



WaterSMART Environmental Water Resources Projects for Fiscal Year 2023

Roan Creek Fish Barrier & Diversion Infrastructure Upgrade



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March 24, 2023

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Technical Proposal & Evaluation Criteria

Executive Summary

Date: March 24, 2023

Applicant Name: Middle Colorado Watershed Council (MCWC) -as a Category B applicant, MCWC is partnering with Garfield County as a Category A applicant.

Project Location: Garfield County, Colorado

Proposal Summary

The Roan Creek Fish Barrier & Diversion Infrastructure Project was developed through a collaboration of the Middle Colorado Watershed Council, Garfield County, Bureau of Land Management, Colorado Parks & Wildlife, the land owner, and the water rights holder. The project will construct a fish barrier that effectively eliminates the upstream movement of non-native fish in an effort to improve Roan Creek's aquatic and riparian habitat and protect a unique native fish assemblage of four species, including the Colorado River cutthroat trout, bluehead sucker, speckled dace, and mottled sculpin. The project will also benefit the water rights owner by providing water diversion enhancements that make water delivery more efficient and less impactful to water quality by eliminating the need to construct a pushup dam each year. The project, located on Roan Creek, northwest of De Beque, Colorado, is a high-priority project in the Middle Colorado River Integrated Water



Management Plan and supports goals in the Colorado Basin Implementation Plan.

Length of Project Time: Once funding agreements are in place, which are expected by October 2023, final engineering design will begin. Final permitting and design will conclude by June 2024 with construction beginning in late summer/early fall of the same year. Construction is anticipated to take approximately 5 months. The entire project from the start of final design to adaptive management and monitoring will take 27 months.

Estimated Completion Date for Project: February 2025

Federal facility/land involvement: The Roan Creek Fish Barrier & Diversion Infrastructure Project is not on a Federal facility and does not involve Federal land. It is located

exclusively on private land, however the project would protect several miles of Roan Creek managed by the BLM upstream of the project site from invasion of nonnative fish species.

Project Location

The Roan Creek Fish Barrier & Diversion Infrastructure Project is located in Garfield County, Colorado, on the mainstem of Roan Creek up County Road 204, approximately 18 miles northwest of the Town of De Beque. The project latitude is 39° 30.632'N, and the project longitude is 108° 31.703'W. Roan Creek is a 45.7-mile-long tributary to the Colorado River in western Colorado. Roan Creek is a moderate-gradient stream with its headwaters in the Roan Plateau. A map showing the location of the existing barrier as compared to the proposed barrier is provided in Figure 1. The project location and vicinity map is provided in Figure 2.

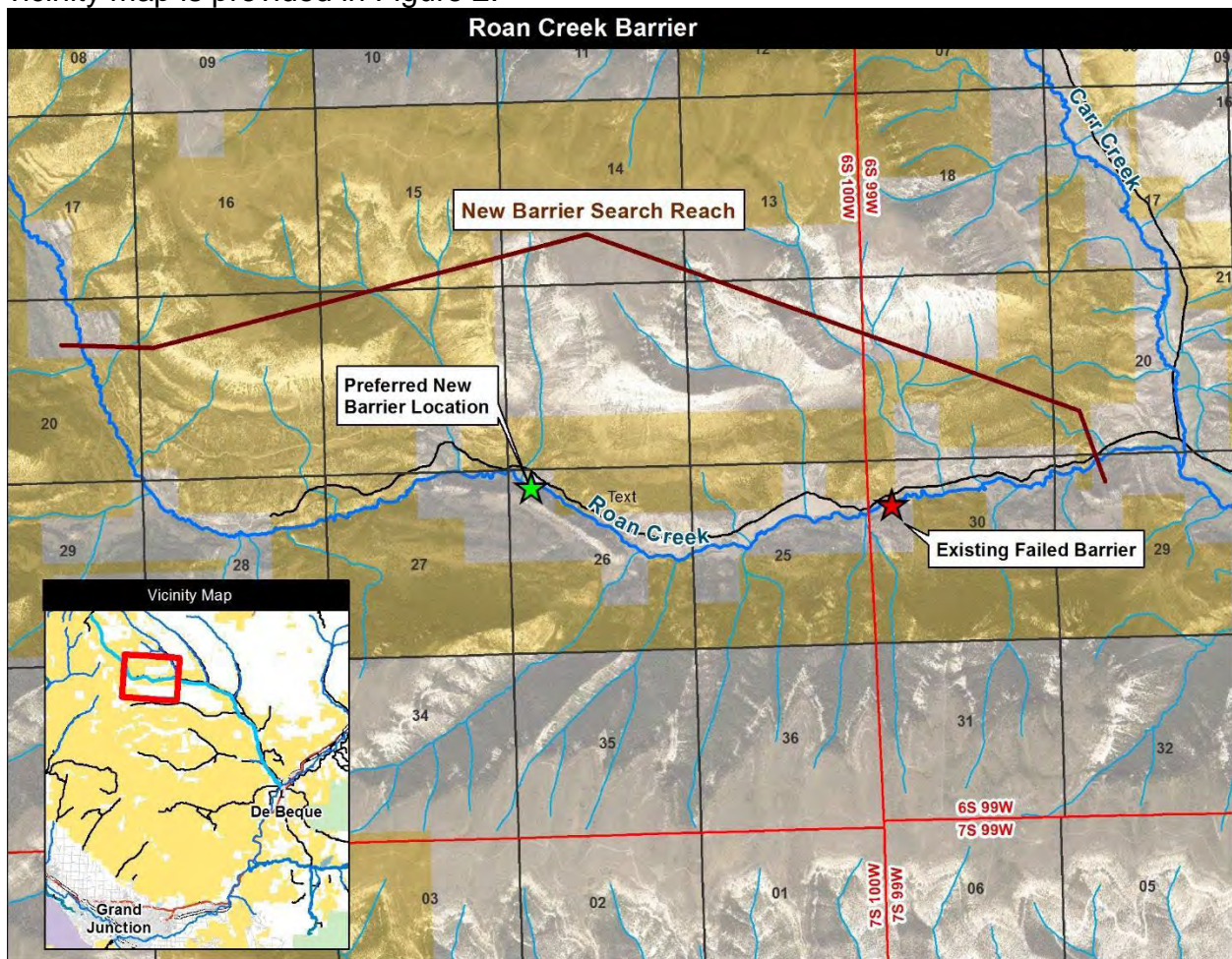


Figure 1. The extent of the new barrier search reach with the preferred location for the new barrier (green star) versus the existing barrier (red star).

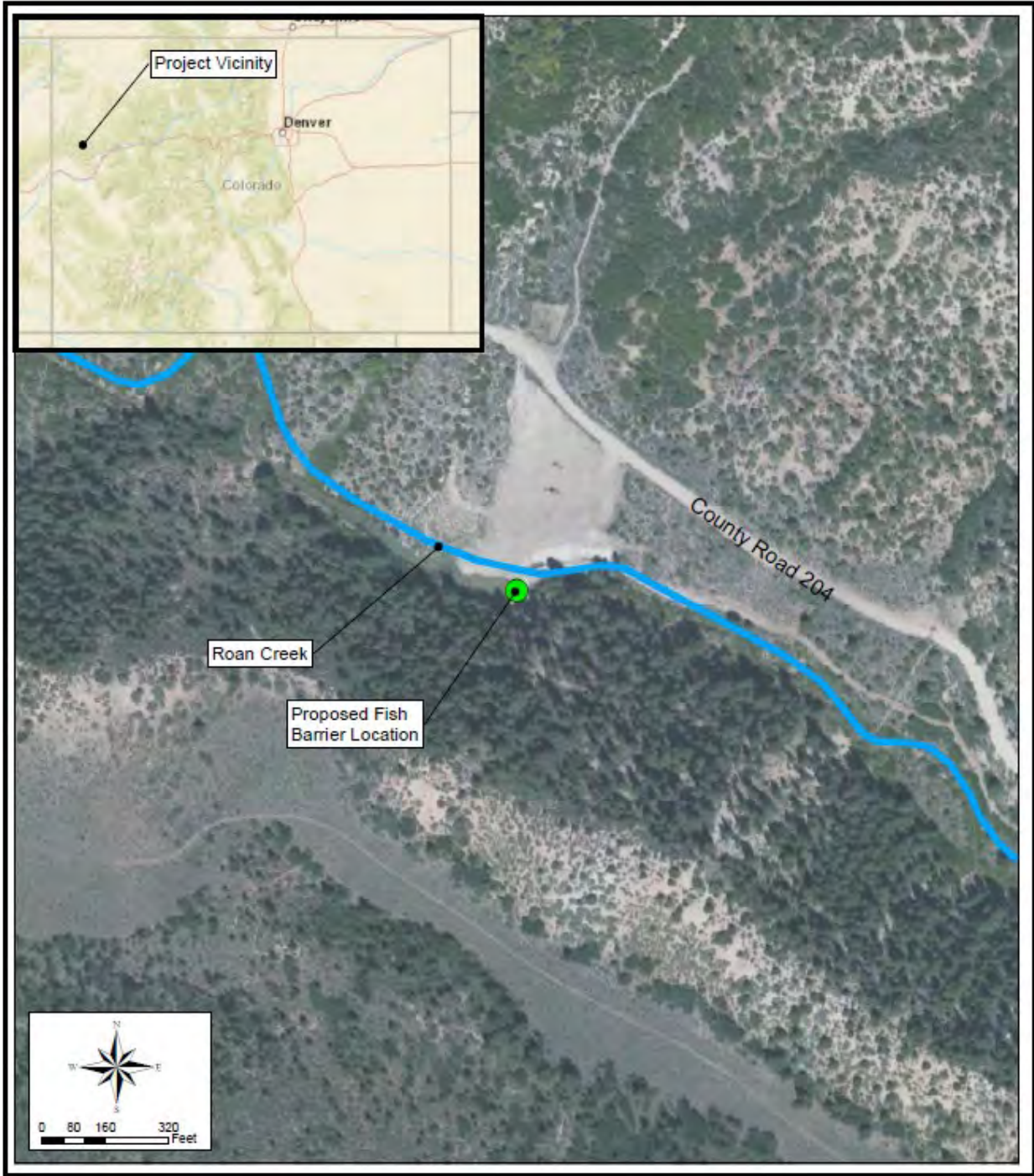


Figure 2. Roan Creek Fish Barrier location and vicinity map, Garfield County, CO. Wright Water Engineers, Inc.

Technical Project Description

Given that the project site is located at the point of diversion for an existing water right, the goal of the project is to conserve a unique, native fish assemblage while improving the efficiency of water delivery to the water rights holder. This will be accomplished through:

- The construction of a fish barrier that effectively eliminates the upstream movement of non-native fish,
- Revegetation of the riparian area, and
- Improvements to the diversion, headgate, sluice, flume, and ditch.

The fish barrier was designed as a large weir structure. It will be constructed across the riverine valley to convey water at one centralized location. The weir will be rectangular in shape with a low flow notch to provide sediment continuity and other hydraulic benefits. The dimensions of the low flow notch were developed based on field investigations and geomorphic review. Baffle boards can be installed in the low flow notch to better control hydraulics for the diversion of the decreed water right. Figure 3 depicts the general weir configuration.

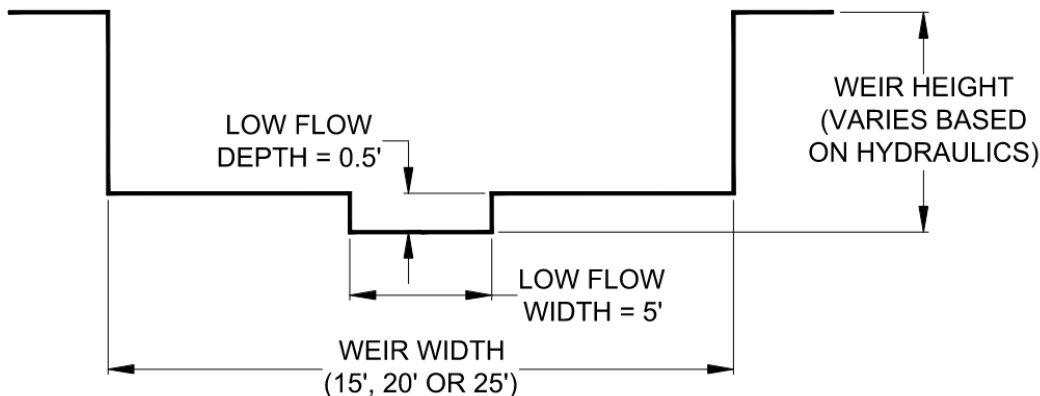


Figure 3. General Weir Configuration

The most controlling aspect of the fish barrier is the weir width, which controls the upstream water surface elevation. The overall width of the weir must be balanced with the constructability of the fish barrier in a narrow canyon with rockfall potential on river right and a diversion ditch on river left, which limit the structure footprint. As the structure gets wider, the structure gets shorter, which is desirable but limited by the surrounding topography and appurtenances.

The next controlling aspect of the fish barrier is the splash pad elevation, which controls the downstream water surface elevation as well as velocity. The goal of the downstream splash pad is to cause as much turbulence and high velocities as possible to limit the ability of fish to migrate upstream.

The weir will have an opening width of 20' and a splash pad raised 1' above the existing thalweg. The weir will be constructed with a 5' wide and 0.5' deep low-flow notch. The

weir will need to be approximately 5' tall, including the low-flow notch. The concrete structure will be 1' thick and composed of structural concrete with reinforcing steel. The upstream wing walls are aligned to provide the best hydraulics for the diversion as well as tie in effectively and efficiently to the surrounding landscape. The river right wing walls will require excavation and anchoring into competent material. The river left wing wall will be angled upstream initially, where the diversion headgate will be placed, and then angled back across the valley to tie in as efficiently as possible. The river left wing wall will be composed of earthen material in areas not susceptible to erosion and scouring velocities.

The crest of the weir will be set about 1.5' above the existing creek thalweg on the upstream side. The channel downstream of the weir will be excavated to provide the required vertical separation from the crest of the weir's low-flow notch to the 100-year water surface elevation. The structure will be approximately 12.7' from the downstream invert of the splash pad to the top of the weir wall.

Downstream of the weir crest will be a 20' wide and 25' long concrete splash pad. The slope of the splash pad will be at least 1% to reduce ponding and aggradation. It is recommended the concrete splash pad be elevated above the creek thalweg to reduce overall structure height and provide additional velocity barriers due to rapid variations in slope. The downstream splash pad will also have concrete wing walls running parallel to the splash pad. The wing walls will start at the top of the weir and tie into the existing grade at the end of the splash pad. This will provide better control of water during 100-year events and limit opportunities for water to scour behind the structure. Large boulders and stream substrate will be placed downstream of the splash pad to reduce scour and erosion. In areas where feasible, grades will be tied in with boulders instead of concrete. Tie-in slopes will be as flat as feasible and potentially incorporate soil riprap for added stability and revegetation.

Due to the depth to competent rock, the concrete structures at Roan Creek will engage passive resistance from the downstream fill and rock material. Stability, in this case, will largely be derived from embedment in the alluvial soils. The approach wall toward the hillside will extend and tie into the rock face. This connection will control flows and reduce the potential for erosion, which could otherwise provide a pathway for fish to swim around the structure. The project will also include the installation of sheet piles driven 25' into the ground that the concrete structure will be anchored against. This will help to provide a stable structure in the alluvium cobble.

The concrete utilized for the project will be able to withstand conditions beyond structural loading requirements, including weather (freeze-thaw, hot weather concreting, cold weather concreting) and hydraulic flow conditions (velocity and duration). Structural concrete will have a minimum 4,500 psi compressive strength at 28 days. The water/cement ratio will be limited to 0.45 to limit susceptibility to freeze-thaw. All reinforcing steel will be standard ASTM A615 Grade 60 reinforcement, with minimum yield stress of 60,000 psi and minimum tensile stress of 90,000 psi. Welded wire fabric, if used, will be standard A1064 deformed reinforcement with minimum yield stress of 70,000 psi. Selection of materials, design strengths, maximum water-cement ratios, and

concrete placement requirements are all tools used to provide durable concrete for the project.

A steep cliff on the right side of the creek is composed of shale and sandstone that is friable, loose, and easy to erode. The proposed fish barrier has been located away from the potential rockfall area as much as possible while maintaining the geometry needed to meet project criteria. Small rockfall events are common at the site, and excavations at the toe of the slope could have the potential to undermine its stability and could lead to additional slope failures. If the selected engineering contractor is concerned about rockfall damaging the integrity and functionality of the diversion or the safety of laborers and equipment operators, rockfall netting will be added to the project with the expenses covered by contingency funding and/or other grant sources. The rockfall netting, if needed, is expected to cost approximately \$100,000.

Downstream of the proposed project location is a narrow riverine corridor. The downstream corridor is very confined with steep banks. The downstream hydraulics control the ultimate performance of the fish barrier structure itself. The narrow corridor causes increased depths during the 100-year flood event that propagate upstream in the form of a backwater, affecting fish barrier design elevations. The narrow corridor also produces high shear stresses and velocity near the banks that could cause future erosion, bank failures, and treefall downstream of the project area. Work is limited to the project location, but downstream constraints and controls have been investigated for their influence on the functionality of the structure. The hydraulics of the reach downstream of the project area will remain relatively unchanged.

The project design team considered a number of other fish barrier design options, such as the use of stream power and velocity. However, such design types do not consistently prevent the upstream migration of salmonids across a full range of flow conditions and were therefore eliminated as viable options.

In the course of constructing the fish barrier, the current concrete diversion structure will be reconstructed so that the water rights owner does not need to construct a pushup dam. Due to the existing structure being composed of rocks and boulders, the water rights owner had difficulty checking water up to a high enough elevation to convey the water through his headgate and down his ditch. The new structure being composed out of concrete and including baffle boards will remove the need for the contractor to disturb the creek's ecosystem to divert their decreed water right. The new structure will include new diversion appurtenances such as a head gate, fish screen, flow measuring device, and 1000 feet of ditch lining. All of these added improvements will benefit the water rights owner and also the environment.

Riparian revegetation is a critical aspect of the project to restore aquatic and riparian habitat. Approximately 2600 square feet of riparian area will be replanted with willows and a riparian seed mix, while an additional 4500 square feet of upland habitat within the project area and another 6200 square feet in the project staging areas will be reseeded with an upland seed mix following the removal of heavy equipment. One goal of the project is to work with volunteers following final construction to provide additional

revegetation throughout the project area as well as up and downstream. This will also provide an educational opportunity for the community and stakeholders.

Additionally, the project will be monitored in the months and years following construction. Monitoring will initially evaluate the design and ensure it is functioning correctly. Furthermore, adaptive management will be emplaced in case there ends up being a need to modify or repair small aspects of the project. The monitoring will also include the evaluation of the watershed as it relates to biomass of native species and the confirmation of no non-native fish species.

The Roan Creek Fish Barrier 90% Design is included in the attachments. Note that the sheet pile wall is not depicted in the 90% design and will be included in the final design.

Applicant Category and Eligibility of Applicant

As a nonprofit 501c3 organization and a watershed group, MCWC is a Category B applicant. MCWC meets the definition of a watershed group as outlined in the Cooperative Watershed Management Act, Section 6001(6), as it:

- Is a grassroots, non-regulatory entity addressing water quality and quantity issues in the Middle Colorado watershed of Colorado.
- Promotes the sustainable use of water resources in the Middle Colorado watershed.
- Makes consensus-based decisions.
- Represents a diverse group of stakeholders and water users, including agriculture, water providers, recreation groups/interests, private landowners, Federal/State/local governments, and more.

MCWC's Category A partner is Garfield County, which is a local county government in Colorado. A letter of partnership from Garfield County is attached.

Performance measures

Actual project benefits after project completion will be measured through annual fish sampling (biomass surveys), photographic monitoring (ground and aerial), revegetation monitoring, and water delivery monitoring. More details are provided in section E.1.5 "Evaluation Criterion E: Performance Measures."

Evaluation Criteria

E.1.1 Evaluation Criterion A: Project Benefits (25 Points)

E.1.1.1 Subcriterion A.1: Project Benefits

E.1.1.1.1 General Project Benefits

Explain how the project will benefit ecological values that have a nexus to water resources or water resources management, including benefits to plant and animal species, fish and wildlife habitat, riparian areas, and ecosystems that are supported by rivers, streams, and/or other water sources, or that are directly influenced by water resources management. Identify the specific ecological values benefitted and how those ecological values depend on, or are influenced by, water resources or water resources management. Explain whether the

project will increase water supply reliability for ecological values by improving the timing or quantity of water available; improving water quality and temperature; or improving stream or riparian conditions for the benefit of plant and animal species, fish and wildlife habitat, riparian areas, and ecosystems; or through similar approaches.

Colorado Parks and Wildlife (CPW) constructed a fish barrier on Roan Creek around 1993 to protect and isolate native fishes in the headwaters of the drainage basin. This protective fish barrier failed, allowing nonnative trout to move into the upper reaches of Roan Creek, as first detected during sampling efforts in 2010. CPW has conducted mechanical removal of the nonnative trout above the failed barrier for the past several years to reduce the abundance and upstream spread of these species, which hybridize and outcompete the native fishes.

The Roan Creek Fish Barrier & Diversion Infrastructure Project will construct a new fish barrier to protect the four native, endemic fish species in the headwaters of Roan Creek, a tributary of the Colorado River. In conserving this unique fish assemblage, the project conserves biodiversity in the Colorado River basin, thereby supporting aesthetic and intrinsic values such as ecosystem function and response to change (Hiddink et al. 2008).

Additionally, the upgraded diversion infrastructure will eliminate the current annual practice of building a pushup dam, which increases sediment and damages riparian vegetation. A revegetation effort, included in the project activities, will provide habitat and cover for the native fish as well as other aquatic and riparian species.

Will the project improve watershed health in a river basin that is adversely impacted by a Reclamation water project?

The river basin was not adversely impacted by a Reclamation water project.

Is the project for the purpose of meeting existing environmental mitigation or compliance obligations under Federal or State law?

No

If the project will benefit aquatic or riparian ecosystems within the watershed, explain the extent of those benefits. Estimate expected project benefits to ecosystems and provide documentation and support for this estimate, including a detailed explanation of how the estimate was determined.

By constructing the fish barrier in the selected location, approximately 12 miles of Roan Creek will be available exclusively to native fish as long as the barrier is intact. The habitat above the barrier is in good condition. Therefore, once the threat of non-native species is removed, the stream provides excellent aquatic habitat for Colorado River cutthroat trout, bluehead sucker, mottled sculpin, and speckled dace.

If the project will benefit specific species and habitats, describe the species and/or type of habitat that will benefit and the status of the species or habitat. Describe the extent to which the project will benefit the species or habitat, including an estimate of expected project benefits and documentation and support for the estimate.

The upper portion of Roan Creek contains a unique native fish assemblage comprised of Colorado River cutthroat trout, bluehead sucker, mottled sculpin, and speckled dace.

The Colorado River cutthroat trout (CRCT) (*Oncorhynchus clarkii pleuriticus*) is listed in Colorado as a tier 1 priority species and a species of “special concern” (CPW 2015). It is listed as a sensitive species by both the US Forest Service and the Bureau of Land Management. The CRCT’s range has been reduced due to competition and predation by introduced non-native trout species, hybridization with non-native trout, disease (whirling disease), and habitat alteration (CPW 2014). The CRCT only occupies 7% of its historical range in Colorado (Hirsch et al. 2013). The CRCT is one of only three still existing subspecies of trout native to Colorado (Behnke 1992; CPW 2014) and the only subspecies indigenous to Colorado’s West Slope (CPW 2015). The cutthroat trout present in Roan Creek is a unique haplotype of green lineage cutthroat trout.

The bluehead sucker (*Catostomus discobolus*) is a tier 1 priority species for the state of Colorado and is considered in urgent need of conservation action (CPW 2015). It is listed as a sensitive species by both the US Forest Service and the Bureau of Land Management. The non-native white sucker has hybridized with the native bluehead sucker (McDonald et al. 2008). Roan Creek has a unique haplotype of bluehead sucker.

Roan Creek also has a unique haplotype of mottled sculpin (*Cottus bairdii*), which are also unique for this area. The speckled dace (*Rhinichthys osculus*) is a native game fish in Colorado.

Additionally, the yellow-billed cuckoo is a riparian obligate species federally listed as threatened. Although they have not been sighted in the immediate area, CPW has noted possible occurrences of the species in Garfield County.

If the proposed project will benefit federally listed threatened or endangered species, address the following: Is the species subject to a recovery plan or conservation plan under the ESA? What is the relationship of the species to water supply? What is the extent of the proposed project that would reduce the likelihood of listing or would otherwise improve the status of the species? Is the species adversely affected by a Reclamation project?

None of the fish species are federally listed. However, BLM manages Roan Creek as an “area of critical environmental concern.” Such areas are identified during Resource Management Planning efforts. The fish, primarily the genetically pure Colorado River cutthroat trout, were the “relative and important” (R&I) resource that prompted the heightened management attention. The area is emphasized for management of the R&I value and has prescriptive protections to reduce impacts from other activities or actions. Additionally, the State of Colorado designated the bluehead sucker as a “Tier 1 species of greatest conservation need” and the Colorado River cutthroat trout as a species of “special concern.” Additionally, the bluehead sucker is listed by both the US Forest Service and the Bureau of Land Management as a “sensitive species” (CPW 2014; CPW 2020a). By conserving these populations, the project may help to reduce the likelihood of future federal listings.

The yellow-billed cuckoo is a federally-listed endangered species. Although the project location does not overlap with critical habitat (USFWS 2023), CPW recommends improving riparian habitat quality for the cuckoo by controlling weeds, restoring degraded riparian areas, and preserving habitat (CPW 2020b), all of which this project does.

Will the project address drought conditions or drought-related impacts on water supplies, habitat, species, or the ecosystem as a whole? If yes, describe past and current drought conditions and impacts and forecasted drought conditions and anticipated impacts. How will this project help build resilience to drought?

The project will provide a better environment during droughts due to the fact there won't be competition between the various fish species we are trying to preclude. Also, it will make water diversions easier during drought and will reduce environmental damage caused by the annual creation of a pushup dam, especially when flows are low. We are also providing a section of single thread channel with a terraced floodplain, which is beneficial to the environment, especially during low flows, to take better advantage of reduced flows and also allow for greater connection to groundwater and riparian areas. There is a revegetation component that is also taking place to provide habitat and cover. The tertiary goal is to provide better, and more efficient water deliveries potentially making it feasible to leave more water in the creek.

If the project will result in long-term improvements to water quality (e.g., decrease sediment or nutrient pollution, improve water temperature, or mitigate impacts from floods or drought), explain the extent of those benefits (i.e., magnitude and geographic extent). Estimate the expected project benefits to water quality and provide documentation and support for this estimate, including a detailed explanation of how the estimate was determined.

The revegetation of the upland and riparian areas will assist in water quality improvements by capturing sediment and organic matter. The riparian plants also uptake chemicals and nutrients that can negatively impact water quality. Additionally, the annual practice of building a pushup dam will be eliminated, reducing turbidity and annual sediment-loading to the stream. An expanded riparian corridor along the creek will provide cover, which not only provides a food source and protection from predation but also reduces water temperatures.

Are there project benefits not addressed in the preceding questions? If so, what are these benefits?

MCWC will use the project as a service-learning and general educational resource for community and school groups. Furthermore, this multi-benefit project is replicable on other streams in the area and can serve as an example to other water rights holders and landowners in the area. The project site is easily accessible, and with landowner permission, the project proponents intend to bring potentially interested parties to the site when considering the implementation of the project on their own property.

E.1.1.1.2 Water Conservation and Efficiency Project Benefits

Describe the amount of estimated water savings (in acre-feet per year) that are expected to result directly from the project. Include a specific quantifiable water savings estimate; do not include a range of potential water savings. Describe the support/documentation for this estimate, including a detailed explanation of how the estimate was determined, including all supporting calculations.

The project design includes lining 1000 linear feet of the ditch, which will limit infiltration and allow for greater efficiencies in conveying water to its point of use. Lining 1000 feet of the ditch can save about 3% of the 2.1 cfs. The water rights owner can divert for about four months a year, which would provide potential water savings of 15 acre-feet of

water per year. The ditch lining will also require less water to be diverted due to the added efficiencies, but also the reduction in needed 'push water.'

The project includes the addition of a new flume, with a measuring device, and headgate, which will allow for more efficient diversions of water and better accounting to prevent over-diverting.

Explain where the water that will be conserved is currently going (e.g., back to the stream, spilled at the end of the ditch, seeping into the ground) and how the water is currently being used. For example, are current losses returning to the system and being used by others? Are current losses entering an impaired groundwater table, becoming unsuitable for future use? Are there any known benefits associated with where the current losses are going? For example, is seepage water providing additional habitat for fish or animal species?

It is assumed that current water seepage supports vegetation communities around the ditch as well as in upland areas. It is likely that some ditch seepage eventually makes its way back to the stream, but at a slightly reduced volume. There are no known benefits associated with where the current losses are going. Undiverted water, due to diversion and conveyance efficiencies, could leave more water directly in the creek.

Explain, in detail, how water conserved as a result of the project will be used to increase water sustainability for ecological values. Will the project commit conserved water to remain instream? If so, provide detailed support for that commitment. Will a formal mechanism (e.g., collaboration with a State agency or non-profit organization, or other mechanisms allowable under State law) be used? Or, if a formal mechanism will not be used, describe the arrangement proposed to contribute conserved water for ecological benefits. Explain the roles of any partners in the process and attach any relevant supporting documents.

The project increases the water right holder's ability to manage, divert, and convey the water more efficiently. Any water conserved or not needing to be diverted will stay in the stream, but the exact amount of water has not been quantified. The project cannot commit reserved water to remain instream.

Describe the benefits that are expected to result from increased instream flows. Will increased instream flows assist in reducing basin-wide water supply and demand imbalances or in complying with an interstate compact? Will increased instream flows result in benefits to fish and wildlife? If so, describe the species and expected benefit of the project. Will the increased instream flows result in benefits to habitat or other ecological benefits? If so, describe these benefits. Will the flows specifically benefit federally designated critical habitat?

Benefits to instream flow will be minimal but will assist in maintaining flow in the creek, which will have minimal influence on the 1922 Colorado River Compact. However, it does result in a small flow contribution. The greatest benefit of the small increase in stream flow will be to the resident fish assemblage, macroinvertebrates, riparian vegetation, water recharge, and water depths within the stream's smaller pool habitats.

E.1.1.1.3 Water Management and Infrastructure Improvements Benefits

If the project will make more water available, or make water available at a more advantageous time or location, how much additional water will be made available?

This project does not include a water management component. The infrastructure improvement component of the project has a potential water savings of 15 acre-feet of water per year by lining 1000 feet of a ditch, as described in section E.1.1.1.2.

E.1.1.1.4 Restoration Project Benefits

Invasive Species - Vegetation:

Invasive plant species are not present in the project area.

Invasive Species – Other Taxa: Explain what measures will be used to prevent reintroduction and why. In addition, describe how removal of invasive species will benefit water resources or water resource management. Provide references and citations.

Portions of the watershed contain nonnative brook trout, rainbow trout, and cutbow (a hybrid of rainbow and cutthroat trouts). Rainbow trout hybridize with native cutthroat trout as well as compete with them and the other native fish for habitat and food resources. Brook trout outcompete native fish, which generally leads to their reduction in numbers or extirpation if left unabated. In an effort to provide long-term protection of headwater populations of native fishes, a new fish barrier must be constructed, followed by non-native fish removal efforts which may consist of mechanical and/or chemical removal efforts to remove any remaining non-native trout from the headwaters.

Physical isolation of native fish species is a recognized management technique frequently employed by natural resource managers to protect unique and important populations and community assemblages. This can be accomplished using either naturally occurring barriers (e.g., waterfalls) or artificially constructed barriers, as proposed with this project. Following the isolation of native populations, resource managers will use a variety of techniques to mechanically and chemically remove non-native fish from the isolation reaches. These types of management actions allow native fishes to thrive in their historic habitats without the threat of competition or hybridization.

The primary elements of the Roan Creek barrier acting as a fish barrier involve vertical separation of the water surface up and downstream of the barrier, the lack of a staging area, and increased velocities within the splash pad. The specifications used for vertical separation (4 ft) and maximum plunge pool depth (< 1 ft) were derived from the work of Kondratieff and Myrick (2006). As mentioned above, the use of velocity barriers is not considered when brook trout are present because they are able to sprint at 25 body lengths per second (Castro-Santos et al. 2013). Furthermore, trout are extremely adept at exploiting small variations in water velocity to their advantage (Liao 2007; Sutterlin et al. 1975).

The current design will also involve the use of a lip protruding past the dam face, to detach the nappe of the falling water (Austiguy 2014). It is more difficult for a fish to “aim” its jump when flowing water is not connected to a substrate, so the detached nappe will further reduce the probability of a successful jump.

The current design also involves the incorporation of a sloped apron that produces high velocities immediately downstream of the structure and a hydraulic jump. This apron is proposed for three reasons. First, high velocities downstream of and at the structure

base prevent staging – a fish would have to sprint to the structure base, reorient its body in a vertical direction, and successfully jump four feet to move past the structure. Second, fish may stage at the hydraulic jump and attempt to jump from there, which would cause them to fall short of the structure. And third, field studies have shown that multiple hydraulic challenges in short succession are more successful in reducing the chances of upstream movement than a single hydraulic challenge (Adams 1999).

Measures have also been implemented to ensure that fish cannot move under the structure (i.e., through interstitial spaces) and to ensure that this structure is not flanked by water. The project will employ sheet piles driven 25' into the ground to provide structural stability but also limit seepage around the barrier. The presence of fine sediment in the interstitial spaces, in combination with the long distance that fish would have to travel to move under the dam, makes it infeasible that the barrier could be breached in this manner. The prevention of flanking is a critical element of stable design – if flows do not move around the dam, neither can fish.

Forest Fuels Management Activities:

Fuels management is not an activity of this project.

Post-Wildland Fire Sediment Removal:

This is not an aspect of this project. However, the area could be used for sediment storage following a fire and later excavated.

E.1.1.2 Subcriterion A.2: Multiple Benefits

If the project will benefit multiple water uses (e.g., benefits to ecological values AND benefits to other water uses, including municipal; agricultural; Tribal; commercial, recreational, subsistence, or Tribal ceremonial fishing; and river-based recreation), explain how and to what extent the project will benefit multiple water uses.

The primary intent of the project is to isolate and conserve a unique, native fish assemblage by installing a fish barrier that will prevent the upstream migration of non-native fish. However, elements will be designed and constructed that also benefit the water rights holder. The proposed crest of the fish barrier will be at a higher elevation than the original thalweg of the creek, allowing for a greater slope in the pipe and ditch, increasing the head pressure, and allowing more efficient diversion of water. A stop-log system will also be designed for the low-flow channel of the fish barrier so that the water-right owner can divert water at the headgate without the use of a pushup dam.

Additional water efficiency measures include ditch repairs directly downstream of the diversion, 1000 feet of ditch lining, a new headgate, sediment sluice, and flume.

The Roan Creek Fish Barrier & Diversion Infrastructure Upgrade project will have benefits for multiple water uses, including ecological and agricultural. The new fish barrier will protect the unique native fish assemblage, while the diversion upgrades will allow for more efficient water delivery for agricultural uses.

If the project will provide multiple restoration benefits (e.g., benefits to ecological values or watershed health; fish and wildlife habitat; protection against invasive species; enhancement

to commercial, recreational, subsistence, or Tribal ceremonial fishing; enhancement of river-based recreation), explain how.

By protecting the native fish assemblage from non-native species, biodiversity will be conserved and restored. The riparian habitat in the project area will be revegetated, providing cover and shade for the native fish and the habitat for numerous species that depend upon the riparian area for at least one life stage. Finally, by eliminating the need for the pushup dam, water quality will be improved by reducing sedimentation downstream and the destruction of riparian vegetation in the vicinity of the diversion.

Will the project reduce water conflicts within the watershed?

The Roan Creek watershed is not experiencing water conflicts.

E.1.2 Evaluation Criterion B: Collaborative Planning (20 Points)

Strategy or Plan: Is your proposed project supported by a specific strategy or planning document?

The Middle Colorado River Integrated Water Management Plan (IWMP) (<https://www.midcowatershed.org/iwmp>) was drafted over a 30-month period beginning in 2018. The mission of the IWMP is to improve security for all water uses in the Middle Colorado River by understanding and protecting existing uses, meeting shortages, and promoting healthy riverine ecosystems and agriculture in the face of increased future demand and climate uncertainty. The planning area extended 77 miles along the Colorado River from the Glenwood Canyon to the De Beque Canyon (MCWC et al. 2021).

The first Basin Implementation Plans (BIP) were drafted in 2015 and updated in 2022. Volume 1 (a summary) and Volume 2 (a more comprehensive version) of the 2022 Colorado BIP can be found here: <https://cwcb.colorado.gov/colorado-water-plan/basin-implementation-plans>.

Strategy or Plan Development: Was the strategy or plan developed through a collaborative process?

MCWC, a watershed group, as defined in Section 6001(6) of the Cooperative Watershed Management Act, in partnership with the Bookcliff, Mount Sopris & South Side Conservation Districts, engaged technical consultants (Lotic Hydrological, Colorado River Engineering Inc, River Restoration, Wright Water Engineers, Eco Metrics, and Stillwater Sciences) to undertake a collaborative process to draft the IWMP with stakeholders from local governments, federal and state agencies, nonprofits, water conservancy districts, conservation districts, the energy industry, universities, recreational outfitters and guides, and more. Stakeholders participated on an advisory committee that was open to the public and that met 12 times. Stakeholders could also participate in four focus groups (water quality and riparian areas; aquatics; recreation; and consumptive uses) that met a total of 23 times.

Additionally, the Colorado Basin Roundtable (CBRT), which drafted the Colorado BIP, is one of nine basin roundtables in the State of Colorado created in 2005 by the Colorado Water Conservation Board for the 21st Century Act. CBRT, like the other roundtables, has diverse representation of water users that actively participate in facilitated

discussions on water management issues with the intent of finding collaborative solutions locally. CBRT is not a watershed group but does have several watershed groups, as defined in Section 6001(6) of the Cooperative Watershed Management Act, as active stakeholders, including MCWC. CBRT meets monthly, and the Colorado BIP was drafted through a collaborative process by CBRT and focuses on the basin's current and future water needs.

Strategy or Plan Support for Project: Describe how the plan or strategy provides support for your proposed project.

The IWMP stakeholders identified 55 high-priority actions by consensus. The Roan Creek Fish Barrier project was one of these high-priority actions.

The Roan Creek Fish Barrier & Diversion Infrastructure Upgrade project addresses three of the goals in the 2022 Colorado BIP:

1. Protecting and Restoring Healthy Streams, Rivers, Lakes and Riparian Areas by increasing the viability of native species in the upper reaches of Roan Creek through the inhibited passage of nonnative species and by discontinuing the annual need to construct a pushup dam, which is destructive to the creek and riparian ecosystems. These activities support the first goal listed under theme 1, "protect and maintain healthy and self-sustaining aquatic and riparian ecosystems and rehabilitate damaged ecosystems" (CBRT et al., 2022, p.14).
2. The reconstruction of the fish barrier and inclusion of appurtenances to support the water rights owner will support the Colorado BIP's third goal under the Sustain Agriculture theme (CBRT et al., 2022, p.17) of "support profitable and productive agriculture and the integrated benefits and services associated with agriculture."
3. The reconstruction of the barrier will promote agriculture conservation, supporting the third goal, "promote agricultural conservation that maintains agricultural production and viability," under the "encourage a high level of basinwide conservation" theme (CBRT et al., 2022, p.20). The water rights owner does not have to construct a pushup dam every year, which causes damage to the creek's ecosystem and is time-consuming.

E.1.3 Evaluation Criterion C: Stakeholder Support for Proposed Project (15 Points)

Describe the level of stakeholder support for the proposed project. Are letters of support from stakeholders provided? Are any stakeholders providing support for the project through cost-share contributions or through other types of contributions to the project?

As one of the 55 high-priority projects identified in the Middle Colorado River IWMP, this project has strong stakeholder support.

The Bureau of Land Management (BLM) and Colorado Parks & Wildlife (CPW) are engaged in the design and implementation of the project. CPW made a commitment of \$125,000 to the project, although a funding agreement has not been finalized at the time of this application.

The water rights holder, Todd Brackett, and the landowner, Roan Creek DMG Investment LLC, are engaged in the project.

The project aligns with the goals and interests of the Colorado River District (CRD), which has provided \$9,500 to support grant writing for the project. MCWC may request additional funding for the project from CRD for future aspects of the project.

As outlined in Criterion B above, the Roan Creek project helps to achieve three of the goals outlined in the Colorado BIP, which was drafted by the Colorado Basin Roundtable (CBRT). The project also aligns with the general goals and interests of CBRT, thereby garnering their support for the project. CBRT reviewed and approved a Water Supply Reserve Fund grant request of \$84,754 for this project. That application is now before the Colorado Water Conservation Board for final approval.

Support is evidenced through attached letters of support from BLM, CPW, Roan Creek DMG Investment LLC, Todd Brackett, CRD, Trout Unlimited, and CBRT. The Category A letter of partnership from Garfield County also provides evidence of their support of the project.

Explain whether the project is supported by a diverse set of stakeholders, as appropriate, given the types of interested stakeholders within the project area and the scale, type, and complexity of the proposed project.

CBRT stakeholders represent municipal, agricultural, recreational, and environmental interests in regard to the Colorado River basin and its water use. CRD represents the interests of all water users in the 15 counties of Colorado's West Slope. The Middle Colorado River IWMP was drafted through a collaborative process with representatives from local government, water conservancy and conservation districts, state and federal natural resource management agencies, nonprofits, private industry, local outfitters, consultants, and private citizens.

Is the project supported by entities responsible for the management of land, water, fish and wildlife, recreation, or forestry within the project area? Is the project consistent with the policies of those agencies?

Roan Creek is managed by BLM for several miles above the barrier, and the project is consistent with their mission to "sustain the health, diversity, and productivity of public lands for the use and enjoyment of present and future generations."

The project is also consistent with CPW's mission to "perpetuate the wildlife resources of the state."

Is there opposition to the proposed project?

There is no known opposition to the project.

E.1.4 Evaluation Criterion D: Readiness to Proceed (20 Points)

Describe the implementation plan for the proposed project. Include an estimated project schedule that shows the stages and duration of the proposed work, including major tasks,

milestones, and dates. This may include, but is not limited to, design, environmental and cultural resources compliance, permitting, and construction/installation.

| Task | 2023 | | | | 2024 | | | | 2025 | | | |
|--------------------------|------|----|----|----|------|----|----|----|------|----|----|----|
| | Q1 | Q2 | Q3 | Q4 | Q1 | Q2 | Q3 | Q4 | Q1 | Q2 | Q3 | Q4 |
| Grant Process | | | | | | | | | | | | |
| Final Engineering Design | | | | | | | | | | | | |
| Final Permitting | | | | | | | | | | | | |
| Construction | | | | | | | | | | | | |
| Adaptive Management | | | | | | | | | | | | |
| Monitoring | | | | | | | | | | | | |

Proposals with a budget and budget narrative that provide a reasonable explanation of project costs will be prioritized under this criterion.

A budget and budget narrative are attached.

Describe any permits and agency approvals that will be required along with the process and timeframe for obtaining such permits or approvals.

Grading and drainage, floodplain, and Clean Water Act permits will be required for this work. Grading and drainage, and floodplain permitting will be coordinated through Garfield County. The proposed project area is within a Zone D floodplain, which means there is potential for flooding but has not been evaluated. It is anticipated that a floodplain permit will be required for this work due to the fact the proposed structure will impound water behind the structure and potentially cause localized rises in base flood elevations in close proximity to the structure. The grading and drainage permit will include any erosion and sediment control work required.

The project will likely receive an agricultural exemption from the requirement for a 404 permit, however, a letter confirming this exemption will be sent to the US Army Corps of Engineers for approval. If required it will likely be a Nationwide Permit that will take approximately three months to acquire, including the 45-day review period.

Identify and describe any engineering or design work performed specifically in support of the proposed project. If additional design is required, describe the planned process and timeline for completing the design. Priority will be given to projects that are further along in the design process and ready for implementation.

The current design is at a 90% or greater level. MCWC worked with Wright Water Engineers, Inc. and GEI Consultants, Inc. to design a fish barrier that could meet the following constraints:

1. A minimum 4-foot water surface drop at the low-flow pour-over during the 100-year flow event, recognizing the drop might be more than 5-6' at low base flows.
2. Ideally, prevent the plunge pool depth immediately below the structure from exceeding 1-foot depth.
3. Prevent water/fish from “outflanking” or swimming around the barrier.
4. Meet criteria 1 through 3 for up to at least the 100-year flow event.

5. Include a concrete splash apron below the structure of sufficient length to prevent undercutting during high flows.
6. Visually blend with adjacent landform geology, color, and geometry.
7. Provide for long-term structural stability and persistence with a life expectancy of no less than 100 years (rebar, high PSI concrete, etc.).
8. Require very limited maintenance (i.e., should readily pass debris).
9. Simple, cost-effective, and feasible construction and maintenance.
10. No injury to water rights in the area of interest or downstream.

Various two-dimensional and one-dimensional hydraulic models were developed to evaluate existing conditions as well as proposed alternatives. The modeling was performed using the US Army Corps of Engineers HEC-RAS hydraulic modeling program and a subcritical flow evaluation. The existing site conditions were evaluated to understand downstream channel hydraulics. Once the existing conditions were understood, hydraulic models were developed by evaluating variations in weir width and splash pad elevation. The various alternatives were evaluated by stakeholders and fishery research professionals.

The 90% project design (Figure 4) was developed by updating the preliminary designs with modifications discussed in the field with the project team and based on additional design evaluations by the design team.

A hydrologic evaluation was performed by Wright Water Engineers (WWE). WWE used regional regression equations provided by USGS StreamStats as a basis for determining various design recurrence flows. The project was designed to effectively convey the 100-year event for the location's drainage area of approximately 34.3 square miles.

A detailed hydraulic model was developed to analyze the existing site conditions, alternatives, and the preferred alternative using the US Army Corps of Engineers HEC-RAS hydraulic modeling program, version 5.0.7. To understand the spatial distribution of velocity and shear stress, as well as the variation in water surface elevation across the structure, each of these conditions was modeled in a two-dimensional environment.

Utilizing the survey information gathered on-site, an existing conditions model was developed to understand the current hydraulics through the system and further inform the project constraints.

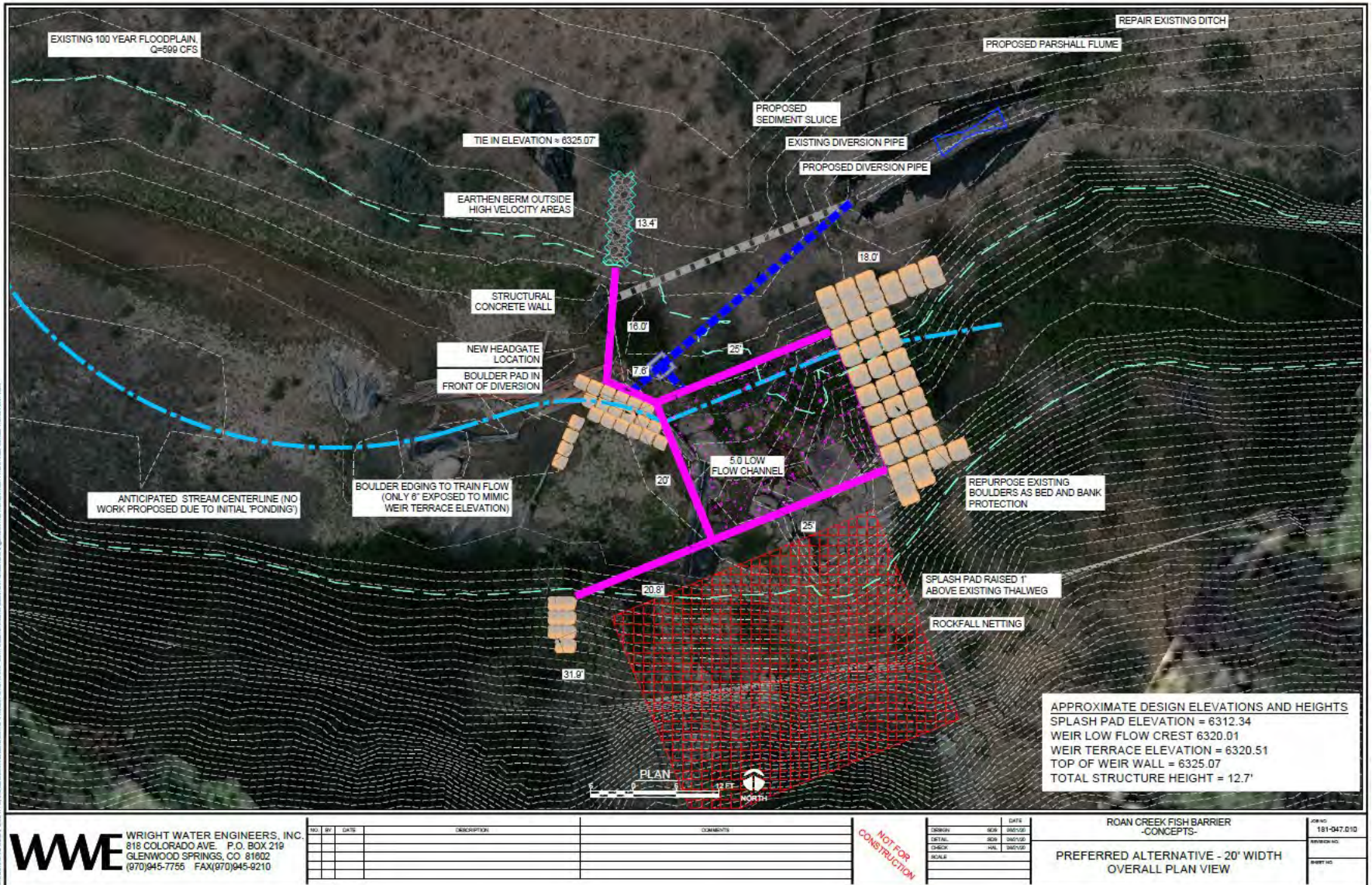


Figure 4. Preliminary Design Plan View

Design alternatives were developed to meet these existing constraints. These alternatives included variations of the structure width, from 15 to 25 feet, and the downstream splash pad elevation. Detailed three-dimensional terrain models of these alternatives were developed as input into the two-dimensional hydraulic model. The model provided estimates of the upstream water surface elevations (dictating the height of the structure), downstream water surface elevation and velocity, and an approximation of the unique hydraulics developed with a vertical grade barrier. These results ultimately informed the layout (width, height, and splash pad elevation) of the preferred alternative.

As with the alternatives, a detailed three-dimensional terrain model of the preferred alternative was built and used as input into the two-dimensional model. This model was used to confirm the results developed during the alternatives analysis. It confirmed that the proposed structure meets the design criteria for vertical separation. It also provided a greater understanding of the hydraulics of the proposed structure to inform design details such as downstream scour protection.

The site was investigated with a geotechnical drill hole advanced on the left side of the creek in the alluvial fan deposits.

Does the applicant have access to the land or water source where the project is located?

MCWC has worked closely with BLM, the land owner, and the water rights holder to develop the project and has been granted access to the project area for the purpose of the project.

Identify whether the applicant has contacted the local Reclamation office to discuss the potential environmental and cultural resource compliance requirements for the project and the associated costs.

MCWC has reached out to the Western Colorado Area Office of the Bureau of Reclamation regarding the environmental and cultural resource compliance requirements of the project and their costs. MCWC may need to hire a contractor and will continue to work with BOR on this aspect of the project. A line item is included in the budget to cover compliance costs, including those of BOR.

Is the project completely or partially located on Federal land or at a Federal facility?

The project is located exclusively on private land.

E.1.5 Evaluation Criterion E: Performance Measures (5 Points)

Describe the performance measures that will be used to quantitatively or qualitatively define actual project benefits upon completion of the project. Include support for why the specific performance measures were chosen.

Fish Surveys: Annual fish sampling will occur above the barrier to monitor the fishery and survey fish populations in an effort to evaluate the success of the barrier in excluding non-native fish. CPW will conduct annual fish sampling above the barrier to monitor the fishery and survey fish populations. If successful, the construction of the fish barrier and eradication of nonnative fish species above the barrier will result in no non-native species found during annual fish sampling.

Photographic Monitoring: The contractor will collect photographs (ground and aerial) of the fish barrier, diversion structure, and plant growth. Photographs provide a baseline of information for future comparison. Additionally, aerial photography provides a different and valuable perspective.

Revegetation Monitoring: The contractor will perform the initial monitoring of the revegetation effort. CPW, the water rights holder, and the land owner will informally monitor the success of the revegetation efforts when they are in the area and will inform MCWC of any concerns or issues to be addressed.

Water Delivery Monitoring: The water rights holder will provide the project team with updates on the delivery of their water right (2.1 cfs).

All applicants are required to include information about plans to monitor improved streamflows, aquatic habitat, or other expected project benefits. Describe the plan to monitor the benefits over a 5-year period once the project has been completed. Provide details on the steps to be taken to carry out the plan.

The monitoring activities outlined in this section, E.1.5., will help to determine success in improving aquatic and riparian habitat and irrigation efficiency.

Fish Surveys: In 2023, CPW will conduct brook trout removal efforts in the headwaters where brook trout are currently found in the drainage. Ideally, once the barrier is constructed, eradication of the non-native fish (including brook trout) in the drainage will reduce ongoing sampling needs as annual non-native fish removal efforts will no longer be necessary. Once non-native fish are reliably not detected above the barrier, CPW will reduce the frequency of sampling. However, although sampling will be less frequent, it will still occur at sites within the 12-mile reach of occupied habitat above the barrier as conservation populations of Colorado River cutthroat trout are to be monitored a minimum of every 5 years to assess population status per the Conservation Agreement and Strategy.

Photographic Monitoring: The contractor will conduct photographic monitoring one year after project completion.

Revegetation Monitoring: The project team will monitor the growth of willows and seeds one year after project completion. If plant mortality is limited and growth is successful a year after the project, continued monitoring will occur informally as the project team visits the site for educational purposes or for fish sampling.

Water Delivery Monitoring: Reports of water delivery will cease after the first successful delivery unless issues arise.

Although not included in the budget, maintenance will be required to ensure the functionality of the fish barrier and its ability to divert water. The structure should be evaluated routinely and after major storm events. Maintenance could include the removal of accumulated debris on the downstream splash pad, revegetation of eroded banks, repair of concrete from rockfall, and addition of material that has been scoured or transported downstream. These are not all the maintenance issues that may be

required. The land owner and water rights holder will be responsible for ongoing maintenance, including time and costs to annually inspect and address any concerns.

E.1.6 Evaluation Criterion F: Presidential and DOI Priorities (15 points)

E.1.6.1 Subcriterion No. E1: Climate Change

How will the project build long-term resilience to drought?

The project will provide a section of single thread channel with a terraced floodplain which will allow for greater connection to groundwater and riparian areas, which builds long-term drought resilience. The project will also provide efficiencies in water diversion and deliveries for the water rights holder.

In addition to drought resiliency measures, does the proposed project include other natural hazard risk reductions for hazards such as wildfires or floods?

The restored floodplain connectivity will support flood resilience as intact floodplain systems reduce flood events' magnitude by reducing the amount of water flowing downstream as well as streamflow velocities (Shannon et al. 2019. p.54.).

Will the proposed project establish and use a renewable energy source?

No

Will the proposed project reduce greenhouse gas emissions by sequestering carbon in soils, grasses, trees, and other vegetation?

By revegetating the riparian and upland areas and reestablishing ecosystem function in the project location there is an increased opportunity to sequester carbon in soils and vegetation.

Does the proposed project include green or sustainable infrastructure to improve community climate resilience?

No

Does the proposed project seek to reduce or mitigate climate pollutions?

No

Does the proposed project have a conservation or management component that will promote healthy lands and soils or serve to protect water supplies and its associated uses?

Yes, the project will support riparian revegetation and improve water quality, which promote healthy lands and protect water supplies.

Does the proposed project contribute to climate change resiliency in other ways not described above?

The four native fish species that will be protected by the implementation of the project are vulnerable to the effects of climate change, and non-native fish species may have an advantage as climate change causes increasing stream temperatures. As a higher elevation headwaters stream, water temperatures will remain cooler and may provide refuge from not only the non-native fish species but from the higher temperatures.

E.1.6.2 Subcriterion No. E2: Disadvantaged or Underserved Communities

This project will not directly benefit or serve a disadvantaged or historically underserved community.

E.1.6.3 Subcriterion No. E.3: Tribal Benefits

This project will not directly serve or benefit a Tribe.

Project budget

The project budget is attached as a separate document and includes the following:

- Funding plan
- Budget proposal
- Budget narrative
- Letters of funding commitment

Environmental and Cultural Resources Compliance

Will the proposed project impact the surrounding environment (e.g., soil [dust], air, water [quality and quantity], animal habitat)? Briefly describe all earth-disturbing work and any work that will affect the air, water, or animal habitat in the project area. Explain the impacts of such work on the surrounding environment and any steps that could be taken to minimize the impacts.

The proposed project will have minor impacts on the environment. The area's existing vegetation is heavily impacted. The creek system itself in the vicinity of the diversion is also not in a healthy condition. During the construction of the project, the ground will be excavated to the proposed design elevation. Sheet piles will initially be driven into the ground to a depth of 25 feet. Structural concrete forms will be established and utilized to form the constructed structure. Additional areas downstream of the diversion will be excavated to allow for the emplacement of the boulders. The impacts will include grading and minor vegetation removal.

The total project area is less than half an acre and therefore, by limiting the construction area we are limiting the impacts. Best management practices (BMPs) and other control measures will be emplaced to limit environmental impacts from the project. Once the project is complete, the environmental benefits of the project will drastically outweigh the temporary environmental concerns from the construction.

Are you aware of any species listed or proposed to be listed as a Federal threatened or endangered species or designated critical habitat in the project area? If so, would they be affected by any activities associated with the proposed project?

According to US Fish & Wildlife Service's Information for Planning and Consultation (IPaC) website (USFWS n.d.), there are no critical habitats at this location. Although 13 federally listed endangered, threatened, candidate, and proposed threatened species are reflected by USFWS as "potentially affected by activities in this area," there are no critical habitats at this location, and none have been observed on the site. Of the 13

species on the list, 10 have established critical habitat that does not overlap with the project location. The other three species do not currently have critical habitat designated. The project is not expected to negatively impact wildlife or habitat and will ultimately improve habitat conditions.

Are there wetlands or other surface waters inside the project boundaries that potentially fall under CWA jurisdiction as “Waters of the United States”? If so, describe and estimate any impacts the proposed project may have.

Yes, there is potential for impacts. The below provided estimates may change as a formal delineation has not been completed.

| | Estimated Temporary Impacts | Estimated Permanent Impacts |
|-----------------------|------------------------------------|------------------------------------|
| Wetlands | 0.1 acres | 0.05 acres |
| Surface Waters | 134 linear feet | 68 linear feet |

When was the water delivery system constructed?

The diversion was likely constructed prior to the water rights adjudication date of 1937. The diversion itself has likely had many modifications over the past 90 years. The diversion was last modified in 1993, which caused the diversion to act as a fish barrier.

Will the proposed project result in any modification of, or effects to, individual features of an irrigation system (e.g., headgates, canals, or flumes)? If so, state when those features were constructed and describe the nature and timing of any extensive alterations or modifications to those features completed previously.

The proposed project will upgrade the current irrigation system, which consists of a pushup dam that is reestablished each year using materials on-hand, such as fencing, poles, metal sheets, and tarps. The ditch, which was likely first developed between 1924 and 1937 (based upon water rights appropriation and adjudication dates), will be lined during the project. See Figures 5 & 6.



Figure 5. A new fish barrier will support native fish habitat, eliminate non-native fish species, and eliminate the annual construction of a pushup dam.

Figure 6. The project will upgrade the diversion infrastructure, including the head gate, flow measuring device, and fish screen.



Are any buildings, structures, or features in the irrigation district listed or eligible for listing on the National Register of Historic Places? A cultural resources specialist at your local Reclamation office or the State Historic Preservation Office can assist in answering this question.

No

Are there any known archeological sites in the proposed project area?

None are known. This will be investigated during the cultural resources compliance survey.

Will the proposed project have a disproportionately high and adverse effect on low-income or minority populations?

No.

Will the proposed project limit access to, and ceremonial use of, Indian sacred sites or result in other impacts on Tribal lands?

No.

Will the proposed project contribute to the introduction, continued existence, or spread of noxious weeds or non-native invasive species known to occur in the area?

No.

Required Permits or Approvals

NEPA: Most likely an Environmental Assessment (EA) will be required. This process will be initiated once a grant agreement is formalized and will conclude 3-6 months later. Construction will not begin until this is complete.

US Army Corps 404 Permit: An agricultural exemption for 404 Permit is expected. A letter confirming exemption will be sent to the US Army Corps. If a 404 Permit is required it will likely be a Nationwide Permit, which takes three months to acquire.

Garfield County grading & drainage permit: The permit application will be filed following final design.

Garfield County floodplain permit: The permit application will be filed following final design.

Official resolution

Attached

Letters of support

Attached

Letter of partnership

Attached from Category A partner, Garfield County

Conflict of interest disclosure statement

No actual or potential conflict of interest exists at the time of application. MCWC will continue to take appropriate steps to avoid conflicts of interest with respect to any Federal financial assistance agreements and in the procurement of supplies, equipment, construction, and services as provided in 2 CFR§200.318.

MCWC will monitor the areas of risk for conflict of interest (procurement of supplies, equipment, construction, and services) and identify, disclose, and mitigate or eliminate the conflicts of interest.

MCWC will notify the Bureau of Reclamation in writing if a conflict of interest arises during the project period.

As a nonprofit 501(c)3 organization, MCWC has strict limitations on its lobbying activities. Furthermore, no federal grant funds will be utilized for lobbying activities.

Uniform audit reporting statement

MCWC did not expend \$750,000 or more in Federal award funds in 2022 and, therefore, is not obligated to submit a Single Audit Report.

Overlap or duplication of effort statement

There is not an overlap between the Roan Creek Fish Barrier & Diversion Infrastructure Upgrade Project and any other active or anticipated proposals or projects in terms of activities, costs, or commitment of key personnel.

This proposal does not in any way duplicate any proposal or project that has been, or will be, submitted for funding consideration to any other potential funding source.

OMB Form 4040-0019 Project Abstract Summary Form

Attached

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RESOLUTION NO. 2023-1

A RESOLUTION OF THE MIDDLE COLORADO WATERSHED COUNCIL BOARD OF DIRECTORS AUTHORIZING AND APPROVING THE APPLICATION FOR GRANT FUNDS FOR THE ROAN CREEK FISH BARRIER AND DIVERSION INFRASTRUCTURE UPGRADE

WHEREAS, the President of the United States and the United States Department of the Interior have provided funds for the WaterSMART Program; and

WHEREAS, the Bureau of Reclamation has been delegated the responsibility for the administration of this grant program, establishing necessary procedures; and

WHEREAS, said procedures established by the Bureau of Reclamation require a resolution certifying the approval of application{s} by the applicant's governing board before submission of said application(s); and

WHEREAS, the applicant, if selected, will enter into an agreement with the Bureau of Reclamation to carry out the activities as described in the proposal.

NOW, THEREFORE, BE IT RESOLVED BY THE BOARD OF DIRECTORS THAT:

SECTION 1.

Approves the filing of an application for the WaterSMART Environmental Water Resources Projects for Fiscal Year 2023 by the Middle Colorado Watershed Council, requesting funding support for the completion of the Roan Creek Fish Barrier and Diversion Infrastructure Upgrade; and

SECTION 2.

Appoints Paula Stepp, Executive Director, to act as agent with legal authority to enter into the grant agreement, conduct all negotiations, execute and submit all documents including, but not limited to, applications, agreements, payment requests and any other grant required correspondence which may be necessary for the completion of the grant program; and

SECTION 3.

Certifies that the Board of Directors for Middle Colorado Watershed Council has reviewed and supports the proposed application; and

SECTION 4.

Certifies that the Middle Colorado Watershed Council will work with the Bureau of Reclamation to meet established deadlines for entering into a cooperative agreement; and

SECTION 5.

This Resolution shall take effect immediately from and after its passage and publication as required by law.

PASSED AND APPROVED THIS 23 DAY OF MARCH, 2023.

MIDDLE COLORADO WATERSHED COUNCIL

A handwritten signature in blue ink that reads "Morgan R. Hill". The signature is written in a cursive style with a large initial 'M'.

Morgan Hill, President



COLORADO

Parks and Wildlife

Department of Natural Resources

Northwest Aquatics
711 Independent Avenue
Grand Junction, CO 81505
P 970.255.6100

Bureau of Reclamation
Attn: Robin Graber
PO Box 25007
Denver Federal Center
Denver CO 80225-0007

RE: Middle Colorado Watershed Council's Bureau of Reclamation WaterSMART Grant Request for the Roan Creek Fish Barrier and Diversion Infrastructure Upgrades

Dear Ms. Graber,

This letter is to express support from Colorado Parks and Wildlife (CPW) for the Middle Colorado Watershed Council's efforts to secure grant funding for completion of the Roan Creek Fish Barrier and Diversion Infrastructure Upgrade Project. The upper portion of Roan Creek contains a unique native fish assemblage comprised of Colorado River cutthroat trout, bluehead sucker, mottled sculpin, and speckled dace. Colorado Parks and Wildlife (CPW) constructed a fish barrier on Roan Creek around 1993 to isolate native fishes in the headwaters of the drainage basin from downstream non-native species that will predate and hybridize the unique native species. Unfortunately, in recent years the protective barrier failed and allowed nonnative trout to move to the upper reaches of Roan Creek. To protect the headwater populations of native fishes in the long term, a new fish barrier needs to be constructed. The project will benefit the water rights owner by providing more efficient water diversion enhancements by including new diversion appurtenances such as a head gate, fish screen, and flow measuring device.

Colorado Parks and Wildlife's mission is to perpetuate the wildlife resources of the state, to provide a quality state parks system, and to provide enjoyable and sustainable outdoor recreation opportunities that educate and inspire current and future generations to serve as active stewards of Colorado's natural resources. Roan Creek has been a high priority for native species conservation for Colorado parks and Wildlife for over 30 years and this project will help ensure this native fishery persist into the future as it prevents further upstream invasion of non-native fish into the Roan Creek headwaters.

We urge you to give the Middle Colorado Watershed Council's application your highest consideration for this shovel-ready project.

Ben Felt
NW Region Senior Aquatic Biologist, Colorado Parks and Wildlife





COLORADO RIVER DISTRICT
PROTECTING WESTERN COLORADO WATER SINCE 1937

March 10, 2023

Via electronic mail

Bureau of Reclamation
ATTN: Ms. Avra Morgan and Ms. Robin Graber
PO Box 25007
Denver Federal Center
Denver, CO 80225-0007

RE: Support Letter: Roan Creek Fish Barrier and Diversion Infrastructure Upgrades Project

Dear Ms. Morgan and Ms. Graber:

The Colorado River Water Conservation District (“River District”) is pleased to support Middle Colorado Watershed Council’s WaterSMART Environmental Water Resources Project (“EWRP”) application regarding the Roan Creek Fish Barrier and Diversion Infrastructure Upgrades Project.

The upper portion of Roan Creek contains a unique native fish assemblage comprised of Colorado River native fish. Colorado Parks and Wildlife (“CPW”) constructed a fish barrier on Roan Creek around 1993 to isolate native fishes in the headwaters of the drainage basin from downstream non-native species that will predate and hybridize the unique native species. Unfortunately, in recent years the protective barrier failed and allowed nonnative trout to move to the upper reaches of Roan Creek. Funding from the WaterSMART EWRP grant would support the implementation of a new fish barrier. The project will benefit the water rights owner by providing more efficient water diversion enhancements and include new diversion appurtenances such as a headgate, fish screen, and flow-measuring device.

In June 2022, the River District launched our Accelerator Grant program to provide grant-writing, feasibility, design, preliminary environmental review, benefits analysis, and engineering to support federal funding applications made available through the Bipartisan Infrastructure Law. This program is made possible through the River District’s Community Funding Partnership Program (“CFP”), which was created in 2021 to fund multi-purpose water projects on the Western Slope. In January 2023, the River District awarded Middle Colorado Watershed Council a \$9,500 Accelerator Grant to support the Roan Creek Fish Barrier and Diversion Infrastructure Upgrades Project.

March 10, 2023

Page 2



The River District promotes, encourages, and supports the wise and efficient use of all of Colorado's water resources. As such, we strongly support the Roan Creek Fish Barrier and Diversion Infrastructure Upgrades Project and the coalition of partners working together to construct a new fish barrier on Roan Creek.

Thank you for your consideration.

Sincerely,

A handwritten signature in blue ink, appearing to read "Andrew A. Mueller". The signature is fluid and cursive, with a long horizontal stroke at the end.

Andrew A. Mueller
General Manager

THE COLORADO BASIN ROUNDTABLE
C/O 201 CENTENNIAL STREET
GLENWOOD SPRINGS, COLORADO 81602

March 7, 2023

Bureau of Reclamation
Attn: Robin Graber
PO Box 25007
Denver Federal Center
Denver CO 80225-0007

RE: Middle Colorado Watershed Council application to the Bureau of Reclamation
Environmental WaterSMART Request for the Roan Creek Fish Barrier and Diversion
Infrastructure Upgrades

Dear Ms. Graber,

This letter is to express support from *the Colorado Basin Roundtable* for the Middle Colorado Watershed Council's efforts to secure grant funding for completion of the Roan Creek Fish Barrier and Diversion Infrastructure Upgrade Project.

The upper portion of Roan Creek contains a unique native fish assemblage comprised of Colorado River cutthroat trout, bluehead sucker, Paiute sculpin, and speckled dace. Colorado Parks and Wildlife (CPW) constructed a fish barrier on Roan Creek around 1993 to isolate native fishes in the headwaters of the drainage basin from downstream non-native species that will predate and hybridize the unique native species. Unfortunately, in recent years the protective barrier failed and allowed nonnative trout to move to the upper reaches of Roan Creek.

To protect the headwater populations of native fishes in the long term, a new fish barrier needs to be constructed. The project will benefit the water rights owner by providing more efficient water diversion enhancements. The work will also include new diversion appurtenances such as a head gate, fish screen, and flow measuring device.

The Colorado Basin Roundtable is made up of stakeholders charged by the State of Colorado with water planning activities on the mainstem of the Colorado River. The basin roundtable supports projects that promote biologically healthy rivers, the Middle Colorado Watershed Council's Roan Creek Fish Barrier and Diversion Infrastructure Upgrade is just that type of project.

We urge you to give the Middle Colorado Watershed Council's application your highest consideration for this shovel-ready project.

Regards,

A handwritten signature in blue ink, appearing to read 'J. Turner', with a long horizontal flourish extending to the right.

Jason V. Turner
Colorado Basin Roundtable

Bureau of Reclamation
Attn: Robin Graber
PO Box 25007
Denver Federal Center
Denver CO 80225-0007

January 27, 2023

RE: Middle Colorado Watershed Council's Bureau of Reclamation WaterSMART Grant Request
for the Roan Creek Fish Barrier and Diversion Infrastructure Upgrades

Dear Ms. Graber,

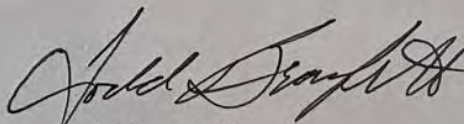
As a water rights holder regarding the ditch structure on Roan Creek, I support the Middle Colorado Watershed Council's efforts to secure grant funding for completion of the Roan Creek Fish Barrier and Diversion Infrastructure Upgrade Project.

The upper portion of Roan Creek contains a unique native fish assemblage comprised of Colorado River cutthroat trout, bluehead sucker, Paiute sculpin, and speckled dace. Colorado Parks and Wildlife (CPW) constructed a fish barrier on Roan Creek around 1993 to isolate native fishes in the headwaters of the drainage basin from downstream non-native species that will predate and hybridize the unique native species. Unfortunately, in recent years the protective barrier failed and allowed nonnative trout to move to the upper reaches of Roan Creek.

To protect the headwater populations of native fishes in the long term, a new fish barrier needs to be constructed.

The project will benefit me, as the water rights owner, by providing more efficient water diversion enhancements by including new diversion appurtenances such as a head gate, fish screen, ditch lining and a flow measuring device.

I urge you to give the Middle Colorado Watershed Council's application your highest consideration for this shovel-ready project.

 01/30/23

Todd Brackett

Address

19190 204rd

De Beque Co. 81630

Bureau of Reclamation
Attn: Robin Graber
PO Box 25007
Denver Federal Center
Denver CO 80225-0007

RE: Middle Colorado Watershed Council's Bureau of Reclamation WaterSMART Grant Request for the Roan Creek Fish Barrier and Diversion Infrastructure Upgrades

Dear Ms. Graber,

As the property owner for a large segment of the upper Roan Creek, this letter is to express support of the for the Middle Colorado Watershed Council's efforts to secure grant funding for completion of the Roan Creek Fish Barrier and Diversion Infrastructure Upgrade Project.

The upper portion of Roan Creek contains a unique native fish assemblage comprised of Colorado River cutthroat trout, bluehead sucker, Paiute sculpin, and speckled dace. Colorado Parks and Wildlife (CPW) constructed a fish barrier on Roan Creek around 1993 to isolate native fishes in the headwaters of the drainage basin from downstream non-native species that will predate and hybridize the unique native species. Unfortunately, in recent years the protective barrier failed and allowed nonnative trout to move to the upper reaches of Roan Creek.

To protect the headwater populations of native fishes in the long term, a new fish barrier needs to be constructed. The project will benefit the water rights owner by providing more efficient water diversion enhancements by including new diversion appurtenances such as a head gate, fish screen, and flow measuring device.

Roan Creek DMG Investment LLC is the owner of approximately 3,000 acres of land along a 10 mile stretch of upper Roan Creek including the proposed location of the proposed Fish Barrier Project. As a landowner of several large ranches/farms, our primary goal on our properties is to provide large areas of conservation, promote wildlife, and provide improvements to enhance the habitat. We purchased the ranch about 18 months ago and are well along into our 5-year project.

We urge you to give the Middle Colorado Watershed Council's application your highest consideration for this shovel-ready project.

Sincerely,

A.J. de Moya, Principal
Roan Creek DMG Investment LLC
Aj.demoya@demoya.com



Richard Van Gytenbeek, Colorado River Basin Outreach Coordinator, Colorado Water Project

Bureau of Reclamation
Attn: Robin Graber
PO Box 25007-Denver Federal Center
Denver CO 80225-0007

March 17, 2023

RE: Middle Colorado Watershed Council application to the Bureau of Reclamation Environmental WaterSMART Request for the Roan Creek Fish Barrier and Diversion Infrastructure Upgrades

Dear Ms. Graber,

Trout Unlimited (TU) would like to express their support for the Middle Colorado Watershed Council's (MCWC) grant application to the Bureau of Reclamation's Water Smart EWRP grant program to fund construction of the Roan Creek Fish Barrier and Diversion Infrastructure Upgrades project.

The upper reaches of Roan Creek, a tributary to the Colorado River at DeBeque CO, supports a number of unique fish species including Colorado River cutthroat trout (CRC), bluehead sucker (BHS), Paiute sculpin, and speckled dace. The CRC and BHS are both species of special concern for Colorado Parks and Wildlife. Neither of these two unique species competes well with non-native trout and sucker species (respectively) for habitat and food. In addition, because they spawn at the same time as non-natives their unique genetic integrity tends to be severely diluted and may ultimately be lost.

Colorado Parks and Wildlife (CPW) constructed a fish barrier in conjunction with an existing irrigation diversion on Roan Creek around 1993 to isolate these native fishes in the headwaters of the drainage basin from downstream non-native species that will predate and hybridize the unique native species. Unfortunately, in recent years the protective barrier failed and allowed nonnative trout to move to the upper reaches of Roan Creek.

To protect the headwater populations of native fishes in the long term, a new fish barrier needs to be constructed. The new barrier is designed to prevent any upstream fish migration and as an irrigation diversion structure. As such, it will also benefit the agricultural water rights owner by providing a more efficient water diversion structure, a new head gate, integrated fish screen and flow measuring device.

TU has partnered with the MCWC for many years in the Middle Colorado basin on a number of different projects. The Roan Creek project has been on the planning board for a long time and MCWC has tenaciously pursued its completion despite many hurdles. The project is multiple use as it is vital to protecting these vulnerable species and their unique genetic pools while helping to ensure that western agriculture remains on the land. Accordingly, TU strongly urges you to positively consider the Middle Colorado Watershed Council's grant application for their Roan Creek Fish Barrier and Diversion Infrastructure Upgrades project.

Sincerely,

Richard Van Gytenbeek.

Trout Unlimited: America's Leading Coldwater Fisheries Conservation Organization
1156 N. 5th St., Suite #409, Grand Junction, Colorado 81501
(307) 690-1267 • r.vangytenbeek@tu.org • www.tu.org

Tom Jankovsky
District 1

John Martin, Chair
District 2

Mike Samson, Chair Pro Tem
District 3



December 19, 2022

Bureau of Reclamation
Attn: Robin Graber
PO Box 25007
Denver Federal Center
Denver, CO 80225-0007

RE: Middle Colorado Watershed Council's Bureau of Reclamation WaterSMART Grant Request for the Roan Creek Fish Barrier and Diversion Infrastructure Upgrades, Category A Partnership

Dear Ms. Graber,

This letter is to express the Garfield County Board of County Commissioners' support for the Middle Colorado Watershed Council's efforts to secure grant funding for the Roan Creek Fish Barrier and Diversion Infrastructure Upgrade Project.


As a supporter of this important project, Garfield County has agreed to participate in the Middle Colorado Watershed Council's Bureau of Reclamation WaterSMART grant application as their Category A Partner. Garfield County agrees to the submittal of the proposal and will review and approve the content of the grant application prior to submission.

The upper portion of Roan Creek contains a unique native fish assemblage comprised of Colorado River cutthroat trout, bluehead sucker, Paiute sculpin, and speckled dace. Colorado Parks and Wildlife (CPW) constructed a fish barrier on Roan Creek around 1993 to isolate native fishes in the headwaters of the drainage basin from downstream non-native species that will predate and hybridize the unique native species. Unfortunately, in recent years the protective barrier failed and allowed nonnative trout to move to the upper reaches of Roan Creek.


To protect the headwater populations of native fishes in the long term, a new fish barrier needs to be constructed. The project will benefit the water rights owner by providing more efficient water diversion enhancements. The work will also include new diversion appurtenances such as a head gate, fish screen, and flow measuring device.

As the Category A Partner, we urge you to give the Middle Colorado Watershed Council's application your highest consideration for this shovel-ready project.

Sincerely,


John Martin, Chairman


Mike Samson


Tom Jankovsky

108 8th Street, Suite 101 • Glenwood Springs, CO 81601
Office: 970-945-5004 • Fax: 970-945-7785