Water Supply Reserve Fund
Water Activity Summary Sheet
September 15-16, 2021
Consent Agenda Item 2(b)

Applicant & Grantee:	Trout Unlimited
Water Activity Name:	Field Support for the "Evaluating Conserved Consumptive Use in the Upper Colorado River" Project
Water Activity Purpose:	Agricultural - Study
County:	Grand County
Drainage Basin:	Colorado River
Water Source:	Upper Colorado River
Amount Requested:	$19,800 Colorado Basin Account $40,000 Statewide Account $59,800 Total Request
Matching Funds:	**Basin Account Match** = $19,800 • 49% of statewide request (meets 10% min) **Applicant & 3rd Party Match** = $22,400 (cash) • 56% of the statewide request (meets 10% min) **Total Match** (Basin request & Applicant Match) = $42,200 • 105% of the statewide request (meets 50% min)

Staff Recommendation:
Staff recommends approval of up to $19,800 from the Colorado Basin Account and up to $40,000 from the Statewide Account to help fund the project: Field Support for the "Evaluating Conserved Consumptive Use in the Upper Colorado River" Project

Water Activity Summary: The overall goal of this proposal is to work with local water users on field-based research to address priority feasibility questions related to temporary reductions in water use, including: best practices for reducing irrigation on perennial irrigated pastures; estimating and verifying actual water savings from those practices, and; working with producers to identify multi-year strategies to create conserved consumptive use while maintaining viable agricultural operations.

The project involves field work and data collection in support of the research, and funding from WSRF grant program will allow the applicant to hire two seasonal field technicians for the remaining three years of the project (2021-2023). These field technicians will work in coordination with the applicant's university research partners to collect forage samples, soil moisture and groundwater data, and maintain research equipment on multiple field sites in the Kremmling area. The applicant anticipates hiring locally to fill these positions, which serves a tangential goal of building local capacity and expertise in water and ag related research.

The applicant believes this project will provide important information on the opportunities and challenges related to temporary Ag water conservation.

The CWCB Board has previously approved funds for this project from the Alternative Transfer Methods grant program, and through a Water Plan Engagement/Innovation grant.

Discussion: The proposed project furthers the Colorado Basin Roundtable's stated objective in its Basin Implementation Plan of sustaining agricultural production, increasing education among the Ag community about Colorado River issues, securing safe drinking water and encourage basin wide to promote agricultural conservation that maintains production and viability.

Issues/Additional Needs: No issues or additional needs have been identified.

Eligibility Requirements: The application meets requirements of all eligibility components.

Evaluation Criteria: Staff has determined this activity satisfies the Evaluation Criteria.

Funding Sources/Match	Cash	In-Kind	Total	Status
American Rivers	$22,400	$0	$22,400	Secured
Sub-Total Matching Funds	$22,400	$0	$22,400	
WSRF Colorado Basin Account	$19,800	$0	$19,800	Secured
WSRF Statewide Account	$40,000	$0	$40,000	
Sub-Total WSRF Funds	$59,800	$0	$59,800	
Total Project Costs	**$82,200**	**$0**	**$82,200**	

CWCB Project Manager: TBD

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Colorado Water Conservation Board

Water Supply Reserve Fund
Grant Application

Instructions

All WSRF grant applications shall conform to the current 2020 WSRF Criteria and Guidelines.

To receive funding from the WSRF, a proposed water activity must be recommended for approval by a Roundtable(s) **AND** the approved by the Colorado Water Conservation Board (CWCB). The process for roundtable consideration and recommendation is outlined in the 2020 WSRF Criteria and Guidelines. The CWCB meets bimonthly.

If you have questions, please contact the WSRF Grant Program Manager (for all Roundtables) or your Roundtable Liaison:

Ben Wade
ben.wade@state.co.us
303-866-3441 x3238 (office)

Sam Stein
Sam.stein@state.co.us
303-866-3441(office)

WSRF Submittal Checklist (Required)

YES■ NO□	This request was recommended for CWCB approval by the sponsoring roundtable.
YES■ NO□	I have read and understand the 2020 WSRF Criteria and Guidelines.
YES■ NO□	Grantee will be able to contract with CWCB using the Standard Contract.[1]

Application Documents included:

YES■ NO□	Exhibit A: Statement of Work[2] *(Word – see Template)*
YES■ NO□	Exhibit B: Budget & Schedule[2] *(Excel Spreadsheet – see Template)*
YES■ NO□	Letters of Matching and/or Pending 3rd Party Commitments[2]
YES□ NO■	Map[2]
YES□ NO■	Photos/Drawings/Reports
YES□ NO■	Letters of Support

Contracting Documents[3]

YES■ NO□	Detailed/Itemized Budget[3] *(Excel Spreadsheet – see Template)*
YES□ NO□	Certificate of Insurance[4] *(General, Auto, & Workers' Comp.)*
YES□ NO□	Certificate of Good Standing(4)
YES□ NO□	W-9 Form[4]
YES□ NO□	Independent Contractor Form[4] *(If applicant is individual, not company/organization)*
YES□ NO□	Electronic Funds Transfer (ETF) Form[4]

[1] Click "Grant Agreements". For reference only/do not fill out or submit/required for contracting
[2] Required with application if applicable.
[3] Additional documentation providing a Detailed/Itemized Budget maybe required for contracting. Applicants are encouraged to coordinate with the CWCB Project Manager to determine specifics.
[4] Required for contracting. While optional at the time of this application, submission can expedite contracting upon CWCB Board approval.

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Schedule		
CWCB Meeting	Application Submittal Dates	Type of Request
January	October 1	Basin Account
March	December 1	Basin/Statewide Account/Water Plan Grant Match[1]
May	February 1	Basin Account
July	April 1	Basin Account
September	June 1	Basin/Statewide Account
November	August 1	Basin Account

[1] If either the basin or statewide match includes matching funds from a pending Water Plant Grant, both must be submitted by December 1st deadline for March Board meeting review.

Water Activity Summary	
Name of Applicant	Trout Unlimited
Name of Water Activity	Field Support for the "Evaluating Conserved Consumptive Use in the Upper Colorado River" Project

Approving Roundtable(s)	Basin Account Request(s)[1]
Colorado River Basin Roundtable	$19,800
Basin Account Request Subtotal	$19,800
Basin Account Request Subtotal Approved by Roundtable	$19,800
Statewide Account Request(1)	$40,000
Total WSRF Funds Requested (Basin & Statewide)	$59,800
Total Project Costs	$82,200

[1] Please indicate the amount recommended for approval by the Roundtable(s)

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Grantee and Applicant Information	
Name of Grantee(s)	Trout Unlimited
Mailing Address	
FEIN	
Grantee's Organization Contact[1]	Mely Whiting
Position/Title	Colorado Water Project Legal Counsel
Email	mely.whiting@tu.org
Phone	720-470-4758
Grant Management Contact[2]	
Position/Title	
Email	
Phone	
Name of Applicant (if different than grantee)	
Mailing Address	
Position/Title	
Email	
Phone	

[1] Person with signatory authority

[2] Person responsible for creating reimbursement invoices (Invoice for Services) and corresponding with CWCB staff.

Description of Grantee
Provide a brief description of the grantee's organization (100 words or less).
Trout Unlimited, Inc. (TU) is a 501(c)(3) non-profit founded in 1959. Today, TU is the nation's largest grassroots coldwater conservation organization with a mission to conserve, protect and restore North America's trout and salmon fisheries and their watersheds. TU works to achieve this mission on a local, state and national level through an extensive volunteer network and dedicated staff. TU currently has staff nationwide that oversee watershed restoration projects, organize hunters and anglers to advocate for improved public lands management, work to systematically improve state water policy to benefit rivers and fish, or promote youth education programs.

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Type of Eligible Entity (check one)	
	Public (Government): municipalities, enterprises, counties, and State of Colorado agencies. Federal agencies are encouraged to work with local entities. Federal agencies are eligible, but only if they can make a compelling case for why a local partner cannot be the grant recipient.
	Public (Districts): authorities, Title 32/special districts (conservancy, conservation, and irrigation districts), and water activity enterprises
	Private Incorporated: mutual ditch companies, homeowners associations, corporations
	Private Individuals, Partnerships, and Sole Proprietors: are eligible for funding from the Basin Accounts but not for funding from the Statewide Account.
✓	**Non-governmental organizations:** broadly, any organization that is not part of the government
	Covered Entity: as defined in Section 37-60-126 Colorado Revised Statutes

Type of Water Activity (check one)	
✓	Study
	Implementation

Category of Water Activity (check all that apply)		
	Nonconsumptive (Environmental)	
	Nonconsumptive (Recreational)	
✓	Agricultural	
	Municipal/Industrial	
	Needs Assessment	
	Education & Outreach	
	Other	Explain:

Location of Water Activity	
Please provide the general county and coordinates of the proposed activity below in **decimal degrees**. The Applicant shall also provide, in Exhibit C, a site map if applicable.	
County/Counties	Grand County
Latitude	40°03’47.25” N
Longitude	106°23’24.26” W

Water Activity Overview
Please provide a summary of the proposed water activity (200 words or less). Include a description of the activity and what the WSRF funding will be used for specifically (e.g. studies, permitting, construction). Provide a description of the water supply source to be utilized or the water body affected by the activity. Include details such as acres under irrigation, types of crops irrigated, number of residential and commercial taps, length of ditch improvements, length of pipe installed, area of habitat improvements. If this project addresses multiple purposes or spans multiple basins, please explain.

