams using field sampling and consolidation of existing information, prioritization of ecological, recreational, and community values, development of goals for flows and physical conditions to protect and enhance streams, and establishing methods and associated opportunities and constraints to make progress toward goals. The plan will be used to inform multi-objective projects to restore and protect the natural and cultural resources within the Rio Grande watershed.

The project will be managed by the RGHRP. The RGHRP has a proven track record of successfully managing projects to improve the condition of the Rio Grande through collaboration with local, state, and federal partners since 2001. The projects, which include a combination of riparian restoration, diversion and headgate rehabilitation, watershed stewardship, and outreach and education, have resulted in improved upland and in-stream habitat, streambank stability, floodplain function, water quality, diversion efficiency, recreation, and community engagement. The RGHRP Executive Director, Emma Reesor will oversee the implementation and administration of the project. A full-time project coordinator will be hired to facilitate the completion of project tasks.

Objectives
1. Maintain and build on the coalition of community partners engaged in stream management planning through frequent and robust stakeholder engagement throughout the project.
2. Summarize and obtain information regarding the biological, hydrological, and geomorphological condition of identified stream reaches in the Rio Grande watershed.
3. Define and prioritize environmental, recreational, and community values.
4. Develop goals to improve flows and physical conditions needed to support values.
5. Outline actions to achieve measureable progress toward maintaining or improving goals.
6. Identify opportunities and constraints for implementation of projects, and additional data needed to inform project development.

Project Tasks

Task 1: Stakeholder Engagement

Description of Task: Maintain existing interest and continually build engagement in stream management planning by facilitating frequent and open conversations with diverse interests in the Rio Grande Basin.

Method/Procedure: The project coordinator will establish a technical advisory group, which will include the existing Rio Grande Roundtable SMP Committee, partners from water user groups, local environment and recreation interests, and state and federal agencies, including CWCB, CPW, USFWS, USFS, BLM, and Natural Resources Conservation Service (NRCS). The coordinator will provide project status updates and seek feedback at regular organization meetings including the regular meeting of the Rio Grande Basin Roundtable, Rio Grande Water Conservation District, San Luis Valley Water Conservancy District, and Conejos Water Conservancy District. The coordinator will also seek feedback from the diverse water user groups including the Rio Grande Water Users Association, Conejos Water Users Association, Saguache Creek Water Users Association, and San Luis Valley Trout Unlimited. The coordinator and technical advisory group will hold periodic public and committee meetings to review data and draft recommendations, and seek community feedback. These meetings and other status updates will be shared on the Rio Grande Basin Roundtable website, in newspapers, and on the radio.

Deliverable: A representative and diverse coalition of community partners working to ensure the stream management planning process is completed in an open, inclusive manner with clear, actionable goals to protect and improve prioritized ecological, recreational, and community values.

Task 2: Summarize Existing Information

Description of Task: Review and summarize existing relevant information regarding the physical condition of the reaches, existing watershed plans and assessments, and land management directives.

Method/Procedure: The project coordinator will compile existing information in a summary document that outlines the known physical conditions of the stream reaches. Relevant studies and documents include (but are not limited to) the Rio Grande Basin Implementation Plan, Rio Grande National Forest (RGNF) Plan, the RGNF Federal Reserve Water Rights Decree, Bureau of Land Management (BLM) Plan, US Fish and Wildlife Service (USFWS) Refuge Management Plan, 2017 Upper Rio Grande Watershed Assessment, Rio Grande Headwaters Restoration Project 2001 Master Restoration Plan, 2016 Lower Rio Grande Study, Rio Grande Natural Area Plan, Habitat Conservation Plan, Colorado Parks and Wildlife (CPW) aquatic sampling and stocking information, Groundwater Management Plans, and the diversion structure inventory of the Rio Grande and Conejos River completed with funding from CWCB in 2006. The coordinator will arrange interviews with technical experts and resource managers as needed to gather additional subject matter and interpret the documents.

Deliverable: A compilation of known data for the biological, hydrological, geomorphological, and physical conditions of the study reaches. An understanding of gaps in information where baseline or follow-up sampling is needed.

Task 3: Biology, Hydrology, Geomorphology, and Physical Conditions Assessment

Description of Task: Use targeted sampling to assess current biological, hydrological, geomorphological, and physical conditions of the study reaches.

Method/Procedure: The condition of the Rio Grande from the headwaters to the state line has been thoroughly documented through the 2017 Upper Rio Grande Watershed Assessment, the Rio Grande

Headwaters Restoration Project 2001 Master Restoration Plan (2001 Study), 2016 Lower Rio Grande Study, and other management plans (Attachment A). Task 2 will inform the technical team of needs for updates to the 2001 Study and the project coordinator will initiate targeted sampling accordingly. The RGHRP, San Luis Valley Water Conservancy District, and San Luis Valley Irrigation District will facilitate access to and assist with characterization of diversion and headgate condition, and surrounding riparian condition assessments on the Rio Grande. The condition of the Conejos River and Saguache Creek is largely undocumented. Therefore, the project coordinator, with input from the technical advisory group will develop a sampling strategy. The sampling strategy will include floating the river where possible (it is certain that at least two thirds of the Conejos river can be floated; Saguache Creek cannot be floated), using field and aerial information to break the river into homogenous subreaches, and completing sampling at a representative location in each subreach that includes channel cross sections, pebble counts, plant community identification, macroinvertebrate sampling, assessments of floodplain function and connectivity, flow readings, and notes on the condition of structures such as bridges, diversions, headgates, and homes within the floodplain. The Conejos Water Conservancy District will facilitate access to and assist with characterization of the Conejos River, and the Saguache Creek Water Users Association will facilitate access to and assist with characterization of Saguache Creek. Streamflow data will be compiled and analyzed using graphical methods. A description of temporal and spatial hydrologic trends will be prepared for each reach, and flow adequacy for nonconsumptive and consumptive needs will be assessed in concert with the biological and geomorphological observations. The project coordinator will complete sampling within their expertise and coordinate contractors, committee members, and technical experts to complete the remaining data collection. The coordinator will compile and summarize the data for the SMPs. The technical advisory group will review the data and provide feedback on the findings and presentation of results.

Deliverable: A written assessment and associated maps and tables of biological, hydrological, geomorphological, and physical conditions of the study reaches on the Rio Grande, Conejos River, and Saguache Creek.

