



Colorado Water Conservation Board

Water Plan

Water Project Summary

Name of Applicant	Colorado Trout Unlimited
Name of Water Project	Elk Creek: Roseman Ditch Company Water Supply/ Delivery Improvements-Design and Planning
Grant Request Amount	\$400,000.00
Primary Category	\$400,000.00
<i>Agricultural Projects</i>	
Total Applicant Match	\$400,000.00
<i>Applicant Cash Match</i>	\$400,000.00
<i>Applicant In-Kind Match</i>	
Total Other Sources of Funding	\$0.00
Total Project Cost	\$800,000.00

Applicant & Grantee Information

Name of Grantee: Colorado Trout Unlimited	
Mailing Address: 1536 Wynkoop Street, Suite 320 Denver CO 80202	
Organization Contact: Nancy Johnston Bramlett	
Position/Title:	Email: nancy.johnston@tu.org
Phone: 970-462-6750	
Organization Contact - Alternate: David Nickum	
Position/Title: Executive Director	Email: david.nickum@tu.org
Phone: 303-440-2937	
Grant Management Contact: Nancy Johnston Bramlett	
Position/Title:	Email: nancy.johnston@tu.org
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Grant Management Contact - Alternate: David Nickum	
Position/Title: Executive Director	Email: david.nickum@tu.org
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Description of Grantee/Applicant

CTU is a statewide organization of more than 12,000 members in 24 local chapters dedicated to conserving, protecting, and restoring Colorado's coldwater fisheries and their watersheds. CTU is coordinating with its Boulder Flycasters Chapter, which led previous South Boulder Creek (SBC) Stream Management Plan (SMP PH I & II) and Watershed Restoration – Engineering (WSR PH I) project phases. CTU works through collaboration, education, grassroots action, and on-the-ground volunteerism. Current efforts include cooperation with front range and west slope water users on “Learning by Doing” in the Colorado headwaters; partnership with Colorado Parks and Wildlife on native trout restoration; and local youth education initiatives.

Type of Eligible Entity

- ☐ Public (Government)
- ☐ Public (District)
- ☐ Public (Municipality)
- ☐ Ditch Company
- ☐ Private Incorporated
- ☐ Private Individual, Partnership, or Sole Proprietor
- ☒ Non-governmental Organization
- ☐ Covered Entity
- ☐ Other

Category of Water Project

- ☒ Agricultural Projects
Developing communications materials that specifically work with and educate the agricultural community on headwater restoration, identifying the state of the science of this type of work to assist agricultural users among others.
- ☐ Conservation & Land Use Planning
Activities and projects that implement long-term strategies for conservation, land use, and drought planning.
- ☐ Engagement & Innovation Activities
Activities and projects that support water education, outreach, and innovation efforts. Please fill out the Supplemental Application on the website.
- ☐ Watershed Restoration & Recreation
Projects that promote watershed health, environmental health, and recreation.
- ☐ Water Storage & Supply
Projects that facilitate the development of additional storage, artificial aquifer recharge, and dredging existing reservoirs to restore the reservoirs' full decreed capacity and Multi-beneficial projects and those projects identified in basin implementation plans to address the water supply and demand gap.

Location of Water Project

Latitude	39.574970
Longitude	-107.543020
Lat Long Flag	
Water Source	Elk Creek
Basins	Colorado
Counties	Garfield
Districts	39-Rifle/Elk/Parachute Creeks

Water Project Overview

Major Water Use Type	Agricultural
Type of Water Project	Design / Engineering
Scheduled Start Date - Design	5/1/2025
Scheduled Start Date - Construction	5/30/2026
Description	Trout Unlimited (TU) and the Roseman Ditch Company (RDC) are partnering to upgrade (line, pipe, siphon) ~5 miles of the RDC main irrigation delivery ditch from the headgate to the decreed lands in Peach Valley (agricultural land downstream of New Castle, CO). RDC has water rights to 21 cubic feet per second diverted

from Elk Creek, a tributary of the Colorado River at New Castle, Colorado. Irrigation water transmission losses approach 50% in this reach of the ditch. Upgrades could reduce water losses to close to 0%. Water savings would increase water supply reliability for RDC shareholders and enable voluntary bypass of irrigation water when their crops and livestock are satisfied and benefit the aquatic environment in Elk Creek. This project compliments and strengthens the RDC headgate/ diversion dam project poised to begin construction in late fall 2024, a CWCB-CWP and Bureau of Reclamation-funded project.

