Animas River Removal and Replacement of Invasive Phreatophytes, Phase II

POGG1,PDAA,201900002100

Final Report

Prepared for:
Colorado Water Plan Grant Program
Attn: Steve Reeves

January 31, 2024

Mountain Studies Institute
SAN JUAN MOUNTAINS COLORADO

Grant Amount: $48,713.50

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Introduction

Building on the success of MSI's previous efforts to remove and replace invasive phreatophytes in the Animas River Subbasin, this project endeavored to continue the removal efforts in Phase II, working with private landowners, businesses, Southwest Conservation Corps (SCC), City of Durango (COD), and Southern Ute Indian Tribe (SUIT) to reduce populations of Russian olive (*Elaeagnus angustifolia*) and tamarisk (*Tamarix* spp.) in the Animas River Watershed in support of state-mandated noxious weed management goals. This report covers the performance period for this Colorado Water Plan Grant from August 2, 2018 to November 30, 2023.

Background

MSI began this effort with Phase I, under CWCB's Invasive Phreatophyte Control Program. During Phase I of this work, MSI built strong relationships with the community to engage landowners to remove invasive phreatophytes and encouraged replacement with native species. Phase I was implemented from 2016-2018 and accomplished treatments on approximately 347 acres in the Animas Watershed. MSI began the Phase II effort in 2019 and has since continued to engage additional landowners and the business community. We also expanded our partnership with the SUIT and were able to address populations of Russian olive that crossed the "checkerboard" of private property and tribal property boundaries. During Phase II, MSI and our partners treated an additional 219 acres (approximately), which includes 39 acres of retreatment.

This project aligns with multiple stated goals in Colorado's Water Plan:
Colorado Water Plan, Section 6.2, pg. 6-15:
"Colorado's Water Plan uses a grassroots approach to formulate projects and methods that avoid some of the undesirable outcomes of the supply-demand gaps. The plan addresses the gaps from multiple perspectives—such as water storage, reuse, recycling, integrated water management, restoration, and conservation." This project supports this goal by working with private landowners and business owners, as well as tribal and local government to restore the watershed by removing invasive phreatophytes.

Colorado Water Plan, Section 6.6, pg. 6-157:
The policy of the State of Colorado is to identify and implement environmental and recreational projects and methods to achieve the following statewide long-term goals:

- Promote restoration, recovery, sustainability, and resiliency of endangered, threatened, and imperiled aquatic- and riparian-dependent species and plant communities.
- Protect and enhance economic values to local and statewide economies that rely on environmental and recreational water uses, such as fishing, boating, waterfowl hunting, wildlife watching, camping, and hiking.

- Support the development of multipurpose projects and methods that benefit environmental and recreational water needs as well as water needs for communities or agriculture.
- Understand, protect, maintain, and improve conditions of streams, lakes, wetlands, and riparian areas to promote self-sustaining fisheries and functional riparian and wetland habitat to promote long-term sustainability and resiliency.
- Maintain watershed health by protecting or restoring watersheds that could affect critical infrastructure and/or environmental and recreational areas.

This project supports these goals by removing invasive phreatophytes from a reach of the Animas River that is highly prized for recreational value, including boating and fishing, as well as environmental values, such as wildlife habitat. In Phase I of this project, removal efforts were focused on the upper reaches of the watershed, in an attempt to treat seed sources high in the watershed. In Phase II, efforts were focused on the lower part of the Animas River in Colorado, near the New Mexico state line. In these lower elevation areas, MSI and SCC encountered populations of Russian olive much denser than in Phase I, at higher elevations. It became apparent that additional labor would be needed to complete Phase II, which continued into 2023 and will for several more years. We now focus on treating the denser populations, as well as going back to re-treat the higher elevation seed source populations, which have shown some resprouting since the initial treatments. Additionally, we continue to work with the City of Durango to treat areas of City-administered lands throughout the recreation corridor, focusing on areas near river put-ins and take-outs.

Additionally, this project aligns with the Southwest Basin Round Table, Basin Implementation Plan, 2015. This project addresses and contributes to the Measurable Outcomes of the following goals identified in the BIP.