Task 4: Identify and Prioritize Ecological, Recreational, and Community Values

Description of Task: Utilize community feedback, stakeholder engagement, data from Tasks 2 and 3, and a partnership with American Whitewater to identify the extent of recreation opportunities within the study reaches, summarize distribution of aquatic habitat and species, define priority ecological and floodplain functions, and determine community values.

Method/Procedure: The project coordinator and American Whitewater (AW) will work with the technical advisory group, agency partners, water users, recreational boaters and fishermen, and environmental interests to identify the location and types of river based recreation opportunities within the study reaches. Project partners will collaborate with American Whitewater (AW) to complete a boatable days study on the Rio Grande between Rio Grande Reservoir and on the Del Norte gage and the Conejos River between Platoro Reservoir and the Mogote gage. The boatable days study will identify the flows needed for whitewater boats, rafts, kayaks, paddle boards, and fishing crafts, the frequency with which those flows are present, and potential changes in boatable days due to climate change and water projects. The project coordinator will work with Trout Unlimited, outfitters, fishermen, and CPW to characterize distribution of fish species, locations of and flows to support different types of fishing, and desired flows and physical conditions to support aquatic management objectives. The project coordinator and community stakeholders will review field data and identify specific locations of importance within the stream reaches for flood protection, upland and aquatic habitat, water quality protection, agriculture water diversions, groundwater recharge, and sediment transport capacity. The

data developed in Tasks 2, 3, and 4 will be used by the technical advisory group and stakeholders to identify and prioritize recreation, ecological, and community values within the study reaches.

Deliverable: An inventory and understanding of the interplay between the types and location of river based recreation, aquatic habitat and species distribution, fluvial and floodplain functions, groundwater recharge, and agriculture water use in the study reaches. Prioritized ecological, recreational, and community values with spatial and temporal considerations.

Task 5: Develop Goals and Identify Methods for Implementation
Description of Task: Utilize the assembled data regarding the physical condition of the stream reaches to develop goals and potential methods to improve and protect the identified ecological, recreation, and community values.

Method/Procedure: The project coordinator will present the data assembled in Tasks 2, 3, and 4 to the technical advisory group, project cooperators, and different stakeholder groups. Feedback from partners will help determine if information gaps exist and, if so, identify the best methods for obtaining missing information. Additional information may be collected in a future phase of the project. The project partners will utilize the physical data and prioritized ecological, recreation, and community values to quantify numeric flow ranges and physical conditions to support values within each reach and subreach. The partners will determine the types of multi-purpose projects that could improve physical conditions, such as in-river structure updates, headgate automation, additional measurement devices, fish passage construction, furthering the flow programs (Attachment B – TU support letter), riparian restoration, floodplain connectivity, flood protection, and aquifer recharge. Partners will also identify temporal, geographical, legal, or administrative constraints and opportunities that may limit or assist in the ability to meet goals and utilize implementation methods.

Deliverable: Well defined goals and methods to protect and improve the ecological, recreation, and community values in each of the stream reaches, with an understanding of limitations, constraints, and opportunities.

Task 6: Project Administration
Description of Task: Administer the project effectively by completing all necessary contracts, status reports, and internal and external documents. Ensure Tasks are completed within approved costs and timelines.

Method/Procedure: The RGHRP will administer the project and oversee the project coordinator. This includes completing contracts with the CWCB, project partners, and contractors; managing invoices, budgets, and reimbursement requests; and completing reports. Additionally, the RGHRP will perform Project oversight; making certain implementation is timely and accordance with the Scope of Work.

Deliverable: All appropriate contracts, external and internal reports, and Project activities completed within planned period and anticipated costs.

Reporting and Final Deliverable
The RGHRP will provide a progress report to CWCB every 6 months describing the completion of the tasks identified in the statement of work including a description of any major issues that have occurred and any corrective action taken to address these issues. The RGHRP shall provide the CWCB a final report that summarizes the project and documents how the project was completed.

Rio Grande, Conejos, and Saguache Creek Stream Management Plan - Phase 1: Timeline and Budget by Task and Funding Source											
				Cash Contributions					In-kind Contributions		
Task	Description of Task	[1] Proposed Start Date	Proposed End Date	CWCB Watershed Restoration Program	CWCB CO Water Plan Grant	SLV Water Conservancy District	American Whitewater	Rio Grande Headwaters Restoration Project	Conejos Water Conservancy District	Technical Team	TOTAL
Task 1	**Stakeholder Engagement**	3/1/18	8/31/19	$ 8,000	$ -	$ -	$ -	$ -	$ -	$ 1,300	$ 9,300
Task 2	**Summarize Existing Information**	3/1/18	5/31/18	$ 6,500	$ -	$ 5,000	$ -	$ -	$ -	$ 1,000	$ 12,500
Task 3	**Physical Conditions Assessment**										
	Biology - Botany and Aquatic Habitat	5/1/18	10/31/18	$ 12,500	$ -	$ -	$ -	$ 1,500	$ -	$ 1,000	$ 15,000
	Hydrology	5/1/18	10/31/18	$ 13,000	$ -	$ -	$ -		$ -	$ -	$ 13,000
	Geomorphology	5/1/18	10/31/18	$ 15,000	$ -	$ -	$ -	$ 1,500	$ -	$ 1,000	$ 17,500
	Structures within the Floodplain	5/1/18	10/31/18	$ 15,000	$ -	$ -	$ -	$ 1,500	$ 5,000	$ 1,000	$ 22,500
Task 4	**Identify and Prioritize Ecological and Recreation Values**										
	Environmental Priorities	11/1/18	3/15/19	$ 5,000	$ -	$ -	$ -	$ -			$ 5,000
	[2] Recreation Inventory and Boatable Days	1/15/18	3/15/19	$ 5,000	$ 29,100	$ -	$ 40,860	$ -	$ -	$ 1,300	$ 76,260
Task 5	**Develop Goals and Identify Methods for Implementation**										
	[2] Quantify Flow Recommendations	11/1/18	3/15/19	$ 5,000	$ 1,100	$ -	$ 1,100	$ -	$ -	$ 2,000	$ 9,200
	[2] Identify Constraints and Opportunities	11/1/18	3/15/19	$ 5,000	$ 9,000	$ -	$ 9,000	$ -	$ -	$ 2,000	$ 25,000
Task 6	**Project Administration**										
	Mapping	5/1/18	8/15/19	$ 15,000	$ -	$ -	$ -	$ -	$ -	$ -	$ 15,000
	SMP Preparation	5/1/18	8/31/19	$ 10,000	$ -	$ -	$ -	$ -	$ -	$ 3,000	$ 13,000
	Reporting and Grant Management	5/1/18	9/30/19	$ 3,000	$ -	$ -	$ -	$ -	$ -	$ 2,000	$ 5,000
			TOTAL	**$ 118,000**	**$ 39,200**	**$ 5,000**	**$ 50,960**	**$ 4,500**	**$ 5,000**	**$ 15,600**	**$ 238,260**
			% of Project Budget	49.5%	16.5%	2.1%	21.4%	1.9%	2.1%	6.5%	