Measurable Results

	New Storage Created (acre-feet)
	New Annual Water Supplies Developed or Conserved (acre-feet), Consumptive or Nonconsumptive
	Existing Storage Preserved or Enhanced (acre-feet)
	New Storage Created (acre-feet)
	Length of Stream Restored or Protected (linear feet)
26,400.00	Length of Pipe, Canal Built or Improved (linear feet)
	Efficiency Savings (dollars/year)
3,186	Efficiency Savings (acre-feet/year)
	Area of Restored or Preserved Habitat (acres)
	Quantity of Water Shared through Alternative Transfer Mechanisms or water sharing agreement (acre-feet)
72	Number of Coloradans Impacted by Incorporating Water-Saving Actions into Land Use Planning
72	Number of Coloradans Impacted by Engagement Activity

Other

The project seeks to reduce and/or eliminate transmission losses in the first five miles of the Roseman Ditch. Project funds will be used to plan and design canal upgrades which will likely include a combination of canal lining, canal piping, and a potential siphon to bypass the lower ~1.5 miles of ditch. The previous reference to 26,400 linear feet includes the entire length of the project without the siphon.

Water Project Justification

Building on previous phases of the Middle Colorado Agricultural Collaborative (MCAC) in the Elk Creek basin, this project will continue to compliment and further the objectives, goals and actions as described in Chapter 6 “Vision and Actions for Addressing Colorado’s Risks” of the Colorado Water Plan, as well as the themes, goals and strategies stated in the Colorado Basin Roundtable’s Basin Implementation Plan and Project List.

The Colorado Water Plan

The Colorado Water Plan identifies “Vision and Actions” to address water related risks in Colorado and how both partners Trout Unlimited (TU) and CWCB (the agency) can work to address those risks. This project aligns with the Robust Agriculture and Thriving Watersheds components of the Visions/Actions chapter.

Robust Agriculture

Partner Actions (pg. 194)

Meeting Future Water Needs

Measurement of agricultural uses:

Wise Water Use

Conveyance Efficiency Improvements

Agency Actions (pg. 202)

2.8 Streamline Agricultural Infrastructure Funding

The CWCB.....will support agricultural producers seeking infrastructure funding.

Applicant Comment: The Roseman Ditch Design and Planning project will complement and build upon the MCAC

Phase 3 Roseman Ditch headgate/ diversion structure upgrades, including fish passage (previously funded by CWCB).

Measurement of agricultural uses: The Roseman headgate/ diversion project is in the construction phase (November 2024 - April 2025) and will increase diversion efficiency by replacing the entire structure and installing telemetry actuated gates. Precise water diversion enables the ditch company to take only what is needed for crops and animals, leaving unneeded water in Elk Creek. It further helps the company to understand when and where water is needed or not needed during the irrigation season.

Conveyance Efficiency Improvements: Reducing or eliminating transmission losses in the first five miles of the ditch below the headgate will help water short shareholders at the end of the system and will likely increase in-channel flows improving the aquatic environment (integration across action areas). This project aspect is directly related to the measurement of diverted water at the headgate.

Streamline Agricultural Infrastructure Funding: TU has already applied for a Bureau of Reclamation WaterSMART Project Planning & Design grant to provide 50% match funding for the project. The result will be complete construction plans for the upgrades that enable the Roseman Ditch Company (RDC) to apply for construction funding. Further, once construction is completed the RDC will be well positioned to pursue future projects to improve water application methods, including the installation of sprinklers.

Thriving Watersheds

Partner Actions (pg. 205-206)

Meeting Future Water Needs

Increased Access to Recreational Opportunities:

Wise Water Use

Streamflow Level Protections for Environmental Needs

Agency Actions (pg. 212)

3.6 Enhance Use of Water Plan Grant Funding for Watersheds, Environment and Recreation

The Water Plan Grant Program can better support a holistic view of watershed health in terms of recognizing and equally funding environmental projects, watershed projects, applicable forest health projects, and recreation.

Applicant Comment

Increased Access to Recreational Opportunities: CWCB has supported multiple fish passage projects in the Elk Creek basin. This creek provides excellent opportunities for large trout from the Colorado River to spawn and for their progeny to hatch and grow. Low flow conditions in late summer and throughout the winter do not provide sufficient cover and food for larger fish forcing most to return to the Colorado River main-stem and provide increased angling opportunities in one of the most accessible reaches of a large river in the state.

