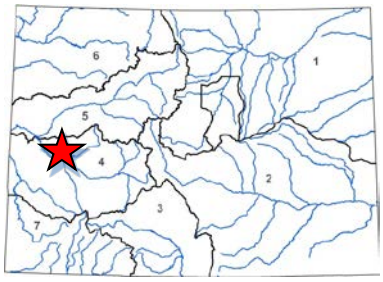
COLORADO
Colorado Water Conservation Board
Department of Natural Resources

Stewart Mesa Canal Diversion Modification and Restoration Project
Trout Unlimited

January 2021 Board Meeting

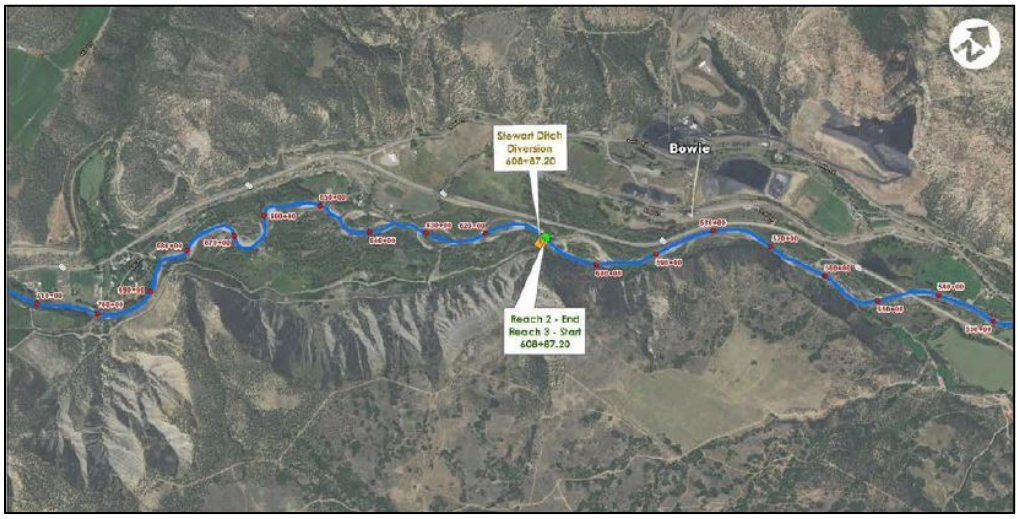
Colorado Watershed Restoration Program Application



LOCATION	
County/Counties:	Delta
Drainage Basin:	Gunnison

DETAILS	
Total Project Cost:	$511,060
Colorado Watershed Restoration Program Request:	$135,000
Recommended amount:	$22,000
Other CWCB Funding:	$65,000 pending
Other Funding Amount:	$9,410 secured $270,150 pending $18,500 in-kind
Applicant Match:	$13,000 in-kind
Project Type(s): Watershed Restoration	
Project Category(Categories): Watershed/Stream Restoration	
Measurable Result: Modified diversion; increase in fish passage	

Trout Unlimited (TU) is working with water management entities, including the Stewart Mesa Canal Company, landowners, water users, and other conservation organizations to restore, reconnect, and protect areas of the North Fork of the Gunnison Watershed. TU has participated in assessments of irrigation infrastructure and environmental and recreation attributes within the basin. The assessments identified the need to address the diversion of the Stewart Mesa Canal, which consists of a 1200-ft long push-up dam and an antiquated headgate to divert around 60 cfs from the river for irrigation of approximately 2,500 acres of farms and orchards. Maintenance of the diversion dam has created an island in the river, impacted steam banks, caused erosion and over-widened a portion of the river. The push-dam also acts as a barrier for fish and the canal is known to entrain considerable numbers of fish during the irrigation season. The headgate overtops during high flow events and pulls in debris from the river which impacts canal operations.



TU is proposing to design and construct a diversion works that restores river and floodplain function, reducing fish loss, improving fish migration, and improve functionality of diversion infrastructure.

The partial funding recommendation satisfies the request for the design phase of the project. Unfortunately, the available funding, the application score, and the need to reduce funding across all the major river basins represented in the applicant pool resulted in a reduced recommendation for this application. Staff encourages the applicant to seek funding from other sources or in subsequent grant cycles of the CWCB's Colorado Watershed Restoration Program.