[1] Anticipated Notice to Proceed on April 30, 2018

[2] American Whitewater (AW) will be a key project partner in this task. AW has proposed an end date of 1/15/21 for their involvement; The portion of the project funded by the Colorado Watershed Restoration grant will conclude 9/30/19

1. PROJECT PROPOSAL SUMMARY SHEET

Project Title: St. Vrain & Left Hand Stream Management Plan

Project Location: South St. Vrain Creek, Middle St. Vrain Creek, North St. Vrain Creek, and the main stem of St. Vrain Creek to the confluence of the South Platte River, also including the tributary of Left Hand Creek upstream and including its tributaries James Creek and Little James Creek. (See Attachment A)

Grant Type: Watershed Restoration Program: Stream Management Planning

Grant Request: $150,000

Cash Match Funding: $57,500
WSRF Grant Match: $50,000 (Pending Approval)
In-Kind Match Funding: $7,000
Cash Match Funding: $35,500 (Request and Approval Necessary)

Project Sponsor: St. Vrain and Left Hand Water Conservancy District

Contact: Sean Cronin, Executive Director, 303-772-4060, sean.cronin@svlhwcd.org

Project description:
The St. Vrain Creek watershed (which includes Left Hand Creek) is critical to maintaining the health, biodiversity, character, and economy of communities within the region, including Lyons and Longmont. The creek is home to a diverse population of native fish, receives Colorado River transmountain water, hosts one of the country's largest outdoor games, has its headwaters in Rocky Mountain National Park and the Indian Peaks Wilderness, and its confluence in a county that is the largest agricultural economic producing county in Colorado. Further, the watershed has a diverse array of stakeholders that use and derive value from the waters including agricultural users, domestic water providers, and recreational users.

Colorado's Water Plan (CWP) sets a measurable objective to cover 80 percent of the locally prioritized lists of rivers with stream management plans. CWP used the South Platte Basin Implementation Plan (BIP) to help inform this measurable objective. The South Platte BIP studied a reach of St. Vrain Creek for environmental and recreational opportunities and concluded streamflows may be present to achieve environmental and recreational outcomes. However, the BIP further concluded "studies that relate the channel form and function to the streamflows can make assessment of flows in the area more robust". Moreover the BIP further states, in recognition of the significant post-flood stream restoration activities "assessments should be made regarding the requirements of aquatic and riparian ecosystems in the area…".

The BIP also concluded for the St. Vrain that "streamflows necessary for recreational needs should be assessed". Opportunities for flow improvements may be available. For example, the BIP referenced the St. Vrain as one of two tributaries to the South Platte River that have the largest annual potential for water availability, furthermore the St. Vrain and Left Hand Water Conservancy District (District) owns a relatively senior water right, not currently in use, decreed for uses that include environmental and recreation.

With such a wide range of uses and intense focus of study, the St. Vrain poses an excellent opportunity to balance river health with water users' needs through completion of a stream management plan (SMP).

The overall goal of the SMP is to collaboratively identify projects and management strategies in both St. Vrain and Left Hand Creeks that transition stakeholders from flood recovery to stream health projects that improve environmental conditions in the river while also meeting water users' current and future needs and are aligned with private property rights, public land and resource management plans, and the prior appropriation system. The District will lead the development of a SMP that will take place in two phases over approximately five years.

2. BACKGROUND & STATEMENT OF NEED

2.1. Basin Background

The St. Vrain Creek watershed (which includes Left Hand Creek) is critical to maintaining the health, biodiversity, character, and economy of communities within the region, including Lyons and Longmont. The creek is home to a diverse population of native fish, receives Colorado River transmountain water, hosts one of the country's largest outdoor games, has its headwaters in Rocky Mountain National Park and the Indian Peaks Wilderness, and its confluence in a county that is the largest agricultural economic producing county in Colorado. With such a wide range of uses and an intense focus of study, the St. Vrain poses an excellent opportunity to balance river health with water users' needs through completion of a stream management plan.

2.2. Project Need

With few exceptions, the St. Vrain Creek watershed (which includes Left Hand Creek) has historically been managed without a collective vision to maximize the river's use while also balancing its health. The September 2013 flood brought about a reenergized and expansive era of collaboration along with hundreds of millions of dollars for stream restoration. The collaborative flood recovery created a greater level of trust and partnership amongst water users, and many now want to transition to discussions of water management activities that can maximize post-flood projects to further benefit environmental, recreational, agricultural and domestic uses. A SMP appears to many stakeholders as a means to facilitate this transition.

Colorado's Water Plan sets a measurable objective to cover 80 percent of the locally prioritized lists of rivers with stream management plans. Colorado's Water Plan used the South Platte Basin Implementation Plan (BIP) to help inform this measurable objective. The South Platte BIP studied a reach of St. Vrain Creek for environmental and recreational opportunities and concluded streamflows may be present to achieve environmental and recreational outcomes. However, the BIP further concluded that significant additional flow information is necessary, that stream channel and fish passage modifications should be further analyzed, and voluntary operational flow agreements, such as those previously operated by the St. Vrain Corridor Committee, should be explored.

Following flood recovery projects, BIP completion, and in response to requests for leadership, the St. Vrain and Left Hand Water Conservancy District convened stakeholder meetings over two months to obtain feedback on: 1.) interest in pursuing a Stream Management Plan, and 2.) if the District should take the lead on applying for the grant. Through these face to face meetings, as well as one-on-one interviews conducted with the help of River Network, stakeholders agreed the District should have a leadership role and this grant could serve as an opportunity to transition our focus from flood recovery to water use strategies that benefit river health.

3. GOALS AND OBJECTIVES

3.1. Project Goal

The overall goal of the Project is to collaboratively identify projects and management strategies in both St. Vrain and Left Hand Creeks from the headwaters to the confluence of the South Platte River that transition stakeholders from flood recovery to stream health projects that improve environmental conditions in the river while also meeting water users' current and future needs and are aligned with private property rights, public land and resource management plans, and the prior appropriation system.

3.2. Objectives

The District proposes to develop the Project in two phases over approximately five years. The overall objectives and schedule for each phase is described below.