- A5 Maintain watershed health by protecting and/or restoring watersheds that could affect critical infrastructure and/or environmental and recreational areas.
- D1 Maintain, protect and enhance recreational values and economic values to local and statewide economies derived from recreational water uses, such as fishing, boating, hunting, wildlife watching, camping, and hiking.
- E1 Encourage and support restoration, recovery, and sustainability of endangered, threatened, and imperiled aquatic and riparian dependent species and plant communities.
- E2 Protect, maintain, monitor and improve the condition and natural function of streams, lakes, wetlands, and riparian areas to promote self-sustaining fisheries, and to support native species and functional habitat in the long term, and adapt to changing conditions.

These goals are particularly important to MSI, as we view these efforts to control invasive phreatophytes as enhancing the overall resilience of our communities to adapt to future

extended drought and a warming climate, which will promote rapid expansion of Russian olive populations in our watershed.

Methods

During Phase 2 of this project, MSI expanded on the work done during Phase 1. We concentrated our efforts in multiple areas: the Bodo Industrial Park in Durango, CO; the southernmost reach of the Animas River corridor in Colorado, which includes SUIT lands; the recreation corridor of the Animas River, which extends from Oxbow Park and Preserve to Dallabetta Park; and the Hermosa Valley area. MSI partnered with SCC, SUIT, and COD to accomplish our goals. Together we accomplished the mechanical removal and herbicide treatment of Russian olive and tamarisk on approximately 219 acres from 2019-2023 (Figure 1). This includes approximately 39 acres that were retreated throughout the project. We expect that retreatment may continue to be needed over the next 5-20 years to fully accomplish eradication of these species due to their persistence through resprouting and the longevity of the seeds in the seedbank. Through partnership with the SUIT's Division of Wildlife, we treated approximately 61 acres of tribal land (Figure 2), which complements approximately 100 acres in the Animas and La Plata sub-watersheds, which the SUIT restored with matching funding sources (provided through Bureau of Indian Affairs). While invasive species eradication is a long-term goal, MSI and our partners continue to work towards a fully restored upper San Juan watershed to create a sustainable future for Colorado wildlife and communities.

In the Bodo Industrial park, MSI obtained permission from 22 individual businesses that had Russian olive growing on their grounds. Due to limited time, Russian olive was removed from the grounds of 8 businesses in 2020-2022. Due to the nature of where these Russian olive were growing, as part of landscaping, these trees were replaced with non-invasive species grown at local nurseries. This work was augmented by the City of Durango through purchase of additional trees, use of their chipper and truck, and the labor of their staff. One project site of particular note is the Juniper School, a charter elementary school in Bodo Industrial Park. The Juniper School grounds were populated with very large, mature Russian olive trees. MSI staff conducted a 5-week education program with the elementary students about why the trees were being removed and replaced. This work was supported through CPW and COD funds (not counted as match for this project). Eight replacement trees were planted from November 2020-April 2021. Students helped with the April 2021 plantings as part of the COD's Arbor Day celebrations. Replacement trees were also planted at several other businesses. MSI will continue to work with the remaining businesses with Russian olive on their property through additional funding from the Colorado Water Conservation Board.

An additional aspect of this project which provided a community benefit, while solving the problem of slash disposal was to work in cooperation with the Durango Daybreak Rotary club. The club operates an annual firewood assistance program to help low-income families and seniors to heat their homes. Rotarians volunteered their time and personal vehicles to pick up the firewood sized slash from project sites and hauled it to a staging area to dry. The Rotary club reported that they collected approximately 31 cords of woods from 2020-2022. No wood was collected in 2023, because all of the sites worked on by SCC were not easily accessible by truck to collect the wood.

Invasive Phreatophyte Treatment Methods

Cut-Stump treatment method
The cut-stump technique involved cutting the trees and shrubs to ground level and spraying stumps with herbicide (Garlon 4 or Rodeo) and JLB oil. Chain saws, brush cutters, lopping shears and other hand tools were used. Stumps were sprayed using hand-held spray bottles, sprayers, or "painted on". The herbicide was applied to the stump immediately following cutting to maximize efficiency of the herbicide treatment.

Frill cut treatment method or "hack-and-squirt"
Using a hatchet, machete, or similar device a frill cut was made at a downward angle at intermittent spacing around the trunk (not completely girdling the tree). After striking, the hatchet was pulled backwards to produce a "cup" to hold the herbicide. Cuts were made to penetrate through the bark into living cambium tissue. Herbicide (Garlon 4 or Rodeo) mixed with JLB oil, according to the label specifications, was sprayed into the frill cuts using a sprayer. This method was used to control individual trees greater than five inches in diameter. This method was used in areas where it was difficult to fell trees and is beneficial for wildlife habitat, as standing dead trees become good habitat trees.

Basal bark treatment method
This method was used to address younger plants and re-sprouts with stems no larger than 6 inches in diameter. Herbicide was sprayed onto 12-15 inches of bark around entire stem near the base of the plant.

All treatment methods were applied after the phreatophytes had bloomed and prior to dormancy, between September and November for maximum effectiveness and to reduce re-sprouting, and in order to be outside of the migratory bird nesting season.

Once trees were removed, the wood material was either piled on site for later burning by the landowner, hauled away by the Durango Daybreak rotary club volunteers, or chipped and hauled away for incineration by the City of Durango (funded by in-kind match).

Monitoring and Mapping

In 2023, MSI staff monitored Russian olive and tamarisk visible from the river corridor in two segments. This replicated the approach used in Phase I to get an initial assessment of invasive phreatophytes adjacent to the recreational stretch of the Animas River. Staff floated from the highest elevation point at the project boundary, which is Baker's Bridge, to the Trimble Crossing river access point, and on a subsequent date, from Trimble Crossing to the 32nd Street river access point. All invasives visible from the corridor were recorded with GPS and later mapped on ARC GIS. These points were overlaid on the La Plata County parcel data to inform where new infestations have occurred, as well as where retreatment is necessary. (Not all populations were treated in 2023 due to lack of time and capacity during the September-November season.)

SCC staff map each area treated while in the field. Based on conditions at each site, SCC staff either record polygons of closely grouped trees or take a point at each stem treated. This data is then relayed to MSI. MSI staff map all treated areas using ARC GIS. For point data, MSI applies a 20-meter buffer to each point, based on the zone of influence of each tree, and then applies a "dissolve" to every point to create a shapefile. In this way, we hope to create an accurate assessment of the areas treated each season. This data is mapped in Figures 1 and 2.

Results

Through this project, and additional matching sources, the mechanical removal and herbicide treatment of Russian olive and tamarisk was accomplished on approximately 566 acres in Phase I and II, collectively from 2016 through 2023 (Figure 1), which included approximately 61 acres of tribal lands, treating 14,188 stems. This includes approximately 39 acres that have been retreated. This complements over 100 additional acres (as last reported) in the Animas and La Plata sub-watersheds, which the SUIT restored with matching funding sources to pay for SCC's labor. In 2023, 101 acres were newly treated and 1 acre was retreated. In 2022, 15.3 acres were newly treated and 1.8 acres were retreated (progress was greatly reduced in 2022 due to a lack of staff at SCC). MSI and SCC have worked diligently to retreat areas that were previously treated to be able to prevent resprouts from becoming established as mature trees (Figure 2).

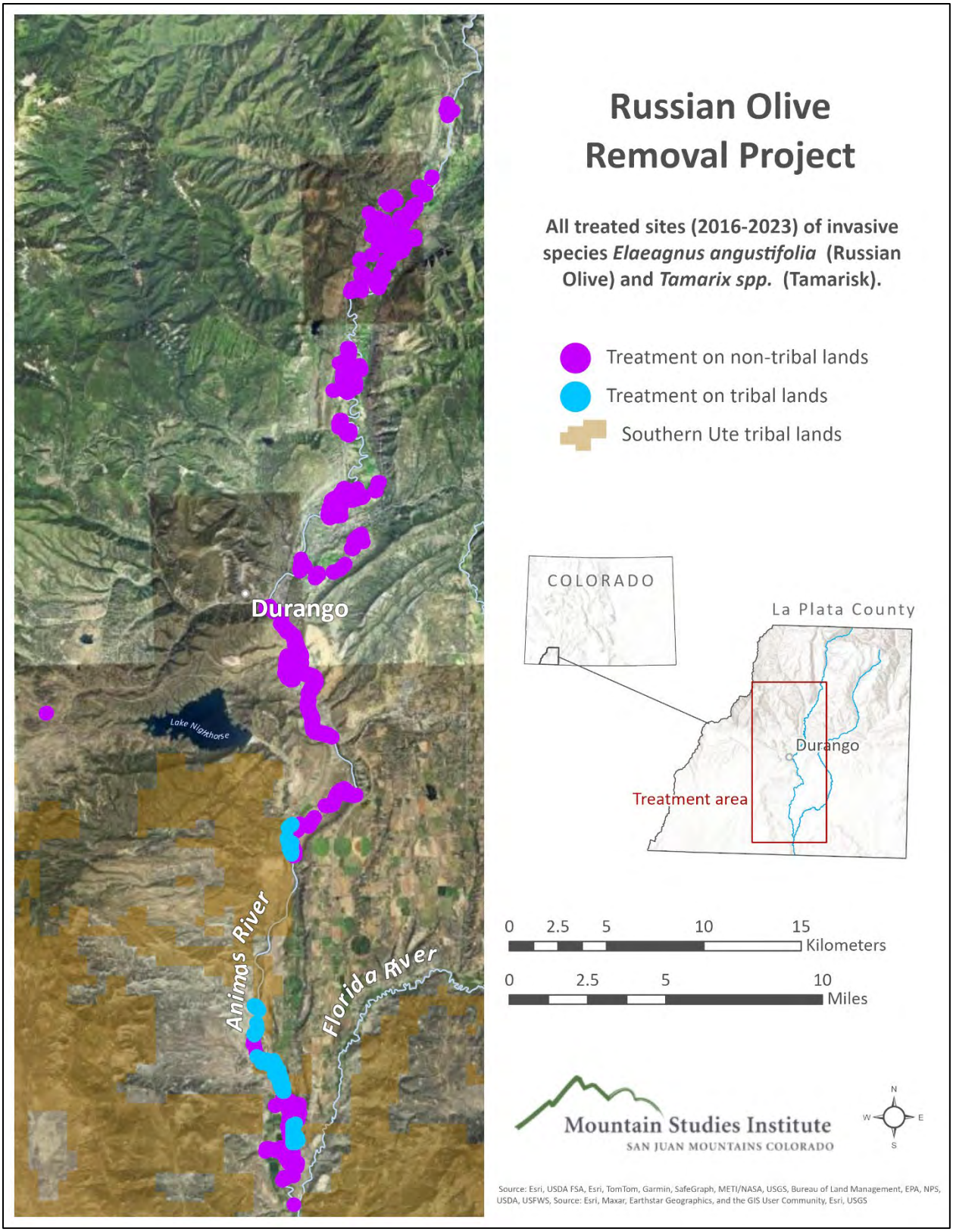

Figure 1. Acreage treated in Phase 1 (2016-2018) and Phase 2 (2019-2023) on tribal and non-tribal lands.

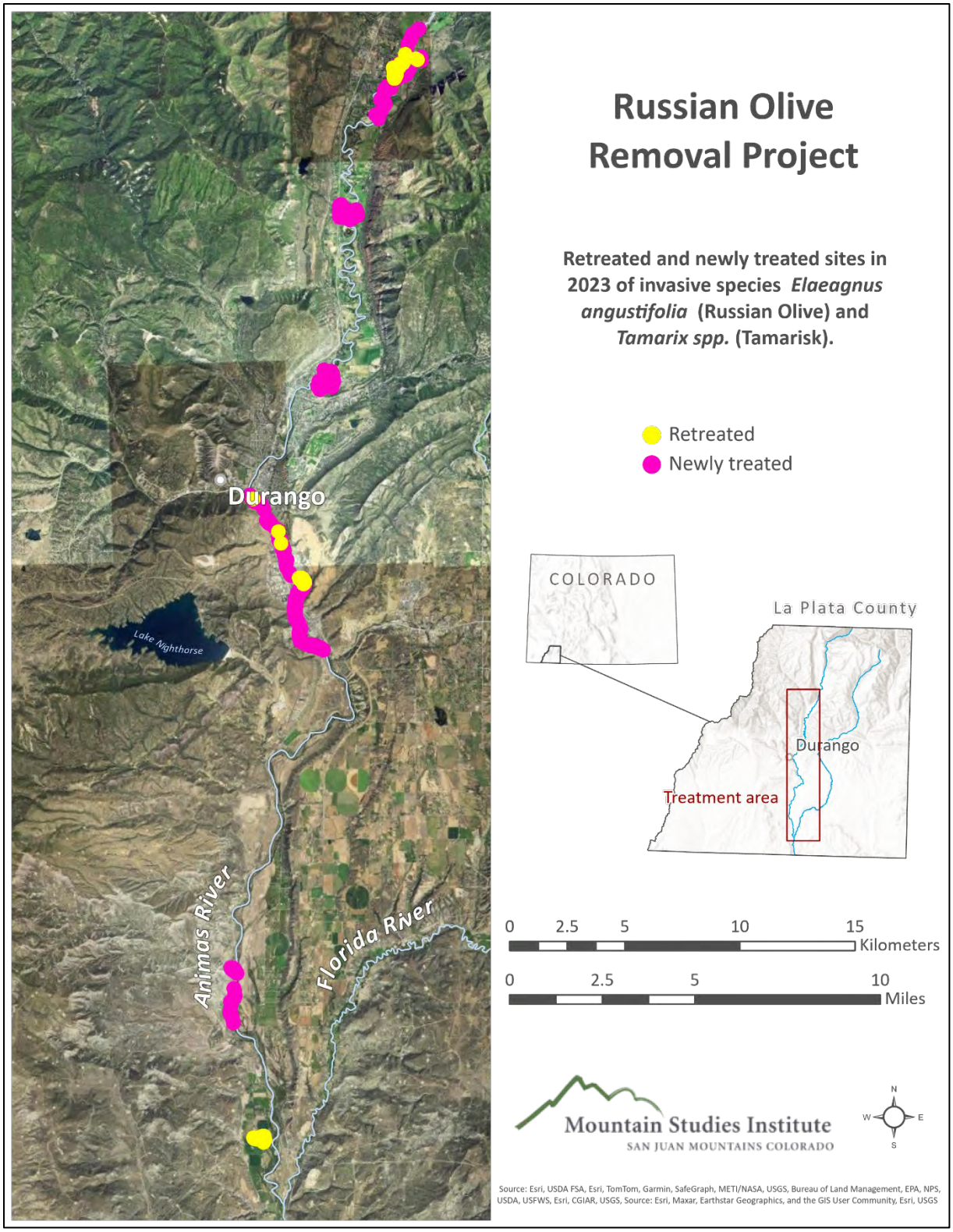

Figure 2: In 2023, SCC crews treated new areas, as well as retreating areas that had been treated in 2016-2023.

Conclusions and Discussion

The methods for removal of invasive phreatophytes continue to prove effective overall. We detect some resprouting from year to year, which is to be expected for these species, particularly Russian olive. By retreating the resprouted individuals before they become established as mature trees with a large seed crop, we continue to diminish the population overall.

The collaborative effort that MSI has developed by partnering with SCC, private landowners, SUIT, and COD, has proven to be effective. By working across boundaries of land ownership, we have created a comprehensive approach to reducing the impact of invasive phreatophytes overall. We still encounter landowners that are unwilling to work with our program. However, as the public perception of the detrimental effects of invasive phreatophytes grows, and the "word of mouth" communication between landowners amplifies, we are seeing more cooperation in key areas for removal.

MSI intends to keep this program going for several years. Funding has been secured through SCC, in partnership with MSI, to be able to employ SCC crews for an additional year, and we intend to continue to purse funding collaboratively. MSI has been unable to complete project work on all potential project sites each year that we have been working on this project. In other words, we have more work available than we have capacity to complete in a season. We continue to work towards eradication of invasive phreatophytes year after year.

Actual Expense Budget

Table 1 shows the actual budget including all cash match and in-kind match funding and the total amount spent. Matching sources are from the SUIT and the City of Durango, MSI, and SCC. No dollar amount was allocated to Task 3. This is because the expenses related to replacement of vegetation were covered by another grant, not counted as match to this grant, from Colorado Parks and Wildlife's Wetland Enhancement grant program. Additionally, during the 5-year period of this grant MSI received funds (not included as match) from CWCB through the Colorado Water Plan and Watershed Restoration grant programs, as well as smaller funds from the Colorado Tree Coalition and US Fish and Wildlife's Partners for Fish and Wildlife private landowner funds (funds were given directly to the landowner, and then to MSI). Through leveraging these multiple funding sources, MSI has been able to keep this program running continuously since 2016, which has been vital to keeping relationships with private landowners, the SUIT, and the City of Durango strong.

COLORADO
Colorado Water Conservation Board
Department of Natural Resources

Colorado Water Conservation Board

Water Plan Grant - Detailed Budget Estimate

Fair and Reasonable Estimate

Date:	**31-Jan-24**
Name of Applicant:	**Mountain Studies Institute**
Name of Water Project:	**Animas River Removal and Replacement of Invasive Phreatophytes, Phase II**

Budget

PERSONNEL

Task	Item	Hourly Rate	# Hours	Total Cost	Proposed CWCB Funds	Actual CWCB Funds	Matching Funds	Matching Inkind
Task 1- Outreach/Coordination								
	Project Coordinator	$ 45.00	300	$ 13,500.00	$ 12,500.00	$ 15,729.70	$ 1,000.00	
	Conservation Intern	$ 15.00	100	$ 1,500.00	$ -	$ -		$ 1,500.00
Task 2- Removal/Retreatment								
	Project Coordinator	$ 45.00	85	$ 3,825.00	$ 3,825.00	$ 3,810.00		
	SUIT Wildlife Manager	$ 45.00	40	$ 1,800.00	$ -			$ 1,800.00
Task 3 - Replacement/Revegetation								
	Project Coordinator	$ 45.00	85	$ 3,825.00	$ 3,825.00	$ -		
	COD Forester/Weed	$ 55.00	200	$ 11,000.00				$ 5,520.00
Task 4- Monitoring/Reporting								
	Project Coordinator	$ 45.00	100	$ 4,500.00	$ 4,500.00	$ 4,908.75		
Personnel Total				**$ 39,950.00**	**$ 24,650.00**	**$ 24,448.45**	**$ 1,000.00**	**$ 8,820.00**

DIRECT EXPENSES

Expense	Item	Unit Cost	Units	Total	CWCB Funds	Actual CWCB Funds	Matching Funds	Matching Inkind
Removal/Retreat Contractor								
Southwest Conservation Corps	8 Person, 40h Crew	$ 7,500	1	$ 7,500.00	$ 7,500	$ 24,000		
Southwest Conservation Corps	3 Person, 40h Crew	$ 3,300	5	$ 16,500.00	$ 16,500			
Southwest Conservation Corps	SUIT Removal- lump sum	$ 5,882	8.5	$ 50,000.00	$ -		$ 50,000.00	
SCC Volunteer Inkind Contribution	All weeks	$ 7,382	1	$ 7,381.91	$ -			$ 7,381.91
City of Durango	Labor, expenses, etc			$ -			$ 7,075.00	$ 7,525.00
TOTAL				**$ 81,381.91**	**$ 24,000.00**	**$ 24,000.00**	**$ 57,075.00**	**$ 14,906.91**

Other Direct Costs

Units:	Item	Unit Cost	Units	Total	CWCB Funds	Actual CWCB Funds	Matching Funds	Matching Inkind
Travel to project sites	**Mileage**	**$0.545**	**$ 300.00**	**$ 163.50**	**$ 63.50**	**$ 265.60**	**$ 100.00**	
TOTAL Other Costs				**$ 163.50**	**$ 63.50**	**$ 265.60**	**$ 100.00**	

TOTAL COSTS				$ 121,495	$ 48,714	$ 48,714	$ 58,175	$ 23,727

Table 1. Proposed Budget vs Actual Expenses, with matching cash and in-kind, by task.

References

Basin Implementation Plan, Southwest Roundtable. 2015. Oliver, A. and C. Lile. Harris Water Engineering, Inc.

Colorado's Water Plan. 2015. Available at : https://dnrweblink.state.co.us/CWCB/0/edoc/199531/FinalCombinedCWPJune2016.pdf