COLORADO WATERSHED RESTORATION PROGRAM

Summary Sheet

Project Title: Stewart Mesa Canal Diversion Modification and Restoration Project

Project Location: Latitude- 38.914238 Longitude- -107.544197

Grant Type: Colorado Watershed Restoration Fund

Grant Request/Amount: $135,000

Cash Match Funding: $344,560

In-kind Match Funding: $31,500

Project Sponsor: Trout Unlimited

Contact Person: Cary Denison, cary.denison@tu.org, 970-596-3291

Brief description of the project:

Trout Unlimited (TU) is working with water management entities including the Stewart Mesa Canal Company, landowners, water users, and other conservation organizations to restore, reconnect, and protect areas of the North Fork of the Gunnison Watershed. Trout Unlimited participated in assessments of irrigation infrastructure and environmental and recreation attributes within the North Fork of the Gunnison Watershed. These efforts were led by the North Fork Water Conservation District and Western Slope Conservation Center. The assessments both identified the need to address the diversion of the Stewart Mesa Canal. The diversion consists of a 1200-foot long push-up dam and an antiquated headgate to divert around 60cfs from the river for irrigation of approximately 2,500 acres of farms and orchards. Maintenance of the diversion dam has created and island in the river, impacted stream banks, caused erosion and over widened a portion of the river. The push-up dam also acts as a barrier for fish during and the canal is known to entrain considerable numbers of fish during the irrigation season. The headgate overtops during high flow events and pulls in debris from the river which impacts canal operations. The Stewart Mesa Canal Company (SMCC) contacted TU about rebuilding the diversion works of the canal in November, 2019. Since then TU has gathered information related to the project, discussed design options with engineers and partners, consulted with local stakeholders, completed site visits, and collected cost estimates for construction and design. The canal company has consulted with an engineering company that has provided conceptual designs and costs for the improvements to the diversion.

TU is proposing to design and construct a diversion works that restores river and floodplain function, reducing fish loss, improving fish migration, and improve functionality of diversion infrastructure. To accomplish this goal, TU is requesting funding from the CWCB Watershed Restoration Fund to assist in the creation of a design and construction of the diversion structure.

Applicant Qualifications

TU has extensive experience managing restoration projects as well as in tracking financial support and in-kind contributions provided from federal, state, philanthropic, and private sources. Cary Denison TU's Gunnison Basin Project Manager will be serving as project lead this effort. Cary oversaw the design, fund raising, and planning for the Hartland Dam modification and the Relief Ditch Diversion modification on the Gunnison River. Cary has more than 14 years of experience with heavy construction and restoration work in rivers.

TU's Colorado staff are part of the Western Water and Habitat Program, which is the largest TU conservation program. There are more than 75 attorneys and project managers in ten includes hydrologists, attorneys, GIS experts, and biologists – all with water rights, project management, and construction management experience. Drew Peternell leads the Western Water and Habitat Program in Colorado. Drew has worked for TU for over 13 years and holds a B.A. in political science from Vanderbilt University and a J.D. and Certificate of Specialization in Environmental Law from the University of California, Berkeley.

TU has had multiple successes with irrigation efficiency upgrades and habitat projects throughout the Colorado River basin. TU is a partner in the Lower Gunnison NRCS RCPP project that has resulted in considerable upgrades to the Fire Mountain Canal in the North Fork of the Gunnison. TU staff in Wyoming and Utah recently completed a project very similar to the Stewart Canal Diversion on the Bear River in Utah.

TU was involved in and supported an Integrated Water Management Plan process, also known as a stream management plan, led by Western Slope Conservation Center (WSCC) and the North Fork Water Conservancy District (NFWCD). The stream management planning efforts resulted in reports that identified environmental and recreation needs and consumptive water use needs. These separate studies identified the need for improvements at the Stewart Mesa diversion to address fish passage, boater passage, disturbances to the floodplain, and operations and maintenance issues. TU, with help from partners like WSCC, has cultivated relationships with water managers and users on the Stewart Mesa canal and with landowners on the North Fork adjacent to the project site. WSCC initiated a second phase of water planning that brought irrigators together with other water users to discuss priority projects and how those projects could be implemented.