Phase 1 – 2018-2019

- Objective 1: Develop support from stakeholders and the community at large for projects and management options that improve stream health and water availability for agricultural, municipal and recreational users
- Objective 2: Compile existing databases, reports, studies, and analyses of environmental, recreational, municipal, and agricultural water uses within the Study Area

- Objective 3 - Characterize the future water needs of agricultural, environmental, recreational, municipal and industrial users in the Study Area, including shortages and infrastructure needs
- Objective 4 – Assess river functional health within the Study Area and inventory stressors that are challenging or degrading it
- Objective 5 – Compile results from Objectives 1 – 4 and develop an on-line interactive report that communicates those results and makes recommendations for proceeding to Phase 2

Phase 2 – 2019 - 2022

- Objective 1 – Collect additional data on priority reaches as identified in Phase 1
- Objective 2 – Work with stakeholders to select specific management objectives for the priority reaches and describe measureable goals.
- Objective 3 - Quantify projects or management options such as ranges of numeric flow recommendations to support environmental and recreational values that meet water users' needs as identified in Phase 1
- Objective 4 – Identify constraints and opportunities that may limit or assist meeting project goals
- Objective 5 - Revise the Community and Stakeholder Engagement Plans to reflect the roles and responsibilities of the stakeholders for project implementation.

4. GEOGRAPHIC SCOPE AND EXISTING INFORMATION

4.1. Geographic Scope

This project will encompass South St. Vrain Creek, Middle St. Vrain Creek, North St. Vrain Creek, and the main stem of St. Vrain Creek to the confluence of the South Platte River, also including the tributary of Left Hand Creek upstream and including its tributaries James Creek and Little James Creek. See Attachment A for project maps.

4.2. Existing Information

The St. Vrain Creek Watershed has several natural and ecological resources which provide distinct challenges and opportunities. As an example, a 2010 Colorado Parks and Wildlife inventory found that St. Vrain Creek outranks all other South Platte tributaries in the number of native fish species at 17, with 3 listed as Colorado species of concern. Though the St. Vrain hosts the largest diversity, the number of species has declined and many believe altered habitat, flow regime, and stream fragmentation are possible reasons.

Following the September 2013 flood, stream restoration activities improved habitat and many diversions were repaired with the addition of boat and fish passage to allow for greater stream connectivity. However, flow was not specifically addressed and future approaches, if any, to address flow needs will be piecemeal and not part of a comprehensive effort. According to the South Platte Basin Implementation Plan, which focused on a section of the St. Vrain to serve as an example for assessing environmental and recreational protections, additional "studies that relate the channel form and function to the streamflows can make assessment of flows in the area more robust". Moreover, in recognition of the significant post-flood stream restoration activities, the BIP also recommends "assessments should be made regarding the requirements of aquatic and riparian ecosystems in the area…" and "streamflows necessary for recreational needs should be assessed".

As shown above, the waters of St. Vrain watershed (which includes Left Hand Creek) have been studied extensively over the past 20 years. Studies from Colorado State University, University of Colorado, Boulder County Parks and Open Space, City of Longmont, Town of Lyons, Colorado Parks and Wildlife and the most recent flood master plans all provide a foundation to maximize the grant funding. A comprehensive list of the studies can be found in Attachment B. If funded, these studies' findings will be utilized and built upon to further the objectives of the SMP and the efforts will be made to address those information gaps to the greatest extent feasible.

5. ORGANIZATIONAL CAPACITY

5.1. Project Lead and Stakeholders

The St. Vrain and Left Hand Water Conservancy District will serve as both the fiscal agent and lead entity for this Stream Management Plan. The District will work closely and collaborate with a wide range of stakeholders and

engage these stakeholders at various levels throughout the process. When gathering feedback on whether or not to undertake a Stream Management Plan, the District convened the following for input:

- American Whitewater
- Boulder County
- City of Longmont
- Colorado Parks and Wildlife (unable to attend due to time constraints)
- Colorado Trout Unlimited
- Division Engineers Office (not able to attend due to time constraints)
- Highland Ditch Company (unable to attend due to time constraints)
- Left Hand Ditch Company
- Left Hand Water District
- Lefthand Watershed Oversight Group
- St. Vrain Creek Coalition
- Town of Lyons
- US Forest Service

If the grant is awarded it is expected the list above will be expanded to include other experts, the general public and other stakeholder groups. Specific levels of involvement will be finalized with guidance from the consulting team and stakeholders (see Task 1).

5.2. History of Accomplishments

The St. Vrain and Left Hand Water Conservancy District was formed in 1971 to develop, manage and protect water resources in the Longmont area by providing cutting edge water education, acting as stewards for a very precious natural resource, helping people and governmental agencies find creative solutions to meet their water needs, fighting threats to local water supplies and protect existing water rights, and ensuring high quality water is available for future generations.

For over 45 years the District has lead and partnered in many significant water related activities in the basin. A few examples are provided below:

Protection of North St. Vrain Creek: The District fought alongside other water users on a proposal designating the North St. Vrain Creek as Wild and Scenic. Concerned about restrictions and effects on private property and water rights, the District participated in a decade long process that resulted in a 1996 compromise amending the legislation that created Rocky Mountain National Park to include a prohibition on "construction of any new dam, reservoir, or impoundment on any segment of North St. Vrain Creek or its tributaries within the boundaries of Rocky Mountain National Park or on the main stem of North St. Vrain Creek downstream to the point at which the creek crosses the elevation 6,550 feet" (approximately the upstream terminus of Button Rock Reservoir).

Flow Enhancements along St. Vrain Creek: In 2009, the District as a member of the St. Vrain Corridor Committee facilitated an effort to install gates within diversion structures to pass voluntary winter flows from Button Rock Reservoir to Longmont. This project was partially funded by a CWCB grant.

St. Vrain Creek Coalition: Following the September 2013 flood, the District advocated for a collaborative approach to flood recovery. Working closely with federal, state and local partners the District played a critical leadership role ensuring the coalition was structured effectively to maximize flood recovery funding. For example, the District facilitated local stakeholders in the process of creating coalition bylaws and governance structure.

Ditch Company Funding: Following the September 2013 flood, the District worked with FEMA and CWCB to design a method for ditch companies to receive funding. The work with FEMA lead to "Issue Paper #4" that provided 75% funding for ditch company diversions (which had never been provided in the past) and the work with CWCB lead to unique emergency loan and grant programs.