Streamflow Level Protections for Environmental Needs: Reducing the transmission loss in the first five miles of the Roseman ditch to near zero could save up to 3,000 acre-feet over the course of the irrigation season. Not only would this benefit agricultural producers in the late season but would enable voluntary environmental bypass flows when shareholder crops and animals do not need the water.

Enhance Use of Water Plan Grant Funding for Watersheds, Environment and Recreation: The Roseman Ditch Upgrade Design and Planning project will reduce and potentially eliminate transmission losses in the first five miles below the headgate structure. The resulting water savings will accrue to the agricultural producers, the aquatic environment of Elk Creek, and ultimately to recreational angling opportunities in the main-stem Colorado River. The applicant believes that providing Water Plan funds to this project will continue to realize a holistic approach to the Elk Creek basin in which agriculture, the environment, and the community all benefit.

The CBRT-Updated Basin Implementation Plan

The Colorado Basin Roundtable Basin Implementation Plan continues to employ the original “6 Themes” and associated goals found in the original BIP (with some new additions). These themes and goals are further supported by identified strategies. This project supports specific goals within two of the six themes; “Protect and

Restore Healthy Streams, Rivers, Lakes, and Riparian Areas” and “Sustain Agriculture”. These goals are: Protect and maintain healthy and self-sustaining aquatic and riparian ecosystems, and rehabilitate damaged ecosystems.

Reduce and prevent agricultural water shortages.

Protect and preserve agricultural lands.

Applicant Comment: This project will support each of these goals as described:

Protect and maintain healthy and self-sustaining aquatic and riparian ecosystems, and rehabilitate damaged ecosystems: As previously stated this project has the capacity to save a large quantity of water from transmission loss thereby improving delivery to ditch shareholders and enabling voluntary bypass flows for environmental benefit.

Reduce and prevent agricultural water shortages: Currently the Roseman Ditch shareholders experience water shortages at the end of the system in mid to late summer. This project will help to address those shortages.

Protect and Preserve Agricultural Lands: Consistent water delivery helps to ensure dependable crop yields and profitability, thereby helping provide producers with sustainable profit margins and allowing them to continue production from year to year.

The project further supports the following CBRT identified strategies:

Use the IWMP mechanism to reduce risks and enhance benefits across all sectors.

Implement projects that support the Goals.

Applicant Comment: This project largely originates from and was supported by the Middle Colorado IWMP process. The project is listed on the CBRT Projects Database as project #00962-”Coordinate Agricultural Infrastructure Upgrade Designs to Benefit Aquatic Habitat and Fish Passage (previously listed as CO-2020-0001). The project is an extension of projects #00959-”Install Fish Screens to Minimize Entrainment” (previously listed as CO-2020-0014) and #00960-”Reconfigure Barriers for Fish Passage on Tributaries” (previously listed as CO-2020-0015).

Citations:

<https://socgov19.my.salesforce-sites.com/DNRProjectsByBasin?recordId=a0L5Y00000tTCGzUAO&projectRecordId=a0L5Y00000tTCGzUAO>

Additional Project Information

Introduction

The Middle Colorado Agricultural Collaborative initiated a three phase project in May 2022 to work with irrigators in Elk Creek to upgrade their infrastructure and improve fish passage. Four projects in the basin were ultimately identified and have engineering designs completed and three of those projects are scheduled for construction and will be complete by spring 2025. One of these projects, the Roseman Ditch Company (RDC) project, will rebuild the irrigation diversion headgate and diversion dam improving diversion efficiency (via telemetry) and enabling fish passage (rock ramp). The telemetry addition is one of the key project benefits which would enable accurate diversions and enable potentially reducing diversion amounts. As this project moved forward, TU became aware that the RDC’s primary conveyance ditch was experiencing substantial transmission losses (up to 50%) in the first five miles of ditch as it traversed the Grand Hogback near New Castle, CO.

The opportunity to complement and reinforce the benefits of the headgate/ diversion dam upgrades by mitigating or if possible eliminating transmission losses presented an enormous opportunity. TU, Wright Water Engineers (WWE), and the RDC board of directors (all working pro bono) initiated a preliminary inventory of the ditch and conceptual design utilizing lining, piping and a siphon options.

In order to move this project forward TU has made an application for a Bureau of Reclamation Water Smart Planning and Project Design grant in May 2024, which should be announced in December. This grant application, herein, is made to the CWCB Colorado Water Plan (CWP) grant program in hopes of providing matching funds to enable design and planning (to complete construction drawings and specifications) to address transmission losses in the first five miles of the Roseman Ditch. While this project is primarily an agriculturally focused project, TU believes that there are ancillary benefits that accrue to the aquatic environment.

This project broadens and complements the work underway to rebuild the existing RDC headgate and diversion structure to increase diversion efficiency and provide fish passage. One of the key components of this project is the addition of telemetry actuated headgates enabling ditch personnel to remotely and accurately divert water as needed by producers. This will enable RDC to voluntarily bypass water when it is not needed.

Currently, the first five miles of the RDC ditch are experiencing transmission losses approaching 50%. Lining this reach of the ditch to reduce transmission losses could save up to 3,000 AF of diverted water each irrigation season. This additional water will benefit water short shareholders and may further enable voluntary bypass flows.

Many RDC shareholders are interested or already have engaged the Natural Resource Conservation Services Environmental Quality Incentives Program (NRCS-EQIP) to transition from flood irrigation to sprinkler irrigation. NRCS and the Bureau of Reclamation (providing matching funds for this project) encourage a nexus between their grant programs. A Reclamation funded RDC project to reduce transmission loss will likely help producers to obtain NRCS-EQIP funds to transition from flood to sprinklers.

Project Location

The Roseman Ditch headgate is approximately 2.5 miles northwest of New Castle, Colorado off CR 245 (39.59708, -107.571), and the ditch runs over 5 miles southeast and then west through the Grand Hogback geologic formation and into Peach Valley, an agricultural area located north of the Colorado River and Interstate-70 between Newcastle and Silt, Colorado.

Project Benefits

Benefits to RDC Shareholders

The Elk Creek basin originates on the southwest side of the Flattop Range in north central Colorado. Geographically it tends to be less dramatically influenced by El Niño and La Niña patterns than other mountain ranges in Colorado. Examining the 5 strongest El Niño and La Niña years since 1988 indicates snow water equivalents very close to average annual median peaks in 8 out of the 10 years.[1] Despite that advantage, increasing temperature, overall reduced snowpack, earlier snowmelt and reduced streamflow will continue to present challenges to the aquatic environment and to local agriculture.

The RDC has various water rights which total 21 cubic feet per second (cfs). That amount is roughly split in half with 10 cfs having adjudication dates between 1889 and 1913 and 11 cfs having an adjudication date of 1943. The more junior water right is usually called out in late July or early August leaving 10 cfs in priority for the remainder of the irrigation season.

Current ditch transmission losses are estimated in cubic feet per second and in acre feet as follows:

Early irrigation season (April 15-July 31) includes a pre-irrigation season from April 15-April 29) and the first half of the irrigation season (April 30-July 31).

Duration = 107 days. Water loss = 10.5 cfs.

$(107 \text{ days}) \times (24 \text{ hrs/day}) = 2568 \text{ hrs.}$

$(2568 \text{ hrs}) \times (60 \text{ min/hr}) = 154,080 \text{ min.}$

$(154,080 \text{ min}) \times (60 \text{ sec/min}) = 9,244,800 \text{ sec}$

$(9,244,800 \text{ sec}) \times (10.5 \text{ cu ft/sec}) = 97,070,400 \text{ cu ft}$

$(97,070,400 \text{ cu ft}) / (43,560 \text{ sq ft/acre}) = 2228 \text{ acre feet of water saved.}$

Late irrigation season (August 1-October 31).

Duration = 92 days. Water loss = 5.25 cfs.

$(92 \text{ days}) \times (24 \text{ hrs/day}) = 2208 \text{ hrs.}$

$(2208 \text{ hrs}) \times (60 \text{ min/hr}) = 132,480 \text{ min.}$

$(132,480 \text{ min}) \times (60 \text{ sec/min}) = 7,948,800 \text{ sec.}$

$(7,948,800 \text{ sec}) \times (5.25 \text{ cu ft/sec}) = 41,731,200 \text{ cu ft}$

$(41,731,200 \text{ cu ft}) / (43,560 \text{ square ft/acre}) = 958 \text{ acre feet of water saved.}$

Reducing the transmission loss in the first five miles of ditch to near zero could save 3,186 acre-feet over the course of the irrigation season. Not only would this benefit agricultural producers in the late season but would

enable voluntary environmental bypass flows when their crops and animals do not need the water. See APPENDIX: Memo on RDC water shortages (LINK).

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[1] Snowtel Data: <https://nwcc-apps.sc.egov.usda.gov/awdb/site-plots/POR/WTEQ/CO/Bison%20Lake.html>

Benefits to the Aquatic Environment

The RDC headgate and diversion structure upgrade project has received funding from the Bureau of Reclamation, Colorado Water Conservation Board (CWCB) and the Colorado River District (CRD) to install a fish passage structure and completely rebuild and automate the structure. This work will benefit the aquatic environment in two ways, first it will enable fish to negotiate the structure and expand upstream spawning and juvenile fish habitat. Fish passage upgrades to diversions have been enormously successful in Elk Creek as demonstrated by Ware and Hinds Fish Passage channel project that opened the channel between the Ware and Hinds and the RDC diversion, see APPENDIX: Fisheries Report from CPW (LINK). Second, automation of the headgate enables the RDC to take precise amounts of water needed to irrigate crops and water animals. This in turn enables RDC to voluntarily bypass flows when the water is not needed.

The RDC Water Supply/ Delivery Improvement Project will address acute transmission losses and thereby complement and further enable the ditch company's ability to voluntarily bypass flow when its immediate irrigation needs are met. Current estimates of water loss in the first five miles of the RDC system are estimated at approximately 3,000 acre-feet per year (see following calculations). When this additional water is not needed it could remain in the channel to directly benefit the environment.

Stakeholder Support

The Roseman Ditch Company Water Supply/ Delivery Improvement project is part of a suite of projects in the Elk Creek basin designed to improve agricultural irrigation efficiency and to improve the cold-water aquatic environment. To date TU has completed or will complete the following projects:

2018-Ware and Hinds (WH) fish passage project.

TU worked with the WH Ditch Company to construct a fish passage which opened 3 previously inaccessible miles of Elk Creek to spawning fish. Colorado Parks and Wildlife has subsequently confirmed the success of this effort, documenting increased spawning success and recruitment.

2024-2025 Meadow Creek Ranch

removal of two diversion structures and upgrades of two diversion structures to enhance fish passage and increase diversion efficiency. Scheduled for construction Fall 2024-Spring 2025.

2024-2025 Roseman Ditch Company

Reconstruct headgate and diversion structure to incorporate fish passage and increased diversion efficiency. Scheduled for construction Fall 2024-Spring 2025. The Meadow Creek and RDC headgate upgrade projects will open an additional 4 miles to spawning fish.

This project, the Roseman Ditch Company Water Supply/ Delivery Improvement Project, compliments these projects through reduced transmission loss, increased water supply reliability to agricultural producers, and enables voluntary bypass flows to improve aquatic conditions. The following list of stakeholders have supported TU's previous projects and continue to support this project. While we do not have letters of support from all supporters they are aware of this project and have verbally supported it and/ or fiscally supported earlier phases of the collaborative. The Middle Colorado Watershed Council and Colorado Parks and Wildlife have provided updated letters of support as they are our primary stakeholders. See APPENDIX (LINK).

Bureau of Reclamation-WaterSmart grant program: Match funder-\$400,000, application pending (LINK to submitted grant proposal).

Colorado River District: Funded previous Elk Creek Projects however, CRD funding is suspended until Shoshone water right purchase is funded.

Colorado Parks & Wildlife: Full support, including ongoing fish surveys.

Middle Colorado Watershed Council: Full support through IWMP.

Garfield County: Project approval

Roseman Ditch Company: Project Owner of Roseman Ditch water rights and current WaterSMART grant

applicant Category A Partner.

Meadow Creek Ranch : Underlying landowner and project owner of Thomkins water right comingled with RDC Ware & Hinds Ditch Company: Fish passage project downstream (2018).

Trout Unlimited (TU): Project management

Colorado TU: Project management

Eagle Valley TU Chapter: Supporter and prior financial contributor

Ferdinand Hayden (Roaring Fork) TU Chapter: Supporter and prior financial contributor

Wright Water Engineers, Inc: Siphon Investigation, TU champion.

Project Schedule

The anticipated project schedule is as follows. TU will be the primary point of contact along with the hired engineer. The Roseman Ditch Company board of directors' president or their representative will also serve a critical role in maintaining the project schedule and meeting milestones in a timely manner.

Related Studies

Prior to applying for design and planning funding Trout Unlimited and Wright Water Engineers worked with the Roseman Ditch Company representatives to inventory the first five miles of the ditch and explore the feasibility of installing a siphon in the most porous section of the ditch as it rounds the south end of the hogback near New Castle, CO. The following picture inventory documents the lower end of the reach:

[LINK](#)

The siphon concept was explored by surveying the invert in and invert out elevations and providing a conceptual pipe alignment. Depicted below:

Taxpayer Bill of Rights

There are no TABOR grant limitations on Trout Unlimited.