In-kind support for the Stewart Project will be provided by TU, WSCC, NFWCD, Stewart Mesa Canal and other partners. TU, as the lead partner, will provide is committed to providing in excess of $13,000 of in-kind support to the project. This in-kind support sum was created by estimating hours of labor, project management, and monitoring services that TU will provide to the project multiplied by a prevailing wage rate of $25.00 per hour.

Cash match for the project will be provided through several sources including NRCS RCPP, and USFWS. At current $9,410 of cash has been committed by WSCC for the design phase of the project. These funds are from the grant that funded the stream management planning effort and were earmarked for signage to direct boaters through the Stewart diversion. Reconstruction of the diversion would eliminate the need for signage. Based on discussions with other funding agencies TU anticipates leveraging Watershed

Restoration funds with financial support from U.S. Fish and Wildlife Service fish passage program, Colorado Water Conservation Board WSRF funds (Basin and State), Natural Resource Conservation Service and possibly other sources. TU has ongoing discussions about support for this restoration project with private landowners in the area and Colorado Department of Transportation (CDOT). CDOT has interest in preventing further erosion along the bank opposite the diversion structure adjacent the highway.

Organizational Capability

TU has partnered with several water user groups and agencies in the North Fork including WSCC and NFWCD on recent Stream Management Plans. TU supported the fund raising and project planning efforts of the Colorado River District on the Lower Gunnison RCPP project that resulted in completion of 2 miles of canal piping and infrastructure improvements at the cost of $4.66mil.

TU has worked with agricultural water users and landowner in the watershed on infrastructure improvements that have resulted in stream flow benefits. In an ongoing effort TU has collaborated with agricultural water users in the North Fork through a group called No Chico Brush that has studied how water can be conserved through a variety of methods. TU is currently working with landowners and variety of partners to construct a barrier on a tributary of the North Fork to protect a population of native trout.

TU's primary staffer for this project will be Cary Denison, Gunnison Basin Project Manager. TU will be able to allocate as much as 15 hours per week for the duration of the project. Cary has worked for TU in the Gunnison Basin for over 9 years. In that time, he has managed numerous projects including diversion modifications and has built relationships with water users in the North Fork and elsewhere in the Gunnison Basin.

TU will also provide considerable volunteer time in the construction and monitoring phases of the projects. TU has a broad base of volunteers in the North Fork and surrounding areas who have provided support to projects such as the Relief Ditch Diversion modification project in the past and are willing to assist with the Stewart Mesa Canal project.

WSCC will also provide management and volunteer support to the project. Jake Hartter, Watershed Coordinator, will lead the efforts for WSCC. Jake, who has a B.S. in Environmental Biology, joined the Conservation Center in 2017. He has experience with developing wetland features and riparian corridors for improving domestic water quality.

Karl Burns is the president of the Stewart Mesa Canal Company. He will be providing and guiding in-kind support from the SMCC. In recent years SMCC has undertaken several large-scale near-farm canal improvement projects. Karl has overseen these efforts and has been leading the company's efforts to improve the diversion structure.

The budget for this project was developed by using cost data from projects of similar size and scope that have been completed recently. These projects include Booth Diversion Modification on the Bear River in

Wyoming and the Relief Ditch Diversion project on the Gunnison River. Engineering estimates have been provided by professional engineers including River Restoration, Harward Engineering, and JUB Engineers. JUB Engineers provided the following rough cost estimates in the agricultural needs assessment report:

Preliminary Cost Estimates –
1. River Signs – $1,000
2. Island Stabilization - $20,000 to $50,000
3. Upstream Headwall - $100,000 to $300,000
4. Diversion Relocation/Complete Rebuild - $1M - $3M

The proposed diversion modification included stabilization of the "island" or dam, and addition of headwall to gain elevation and stabilize stream bed.

Project timeline was developed using information from similar projects and form information provided by professional engineers. The project timeline allows for time to evaluate design prior to construction and monitor the performance of the infrastructure.