5.3. Staffing Resources

This proposal includes the hiring of a project manager, and other expert consultants for the "heavy lift", though local expertise will be provided. Specifically the St. Vrain and Left Hand Water Conservancy District has committed ¼ time of its Executive Director, Sean Cronin, for the entirety of the project. Sean has 20 plus years experience in water resource planning and policy, serves on the Interbasin Compact Committee (IBCC), is a former chair of the South Platte

Basin Roundtable, and serves on the board for Lefthand Watershed Oversight Group and St. Vrain Creek Coalition. Though specific commitments have not yet been obtained, many other stakeholders (listed in section 5.1) have indicated a willingness to dedicate expertise to this project as well.

6. Monitoring and Implementation Plan

Ultimately, project success will be measured on its ability to implement projects or management strategies that protect or improve the health of the St. Vrain and Left Hand creeks while also meeting water users' needs. On a short term basis, the project will measure its success by:

- Active participation by a range of stakeholders and buy-in to proceed to Phase 2
- Completion of all deliverables in the scope of work on time and on budget
- A second grant request to CWCB in 2019 for Phase 2

7. Budget, Match and Schedule

7.1. Budget and Match

Task	Task Description	Estimated Labor Dollars	Estimated Other Direct Costs Dollars	Total Project Costs Dollars
1	Stakeholder Engagement and Community Outreach	$ 26,400	$ 600	$ 27,000
2	Existing Data Collection and Information Review	$ 36,000	$ -	$ 36,000
3	Demand Shortage and Infrastructure Assessment	$ 75,000	$ -	$ 75,000
4	River Health Assessment	$ 69,000	$ 1,000	$ 70,000
5	Phase 1 Final Report and Phase 2 Recommendations	$ 44,400	$ 500	$ 44,900
6	Project Management and Coordination	$ 46,800	$ 300	$ 47,100
	Totals	**$ 297,600**	**$ 2,400**	**$300,000**

As shown above Phase 1 is expected to cost $300,000. The match, shown below, is mostly cash ($7,000 in-kind). There is still $35,500 in funding that has not been committed or secured.

GRANT	MATCH						
CWCB Funds	American Whitewater (In-Kind)	TU - St. Vrain Anglers	SPBRT - WSRF	SVLHWCD	JLB	Boulder County (To be Requested for 2019 Budget)	City of Longmont (Pending 2019 Budget Approval)
$ 13,500			$ 13,500				
$ 18,000		$5,000	$ 13,000				
$ 37,500	$ 7,000		$ 23,500	$ 7,000			
$ 35,000				$ 35,000			
$ 22,450				$ 8,000	$2,500	$ 11,950	
$ 23,550						$ 5,800	$ 17,750
$ 150,000	**$ 7,000**	**$5,000**	**$ 50,000**	**$ 50,000**	**$2,500**	**$ 17,750**	**$ 17,750**

7.2. Schedule

A schedule for the SMP is shown in Attachment C.

Attachment C: Budget and Schedule

Task	Task Description	Estimated Labor Dollars	Estimated Other Direct Costs Dollars	Total Project Costs Dollars
1	Stakeholder Engagement and Community Outreach	$ 26,400	$ 600	$ 27,000
2	Existing Data Collection and Information Review	$ 36,000	$ -	$ 36,000
3	Demand Shortage and Infrastructure Assessment	$ 75,000	$ -	$ 75,000
4	River Health Assessment	$ 69,000	$ 1,000	$ 70,000
5	Phase 1 Final Report and Phase 2 Recommendations	$ 44,400	$ 500	$ 44,900
6	Project Management and Coordination	$ 46,800	$ 300	$ 47,100
	Totals	**$ 297,600**	**$ 2,400**	**$300,000**

GRANT	MATCH						
CWCB Funds	American Whitewater (In-Kind)	TU - St. Vrain Anglers	SPBRT - WSRF	SVLHWCD	JLB	Boulder County (To be Requested for 2019 Budget)	City of Longmont (Pending 2019 Budget Approval)
$ 13,500			$ 13,500				
$ 18,000		$5,000	$ 13,000				
$ 37,500	$ 7,000		$ 23,500	$ 7,000			
$ 35,000				$ 35,000			
$ 22,450				$ 8,000	$2,500	$ 11,950	
$ 23,550						$ 5,800	$ 17,750
$ 150,000	**$ 7,000**	**$5,000**	**$ 50,000**	**$ 50,000**	**$2,500**	**$ 17,750**	**$ 17,750**

Task	Task Description	Target Start	Target Complete
1	Stakeholder Engagement and Community Outreach	7/1/2018	7/1/2019
2	Existing Data Collection and Information Review	9/1/2018	11/1/2018
3	Demand Shortage and Infrastructure Assessment	9/1/2018	3/1/2019
4	River Health Assessment	9/1/2018	5/1/2019
5	Phase 1 Final Report and Phase 2 Recommendations	5/1/2018	7/1/2019
6	Project Management and Coordination	7/1/2018	7/1/2019

	Billing Rate	$ 150	$ 150	$ 150	$ 150	$ 100	$ 100			
	Task 1							**Total Labor Costs Dollars**	**Other Direct Costs Dollars**	**Totals**
	Stakeholder Engagement and Community Outreach									
1.1	Convene key stakeholders; estalish roles and responsibilities	16	16	16	16					
1.2	Develop Stakeholder Engagement Plan	32	8	8	8					
1.3	Develop Community Engagement Plan	32	8	8	8					
	Total Hours	***80***	***32***	***32***	***32***	***0***	***0***	-	-	***176***
	Total Cost	***$ 12,000***	***$ 4,800***	***$ 4,800***	***$ 4,800***	***$ -***	***$ -***	***$ 26,400***	***$ 600***	***$ 27,000***
	Task 2							**Total Labor Costs Dollars**	**Other Direct Costs Dollars**	**Totals**
	Existing Data Collection and Information Review									
2.1	Organize information into database		80							
2.2	Create on-line spatial database		80							
2.3	Develop web-based mapping application		80							
	Total Hours	***0***	***240***	***0***	***0***	***0***	***0***	-	-	***240***
	Total Cost	***$ -***	***$ 36,000***	***$ -***	***$ -***	***$ -***	***$ -***	***$ 36,000***	***$ -***	***$ 36,000***
	Task 3							**Total Labor Costs Dollars**	**Other Direct Costs Dollars**	**Totals**
	Demand Shortage and Infrastructure Assessment									
3.1	Obtain SPDSS data; est. daily point flows; analyze natural vs existing conditions			100						
3.2	Compile information and data on water sector infrastructure; develop recommendations and conceptual costs.			100						
3.3	Recreational flow studies			8		120				
3.4	Project future hydrology and water availability			80						
3.5	Project future demand shortages for ag, munic and rec uses			100						
3.6	Assess need for additional analysis relative to uses for Study Area			32						
	Total Hours	***0***	***0***	***420***	***0***	***120***	***0***	-	-	***540***
	Total Cost	***$ -***	***$ -***	***$ 63,000***	***$ -***	***$ 12,000***	***$ -***	***$ 75,000***	***$ -***	***$ 75,000***
	Task 4							**Total Labor Costs Dollars**	**Other Direct Costs Dollars**	**Totals**
	River Health Assessment									
4.1	Develop stream health assessment framework			60						
4.2	Divide Study Area into homogenous zones and reaches			60						
4.3	Desktop and rapid field evaluations			80						
4.4	Evaluate health of individual reaches, zones based on stressors and evidence assessment			100						
4.5	Identify challenges to maintaining river health			60						
4.6	Develop list of outstanding data needs for ranking			40						
4.7	Draft list of watershed focus areas			60						
	Total Hours	***0***	***0***	***460***	***0***	***0***	***0***	-	-	***460***
	Total Cost	***$ -***	***$ -***	***$ 69,000***	***$ -***	***$ -***	***$ -***	***$ 69,000***	***$ 1,000***	***$ 70,000***
	Task 5							**Total Labor Costs Dollars**	**Other Direct Costs Dollars**	**Totals**
	Phase 1 Final Report and Phase 2 Recommendations									
5.1	Compile project information	16	80	60	60					
5.2	Develop on-line interactive report		80							
	Total Hours	***16***	***160***	***60***	***60***	***0***	***0***	-	-	***296***
	Total Cost	***$ 2,400***	***$ 24,000***	***$ 9,000***	***$ 9,000***	***$ -***	***$ -***	***$ 44,400***	***$ 500***	***$ 44,900***
	Task 6							**Total Labor Costs Dollars**	**Other Direct Costs Dollars**	**Totals**
	Project Management and Coordination									
6.1	Coordinate with Project Team		48	24	24	24				
6.2	Compile team invoices; track project metrics; progress reports		48							
6.3	CWCB progress reports and communication		40							
6.4	Support Task 1 meetings		48	24	24	24				
	Total Hours	***0***	***184***	***48***	***48***	***48***	***0***	-	-	***328***
	Total Cost	***$ -***	***$ 27,600***	***$ 7,200***	***$ 7,200***	***$ 4,800***	***$ -***	***$ 46,800***	***$ 300***	***$ 47,100***

ATTACHMENT D: SCOPE OF WORK

GRANTEE AND FISCAL AGENT – St. Vrain and Left Hand Water Conservancy District (District)
PRIMARY CONTACT – Sean Cronin, Executive Director
ADDRESS - 9595 Nelson Road, Suite 203, Longmont, CO 80501
PHONE – 303-772-4060
PROJECT TITLE/NAME – St. Vrain & Left Hand Stream Management Plan
GRANT AMOUNT REQUEST - $150,000

INTRODUCTION AND BACKGROUND

Following flood recovery projects, the South Platte Basin Implementation Plan, and in response to requests for leadership, the St. Vrain and Left Hand Water Conservancy District convened stakeholder meetings over two months to obtain feedback on: 1.) interest in pursuing a Stream Management Plan, and 2.) if the District should take the lead on applying for the grant. Through these face to face meetings, as well as one-on-one interviews conducted with the help of River Network, stakeholders agreed the District should have a leadership role and this grant could serve as an opportunity to transition our focus from flood recovery to water use strategies that benefit river health.

Through collaboration and inclusivity the St. Vrain and Left Hand Water Conservancy District (District) will lead the development of a Stream Management Plan (SMP) for St. Vrain Creek and Left Hand Creek.

The overall goal of the SMP is to collaboratively identify projects and management strategies in both St. Vrain and Left Hand Creeks that transition stakeholders from flood recovery to stream health projects that improve environmental conditions in the river while also meeting water users' current and future needs and are aligned with private property rights, public land and resource management plans, and the prior appropriation system. The District will lead the development of a SMP that will take place in two phases over approximately five years. The SMP will be based upon assessments that use science and other technical methods to determine water use needs.

OBJECTIVES

The District proposes to develop the Project in two phases over approximately five years. The overall objectives and schedule for each phase is described below.

Phase 1 – 2018-2019

- Objective 1: Identify and engage key stakeholders in developing and implementing a comprehensive Stream Management Plan for the St. Vrain Basin
- Objective 2: Compile existing databases, reports, studies, and analyses of environmental, recreational, municipal, and agricultural water uses within the Study Area. Identify information gaps and address those information gaps to the greatest extent feasible
- Objective 3 - Document future water needs of agricultural, environmental, recreational, and municipal users in the Study Area, including water supply shortages and infrastructure needs
- Objective 4 – Assess river functional health within the Study Area and inventory stressors that are challenging or degrading it, identify priority reaches for Phase 2, and additional data or information needs
- Objective 5 – Compile results from Objectives 1 – 4 and develop an on-line interactive report that communicates the results and makes recommendations for proceeding to Phase 2

Phase 2 – 2019 - 2022

- Objective 1 – Collect additional data on priority reaches as identified in Objective 4, Phase 1
- Objective 2 – Work with stakeholders to select specific management objectives for the priority reaches and describe measurable goals
- Objective 3 - Quantify projects or management options such as ranges of numeric flow recommendations to support environmental and recreational values that meet water users' needs as identified in Objective 3 of Phase 1

- Objective 4 – Identify constraints and opportunities that may limit or assist in meeting the project goals
- Objective 5 - Revise the Community and Stakeholder Engagement Plans to reflect the roles and responsibilities of the stakeholders for project implementation

TASKS

The following tasks support implementation of **Phase 1 (this grant application)**.

Task 1 – Stakeholder Engagement and Community Outreach

Description of Task

The St. Vrain watershed has a diverse array of stakeholders that use and derive value from the waters of the St. Vrain and Left Hand Creeks and its watershed. These include agricultural users including ditch companies, domestic water providers, recreational users, and government agencies. User groups that represent the diverse ecological benefits of the watershed will also be engaged.

Outreach to stakeholders has already begun as part of the scoping process for this grant application. The stakeholders listed in section 5.1 of the application have already actively engaged in this initial process. Evaluation of the project scope by local stakeholders will provide meaningful context for development of a purpose statement and set of planning principles that will guide the remainder of the planning effort. The consulting team will coordinate a Kickoff Meeting where stakeholders will have an opportunity to suggest refinement to the scope and help shape the timeline and guiding principles for the project.