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Water Activity Overview
The Applicant shall also provide, in Exhibit A, a detailed Statement of Work, Budget, and Schedule.
With support from the Alternative Transfer Methods grant program, and under the guidance of the Colorado Basin Roundtable, a broad partnership of local water users, research universities, and NGOs implemented the Evaluating Conserved Consumptive Use in the Upper Colorado project. The overall goal of the project is to work with local water users on field-based research to address priority feasibility questions related to temporary reductions in water use, including: (1) best practices for reducing irrigation on perennial irrigated pastures; (2) estimating and verifying actual water savings from those practices, and; (3) working with producers to identify multi-year strategies to create conserved consumptive use while maintaining viable agricultural operations. The project involves significant field work and data collection in support of the research, and funding from the Water Supply Reserve Fund grant program will allow TU to hire two seasonal field technicians for the remaining three years of the project (2021-2023). These field technicians will work in coordination with our university research partners to collect forage samples, soil moisture and groundwater data, and maintain research equipment on multiple field sites in the Kremmling area. We also envision hiring locally to fill these positions, which serves a tangential goal of building local capacity and expertise in water and ag related research.

Measurable Results		
To catalog measurable results achieved with WSRF funds please provide any of the following values.		
	New Storage Created (acre-feet)	
	New Annual Water Supplies Developed or Conserved (acre-feet), Consumptive or Nonconsumptive	
	Existing Storage Preserved or Enhanced (acre-feet)	
	Length of Stream Restored or Protected (linear feet)	
	Efficiency Savings (indicate acre-feet/year OR dollars/year)	
	Area of Restored or Preserved Habitat (acres)	
	Length of Pipe/Canal Built or Improved (linear feet)	
✓	Other	Explain: This project will provide important information on the opportunities and challenges related to temporary ag water conservation.

Water Activity Justification
Provide a description of how this water activity supports the goals of Colorado's Water Plan, the most recent Statewide Water Supply Initiative, and the respective roundtable Basin Implementation Plan and Education Action Plan [(1)]. The Applicant is required to reference specific needs, goals, themes, or Identified Projects and Processes (IPPs), including citations (e.g. document, chapters, sections, or page numbers). For applications that include a request for funds from the Statewide Account, the proposed water activity shall be evaluated based upon how well the proposal conforms to Colorado's Water Plan criteria for state support (CWP, Section 9.4, pp. 9-43 to 9-44;) (Also listed pp. 4-5 in 2020 WSRF Criteria and Guidelines).

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Water Activity Justification

Over the past several years, multiple efforts have investigated how tools to reduce water use on a voluntary, temporary, and compensated basis can play a role in tackling Colorado's present and future water challenges. In that context, many questions have arisen with respect to the efficacy and risks associated with these practices for agricultural water users. The continuation of the Evaluating Conserved Consumptive Use in the Upper Colorado River supports the goals of both the State Water Plan and the Colorado Basn Roundtable Basin Implementation PlanP by exploring these questions in high altitude pastures. Effect water conservation tools for the Western Slope can also create mechanisms that will support the productive agriculture that is so important to this region's economy. This project will continue evaluating water conservation at scale, fill in critical data gaps identified in various studies, and provide information that is essential to determining whether and how water conservation can work on the Western Slope to address the CBRT BIP priority concerns.

The underlying research project will provide valuable information on the benefits and impacts of applying water conservation measures in high altitude pastures. This information is important to the Colorado Basin Roundtable and will help address the Colorado Water Plan's conservation and compact compliance goals. There is significant interest from local water users in the Upper Colorado in further exploring agricultural water conservation through on the ground, research-based field work. Through this project, we will continue to work with local water users to address key feasibility questions related to temporary reductions in agricultural water use, including: (1) best practices for reducing irrigation on perennial irrigated pastures; (2) estimating and verifying actual water savings from those associated practices, and; (3) working with ag producers to identify multi-year strategies to create conserved consumptive use while maintaining viable agricultural operations.

Section 6.4 of the CWP emphasizes the importance of alternative agricultural transfer methods (ATM) and identifies potential impediments to ATM success to include irrigators' concerns about the potential impact to their water rights and transactional costs. Section 9.5 of the CWP emphasizes the importance of Outreach, Education and Public Engagement. This project will help the state and all its stakeholders better understand the factors and considerations irrigators must address in implementing water conservation activities on the ground. Furthermore, this project involves the collaboration of multiple participants addressing multiple needs to pursue future ATM projects.

One of the CBRT Themes is to sustain agriculture. BIP, p. 16; p.43; pp.49-53. Goals include developing incentives to support agricultural production and increased education among the agricultural community about Colorado River Basin issues. ATMs are widely viewed as one mechanism to achieve this and the aim of this project is to distill the information needed to share with irrigators and others involved in agriculture. Another CBRT Theme is to secure safe drinking water, yet another outcome from ATMs. BIP, p. 16; p.43; pp. 54-58. A third Theme is to encourage a high level of basin wide conservation and a listed goal to promote agricultural conservation that maintains agricultural production and viability. BIP. p. 16; p.43; pp. 59-64. This project will provide important data to further all these goals.

[1] Access Basin Implementation Plans or Education Action Plans from Basin drop down menu.

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Matching Requirements: Basin Account Requests	
Basin (only) Account grant requests require a 25% match (cash and/or in-kind) from the Applicant or 3rd party and shall be accompanied by a **letter of commitment** as described in the 2020 WSRF Criteria and Guidelines (submitted on the contributing entity's letterhead). Attach additional sheet if necessary.	
Contributing Entity	Amount and Form of Match (note cash or in-kind)
Total Match	
If you requested a Waiver to the Basin Account matching requirements, indicate the percentage you wish waived.	

Matching Requirements: Statewide Account Requests	
Statewide Account grant requests require a 50% match as described in the 2020 WSRF Criteria and Guidelines. At least of 10% of the required Statewide Account Grant request match shall be cash from Basin Account funds whether that is from one or multiple basins; and the remaining 40% of the required match may be provided from any source, including other grants, cash from the Basin Account, or any combination of cash, in-kind services, or in-kind materials.and shall be accompanied by a **letter of commitment.** Attach additional sheet if necessary.	
Contributing Entity	Amount and Form of Match (note cash or in-kind):
WSRF Basin Account	$19,800
American Rivers	$22,400
Total Match	$42,200

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Matching Requirements: Statewide Account Requests	
If you requested a Waiver to the Statewide Account matching, indicate % you wish waived. (Max 50% reduction of requirement).	

Related Studies

Please provide a list of any related studies, including if the water activity is complimentary to or assists in the implementation of other CWCB programs.

A. Colorado Water Bank Feasibility Study, Phase II

This study explored if and how a water bank could work with the number of different irrigation systems on the West Slope. For Phase II of the Feasibility Study, the Colorado River Water Bank Work Group (WBWG) partnered with eight different irrigation systems on the West Slope to better understand the range of how water is used and managed. This included irrigation systems of different sizes, in different river basins, and at different elevations. It also included a range of management and ownership structures, from simple systems owned and operated by a small number of individuals, to more complex private ditch companies, to large Federal and Tribal projects. The study concluded generally that each system saw different opportunities and challenges to participating in a water bank. The study was extremely helpful in uncovering the large number of technical, legal, economic, and social questions that would need to be addressed for a water bank to become operational.

B. Agronomic Responses of Grass and Alfalfa Hayfields to No and Partial Season Irrigation

At the same time the WBWG was investigating how a water bank could work with the various irrigation systems on the West Slope, additional questions and concerns were raised about impacts to individual farm and ranch operations. Producers interested in participating needed information on how reduced irrigation would impact crops and how long it would take those crops to recover once full irrigation was restored. To address this, the WBWG partnered with Colorado State University (CSU) on a three-year study to evaluate the agronomic impacts of fallowing and split season irrigation. The study took place on seven different sites on the West Slope that included both grass and alfalfa fields. The study compared reduced irrigation and normal irrigation side by side and took measurements of yield and forage quality, as well as basic estimates of water use. The study helped quantify the reductions in yield expected with reduced irrigation and provided critical info on how well and how long it takes fields to recover. Like the Phase II report, it also raised a number of additional questions and the WBWG chose to continue working with CSU on a longer-term, larger scale field study that is described below.

C. Water Bank Phase IIC: Agronomic Impacts and Measurements of Water Savings

Similar to the previous study, this expanded study also involved a side by side comparison of a number of different reduced irrigation practices with normal irrigation. It also included a number of the same agronomic variables, including yield and forage quality. The study also assessed issues with recovery and management factors such as weed pressure and impacts to soil moisture. This study conducted an in-depth measurement of water savings using a number of different methods. Each field was instrumented to measure a full water budget: water delivered and applied, surface runoff, soil moisture at three different depths, and influence from groundwater, if any. Each study site also has, or is in close proximity to, a full weather station allowing for robust calculations of water use. This is a highly accurate, but costly way to measure water savings. In order to address the question of how to scale up, CSU also used remote

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Related Studies

sensing data to calculate water use and water savings.

D. System Conservation Pilot Program projects

With concerns growing among water managers about declining reservoir levels in Lakes Powell and Mead, the four major municipal water providers in the Colorado River Basin partnered with the Bureau of Reclamation to implement a four-year pilot program to test emergency measures to reduce water use. The SCPP ran from 2015-2018 and completed multiple projects in each Upper Basin state. These pilots were valuable for confirming that producers can find ways to reduce water use temporarily in ways that work for their operation. The pilots also highlighted a number of challenges, including: How do you determine a fair price for both parties? How do you have a simple and transparent method for estimating and confirming water savings? How do we build a program that is large enough to address the scale of the problem? How do we administer and shepherd conserved consumptive use water within State law?

E. Research Synthesis: Agronomic Impacts of Reduction Irrigation

This report reviews research on fallowing and limited irrigation to highlight key findings related to agronomic impacts of limited irrigation or other methods to reduce consumptive use of irrigation water in the Upper Colorado River Basin. The concluding section also identifies remaining research questions and suggests potential implications and possible next steps for a demand management program. The appendix summarizes the parameters of several of the studies reviewed.

F. Colorado River Basin Roundtable Demand Management Workgroup Discussion Points

The Colorado Basin Roundtable formed a demand management workgroup at the end of January 2019. This document summarizes the issues, questions, concerns and principles the CBRT feels should be part of the demand management conversation. A copy of this document is attached to the grant application.

Previous CWCB Grants

List all previous or current CWCB grants (including WSRF) awarded to both the Applicant and Grantee. Include: 1) Applicant name; 2) Water activity name; 3) Approving RT(s); 4) CWCB board meeting date; 5) Contract number or purchase order

Grant Name	CWCB Funding Source (WSRF, CWP, Etc.)	Agreement Number	Total Grant Amount
Upper Gunnison Water, Forest and Range Resiliency	CWCB Watershed Restoration		
Blue River Integrated Water Mgt. Plan Phase 2	CWCB Watershed Restoration		**$200,000.00**
Boles/Manny Ditch Infrastructure Improvement	WSRF-State/Basin Funds	POGGI 2021-2597	**$58,850.00**
Colorado River Connectivity Channel	CWP Env./Rec. Category	CTGG1, 2021*2091	**$18,034,000.00**
Lower Elkhead Crk. Restoration Project-Ph. 1	CWP-Environment/Rec Category	CTGG1, 2021*2407	**$645,829.00**

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Previous CWCB Grants			
Conejos Meadow Resilient Habitat Project.	CWP-Environmental/Rec Category and CWCB WSRF (state and basin funds)	POGG1, PDAA 2021*2567	**$239,729.00**
Applying technology to monitor CU and Yield.	CWP-AG category.	POGG1, PDAA, 2021*2064	**$62,685.00**
Upper Gunnison Multiple Diversion Project	CWP-AG Category and CWCB WSRF (basin funds)	POGG1, PDAA, 2021*2108	**$124,181.00**
Canyon Creek Fish Passage Project	CWP-Environment/Recreation and CWCB-WSRF (basin funds)		**$203,625.00**
Evaluation of Conserved Consumptive Use in the U. Colorado River basin-CMS #160841	ATM Grant Fund	CTGG1 2020*2976	**$888,238.00**
Granby Diversion Structure-CMS #14299	CWCB-WSRF	CTGGI2020*2708	**$325,754.00**
CWP Grant Irrigation efficiency/effects NW Colorado-CMS #148801	CWP-AG Category	POGG1, PDAA, 2020*2712	**$427,527.84**
Innovative Irrigation Efficiency for Mountain Meadows	CWP-Agriculture	POGG1,PDAA,2020*0009	**$112,908**
Octate Properties Channel and Irrigation Improvement	CWP-Environment/Recreation	POGG,PDAA,2020*2815	**$141,589**
Cimmaron Canal Diversion Gate Replacement/Water Mgt. Plan	CWP Environment/Recreation	not executed yet	**$48,418**
Cimmaron Canal Diversion Gate Replacement/Water Mgt. Plan	WSRF-GBRT Basin Funds	not executed yet	
Blue River Integrated Water Mgt. Plan	Stream Restoration-SMP	CTGG12020-032	**$253,639**
Blue River Integrated Water Mgt. Plan	CWP-Environment/Recreation	CTGG12020-032	
Blue River Integrated Water Mgt. Plan	CWP-Engagement/Innovation	CTGG12020-032	
Blue River Integrated Water Mgt. Plan	WSRF-CBRT Basin Funds	CTGG12020-032	
Monarch Pass Gravel Pit Reclamation		not executed yet	
Tomichi Creek Flow Restoration		CTGG1 2018-902	
Tomichi Creek Flow Restoration-WSRF Grant		CTGG1 2018-901	
Colorado Abrams Creek Cutthroat		CTGG1 2018-298	**$1,341,650**

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Previous CWCB Grants			
Ware Hinds Fish Bypass	WSRF-CBRT Basin Funds and State Funds (50/50)	POGG1 2017-0749	**$174,930**
Irrigators in Kremmling		CTGG1 2017-0667	
Windy Gap Reservoir Bypass	WSRF-CBRT	POGG1 2016-0900	
Windy Gap Reservoir Bypass Project	CWP-Environment/Recreation	CTGG1 2019-2233	**$2,129,147**
San Miguel River Stream Management Plan Pilot	WSRF-SWBRT	POGG1 2016-0800	**$128,551**
Kerber Creek Restoration		POGG1 2015-0286	
River Ranch Irrigation Diversion		CTGG1 2015-3313	**$183,000**
Redburn Ranch Diversion Dam		CTGG1 2015-2791	
W-Mountain Ranch Restoration		POGG1 2016-0610	
South Arkansas River Restoration		POGG1 2015-0175	
Upper Ohio Creek Flow Restoration		POGG1 2015-0161	

Tax Payer Bill of Rights
The Tax Payer Bill of Rights (TABOR) may limit the amount of grant money an entity can receive. Please describe any relevant TABOR issues that may affect the applicant.
Not applicable.

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Colorado Water Conservation Board	
Water Supply Reserve Fund	
Exhibit A - Statement of Work	
Date:	**March 29, 2021**
Water Activity Name:	**Field Support for the "Evaluating Conserved Consumptive Use in the Upper Colorado River" Project**
Grant Recipient:	**Trout Unlimited**
Funding Source:	**Basin & Statewide WSRF Grant Program**

Water Activity Overview: (Please provide brief description of the proposed water activity (no more than 200 words). Include a description of the overall water activity and specifically what the WSRF funding will be used for. (PLEASE DEFINE ALL ACRONYMS).

With support from the Alternative Transfer Methods grant program and under the guidance of the Colorado Basin Roundtable, a broad partnership of local water users, research universities, and conservation non-profits implemented the *Evaluating Conserved Consumptive Use in the Upper Colorado* project. The overall goal of the project is to work with local water users on field-based research to address priority feasibility questions related to temporary reductions in water use, including: (1) best practices for reducing irrigation on perennial irrigated pastures; (2) estimating and verifying actual water savings from those practices, and; (3) working with producers to identify multi-year strategies to create conserved consumptive use while maintaining viable agricultural operations.

The project involves significant field work and data collection in support of the research, and funding from the Water Supply Reserve Fund grant program will allow Trout Unlimited (TU) to hire two seasonal field technicians for the remaining three years of the project (2021-2023). These field technicians will work in coordination with our university partners to gather forage samples, collect soil moisture and groundwater data, maintain research equipment on multiple field sites, and coordinate with participating landowners. We also envision hiring these positions locally, which helps building local capacity and expertise in water and ag related research.

Objectives: (List the objectives of the project. (PLEASE DEFINE ACRONYMS).

This grant proposal, and funding for field technicians, is in direct service to the larger research project goals to integrate multiple facets of agricultural water management, including science-based estimations of consumptive use for perennial grasses, strategies for reduced consumption, economic considerations, forage yield and quality impact of reduced pasture irrigation, and producer involvement and feedback. This project is focused on informing the Colorado Basin Roundtable about the viability of reducing irrigation on high elevation irrigated pasture to supply water that can be used for a number of potential purposes including, but not limited to, enhancing environmental flows and providing temporary municipal supplies in times of shortages. In addition, the project will also help address related questions on how to best implement, manage, monitor, and determine water conservation from reduced irrigation.

The following are the primary objectives for the project.

- Use remote sensing models to estimate consumptive use (CU) and conserved consumptive use (CCU) on large (200-1000 acres) irrigated high-elevation pastures characterized by various grasses, forbs, and sedges under varying soil and groundwater conditions. This will also include a comparative evaluation between the remote sensing models and field data from eddy covariance instrumentation, soil moisture sensors, groundwater observation wells, and local weather stations.
- Evaluate impacts and recovery for forages subjected to different levels of irrigation curtailment. This will include documentation of weed pressure and other impacts to yield, forage quality, plant carbohydrates, root depth and nutrient carryover.
- Evaluate whether soil health practices can help improve field recovery following reduction irrigation.
- Construct water production functions for different grass, forb, and sedge forages under varying soil and groundwater conditions to better understand CU rates in relation to these different species as well as how yield and forage quality relate to CU rates.
- Complete ranch enterprise budgets to assist agricultural producers in comparing water leasing against baseline farming and ranching profitability and to inform questions of cost and price negotiations for ATM projects.
- Provide regular outreach and education opportunities on the project to support constructive dialogue on water sharing programs affecting the Colorado Basin and Western Slope overall.

Tasks

Task 1 – Forage Data Collection

Description of Task: In 2020, the research team established two fixed locations on each reference and treatment field participating in the project. These two locations reflect a “high” and “low” productivity area identified by the landowner and selected as a means of packaging several research variables into a single location, since productivity is largely influenced by grass species and underlying soil conditions. For this task, the field technicians will collect monthly forage samples from the two locations on all fields as outlined in the methodology below.

Tasks
Method/Procedure:
The field technicians will clip grass from a 0.25 m^2 grid square at each of the two fixed locations on the reference and treatment fields and collect composite grass samples from the area surrounding the fixed locations. The field technician is then responsible for appropriately labeling each sample with the location and collection date before weighing, drying, and transmitting to Colorado State University for further analysis.
Grantee Deliverable: (Describe the deliverable the grantee expects from this task)
Grass samples from each fixed location and composite samples from the surrounding area. Documentation of sample date and initial weight.
CWCB Deliverable: (Describe the deliverable the grantee will provide CWCB documenting the completion of this task)
Quarterly progress updates and an annual report on forage yield and quality for the participating reference and treatment fields.

Tasks
Task 2 – Soil Moisture/Groundwater Data Collection
Description of Task:
As described above, each project reference and treatment field has two fixed locations representing areas of relatively high and low forage productivity. At each high productivity location, the research team has previously installed instrumentation to measure water conditions in the soil and plant root zone. This instrumentation is designed to provide “real-time” measurements on energy fluxes, soil moisture conditions, soil electrical conductivity, and temperature. The instrumentation also includes data loggers programmed to record measurements 15 minutes and a rain gage.
Method/Procedure:
The field technicians are responsible for accessing the data loggers on a monthly basis to collect data from the data logger and upload it to the shared file site for the project for evaluation by CSU. During these visits, the field technician will also collect the rain gage data.
Grantee Deliverable: (Describe the deliverable the grantee expects from this task)
Monthly uploads of data from the soil moisture monitors, groundwater observation wells, and rain gages.
CWCB Deliverable: (Describe the deliverable the grantee will provide CWCB documenting the completion of this task)
Quarterly progress updates and an annual report on the soil water balance for participating reference and treatment fields that provides an estimate of evapotranspiration (ET) for comparison.

Tasks
Task 3 – Equipment Maintenance
Description of Task:
This task involves regular coordination with Colorado State University researchers and participating landowners to ensure that the field instrumentation is maintained and operational throughout the irrigation season.
Method/Procedure:
Field technicians will work with CSU to turn on field instrumentation and test its function at the beginning of each irrigation season, provide ongoing maintenance and repair to the instrumentation and the research enclosures throughout the season, and work with CSU to turn off and winterize the equipment at the end.
Grantee Deliverable: (Describe the deliverable the grantee expects from this task)
Maintained instrumentation and research equipment.
CWCB Deliverable: (Describe the deliverable the grantee will provide CWCB documenting the completion of this task)
Quarterly progress reports

Budget and Schedule
Exhibit B - Budget and Schedule: This Statement of Work shall be accompanied by a combined Budget and Schedule that reflects the Tasks identified in the Statement of Work and shall be submitted to CWCB in excel format. A separate excel formatted Budget is required for engineering costs to include rate and unit costs.

Reporting Requirements
Progress Reports: The grantee shall provide the CWCB a progress report every 6 months, beginning from the date of issuance of a purchase order, or the execution of a contract. The progress report shall describe the status 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 CWCB may withhold reimbursement until satisfactory progress reports have been submitted.
Final Report: At completion of the project, the grantee shall provide the CWCB a Final Report on the grantee's letterhead that: • Summarizes the project and how the project was completed. • Describes any obstacles encountered, and how these obstacles were overcome. • Confirms that all matching commitments have been fulfilled. • Includes photographs, summaries of meetings and engineering reports/designs.
Payments

Last Update: March 17, 2020

https://cwcb.colorado.gov/

Reporting Requirements
Payment will be made based on actual expenditures, must include invoices for all work completed and must be on grantee's letterhead. The request for payment must include a description of the work accomplished by task, an estimate of the percent completion for individual tasks and the entire Project in relation to the percentage of budget spent, identification of any major issues, and proposed or implemented corrective actions. The CWCB will pay the last 10% of the entire water activity budget when the Final Report is completed to the satisfaction of CWCB staff. Once the Final Report has been accepted, and final payment has been issued, the water activity and purchase order or contract will be closed without any further payment. Any entity that fails to complete a satisfactory Final Report and submit to CWCB within 90 days of the expiration of a purchase order or contract may be denied consideration for future funding of any type from CWCB.

Performance Requirements
Performance measures for this contract shall include the following: (a) Performance standards and evaluation: Grantee will produce detailed deliverables for each task as specified. Grantee shall maintain receipts for all project expenses and documentation of the minimum in-kind contributions (if applicable) per the budget in Exhibit B. Per Grant Guidelines, the CWCB will pay out the last 10% of the budget when the final deliverable is completed to the satisfaction of CWCB staff. Once the final deliverable has been accepted, and final payment has been issued, the purchase order or grant will be closed without any further payment. (b) Accountability: Per the Grant Guidelines full documentation of project progress must be submitted with each invoice for reimbursement. Grantee must confirm that all grant conditions have been complied with on each invoice. In addition, per the Grant Guidelines, Progress Reports must be submitted at least once every 6 months. A Final Report must be submitted and approved before final project payment. (c) Monitoring Requirements: Grantee is responsible for ongoing monitoring of project progress per Exhibit A. Progress shall be detailed in each invoice and in each Progress Report, as detailed above. Additional inspections or field consultations will be arranged as may be necessary. (d) Noncompliance Resolution: Payment will be withheld if grantee is not current on all grant conditions. Flagrant disregard for grant conditions will result in a stop work order and cancellation of the Grant Agreement.

Last Update: December 17, 2019

COLORADO
Colorado Water Conservation Board
Department of Natural Resources

Colorado Water Conservation Board

Water Supply Reserve Fund

EXHIBIT B - BUDGET AND SCHEDULE - Direct & Indirect (Administrative) Costs

Date: March 15, 2021

Water Activity Name: Upper Colorado Project Field Support

Grantee Name: Trout Unlimited

Task No.[1]	Description	Start Date[2]	End Date	Matching Funds (cash & in-kind)[3]	WSRF Funds (Basin & Statewide combined)[3]	Total
1	Forage Data Collection	5.1.2021	12.1.2023	$ 7,466.67	$ 19,933.33	$ 27,400.00
2	Soil Moisture/Groundwater Data Collection	5.1.2021	12.1.2023	$ 7,466.67	$ 19,933.33	$ 27,400.00
3	Equipment Maintenance	5.1.2021	12.1.2023	$ 7,466.66	$ 19,933.34	$ 27,400.00
			Total	$ 22,400.00	$ 59,800.00	$ 82,200.00

(1) The single task that include costs for Grant Administration must provide a labor breakdown (see Indirect Costs tab below) where the total WSRF Grant contribution towards that task does not exceed 15% of the total WSRF Grant amount.

(2) Round values up to the nearest hundred dollars.

• Additional documentation providing a Detailed/Itemized Budget may be required for contracting. Applicants are encouraged to coordinate with the CWCB Project Manager to determine specifics.

The CWCB will pay the last 10% of the entire water activity budget when the Final Report is completed to the satisfaction of the CWCB staff project manager. Once the Final Report has been accepted, the final payment has been issued, the water activity and purchase order (PO) or contract will be closed without any futher payment. Any entity that fails to complete a satisfactory Final Report and submit to the CWCB with 90 days of the expiration of the PO or contract may be denied consideration for future funding of any type from the CWCB.

• Additonally, the applicant shall provide a progress report every 6 months, beginning from the date of contract execution

American Rivers
RIVERS CONNECT US®

Colorado Water Conservation Board
Water Supply Planning Section
WSRF Application
1313 Sherman Street, Room 718
Denver, CO 80203

Dear Colorado Water Conservation Board Members:

American Rivers' enthusiastically supports Trout Unlimited' s Water Supply Reserve Fund (WSRF) grant application: *Field Support for the "Evaluating Conserved Consumptive Use in the Upper Colorado River" Project.* American Rivers has been rigorously involved and has supported this project from the beginning. We are contributing $22,400 in cash to support this critical phase of the project- specifically to support on-the-ground and local field technicians to gather data necessary to inform state decisions on water management.

Water users and the environment are facing unprecedented challenges when it comes to water supply in Colorado. It is critical that the state understand the role agricultural water conservation can play in advancing solutions for a healthy environment and productive and profitable agriculture. The Upper Colorado River Project will help do this by working with local water users on field-based research to address priority feasibility questions related to temporary reductions in water use. This research involves significant field work and data collection. Funding from the WSRF grant program will allow TU, the fiscal agent for the project, to hire two seasonal field technicians for the remaining three years of the project.

American Rivers is proud to support this important project and grateful for the continued support of the Colorado Water Conservation Board. This project is contributing to the State of Colorado's leadership in advancing solutions for a sustainable future for the Colorado River and the people that depend on it.

We are grateful for your consideration,

Matt Rice

Director, Colorado River Basin Program
American Rivers
mrice@americanrivers.org
803-442-5244

THE COLORADO BASIN ROUNDTABLE

C/O P.O. BOX 1120
GLENWOOD SPRINGS, COLORADO 81602

May 24, 2021

Colorado Water Conservation Board
Water Supply Planning Section c/o Ben wade
1313 Sherman Street, Room 721
Denver, CO 80203

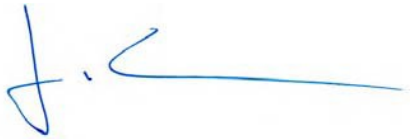
Dear Ben:

I am writing on behalf of the Colorado Basin Roundtable (CBRT) to offer our support for Trout Unlimited's Water Supply Reserve Fund (WSRF) grant application: *Field Support for the "Evaluating Conserved Consumptive Use in the Upper Colorado River" Project*

We are facing unprecedented challenges when it comes to water use in Colorado, and we need to understand the potential role agricultural water conservation can play in addressing these challenges. The Upper Colorado River Project will help do this by working with local water users on field-based research to address priority feasibility questions related to temporary reductions in water use. This research involves significant field work and data collection, and funding from the WSRF grant program will allow TU to hire two seasonal field technicians for the remaining three years of the project

The CBRT fully supports this effort and has approved a grant for $19,800 for this work from our Basin Account. We believe that this important work is relevant for our roundtable, the State, and the broader Upper Colorado River Basin and encourage the CWCB to fully support the Statewide funding request.

Regards,



Jason V. Turner, CBRT Chair