Project Effectiveness

Information from the stream management planning efforts has proven valuable for identifying restoration objectives as well as determining project costs. Through communications with CPW and analysis of fish population surveys, TU has determined that the Stewart diversion impacts populations of trout and native "three species" - bluehead and flannelmouth sucker, and roundtail chub, which are species of special concern in the Colorado River basin. The Stewart Canal diversion and headgate has also been listed on the Gunnison Basin Roundtable's projects list and on the Basin Implementation Planning list that is under revision.

From the 2017 Environment and recreation assessment for the North Fork of the Gunnison:

> *b. Construction of a new diversion or rehabilitation of the existing*
> *i. facilities at the Stewart Ditch, with incorporated riparian bioengineering and geo-stabilization on the "island" created between the diversion channel and the North Fork.*

Excerpt from Agricultural needs assessment:

> *There is currently no mechanism to control flow into the diversion channel other than building a "push up" dam in the river channel. For this reason, the diversion channel often acts as the main river channel. This potentially creates a fish passage issue during certain, relatively short times of the year.*
> *Diversion Issues that Affect Recreational Users –*
> *Since the diversion channel is of similar size to the main river channel, recreationalists have inadvertently traveled down the diversion channel rather than the river channel. The boulder weir is an impassable obstruction for boaters, which results in frustration for recreational users that inadvertently travel down the diversion channel.*

Along with project partners, TU has evaluated how similar projects have been developed and implemented to best understand potential benefits, costs, and hurdles. TU has consulted with biologists and fisheries experts about the Stewart Canal diversion impacts to health of fisheries and how to best mitigate impacts. The Bureau of Land management, who owns land adjacent on at the diversion has been consulted about the project. Project proponents intend for this project to serve as an example for ditch companies in the area that face similar issues.

This project concept was created in part through the stream management planning processes that helped consumptive water users understand the impacts to the river and riparian areas as well as that addressing the needs of other users can create a multi-benefit project. The objectives for the diversion modification project are as follows:

- Improve channel stabilization
- Improve riparian habitat
- Improve water diversion management
- Enhance recreational opportunities
- Address fish passage and entrainment

Irrigation diversions just upstream and downstream of the Stewart canal have also been identified as barriers to fish migration and threats to boaters, through the stream management plans and other assessments. The landowner upstream of the Stewart Canal has made improvements to the river and fish habitat and is currently working with CDOT to address river migration issues that threaten the highway. TU has been working on improving water management and efficiency on tributaries upstream of the Stewart diversion. The improvements to the Stewart canal will complement and inform these other projects nearby on the river.

TU will work with WSCC, SMCC and others to monitor and evaluate the function of the improved diversion for a period of two years post construction. The plan to monitor the project includes inviting feedback from members of the recreational community including anglers and boaters. SMCC will provide feedback on the operations of diversion and success of stopping fish entrainment. TU, with assistance from Colorado Parks and Wildlife, will evaluate water velocities at low and moderate flows through the diversion to determine if fish can pass the modified diversion. Health of the restored and revegetated riverbanks will be assessed and monitored by TU and WSCC staff and volunteers. Photos of the structure will be recorded during site visits and will be provided to project funders in project update reports.

Scope of Work

GRANTEE and FISCAL AGENT: Trout Unlimited

PRIMARY CONTACT: Cary Denison

ADDRESS: 264 County Road 4, Montrose, Colorado 81402

PHONE: 970-596-3291

PROJECT NAME: Stewart Mesa Canal Diversion Modification and Restoration Project

GRANT AMOUNT: $135,000

INTRODUCTION AND BACKGROUND:

Trout Unlimited and partners in the North Fork of the Gunnison Watershed are proposing to address multiple deficiencies on the North Fork river at the Stewart Mesa Canal by implementing a river restoration and diversion modification project. The project will build off the recent stream management planning efforts funded by CWCB that identified issues and built stakeholder interest. While led by TU, the project will be a collaborative effort that will benefit multiple users and involve their input on design and monitoring. TU intends to raise funding through grants from NRCS RCPP, USFWS Fish Passage Program, CWCB and possibly other entities. In-kind support will be provided by project partners and stakeholders in the North Fork Watershed.