It is recognized that not all stakeholders will want to engage with the stream management planning process in the same ways. Therefore, a purpose of this task is to organize and convene the key stakeholders, who will contribute meaningfully, in the Study Area and assign roles and responsibilities throughout Phase 1. Moreover this task will both maximize the outreach effort, and maximize the engagement opportunities for those stakeholders that elect to participate. Specific subtasks are described below.

- Subtask 1.1 - Convene key stakeholders and outline operating protocols, roles and responsibilities and group decision making procedures that will move the planning process forward.
- Subtask 1.2 – Develop a Stakeholder Engagement Plan that identifies tangible and metrically-driven involvement and participation goals and objectives, targeting consumptive and non-consumptive stakeholders. Specific elements of this plan will include, but not be limited to:
    - Creation of a list of the stakeholders who should be included throughout all phases of SMP development.
    - Development of guiding principles for stakeholder engagement, including expectations and outcomes of the plan.
    - Creation of a schedule and objectives for each meeting (will be dynamic as the phases of the SMP are completed); anticipate 8 meetings.
    - Identification and prioritization of ecological and recreational values that could be protected or enhanced.
- Subtask 1.3 – Implement Stakeholder Engagement Plan
    - Fulfill elements of engagement plan.
    - Facilitation of each meeting to ensure adherence to agenda topics, respectful and construction dialogue, and equal and fair treatment of all individuals and perspectives in the group.
    - Documentation of each meeting to capture key themes of discussion (including minority viewpoints and areas of disagreement), agreements, and action items.
    - Circulation of draft documents for stakeholder review, consideration of all proposed changes, revision of draft documents as appropriate, and distribution of all final summaries.
- Subtask 1.4 - Develop a Community Engagement Plan that identifies tangible and metrically-driven involvement and participation goals and objectives. Specific elements of this plan will include, but not be limited to:

- Consultation with the stakeholder group to solicit input on best approaches to community engagement in the Study Area.
- Additional consultation if/as needed with local watershed groups, ditch companies, recreation groups, and others to solicit input on the best methods for community engagement.
- Host up to three Community Engagement meetings that will aim to meet the objectives of the Plan.

Method/Procedure

The District will capitalize on local knowledge and experience by involving stakeholder groups, such as the St. Vrain Creek Coalition, Left Hand Watershed Oversight Group, and other entities in the watershed throughout the SMP development. Outreach will be obtained and conducted through a series of progress meetings and/or other means such as surveys, etc. as identified in the Stakeholder and Community Engagement Plans.

The District believes a Facilitation Consultant is necessary as part of the consultant team to support the stakeholder and community engagement meetings as well as a Project Manager to support the organization, coordination, and documentation needed for this task. We anticipate that the stakeholder group will meet approximately 8 times, and the broader community will meet 3 times over the course of Phase 1 of the project. Consulting teams however will be encouraged for proposals to recommend cost effective strategies that maximize funds and stakeholder contact.

Deliverable(s)

- Organize and facilitate eight Stakeholder Meetings and three Community meetings
  - Input from a broad array of stakeholders that represent both geographic, issue, and value diversity within the watershed.
- Meeting agendas, participants, and notes
- Stakeholder Engagement Plan
- Community Engagement Plan

Task 2 – Existing Data Collection and Review

Description of Task

An extensive literature review will be carried out to determine what relevant information is already available, and to synthesize that information in a manner that is accessible (an interactive web mapping application) and connects datasets and conclusions. This literature review will serve as the foundation of the stream management plan.

The literature review will emphasize information on water supply, current consumptive and non-consumptive water use, projected future water use, recreational needs, and ecological needs. Quantitative information gaps identified in the literature review process will also be prioritized for additional data collection as part of the stream management plan, specifically the calculation of water supply and demand, as well as quantitative assessment of environmental and recreational needs. Where this information does not adequately exist, it will be prioritized for development as part of the stream management plan in Phase 2. A comprehensive listing of existing studies/reports can be found in Attachment B of the grant application. Specific subtasks are described below.

- Subtask 2.1 – Extract and organize information from existing studies and databases.
- Subtask 2.2 - Create an on-line spatial GIS database to house or link to existing information and data.
- Subtask 2.3 – Develop a publicly accessible web-based mapping interface (like the Colorado Basin Roundtable's or equivalent) that allows users to access and view the spatial database information. This is being identified as a separate task as it adds an additional level of complexity to providing an interface with the data and user.

Method/Procedure

This task is limited to only the collection, compilation, and reduction of existing data. No new assessments will be done for this phase.

Deliverable(s)

- On-line spatial GIS database
- Web-based mapping interface
- Prioritized list of, and action plan for, additional data needs to be developed as part of the stream management plan

Task 3 – Hydrology Characterization, Demand Shortage and Recreation Assessment

Description of Task

The purpose of this task is to characterize point flows in St. Vrain Creek and Left Hand Creek and how water is currently stored, diverted, consumed, and returned within the Study Area. This task will also identify the future needs of the domestic, recreational and agricultural water users in the Study Area, including shortages.

- Subtask 3.1 – Obtain existing monthly SPDSS river flow data (1950 through 2012) and develop estimated daily point flows for Study Area streams from the dataset. Describe river flow data, decreed diversions, and irrigated acreages. River flow data will be considered for natural conditions (no diversions, imports or releases) and existing conditions (current diversions) for wet, dry and average conditions.
- Subtask 3.2 – Compile information and data on the condition of the existing domestic and agricultural diversions, delivery and application (irrigation) infrastructure.
- Subtask 3.3 - Develop and conduct recreational flow studies on those river reaches in the Study Area with significant current or planned recreational (boating or fishing) use, to collect and organize overall and specific flow evaluations, and define optimal and acceptable flow ranges that meet current recreational needs.
- Subtask 3.4 -- Project future changes in hydrology and water availability patterns due to climate scenarios developed by the CWCB.
- Subtask 3.5 – Project potential future demand shortages in agricultural, municipal and recreational uses. It is anticipated that the calculation of each of these demands will require different tools and approaches.
- Subtask 3.6 – Assess whether more detailed daily point flow modeling is beneficial for assessment of stream conditions relative to uses for all or portions of the Study Area and recommend any needed hydrology modeling for Phase 2.

Method/Procedure

A database of monthly point flows (presented as average daily flows) at diversions and confluences on streams within the Study Area will be created using existing StateMod modeling of the St. Vrain and Left Hand basins developed for the South Platte Decision Support System (SPDSS). The SPDSS modeling includes data for natural flows as well as for historical conditions. Communications with owners of existing municipal, agricultural, and recreational infrastructure and field reconnaissance where necessary, will be used to develop information for subtask 3.2. If available, information regarding effects of climate change on stream hydrology will be sought and characterized and incorporated into the point flows database. Water providers and water users will be contacted, and existing information will be reviewed and used to the extent possible, to assess future demand increases for municipal, agricultural and recreational water users, and the resulting impacts on point flows. The project will seek to identify where/whether a true daily point flow model needs to be developed in Phase 2 to assess needs and to project results of management changes.

Deliverable(s)

- Information (data and graphics) showing estimated daily hydrology in the basin under natural, current and projected future conditions
- Infrastructure condition assessment results
- List of recommended infrastructure improvements and conceptual costs
- List of recommended strategies for those locations that can also benefit stream health conditions and any incremental costs associated with those improvements
- Recommendation for further daily point flow development
- Technical Report summarizing results of subtasks 3.1 – 3.6

Task 4 – River Health Assessment

Description of Task

The purpose of this task is to assess river functional health within the Study Area, inventorying stressors using data and analyses compiled during Tasks 2 and 3, and completing additional desktop and rapid field evaluations. Functional health assessment results can then be compared to stakeholders' priority ecological and recreational values to identify a subset of priority reaches. Priority reaches will be assessed for projects and management strategies, including flow targets, in Phase 2. The river health assessment will be carried out by a multi-disciplinary team hired by the District. Specific subtasks are described below.

- Subtask 4.1 – Develop a stream health assessment framework calibrated specifically to the study area based on an appropriate holistic stream health assessment methodology, such as the Colorado Stream Health Assessment Framework, that includes assessment of fluvial geomorphology, water quality, aquatic habitat quality and riparian area health.
- Subtask 4.2 – Divide the study area into relatively homogenous zones and reaches to be evaluated.
- Subtask 4.3 – Conduct desktop and rapid field evaluations as needed to complete river health assessment. The extent of evaluations will depend upon the quality and quantity of data found in Task 2.
- Subtask 4.4 – Evaluate the health of individual reaches, zones, streams (St. Vrain and Left Hand) and the watershed based on assessment of stressors and evidence of their effects.
- Subtask 4.5 – Use the list of priority ecological and recreational values identified in subtask 1.2 to characterize challenges to maintaining river health in light of societal demands.
- Subtask 4.6 – Compile results from subtask 4.1 – 4.5 and develop a set of criteria that allows the stakeholders to rank and select their top priority reaches for management strategies.
- Subtask 4.7 – Draft a list of watershed focus areas based on the needs identified in previous subtasks and identify outstanding data needs for each.

Method/Procedure

The St. Vrain and Left Hand Creek stream health assessment framework will be assembled by a multi-disciplinary team based on sound science, while being responsive to known issues and stakeholder input (subtask 4.1). The study area will be divided based on stream system (St. Vrain vs. Left Hand). Each of the two stream systems, including the mainstem and major tributaries will be subdivided into appropriately homogenous zones and/or individual reaches based on process domains and land cover/land use (subtask 4.2).

According to the assessment methodology chosen, desired ranges for stream health variables or criteria will be designated. Desired ranges will incorporate stakeholder input. They will be articulated by the study team and should represent levels which will maintain the balance between stream needs and its ability to provide the ecosystem services society depends on, remain resilient and ecologically viable, while satisfying purely human needs such as municipal and agricultural water supply.

Once the stream health study framework and design have been developed, stream health will be evaluated using the best available information (subtask 4.4). The stream health assessment will be considered a "living" document that will be continually built upon and improved as new information is developed. Existing data and the collection of new data will be used to fill out the framework (subtask 4.3). New data will be collected at a level of intensity commensurate with need and available budget. Based on these analyses and those of previous tasks, opportunities for, and challenges to, maintaining river health will be articulated (subtask 4.5).

Once analysis of river health is complete, lists of priority reaches will be assembled based on identified stream needs and stakeholder input (subtask 4.6).

Analyses of river health will reveal areas and subjects for which insufficient information exists to make decisions with an appropriate level of certainty. Data gaps will be listed and candidate priorities for obtaining new

information will be developed (subtask 4.7).

Deliverable(s)

- Completed health assessment including hierarchical summary of reach condition, zone condition and overall stream condition. The health assessment will include graphical exhibits and be integrated into the geospatial database created in Task 2.
- Narrative and quantitative rationale for each health conclusion.
- A list of candidate priority reaches for health improvement and data gaps needed to be filled in Phase 2 to better assess and recommend strategies.

Task 5 – Phase 1 Final Report and Phase 2 Recommendations

Description of Task

The purpose of this task is to compile results from Tasks 1 – 4 and develop an on-line interactive report that: 1) highlights the existing and future demand gaps and infrastructure needs for the agricultural, recreational, and municipal sectors; 2) presents information on the functional health of the Study Area by reach; and 3) discusses next steps for the priority reaches, including identification of data gaps and methods and costs for obtaining that information. This deliverable may resemble the Reach Fact Sheets[1] developed for the Big Thompson River.

Method/Procedure

- Compile data and information from Tasks 1-4
- Develop an on-line interactive report summarizing Phase 1

Deliverable(s)

- On-line interactive report
- Strategies and Recommendations for Phase 2

[1] https://www.abetterbigt.com/baseline-resiliency-assessment

TASK 6 – Project Management and Coordination

Description of Task

The purpose of this task is to support St. Vrain and Left Hand Water Conservancy District with the project management needs of the Project, specifically: tracking project progress, including each subconsultant's deliverables and costs against the scope of work; supporting the District with the necessary communication and coordination with the Project Team; coordinating with Colorado Water Conservation Board (CWCB), as needed; and preparing for and participating in public education and stakeholder meetings. Specific subtasks are described below.

- Subtask 6.1 - Coordinate with Project Team (propose monthly project check-in meetings).
- Subtask 6.2 - Compile monthly subconsultant invoices; track project budget, deliverables, and schedule and document in monthly progress reports (includes tracking of in-kind hours and cash match).
- Subtask 6.3 - Develop required CWCB 6-month progress reports; final report (see Task 5).

Method/Procedure

The District will hire a Consultant to provide Project Management services as identified above.

Deliverable(s)

- Progress reports
- Monthly invoices