The Stewart Mesa Canal Diversion is now a 1200-foot-long push-up dam and an antiquated headgate. The rock dam structure has been created to allow for diversion at low flows. At high flow the river breaks through rock and cobble dam, overtops the diversion structure and causes damage to the riverbanks adjacent to the diversion. The dam also pushes water to the north bank away from the diversion during high flows causing erosion and widening of the river. Due to the orientation of the dam and diversion navigating the river and can be dangerous for boaters at high-flow event. During low and moderate flows, the dam is a barrier to fish that are trying to navigate upstream. The canal intake is known to remove fish from the river due to the dam and diversion configuration.

Within this project, TU and partners will survey the river and diversion works to construct conceptual designs and 2 dimensional hydraulic models. These models will evaluate design options and methods for creating water surface elevations necessary to divert water while allowing fish passage and not worsening erosion. Design options will be evaluated by partners and stakeholders to develop a draft final design. Final design will be created by professional engineers. It is likely that in-river design and headgate design will be done through a partnership of engineering firms.

TU will use design to select contractors who will construct the project as directed by engineers. The construction will include restoration work on damaged banks as well construction of diversion works and in river dam. TU and partners will evaluate and monitor the project to ensure the project is meeting objectives and to identify deficiencies.

OBJECTIVES:

- Improve channel stabilization
- Improve riparian habitat
- Improve water diversion management
- Enhance recreational opportunities
- Address fish passage and entrainment

TASKS:

TASK 1 – Conceptual Design

Description of Task:

This task will create conceptual designs and analyze them. The concepts will strive to show improvements to fish passage, diversion maintenance, sediment transport, recreational navigation, and flood conveyance.

Method/Procedure:

Professional engineers will survey the Stewart Canal diversion and surrounding area. Survey data will be used to create draft designs which will be analyzed for effectiveness using the USBR's SRH-2D numerical hydraulic model. Conceptual designs that meet objectives will be analyzed by stakeholders.

Deliverable:

Conceptual design reports and stakeholder feedback provided to partners and CWCB.

TASK 2 – Final Design

Description of Task:

Professional engineers will create final engineered plans that included structural, location, and material specifications.

Method/Procedure:

By using the conceptual design information engineers will prepare full final plans of diversions structure, headgate and restoration features.

Deliverable:

Full set of final plans and report on process.

TASK 3 – Construction

Description of Task: Selection of contractor and construction.

Method/Procedure:

Through and RFP proposals, TU will select a construction contractor with experience and capabilities to complete the build as designed. Selected contractor will complete, dewatering, material staging, demolition, excavation, material placement, bank stabilization, final grading and other tasks necessary to complete the structure as designed.

Deliverable:

A description construction process including photos, as built information, and description of issues that may have impacted the build.

Budget & Timeline Table

Task	Description	Target Start Date	Target Completion Date	CWCB WSRF	CWCB Watershed Restoration	Other Funding Cash/Source	In-Kind Contribution/ Source	Total
1	Conceptual Design	March 1, 2021	September 30, 2021	0	$8,000	$9,410/ CWC-SMP	$2,000/ TU, WSCC	$19,410
2	Design review Stakeholder outreach	March 1, 2021	December 1, 2021	0	0	$150/ TU	$3,000/ TU, USFWS, SMCC, WSCC	$3,150
3	Final Design	December 1, 2021	April 30, 2022	$5,000	$14,000	$5,000/NRCS	$3,000/ TU, USFWS, SMCC, WSCC	$27,000
4	Construction	September 1, 2022	December 2022, 2016	$60,000	$113,000	$205,000/ NRCS $60,000/ USFWS	$10,000 NFWCD, WSCC, TU, SMCC	$439,000
5	Monitoring	April, 2022	October 30, 2023	0	0	0	$13,500/ NFWCD, WSCC, $9,410/ CWC- SMP TU, SMCC	$13,500
	TOTALS			$65,000	$135,000	$279,560	$31,500	$511,060

This table is a guide. Specifics for each task can be found within grant document.

Reporting and Final Deliverable

Applicant will provide progress reports every 6 months during project. Applicant will also provide a final report at the end of the project that summarizes the entire process.

Attachments

Environmental and Recreation- Watershed Assessment 2017:
https://docs.google.com/document/d/1N5a0RZIeMbHJrYz3byLHskNyZ3TtPeon/edit

Agricultural Water Needs Assessment:

..\..\SMP\NFWCD Irrigation Management Plan-CompiledANDREDACTEDFinal.pdf

Location map of Stewart Diversion:

Design concepts:

Booth diversion Wyoming:

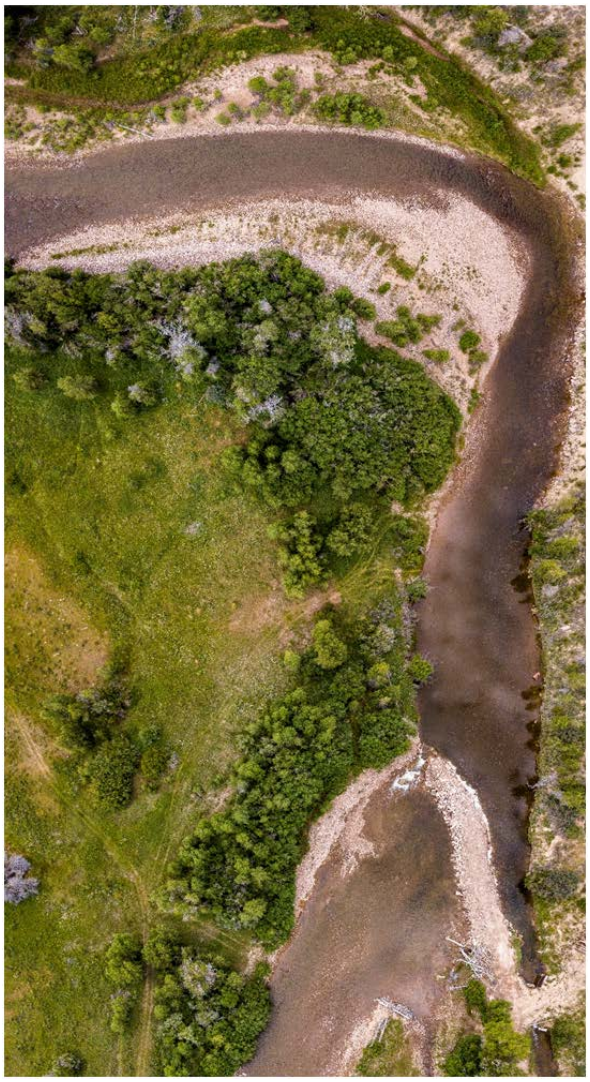


Figure 1 Before

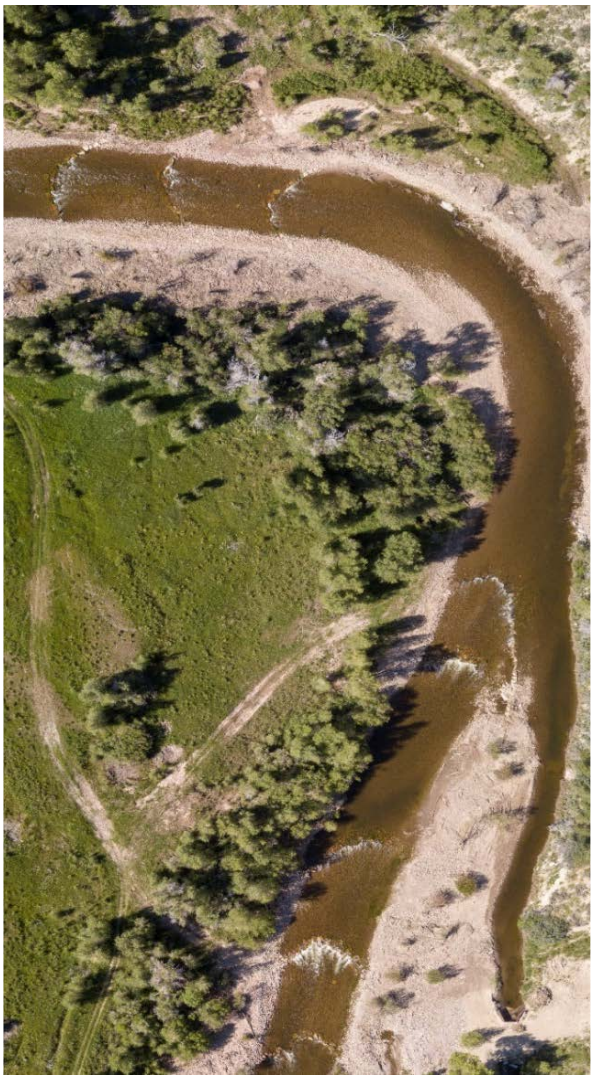
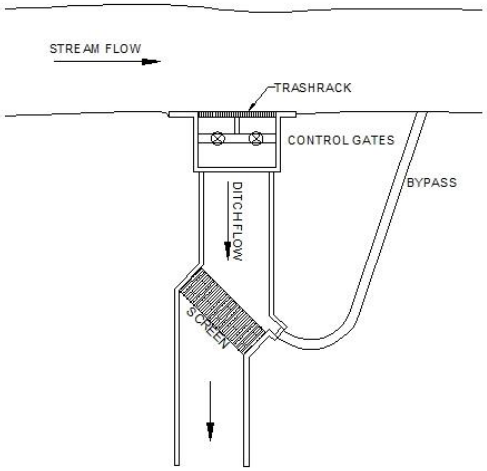
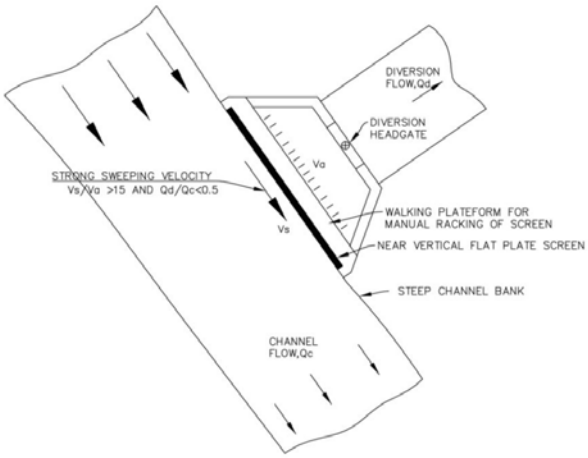


Figure 2 After

Screen concepts: (Pocket Guide to Screening Small Water Diversions, USBR)





Needle Rock Diversion screen and fish passage structure:

United States Department of the Interior

FISH AND WILDLIFE SERVICE
134 Union Blvd
Lakewood, Colorado 80228

In Reply Refer to:
FWS/R6

November 5, 2020

Colorado Water Conservation Board
C/o: Chris Sturm
1313 Sherman Street, Room 718
Denver, CO 80203

This letter is in support of a funding request submitted by Trout Unlimited to the Colorado Water Conservation Board to help support design and construction of fish passage at the Stewart Mesa diversion on the North Fork of the Gunnison River. This project has the opportunity to address several conservation goals within Range-wide Conservation Agreement and Strategy for roundtail chub, flannelmouth and bluehead sucker (known as 3-species), all of which are species of concern for our agency. The project also supports improving fish passage for several recreational trout species as well.

I recently had the opportunity to do a field visit to Stewart Mesa with Trout Unlimited and it's readily apparent that it is a fish passage barrier at most flows. With more thoughtful design, Stewart Mesa would provide more consistent water diversion for irrigators, reduce maintenance costs and allow for fish passage over a greater timeframe throughout the year. Given that the fish species inhabiting the North Fork of the Gunnison all migrate to some degree to historical spawning areas, improving the fish passage capability of the diversion would have far-reaching benefits to the fish community.

Thank you for the opportunity to provide this letter of support, please contact me with any questions at 303-929-6392 or at pamela_sponholtz@fws.gov

Sincerely,

PAMELA SPONHOLTZ

Digitally signed by PAMELA SPONHOLTZ
Date: 2020.11.05 11:55:09 -07'00'

Pamela J. Sponholtz, Project Leader Colorado Fish and Wildlife Conservation Office

Photos:

From diversion looking northeast at spring flow.

Stewart Canal Headgate overtopping during spring flow:

Below the diversion:

Diversion at low water still submerged: