



Watershed group development and restoration planning for the Rattlesnake Creek watershed, MT

Technical proposal for WaterSMART Cooperative Watershed Management Program Phase I for Fiscal Years 2023 and 2024

Submitted by:

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In Association with:

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Executive Summary

Date: December 5, 2023

Applicant Name: The O'Connor Center for the Rocky Mountain West, University of Montana

City, County, State: Missoula, Missoula County, Montana

Project Summary: The Rattlesnake Creek watershed is valued for its ecological, cultural, and recreational abundance. The watershed is in the historical homelands of the modern-day Confederated Salish and Kootenai Tribes where the original Peoples were sustained by the prolific bull trout (*Salvelinus confluentus*) in the creek. In recent history, European settlers, and modern day Missoulians have relied on the creek as a direct municipal water source through the 1980's and more recently as a clean source of groundwater recharge to the Missoula aquifer. The Rattlesnake Creek watershed offers an abundance of recreation opportunities and is beloved by Missoulians for its year-round access to a pristine, federally recognized, Wilderness and National Recreation Area within a 20-minute drive from downtown Missoula.

The Rattlesnake Creek Watershed Group (RCWG) was established in 2008 based on a grassroots response to invasive plants encroaching on habitat in the lower Rattlesnake Creek neighborhood. Over the past 15 years, the group has facilitated between stakeholders in the watershed, actively engaged in watershed planning, and has been a voice of the watershed to the public. In recent years new threats have emerged to the health of the watershed. The water rights of the creek, and the management of multiple wilderness dams that have exceeded their useful life, have shifted from private to public ownership with the City of Missoula. Decisions must be made on whether to rehabilitate these dams, and potentially use them to augment stream flows, or to decommission the dams and return the lakes to their natural state. Naturally low groundwater input to the creek and a changing climate are leading to higher stream temperatures and decreases in the abundance and redd counts of the federally endangered bull trout. Non-native annual grasses are encroaching on native plant habitat, potentially altering the hydrologic cycle and the forage habitat for native elk populations. RCWG is collaborating with the O'Connor Center for the Rocky Mountain West at the University of Montana to address these pressing issues. This proposal aims to (1) further develop the Rattlesnake Creek Watershed Group to be a clearinghouse of ecological and cultural information in the watershed, (2) increase outreach to the Rattlesnake watershed residents and those that travel to the watershed for recreation about the pressing issues the watershed faces, (3) bring together the many city, county, federal, tribal, and non-profit stakeholders in the watershed to prioritize specific needs, and (4) conduct baseline data collection, research, and watershed restoration planning.

Length of Project: Jan 2025 – Dec 2027

Federal Facility: The U.S. Forest Service through the Lolo National Forest owns and manages

more than 50% of the watershed in which this work is proposed.

Project Location

The Rattlesnake Creek-Clark Fork watershed (HUC 10; 1701020401) largely consists of two HUC 12 subwatersheds (Upper and Lower Rattlesnake Creek) that drain Rattlesnake Creek (Figure 1). The headwaters of Rattlesnake Creek begin in the Rattlesnake Wilderness and National Recreation Area, after which the creek flows approximately 23 miles east and south to its terminus with the Clark Fork River in downtown Missoula, MT (Figure 2). Our proposed project area will focus on the entirety of the two HUC 12 subwatersheds of Rattlesnake Creek (~75% of the HUC 10 area).

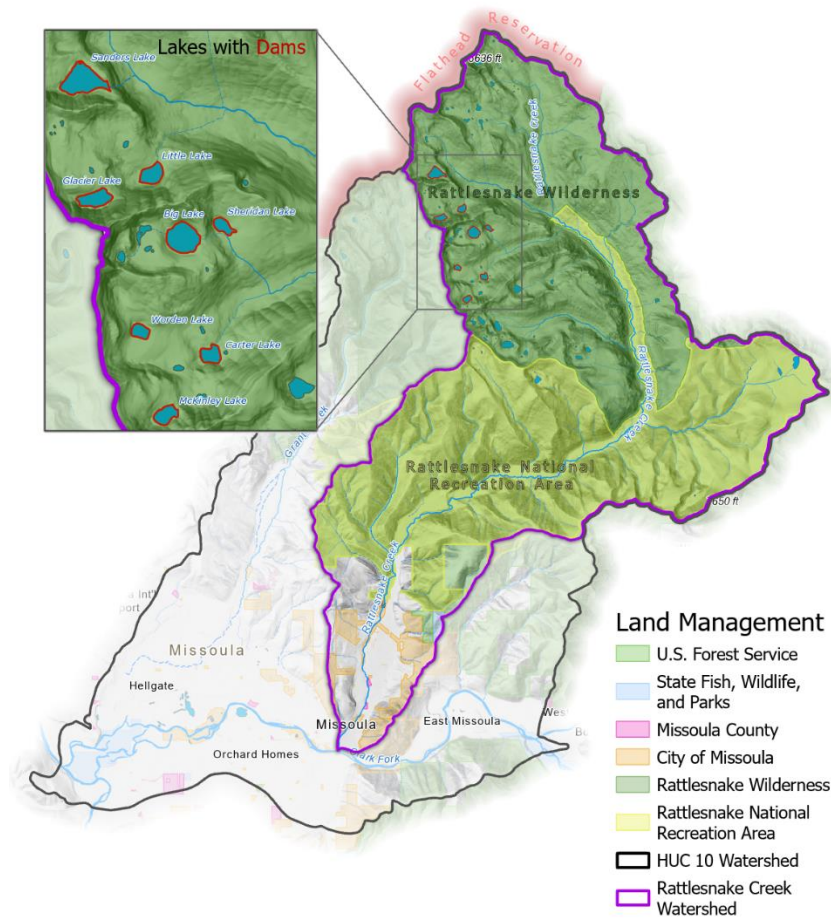


Figure 1. Land managers within the Rattlesnake Creek watershed. The City of Missoula owns the water rights and management obligation of 10 wilderness dams on 8 lakes in the Rattlesnake Wilderness. See Figure 2 for an inset of the lower Rattlesnake Creek neighborhood.

Applicant Category

The University of Montana is applying as a fiscal sponsor of an Existing Watershed Group. The Rattlesnake Creek Watershed Group (RCWG; EIN 26-2570698; <https://www.rattlesnakecreekwatershedgroup.org/>) was established in 2008, and is registered in Montana as a nonprofit, community benefit corporation with a mission to a) protect, preserve, and restore the Rattlesnake Creek Watershed through community outreach, education, science, and stewardship and b.) to promote and foster appreciation and respect for the unique qualities of the Rattlesnake Creek watershed for its residents and the broader Missoula community. The volunteer RCWG board currently consists of five-members, most of whom have lived, worked, and recreated in the Rattlesnake Creek watershed for many years. The board brings much natural history knowledge as well as personal connections with many of the stakeholder groups through previous employment or as volunteers. The group was originally founded based on a neighborhood response to invasive plants encroaching on habitat in Bugbee Nature Preserve in the lower Rattlesnake Creek neighborhood. As time progressed the group expanded their purview to include measurements of water quality and quantity with a grant from the Montana Department of Environment Quality (MDEQ), which included a paid coordinator. In 2011, a Watershed Action Plan was generated with the MDEQ grant, with specific goals and objectives focused on: Noxious Weeds and Invasive Species, Water Conservation, Habitat and Water Quality, Improving Fisheries Passage, and Health, and to Build Capacity of the Rattlesnake Creek Watershed Group. Many, but not all, of these objectives were achieved with the help of the volunteer board and the paid coordinator. By 2015, funded projects were concluded, and the group returned to an all-volunteer board status. For the next few years, the group continued a wide variety of work with a heavy focus on tracking forest management activities and supporting efforts to minimize human-bear conflicts. The group had a renaissance in 2021 with added goals of being a clearinghouse of the many groups working in the watershed and providing residents and recreators resources for watershed care. The primary activities of the current group include a monthly newsletter (sent to ~400 contacts) containing information, news, and events focused on the Rattlesnake Creek watershed; outreach events, nature walks, and tabling; stewardship activities such as weeding and riparian planting; a ‘Rattlesnake Stories’ lecture series; and an

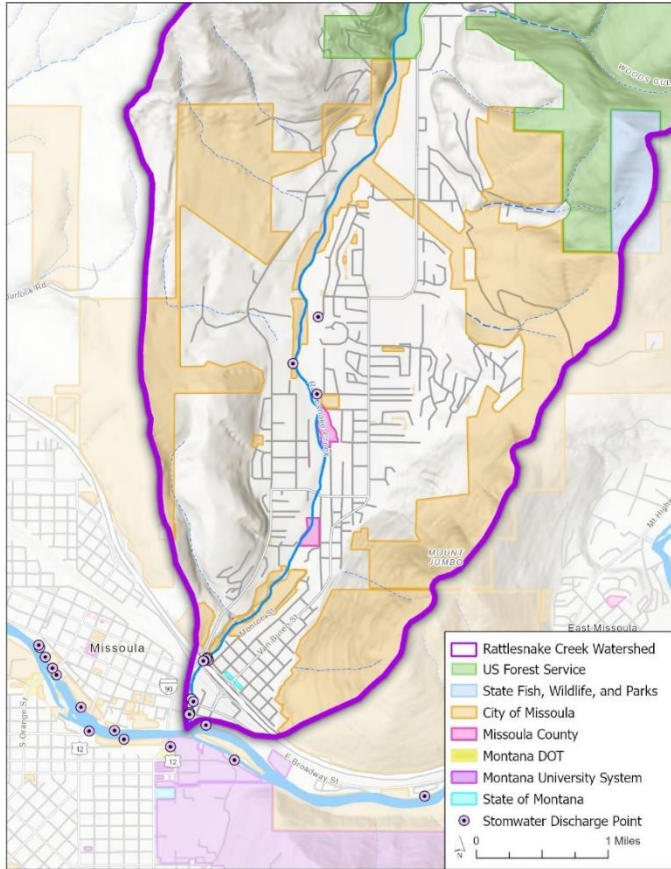


Figure 2 Inset of land managers for the lower Rattlesnake Creek neighborhood. The University of Montana is located across the Clark Fork River from the confluence with Rattlesnake Creek.

initial effort to establish a State of the Rattlesnake report.

Eligibility of Applicant

The O'Connor Center for the Rocky Mountain West (OCRWM) at the University of Montana (UM) will be the fiscal sponsor of the grant on behalf of RCWG. The OCRMW serves as a nonpartisan and trusted clearinghouse to help decisionmakers, stakeholders and the public understand key issues in the Interior Rocky Mountain West of North America. Through an interdisciplinary approach, the OCRMW seeks to use scholarly and science-based approaches to convey the cultural, social, historical, economic, ecological, and climate-driven forces that influence the region's remarkable landscapes and human communities. These efforts include a diversity of voices across the region. The OCRMW has 25 full-time staff, and many more part-time and seasonal field technicians (including UM undergraduate students), with expertise in aquatic and wetland ecology, botany, and Geographic

Information Systems (GIS).

Matt Trentman, the PI for this proposal and Senior Projects Manager with the OCRMW, has been working in water resources for more than 10 years. He has successfully managed multiple federal contracts and agreements. Trentman has also been a board member and treasurer of RCWG, since Dec 2022. Trentman is supervised by Kay Hajek, the Associate Director of OCRMW, who has been working in terrestrial resources for more than 20 yrs. Hajek leads OCRMW and administers more than \$4.2 million (in FY 2023) in federal and state grants, contracts, and agreements. The OCRMW will administer funds for Watershed Group Development (Task A) based on the needs of the RCWG Board. OCRMW will be the lead facilitator of the Watershed Restoration Planning (Task B).

Project Description

Goals

- Bring together watershed stakeholders around the topics of weeds, water, and climate to determine data gaps, and restoration planning needs.
- Collect baseline data and generate restoration plans.

- Conduct outreach to the community through hands on events and citizen science activities.
- Grow and maintain RCWG as a clearinghouse for information and consistent advocate and voice of the Rattlesnake Creek Watershed

Approach

OCRMW is applying for this funding opportunity to develop collaboration between RCWG and the many stakeholders in the Rattlesnake Creek watershed. The proposed activities fall in both **Task A: Watershed Group Development and Task B: Watershed Restoration Planning.**

In the spring of 2023, RCWG, in collaboration with the OCRMW, sent out a survey to groups, agencies, and individuals working in the watershed with the goal of assessing the state, or overall health, of the Rattlesnake Creek watershed. The survey contained questions about the activities and data collection in the Rattlesnake Creek watershed performed by the stakeholder, trends and/or gaps in key watershed health indicators (as defined by the stakeholder), and if the stakeholder was interested in taking part in a technical working group to address issues identified with the survey. The respondents and their answers suggest three priority areas: water quality/quantity, weeds, and climate. While this initial survey has been important to identify the immediate needs in the watershed, there is still need for funding to begin researching and planning solutions to these broad issues. Thus, we have crafted our proposal to address the issues around these topics.

Task Area A: Watershed Group Development

The RCWG desires to be a clearinghouse of information for the stakeholders working in the watershed, and a translator of this information to the public. The RCWG currently fulfills this role in multiple ways. First, by providing a website and monthly newsletter with pieces on the natural and cultural history of the watershed, and news and events in the watershed. Next, the group intermittently conducts outreach activities such as nature walks, weed pulls, fall apple pressings, and tabling at other relevant events. The group also sponsors a winter seminar series where professionals and citizens are invited to speak on ecological, cultural, and historical topics related to the watershed. RCWG wishes to build capacity beyond this work in four ways.

Task A1- RCWG will update its website to be a clearinghouse for information about groups working in the watershed. The goal is to have an easily accessible collection of information that the public or other stakeholders can use, and RCWG can reference in newsletters and public outreach events. Further, the group is actively collaborating with other groups to document the natural and cultural history of the watershed. For example, RCWG recently supported local historians on a grant funded project to create a self-guided cultural and historical walking tour of the lower Rattlesnake Creek neighborhood. Likewise, through the Rattlesnake Stories lecture series, the group has recorded presentations on how the Rattlesnake Wilderness achieved the wilderness designation, and the cultural history of Chinese immigrants in the Missoula and the Rattlesnake Creek watershed, among others. Thus, RCWG wishes to create a website that houses new cultural and historical content and provides easy access to the myriad of information available from stakeholders in the watershed.

Task A1 outcomes

- The RCWG website is updated.

Task A2- The Rattlesnake Creek neighborhoods are growing with a population increase of 10% since 2010 (City of Missoula 2023). Many of these new residents have not lived in the wildland-urban interface, and thus are not familiar with issues such as wildlife conflict and wildfire risk. RCWG will generate outreach to new homeowners in the watershed through this grant. Specifically, RCWG will create pamphlets given to realtors for new homeowners. The pamphlet will contain relevant information, such as actions to reduce wildfire risk, conflicts with wildlife, and permits needed for construction in riparian zones, among others. RCWG will also hold a Welcome to the Rattlesnake in-person event for new homeowners.

Task A2 outcomes

- New homeowner pamphlets distributed to realtors and local businesses.
- RCWG will hold at least one Welcome to the Rattlesnake event for new homeowners in the watershed.

Task A3- RCWG will expand its outreach capabilities by purchasing tabling materials and sign boards, boosting their profile via paid advertising on radio, social media, and other venues, and providing insurance for field trips and events. RCWG has set a goal of sponsoring or co-sponsoring at least two hands on outreach events (e.g., weed pulls), and at least one climate ready response in the Rattlesnake event annually.

Task A3 outcomes

- Supplies and insurance purchased.
- Advertisements are used to promote meetings seeking public feedback from this grant (See Task B4 below) and three public outreach events annually.
- Social media profile boosted.

Task A4- The RCWG board is well connected to community members and stakeholders. While many of these relationships have already been developed, RCWG wishes to expand those connections to include groups not yet engaged. In particular, RCWG and OCRMW will work together to cultivate a meaningful relationship with the Confederate Salish and Kootenai Tribes (CSKT) whose ancestors were the original residents of the watershed. Other groups to engage with include the Missoula Organization of Realtors, recreation groups, and private irrigation ditch owners.

Task A4 outcomes

- RCWG board and OCRMW engage with CSKT leadership, Missoula Organization of Realtors, Recreation groups, etc.

Task Area B: Watershed Restoration Planning

The OCRMW and RCWG wish to enable stakeholders in the Rattlesnake Creek watershed to address their most pressing questions through group facilitation, baseline data collection, and generating watershed restoration plans. Below, we outline specific tasks in Area B.

Task B1- Technical working groups. The survey from spring 2023 was our first step directly engaging stakeholders to identify trends and data gaps in the watershed. While useful in homing in on tangible topics, there is still much work needed to begin actively addressing the issues. Notably, OCRMW and RCWG can act as facilitators across the many jurisdictional boundaries in the watershed, a task that few of the individual stakeholders can perform. In the first year of the proposed work, we aim to form three technical working groups around the topics of water, weeds, and climate with an in-person meeting for each group. We will contract a consultant to prepare for and facilitate these meetings to set clear goals and prioritize tasks, identify baseline data collection projects, and identify research, planning, and outreach activities. The outcome of these technical working group meetings will guide the remaining tasks in this category.

Task B1 outcomes

- Three technical working group meetings with a contracted facilitator in the first half of Year 1 (separated by topics of weeds, water, and climate change)
- Individual, topic-focused, plans for research, baseline data collection, and outreach (n=3).

Task B2- Baseline data collection. The results of the 2023 survey, along with publicly available management plans and reports, show there is great need for baseline data collection, especially related to weeds and water. OCRMW will implement baseline data collection identified by the technical working groups. Examples of potential data collection that have already been identified include water quality samples from stormwater outfalls; flow and stream geomorphology downstream of the wilderness dams; algal mat density, abundance, and species identification; and invasive and/or native plant species inventories. The exact data collection work will be determined by the priorities of the technical working groups in coordination with the PI. All data will be openly shared with technical working group participants through a data repository (e.g., Teams or Box).

When possible, we will include citizen science as a part of data collection to meet the overall goals of gaining information and conducting outreach. For example, citizen scientists could be used to monitor the extent of perennial surface flow (Turner and Richter 2011, Njue et al. 2019) or to identify and report invasive weeds or native plant phenology with Montana Natural Heritage Program. We envision enlisting the many recreation groups active in the watershed (e.g., MTB Missoula, a mountain bike advocacy group) to assist with data collection, especially those groups that venture higher in the watershed where data are particularly sparse. OCRMW and some stakeholders are well equipped to integrate citizen science into this proposal. OCRMW staff are familiar with the use of Survey 123 to generate custom data collection forms (if they do not already exist), and the Center is well stocked with field hardy tablets available for digital data collection, if needed. Further, the Watershed Education Network is an engaged stakeholder that already conducts citizen science in the watershed mostly focused on monitoring the recent dam removal on the mainstem of the Creek.

We will also provide opportunities for students at the University of Montana campus to be involved with the proposed work, when possible. The UM Wilderness Institute is an engaged stakeholder and regularly uses the Rattlesnake Wilderness as an outdoor classroom for students studying the role of Wilderness in human communities. We will recruit students from this program for paid data collection. Separately, there may be opportunities to collaborate with the UM Public History Department, which has interest in linking students with the public to explore local community history. Multiple stakeholders have indicated interest in documenting the complex history of water use, rights, and sustainability in the Rattlesnake watershed, which would be suitable to a semester long student project (UM Public History Department Director, personal communication).

Task B2 outcomes

- 84 person-days of data collection completed. Data collection could include collecting water quality samples, measuring stream discharge throughout the watershed, stream geomorphology measurements downstream of the wilderness dams, mapping algal mat abundance, collecting algal biomass samples for species identification, plant surveys.
- 100 water quality or algal biomass samples sent for laboratory analyses.
- Undergraduate students engaged in summer wilderness data collection and/or semester projects for documenting the history of water use, rights, and sustainability in the watershed.
- Data shared with stakeholders through data repository.
- At least one citizen science project initiated.

Task B3- Research and restoration planning. OCRMW will lead the effort to research and generate restoration plans. First, we will compile and synthesize existing data prior to the technical working group meetings in year 1. This will include identifying data sources (many of which have already been compiled with the 2023 surveys), reformatting similar data from different stakeholders to be in a consistent format, matching granular data with landscape scale attributes (e.g., from remote sensing), and presenting the data in an easily digestible format. Next, following the technical working group meetings, OCRMW will conduct restoration planning. Initially we will review the scientific literature, State/Federal standards and guidance, and interview experts in the field. As needed, OCRMW staff will coordinate and meet with one or more stakeholders for immediate feedback. As a likely example, multiple city and county agencies have expressed interest in a comprehensive weed management plan for the watershed. Thus, we envision this being a high priority of the technical working group and provide a theoretical description of the process. To complete a comprehensive weed management plan, OCRMW botanists would identify successful weed management plans in similar watersheds in the West, inventory treatment methods for the major species of concern, work with individual stakeholders to document the level of effort/funding available for weed management on their land and provide a plan with recommendations for the most efficient and effective use of the available resources.

Task B3 outcomes

- Existing data synthesized in a consistent format.
- Literature reviews, government standards, and expert interviews completed.
- Informal check-ins with stakeholders completed (as needed).

- Synthesize the above outcomes with baseline data collection from Task B2 into topic specific restoration plans (n=3).

Task B4- Continued outreach with stakeholders and the public. In Years 2 and 3 of the proposed work, we anticipate bringing all three technical working groups together in one annual meeting to discuss progress, share successes, and discuss the significant overlap between the three topics. In Year 2, this will also include a solicitation for group feedback on the status of baseline data collection and restoration planning. In Year 3, we will focus on wrapping up the project and identifying other funding sources to continue the work.

In the fall/winter of each year (e.g., beginning in the fall of Year 1), the PI will provide a public presentation to highlight what we are learning through the grant and generate feedback from the public. This presentation will likely be a part of the already established ‘Rattlesnake Stories’ presentation series that was started in 2022, and generally has an audience of 30-90 attendees.

Task B4 outcomes

- All-hands stakeholder meeting, facilitated by contractor, in beginning of Year 2. Feedback provided on tasks B2 and B3.
- All-hands stakeholder meeting for grant wrap-up in the end of Year 3.
- Three public presentations by PI to share grant results and progress and solicit public feedback.

Evaluation Criterion —Watershed Group Diversity and Geographic Scope

Watershed Group Diversity

The RCWG is guided by a Board of Directors with the help of ad-hoc advisory group(s) and dedicated volunteers. The organizational structure is open with the goal of attracting people of diverse perspectives, and relying on grassroots, bottom-up approach to watershed management. Anyone who wants to contribute to the mission can participate. RCWG regularly engages with many stakeholders and wishes to further develop these relationships.

The Rattlesnake Creek watershed is an important and significant stream within the larger Clark Fork River Watershed and there are many stakeholders affected by its management and use, including the Confederated Salish and Kootenai Tribes (CSKT), the Lolo National Forest, City of Missoula, Missoula County, landowners, non-profits, and those that travel to the Rattlesnake Creek watershed for recreation. Below we highlight the notable stakeholders in the watershed and provide a table with the level of engagement of each stakeholder for this proposal (i.e., formal letter of support provided, informal support provided, not yet engaged).

CSKT- This watershed is a part of the historic lands of the modern-day Confederated Salish and Kootenai Tribes. Today, the CSKT are centered on the Flathead Reservation, which has a shared border with the Rattlesnake Creek watershed. The watershed continues to be of cultural significance to the CSKT peoples.

Lolo National Forest- The US Forest Service is the largest landowner and manager by area, with much of the middle and upper Rattlesnake Creek watershed being managed as a National Recreation Area and/or federally designated Wilderness area.

State of Montana- The state of Montana is heavily invested in the health of Rattlesnake Creek primarily due to the presence of the federally endangered bull trout, and other state recognized species of concern. To that end, the MT department of Fish, Wildlife, and Parks regularly monitors water temperature, fish abundance and genetic diversity, and other ecological variables in Rattlesnake Creek. The MT Department of Natural Resources and Conservation (in partnership with Trout Unlimited) maintains a continuous flow gage to measure stream discharge in the lower Rattlesnake Creek and is the state entity responsible for tracking water rights Montana.

Missoula County- The County has multiple departments engaged in the Rattlesnake Creek watershed. The County owns and manages a few parcels of land under the Parks, Trails, and Open lands department. The Water Quality district, under the County Health Department, is responsible for monitoring surface water quality of Rattlesnake Creek, groundwater height and quality, and other tasks. The Department of Ecology and Extension contains the Weed district, which is responsible for managing the County's Invasive Species Strategic plan (Missoula County 2022).

City of Missoula- The Rattlesnake Creek joins the Clark Fork River in Missoula, Montana, a growing city of ~75,000 people. The city manages land in the lower section of the watershed via the Parks and Recreation Department. City owned and managed land includes city parks, and open and conservation lands. The City, through the Water Department, has recently acquired some of the most senior water rights on Rattlesnake Creek and the 10 wilderness dams, and is keen to manage the river for both groundwater recharge and ecological conservation. Finally, the city manages the system of sewers in the lower Rattlesnake neighborhood, including stormwater outfalls that drain directly to Rattlesnake Creek.

Non-profits- Missoula is well known for its high density of non-profits. Trout Unlimited has been heavily involved in conserving the creek habitat for fishes, and the Watershed Education Network has multiple citizen science projects collecting stream invertebrate, groundwater, and large woody debris data, among others in the creek. Climate Smart Missoula has worked with the city and county to develop and ratify the Climate Ready Missoula Plan (Maneta et al. 2020), an invaluable broad framework for planning climate resiliency in the area.

Recreation- The Rattlesnake Creek watershed is beloved by recreationalists in the city of Missoula and the surrounding communities year-round. Many types of recreation are common including mountain biking, equestrian, running, angling, and hiking. Many of our stakeholders have identified increasing recreation pressure as a major issue affecting the watershed.

The University of Montana- The University of Montana (UM) sits adjacent to the confluence of Rattlesnake Creek with the Clark Fork River, and thus is well integrated with the watershed. The UM graduate school has supported many dissertations and theses researching the ecological, sociological, and cultural history of the watershed, many of which are cited below. The Franke

College of Forestry and Conservation-Wilderness & Civilization Program uses the Rattlesnake Wilderness as a living classroom for undergraduate students to learn the proper management of backcountry lands. The Public History Program at UM actively engages undergraduate researchers to document significant cultural and historical topics. RCWG has worked with the Director of the Public History Program to share documentation of topics relevant to the Rattlesnake Creek watershed.

The following table contains a list of stakeholders that we envision engaging with this grant. Those in ***bold italics*** have provided letters of support (Appendix A). Those in *italics* are engaged and have agreed to participate in the proposed work. RCWG and OCRMW will engage with groups in regular text through this project.

	Entity	Watershed Interest
Federal/Tribal	<i>Lolo National Forest</i>	Land manager
	Confederated Salish and Kootenai Tribes	Watershed neighbor and original watershed inhabitants
State of MT	<i>Department of Natural Resources and Conservation</i>	Water quantity and wildfire
	<i>Department of Environmental Quality</i>	Water quality
	<i>Fish, Wildlife, and Parks</i>	Fish monitoring
Missoula County	<i>Conservation District</i>	Riparian health
	<i>Parks, Trails, and Open lands</i>	Riparian and upland health
	<i>Water Quality District</i>	Water Quality
	<i>Ecology and extension-Weed district</i>	Weed management
	Missoula County- Planning (Climate Coordinato)	Climate adaptation and mitigation
City of Missoula	<i>Water Utility</i>	Water quantity and quality
	<i>Stormwater Utility</i>	Water quantity and quality
	<i>Parks and Recreation</i>	Riparian health
	City of Missoula- Neighborhoods	Outreach
Non-profits	<i>Climate Smart Missoula</i>	Climate adaptation and mitigation
	<i>MTB Missoula (Mountain Bike Advocacy Group)</i>	Recreation
	<i>Watershed Education Network</i>	Stream monitoring and citizen science
	Montana Natural History Center	Outreach
	Trout Unlimited	Stream monitoring and restoration
University of Montana	<i>Franke College of Forestry and Conservation-Wilderness & Civilization Program</i>	Stream monitoring and education
	<i>Department of History- Public History Program</i>	Stream monitoring and education

	Master's Program in Environmental Science and Natural Resource Journalism	Stream monitoring and education
Other	Missoula Organization of Realtors	Outreach

While we have begun partnerships with stakeholders with diverse interests, we are targeting additional groups, as these entities hold important decision-making roles, and have information or experience to share. Targeted stakeholders include:

- The Confederated Salish and Kootenai Tribes
- Landowners / small acreage property owners within the watershed
- Recreationists who live outside the watershed
- Realtors

We plan to engage targeted stakeholders through the following efforts:

- Use the many connections of the RCWG board to invite groups to participate in the technical working groups, meetings, and discussions. This includes an acknowledgement that some groups may need time and trust building to be engaged.
- Share stories of collaboration and celebrate small successes through newsletters, website content and press releases.
- Reach out to specific groups with results, and opportunities to act, learn or care for the watershed.

Geographic Scope

The specific tasks and goals outlined in this proposal address water resource issues across the entirety of the Rattlesnake Creek watershed, and the planned membership will represent the full geographic scope of the watershed. There is remarkable variation in land use, cover, and ownership across the proposed project area (Figures 1 and 2). Beginning in the headwaters, the Upper Rattlesnake Creek subwatershed (URCW) is federally owned land managed by the US Forest Service (USFS; Lolo National Forest), with most of the area designated as wilderness (Rattlesnake Wilderness). The URCW consists mainly of evergreen forests with approximately 45 alpine lakes (0.3 - 43 acres). Recreation pressure is limited given there is no-motorized access and almost no development outside of an established trail network. The Lower Rattlesnake Creek subwatershed (LRCW) begins at the confluence of the East Fork Rattlesnake Creek and the mainstem and represents the southernmost area of the designated wilderness. From the confluence, Rattlesnake Creek flows ~7.5 miles through the Lolo National Forest (this area is also a designated National Recreation Area) that experiences relatively heavy recreational use by hikers, mountain bikers, and others. From there, the stream and watershed transitions to mostly private ownership under the jurisdiction of the City of Missoula and Missoula County in the Rattlesnake Creek Neighborhood where development is the dominant land use in the confined valley (Figure 2). Portions of the immediate buffer (10-50 meters) of Rattlesnake Creek are owned and protected by the city and county through a series of parks and protected open space; however much of the remaining area includes private residences that abut the creek. Above the valley, city and county open lands receive heavy recreational use. Rattlesnake Creek eventually leaves the Rattlesnake neighborhood, passing under Interstate Highway 90 and the Pacific Railroad line, and enters the heavily developed area of downtown Missoula before emptying into the Clark Fork River.

Evaluation Criterion B— Developing Strategies to Address Critical Watershed Needs

Critical Watershed Needs or Issues

- Surface and groundwater quantity
- Surface and groundwater quality
- Aquatic life and stream habitat
- Invasive, noxious, and native plant species abundance
- Climate mitigation and adaptation

Surface and groundwater quantity

The US Geological Survey intermittently measured stream discharge in Rattlesnake Creek from 1889 to 1967, with most of this data collected during a ~9-year period starting in 1958. Discharge measurements were initiated again in 2017 by the MT Department of Natural Resources and Conservation with support from Trout Unlimited. It is still too soon to relate recently collected flow data with the historical data to make inference about long-term trends (MT DNRC, personal communication). Three groundwater wells in the lower watershed have been monitored by the Water Quality district since ~1986. All three wells have held near consistent depths for most of this period (Water Quality District, personal communication). More data on flow and water availability are needed throughout the watershed.

There are six relatively small (2-7 cubic feet per second) irrigation diversions in the lower 5 miles of Rattlesnake Creek. These diversions were originally used for agricultural irrigation and to provide stock water, but post-development, they are primarily used for residential lawns (Knotek et al. 2004) or to mitigate water withdrawal elsewhere in the basin (City of Missoula 2018). When Rattlesnake Creek is at baseflow, the combined withdrawal of the ditches could cut the flow in the Creek by half (Knotek 2023). The City of Missoula has ownership of some of these irrigation ditches, while others are privately held. Comprehensive data collected by MT FWP noted that some juvenile fishes, including bull trout, are being entrained in the ditches, separating them from the mainstem Rattlesnake Creek. The irrigation ditches then shunt fishes from Rattlesnake Creek into the Clark Fork River, or fish face lethal effects from dewatering of ditches after becoming entrained (Knotek et al. 2004). To that end, Trout Unlimited has spearheaded work with the city, Fish, Wildlife, and Parks, and the US Fish and Wildlife Service to install fish screens and diversions on some, but not all, ditches. This work prevents fish from entering irrigation ditches or ensures that there is ample water in the ditch during the spawning season to reduce fish becoming entrained when flows would normally diminish (Montana Fish, Wildlife and Parks 2023). Overall, the irrigation ditches are likely detrimental to Rattlesnake Creek fishes and water quantity, especially during periods of drought, and there is no comprehensive plan for their use or improvement going forward.

Rattlesnake Creek was the main source of municipal water for the City of Missoula by early European settlers up until a *Giardia* outbreak in 1983. During this time, a consistent water supply was maintained year-round through a series of dams built and maintained by the Montana

Power Company. The dams were constructed purely to ensure year-round access to Creek water as the main supply of water. First, a dam was built in 1901 on the mainstem of Rattlesnake Creek approximately 1.5 miles upstream of the confluence with the Clark Fork River (City of Missoula 2018). The dam acted as a settling pond and a connection to the main city water supply. Next, between 1911 and 1923, 10 dams were constructed on eight high mountain lakes in what is now the Rattlesnake Creek Wilderness (City of Missoula 2018). Since 1983, municipal water has been sourced from an aquifer with 37 wells. The aquifer supporting these wells is extremely prolific; however, it is susceptible to contamination from surface water because it is unconfined and lacks a continuous overlying protective geologic unit. However, the wells are spaced far enough apart that the overall risk of contamination to the entire water supply is low (City of Missoula 2018). Regardless, it is important to ensure that surface water from Rattlesnake Creek is of high quality and sufficient quantity to provide groundwater recharge to the aquifer.

In 2017 the City of Missoula took over the Missoula water supply by purchasing the water rights, dams, and infrastructure from a private corporation, and forming the Missoula Water department. Immediate action was needed to address the aging dams, which were nearing the end of their useful life. Seven of the 8 wilderness dams have a hazardous classification of 'Significant' primarily due to the strong potential for dam failure and irreparable damage to the downstream ecosystems. Further, the mainstem Rattlesnake Creek dam was a barrier to migrating fish, including the federally endangered bull trout. Thus, by the summer of 2020, the city had acquired funds to remove the mainstem Rattlesnake Creek dam and restore the adjacent stream and riparian area (Trout Unlimited et al. 2021). Next, the city is considering whether to rehabilitate or remove the eight dams in the wilderness area. The decision-making process for the wilderness dams is very complex, as the city must consider how dam removal will affect their established senior water rights and how dam removal may affect flows in Rattlesnake Creek, among other factors. Further, any construction or demolition of the dams would require special planning or permits given that the dams are in a designated wilderness area and surrounded by Forest Service land. Currently, one dam is planned to be decommissioned in the summer of 2024.

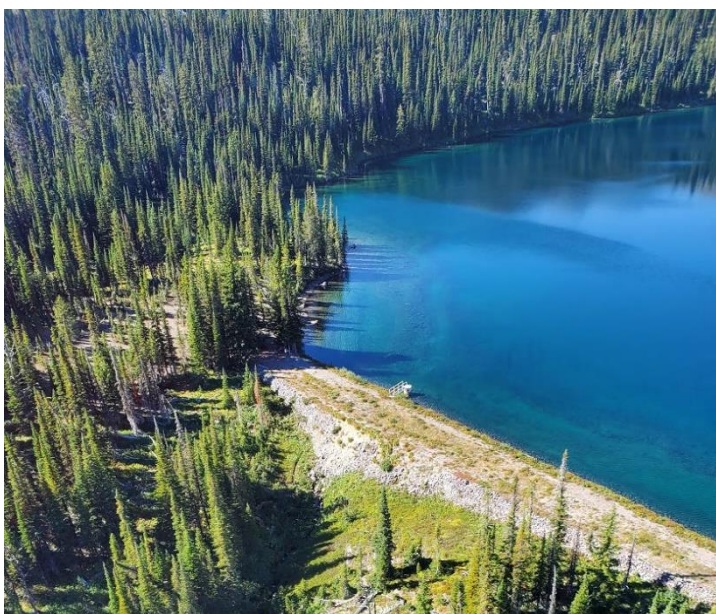


Figure 3 Aerial photo of dam structure at Big Lake. Like many of the dams in the Rattlesnake wilderness, this structure has a 'significant' hazard classification. Photo credit: City of Missoula.

The City of Missoula completed a Rattlesnake Dams Feasibility Study in 2018 outlining the pros and cons of how to manage the remaining seven dams (City of Missoula 2018). While comprehensive in nature, the report unveiled the need for further research and data collection:

- Augmenting Rattlesnake Creek flows for bull trout: “gather temperature, flow and other data to fully understand temporal and spatial aspects including the ability to meet fisheries goals.”
- Climate change: “Evaluate potential impacts of climate change on stream temperatures, snowpack, runoff timing, stream baseflow, drought periods and other aspects to ensure a long-term strategy is achieved.”
- Stream morphology and aquatic resources: “alternative impacts to erosion, fluvial geomorphic and/or environmental stream mechanics should be evaluated.”

Surface and groundwater quality

The water quality of Rattlesnake Creek is generally considered good based on the available data. Monitoring for water quality is regularly conducted by the Missoula Water Quality District (MWQD) and sporadically by other groups (e.g., the MT Department of Environmental Quality). MWQD uses a volunteer water monitoring program to collect surface water samples in Rattlesnake Creek three times a year, samples three groundwater wells twice each per year, and permits septic systems and private wells. Surface water samples are relatively new (collection started in 2019) and thus trends have yet to be identified. The groundwater wells have had mostly stable water quality since monitoring began in 1996 (MCWD, personal communication). While this watershed has relatively high coverage of water quality analyses (relative to other streams in the area), it is still lacking samples targeted during high flows when pollution may be at its highest. Surface water samples are rarely collected during high flows, and the Missoula Stormwater Utility has never sampled water quality from the handful of stormwater outlets that drain directly to the creek.

Aquatic Life and Stream habitat

The Rattlesnake Creek supports a variety of fish species and habitats, including federally listed native species of bull trout (federally threatened) and western cutthroat trout (Montana species of concern). Other native species of interest include mountain whitefish (*Prosopium williamsoni*), sculpin (*Cottus spp.*), longnose sucker (*Catostomus catostomus*), largescale sucker (*C. macrocheilus*), northern pikeminnow (*Ptychocheilus oregonensis*), and longnose dace (*Rhinichthys cataractae*). The creek also supports nonnative fishes that are important to anglers, notably, rainbow trout (*O. mykiss*) and brown trout (*Salmo trutta*) commonly at the confluence of Rattlesnake Creek with the Clark Fork River, brook trout (*S. fontinalis*) common to the middle and upper reaches, and Yellowstone cutthroat and rainbow trout in the wilderness lakes. Approximately half of the wilderness lakes support sustainable populations of westslope cutthroat trout, rainbow trout, and/or Yellowstone cutthroat trout from historic stocking (stocking ceased in 1988)(Knotek et al. 2004).

The diversity of fishes and habitats, proximity to an urban population, and the presence of dams and irrigation ditches have led to much monitoring and research by MT Fish, Wildlife, and Parks among other groups, in Rattlesnake Creek (Knotek et al. 2004). Of note from these data are that fluvial and resident bull trout abundance and distribution are declining, western cutthroat trout are stable, and invasive brook and brown trout are becoming more abundant and widely distributed in the watershed (Knotek 2023). The threats to bull trout and other native fishes in the Rattlesnake Creek are similar to that of many fishes in Montana



Figure 4 Bull trout (*Salvelinus confluentus*)

including habitat loss due to channelization and sedimentation, increasing stream temperature, hybridization with nonnative species, and illegal harvest (Knotek et al. 2004). Below we highlight some of the work that has been done and remaining issues on these topics. Note that there is limited data or activity regarding stream sedimentation and illegal harvests of fishes, even though they are considered threats to the conservation of the creek.

Channelization and stream habitat- The lower reaches of Rattlesnake Creek were channelized as early as 1929 (Miller 2019), along with the building of levees, irrigation withdrawal and side channel manipulations (Trout Unlimited, personal communication). Channelization has reduced habitat complexity, specifically limiting the number of deep pools that provide a thermal refuge during periods of high surface temperatures. Large woody debris (LWD) are good indicators of habitat complexity for fish, and generally assist with pool formation (Triska and Cromack 1980). A survey of LWD conducted in the summer of 2021 along a majority of Rattlesnake Creek found more wood in the reaches upstream of the historic dam, than downstream of the dam (Trout Unlimited et al. 2021). While the dam likely influenced the presence of wood, channelization, and beaver presence (or absence) are also likely contributing factors.

Temperature- While most rivers and streams in western MT are warming, Rattlesnake Creek is especially prone to warming given that groundwater inputs are sparse, and the geographical aspect of the watershed limits natural shading. Indeed, much of the creek already regularly exceeds the 15°C maximum summer temperature considered suitable for many cold-water fishes (Knotek 2023).

Warming streams are welcome for other species that may compete with cold-water fishes. Specifically, brook and brown trout have been expanding in Rattlesnake Creek, likely due to warming waters, and are beginning to compete with bull trout. Algae and macrophytes are also becoming more common, specifically *Didymo* (*Didymosphenia geminata*) (MT FWP, personal communication). While a native species to Montana, *Didymo* spread is commonly attributed to warming temperatures and thick *Didymo* mats can decrease the density of large-bodied macro-invertebrates (MT Natural Heritage Program, *Didymo* Diatom). Quantitative measurements of nuisance algal mat abundance and the potential effects of *Didymo* spread on the benthic ecology of Rattlesnake Creek are currently unknown.

The wilderness dams have some potential to add cold water to the unusually warm waters of the upper Rattlesnake Creek. Currently, many of the dams drain from the top of the lake they create; however, if the dams are rehabilitated, they could be retrofitted to drain from the bottom where water is colder (Knotek 2023). There is still much work to be done to determine how many dams would need to be retrofitted and if this approach would lead to meaningful improvements to downstream temperatures. Further, this is only one of many factors when considering whether to remove or rehabilitate the dams (see above).

Hybridization and genetic diversity- Fish hybridization is of particular concern for westslope cutthroat and bull trout in Rattlesnake Creek. Currently, there is strong evidence for declining genetic diversity of fluvial bull trout in the upper Rattlesnake Creek reaches due to declining populations and some potential for hybridization with brook trout.

Riparian zones- The Missoula Conservation District administers the Montana Natural Streambed and Land Preservation Act of 1975, commonly known as the 310 Law, in Missoula County. The intent of the law is to provide protection to the environment and to protect rivers and natural stream banks. This includes overseeing the permitting process for projects that may impact a stream and keeping soil erosion and sedimentation to a minimum. Permits for construction or significant work in the riparian zones of Rattlesnake Creek have steadily increased over the decades, with 40 total in the past 13 years (MCD, personal communication); however, it is likely that unpermitted work is occurring. It is a major goal of RCWG to ensure that current and new residents of the watershed understand the need for protecting riparian zones through this permitting process.

While fish receive most of the attention in the watershed there are other aquatic organisms of interest. The Western Pearlshell (*Margaritifera falcata*) mussel is present in the watershed and is a species of concern in MT. Further the littoral zones of many of the dammed wilderness lakes are good habitat for many native amphibians, including the long-toed salamander (*Ambystoma macrodactylum*) and the Western Toad (a MT species of concern; *Anaxyrus boreas*), among others. Finally, there is anecdotal evidence that beaver abundance and activity are increasing in the watershed.

Invasive, noxious, and native plant species abundance

Invasive and noxious plant species

Invasive and noxious plant species (i.e., weeds) can be detrimental to the ecological health of upland habitats and the downslope streams and rivers where water drains (de Rouw et al. 2006). Many weeds advantageously colonize disturbed areas and reduce the potential for native species to thrive (Parendes and Jones 2000). Further, weeds can alter natural fire regimes, forage for large herbivores, habitat availability of prey for predators (Thompson 1996). Weeds may alter water infiltration rates and non-native grasses can significantly increase evapotranspiration rates relative to native species, altering the hydrologic cycle (Le Maitre 2004). City, county, and federal entities are actively treating lands for weeds in the watershed; however, none of these entities have an established monitoring plan to identify the abundance of established weeds or to identify new invaders. Treatments are commonly sporadic and identified incidentally. In most

cases, weed treatment is limited by funding to a specific number of acres per year. Many different treatment approaches are used including herbicides (all landowners in the watershed), grazing sheep (City of Missoula), and other biocontrols (Missoula County).

The US Forest Service manages most of the land in the watershed, and their most recent Integrated Weed Management plan (United States Forest Service 2007) identified 21 invasive and noxious weeds across the entirety of the Lolo National Forest (e.g., beyond the Rattlesnake Creek watershed. More granular data are not immediately available). Another 10 species were noted to be present in land adjacent to the Forest Service boundary (United States Forest Service 2007). There currently is not an established weed inventory plan due to a lack of staffing and funding (United States Forest Service 2021); however, there is an exceptional effort to eradicate weeds as USFS staff incidentally find them. Due to the lack of an inventory and monitoring plan there is potential for increased occurrence and severity of existing infestations (United States Forest Service 2021). The situation is more dire for new invaders, which receive less focus than established weeds. Specifically, USFS managers have noted that the lack of an inventory and monitoring plan for new invaders will likely lead to "...species like Yellow star thistle and other highly undesirable species are likely to become established, with potentially devastating ecological impacts." (United States Forest Service 2021).

The City of Missoula considers invasive plants to be the largest threat to native habitats on city-owned Conservation Lands (City of Missoula 2010), and the Missoula County Department of Ecology and Extension considers recreational pressure and invasive annual grasses to be the most important issue on their lands (Missoula County Department of Ecology and Extension, personal communication). The most widespread non-native species on Missoula Conservation Lands include spotted knapweed, leafy spurge, sulphur cinquefoil, Dalmatian toadflax, common tansy (*Tanacetum vulgare*), cheatgrass, invasive pasture grasses (e.g., smooth brome, Kentucky/Canada bluegrass, and orchard grass) and annual mustard species. There are also many new invaders that are now becoming established in city conservation lands. New invaders recognized on Montana's noxious weed list include Japanese knotweed (*Polygonum cuspidatum*), whitetop (*Cardaria draba*), perennial pepperweed (*Lepidium latifolium*), St. John's wort (*Hypericum perforatum*), yellow-flag iris (*Iris pseudacorus*), yellow toadflax (*Linaria vulgaris*) and dyer's woad (*Isatis tinctoria*).

Native plant species

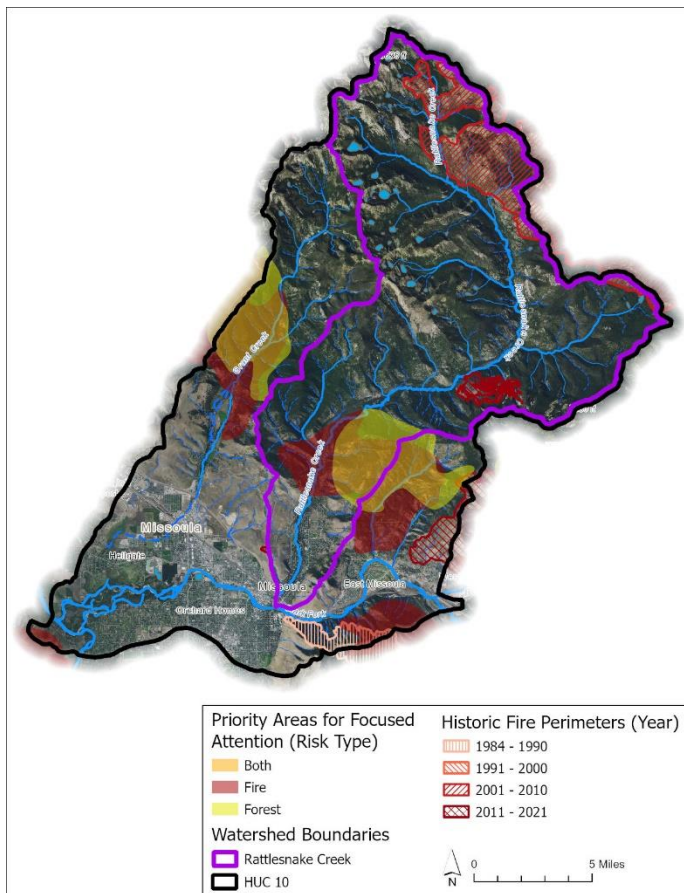
The protection of pristine and/or mostly intact native plant communities is a high priority of stakeholders in the watershed. Strong native plant communities support healthy ecosystems and are better adapted to local soils and climates. However, like weeds, native plant community cover is not widely known in the watershed, and multiple stakeholders have expressed interest in partnerships for monitoring native plant communities alongside work with invasive and noxious weeds (Missoula County Department of Ecology and Extension and Missoula County Parks, Trails, and Open Lands, personal communication).

Climate mitigation and adaptation

The city of Missoula, Missoula county, and Climate Smart Missoula developed and adopted a county-wide climate resiliency plan in 2020 (Maneta et al. 2020). The resiliency plan is a wide

ranging and broad framework that is meant to be downscaled and applied to individual landscapes (e.g., watersheds) within the county. This proposal will address specific goals of the plan. First, there is a need to identify management options for forest, terrestrial and aquatic resources that account for climate change. Next, there is need for planning on how to enhance water storage opportunities and infrastructure to reduce the impact of flooding and low-stream events (Missoula County Climate Coordinator, personal communication).

The climate resiliency plan identified several climate vulnerabilities of Missoula County that are relevant to the proposed work: wildfire, higher temperatures (including drier summer and drought), wetter winters/springs and flooding, and climate migration and population changes. Below, we briefly highlight how these variables may affect the Rattlesnake Creek watershed.



Wildfire- The Rattlesnake Creek watershed is highly susceptible to wildfire, which could have devastating impacts on the neighborhoods in the lower watershed, and terrestrial and aquatic ecosystems throughout the watershed. Missoula County is in the 89th percentile among all western counties in the US for wildfire risk to existing developments in the wildland urban interface (WUI), and in the 98th percentile for wildfire risk to potential developments of private land adjacent to fire-prone public lands. The Rattlesnake Creek is emblematic of Missoula County in these threats. The city population growth rate of the Lower and Upper Rattlesnake Creek neighborhoods (both neighborhoods are in the WUI) was 10% and 4%, respectively, from 2010-2022 (City of Missoula 2023). Thus, the State of Montana has listed the WUI between USFS and private land of the upper Rattlesnake Creek neighborhood as ‘Priority Area for Focused Attention’ (Figure 5)(The Montana Forest Action Advisory Council 2020).

Figure 5. Priority areas for focused attention as defined by the state of Montana. Historical fire perimeters from 1984- present.

The relative wildfire risk and potential fire intensity on Forest Service lands in the upper watershed is among the highest in the county (Missoula County 2018). There have been three wildfires in the past 20 years in the watershed, including the Mineral-Primm fire that burned parts of upper Rattlesnake Creek (Figure 5). Large fires will likely lead to increases in sediment transport to streams (Coombs and Melack 2013), and the increased spread of cheatgrass and other invasive annuals in the watershed (Ypsilantis 2003).

Higher temperatures, drier summers and drought- By mid-century, average annual air temperatures are predicted to increase by 3-5°F, mostly in the summer. Higher temperatures are likely to increase forest pathogen spread, altering terrestrial communities' and increasing fuel for fires. Higher air temperatures can increase evapotranspiration and reduce streamflow during periods of drought. Low-elevation snowpack will decline leading to earlier spring runoff and reduced baseflows later in the summer. Finally, as noted above, higher stream temperatures will lead to stress of native cold-water trout (Knotek 2023).



Figure 5 Recently constructed bioretention swale in the lower Rattlesnake neighborhood. Photo credit: Matt Trentman 2023

Wetter winters/springs and flooding- Missoula County will likely see more precipitation in winter and spring with a changing climate. More frequent and intense flooding will change the quality of instream habitats by leading to incision and disconnecting the stream from its floodplain. The stormwater infrastructure of the lower Rattlesnake Creek neighborhoods. The current stormwater infrastructure in Rattlesnake Creek was not designed to handle the anticipated storms and improvements are needed to reduce flood and protect properties (Stormwater Utility, personal communication).

Climate migration and population changes- A preliminary analysis of Missoula County population trends suggests that the county is likely to grow due to climate migrants. The Rattlesnake neighborhoods, and Missoula at large, are desirable places to live and will likely absorb much of that growth. This is on top of the exceptional growth that's occurred over the past 20 years, over 18%, nearly double the state-wide average (City of Missoula 2023). Many of the

stakeholders have noted they are observing increased recreational pressure because of the current growth, and climate migration will only exacerbate this issue.

Project Benefits

In the past ten years, many of the stakeholders have generated reports or management plans that cite important next steps. When combined with the more current information from the 2023 survey results, we believe that this proposal will be successful in benefiting many of the needs of the stakeholders. Below, we highlight the potential benefits for each of the topics listed in Sub-criterion No. B1. Critical Watershed Needs or Issues.

Critical watershed issues	Most likely group(s) to benefit	Supporting Literature	Potential benefits
<i>Surface and groundwater quantity.</i>	City of Missoula, MT FWP, USFS, Trout Unlimited, private landowners, MT DNRC	-Rattlesnake Dams Feasibility Study (2020) -Rattlesnake Creek Dam Removal Monitoring (2021) -Lolo National Forest Biennial Monitoring and Evaluation Report (2021)	-Collect baseline temperature, flow, and stream morphology data to fully understand temporal and spatial aspects of wilderness dam management for fisheries and stream mechanics. -Document the complex history of water availability and use for the public. -Research management or restoration options for irrigation ditches.
<i>Surface and groundwater quality</i>	Missoula Water Quality District, Missoula Stormwater Utility	NA	-Collect baseline water quality samples of high flows in Rattlesnake Creek -Collect baseline water quality samples of sewer outlets (when flowing) -Research and/or identify potential stormwater improvement locations
<i>Aquatic Life and stream habitat</i>	MT FWP, Missoula Conservation District	-Rattlesnake Creek Dam Removal Monitoring (2021) -Rattlesnake Creek: Fisheries Assessment and Enhancement 1999-2003 (2004)	-Collect baseline temperature, stream habitat, and algal mat abundance and distribution. -Synthesize disparate data sources to better prioritize management goals -Outreach to riparian landowners about 310 permitting process
<i>Invasive, noxious, and native plant species abundance</i>	Missoula County, City of Missoula, Lolo National Forest	-Integrated Weed Management Plan (2007) -Lolo National Forest Biennial Monitoring and Evaluation Report (2021) -Conservation Lands Management Plan (2010) -Invasive Species Strategic Plan (2022)	-Collect targeted baseline invasive and native plant species inventories -Research and prepare comprehensive weed management plan
<i>Climate mitigation and adaptation</i>	Climate Smart Missoula, MT DNRC, private landowners	-Climate Ready Missoula (2020) -Montana Forest Action Plan (2020) -Community Wildfire Protection Plan (2018)	-Downscale climate resiliency plan and develop priority goals for the watershed -Outreach to landowners on how to be climate resilient

Evaluation Criterion C—Readiness to Proceed

Project Schedule

The approach for implementing the proposed work is included in the project description section of this proposal. Tasks, milestones, and proposed timelines are outlined below. Generally, RCWG will be responsible for Tasks A and OCRMW will be responsible for Task B, although we expect there will be overlap as needed (we note in the milestones where overlap is expected). The timeline assume funding is provided in Dec 2024, with the project beginning soon after.

Both groups are prepared to proceed with the proposed work if funded. The RCWG has identified this project as a priority and is excited to have support to move forward. OCRMW has multiple full-time staff who are ready to start and oversee the tasks. OCRMW also has the equipment and supplies to complete field work including water quality sensors and sample bottles; waders, tape measurers and depth rods for stream geomorphology; Serber samplers and storage containers for aquatic insects; and plant identification manuals; among other equipment. The University of Montana provides access to software (e.g., GIS, Microsoft Office, etc.) and basic printing and office supplies.

Tasks	Milestones	Start Date	End Date
Task A1-Update RCWG website	1. Plan and consult with website developer. 2. Update website.	Jan 2025	Aug 2025
Task A2-Generate outreach materials	1. Plan and consult with graphic designer. 2. Create and print pamphlets. 3. Connect with groups to disperse materials (Relators Assoc., local businesses, etc.).	Jan 2025	May 2026
Task A3-Conduct outreach	1. Purchase outreach materials and group insurance 2. Purchase advertisements 3. Complete at least three outreach events (in conjunction with OCRMW)	Jan 2025	Jan 2027
Task A4-Connect with stakeholders	1. Create plan for outreach to stakeholders. 2. Connect and engage (in conjunction with OCRMW)	Jan 2025	Jan 2026
Task B1-Technical working groups	1. Plan and consult with facilitator. 2. Conduct in person meetings (n=3) 3. Summarize priorities for baseline data collection, restoration planning, and outreach	Jan 2025	Jan 2026
Task B2-Baseline data collection	1. Create shared data repository for stakeholders (e.g., Teams or Box) 2. Collect data based on priorities of stakeholders (revise data collection plan annually, as needed)	May 2025	Jan 2028
Task B3- Research and generate restoration plans	1. Compile, reformat, and synthesize existing data. (year 1) 2. Identify successful restoration plans, review scientific literature and State/Federal standards/guidance, and interview experts in the field. (years 2 and 3)	Jan 2025	May 2028

	<ol style="list-style-type: none"> 3. Document current funding resources (years 2 and 3) 4. Get feedback from stakeholders (and revisit milestones 1, 2, 3 if needed) 5. Generate recommendations and final report (year 3) 		
Task B4- Continued outreach about the project with stakeholders and the public	<ol style="list-style-type: none"> 1. Annual meeting with all stakeholders (years 2 and 3) 2. Annual presentation to the public (fall/winter, in conjunction with RCWG) 	Jan 2025	Jan 2028

Presidential and Department of the Interior Priorities

Climate Change

Climate resiliency is a major tenant of this proposal. As mentioned above, we propose working with the city, county, and local non-profit Climate Smart Missoula to downscale their broad plan for climate resiliency to the Rattlesnake Creek watershed. We will focus our efforts on addressing the following climate vulnerabilities as noted in the Climate Ready Missoula Plan: wildfire, higher temperatures (including drier summer and drought), wetter winters/springs and flooding, and climate migration and population changes (more detail on these topics and their relevancy to the Rattlesnake Creek watershed are above). Many of these topics directly or indirectly affect water supply sustainability to the City of Missoula given that Rattlesnake Creek is an important component of groundwater recharge to the Missoula aquifer. We will conduct research and outreach projects that add resiliency from the effects of increased winter/spring precipitation. Stakeholders in the watershed have already identified the need for research on green storm water infrastructure (e.g., bioretention swales) in the watershed (Stormwater Utility, personal communication). Others are interested in facilitating workshops to build rain barrels for residents in the Rattlesnake neighborhoods (Climate Smart Missoula, personal communication).

Benefits to Disadvantaged, Underserved, and Tribal Communities

Disadvantaged communities- The City of Missoula has multiple census tracts that are considered disadvantaged by the White House Climate and Economic Justice Tool due to low income, high housing costs, and natural disaster threats due to a changing climate. Some, but not all, of these census tracts overlap with the Rattlesnake watershed; however, the watershed is important recreationally and as a major aquifer recharge source for all residents of Missoula and the surrounding communities. The north, central, and western neighborhoods in Missoula are in the 71st to 81st percentile of low income and face burdens of expected population loss rate due to fatalities and injuries resulting from natural hazards each year (89th-96th percentile) and wildfire risk (95th-96th percentile). The lower Rattlesnake neighborhood census track is not defined as socioeconomically disadvantaged; however, it does face similar natural hazard burdens.

Tribal communities- As mentioned above, the Rattlesnake Creek watershed and the City of Missoula, are a part of the ancestral homeland of the modern-day Confederated Salish and

Kootenai Tribe (CSKT). The RCWG respects CSKT’s history and culture and seeks to follow their example in caring for the watershed for future generations. RCWG has partnered with individual Tribal members and local historians to describe the history of the Salish Peoples in the lower Rattlesnake Creek watershed through a public presentation and supporting a lower Rattlesnake Creek historical tour. In this proposal, RCWG and OCRMW will work to strengthen our relationship with the CSKT to improve the sustainability of the watershed. For example, much of the upper Rattlesnake Creek watershed abuts Tribal land on the Flathead Reservation (Figure 1) via the South Fork of the Jocko Primitive Area. The Primitive Area has been set aside for recreational and cultural use of Tribal members and their families. Management and research that occurs in the Rattlesnake Creek watershed is likely to impact Tribal land and vice versa. Further, we will address some of the most pressing questions of the sustainability and resiliency of bull trout in Rattlesnake Creek, which are culturally important to the Tribe. Thus, it is important that we offer CSKT a seat at the table to share knowledge and provide input for this project.

Project Budget

Duplication of Effort Statement

The work proposed under this project is not funded through other programs or proposals. The efforts will uniquely build on existing work being done in the Watershed as described in the Evaluation Criteria above.

Total Project Cost Table

Funding Source	Amount
Non-Federal Entities	
Cost to be paid by the applicant	\$0
Value of third-party contributions	\$0
Non-Federal Subtotal	\$0
Requested Reclamation Funding	\$213,014

Total Budget Description

Budget Item Description	\$/Unit	Quantity	Unit	Total Cost
Salaries and wages				
OCRMW PI	\$44	103.5	hours	\$4,580
OCRMW Aquatic Ecologist	\$24	1213	hours	\$29,120
OCRMW Botanist	\$24	1213	hours	\$29,120
UM student	\$17	500	hours	\$8,500
<i>Salaries and wages subtotal</i>				\$71,320
Fringe				
OCRMW PI	31.5%	\$4,580	\$	\$1,443
OCRMW Aquatic Ecologist	31.5%	\$29,120	\$	\$9,173
OCRMW Botanist	31.5%	\$29,120	\$	\$9,173

UM student	10.9%	\$8,500	\$	\$927
<i>Fringe subtotal</i>				\$20,716
Health Insurance				
OCRMW PI	\$1054	0.6	months	\$664
OCRMW Aquatic Ecologist	\$1054	7.4	months	\$7,747
OCRMW Botanist	\$1054	7.4	months	\$7,747
<i>Health insurance subtotal</i>				\$16,158
Travel				
Fieldwork-Rental truck	\$2000	1	month	\$2,000
Fieldwork-Per diem	\$9.25	84 (3 travelers * 28 days)	person- days	\$777
Stakeholder meetings- per diem	\$33.5	8 (2 travelers * 4 days)	person- days	\$268
Stakeholder meetings- rental car and gas	\$75	4	days	\$300
<i>Travel subtotal</i>				\$3,345
Supplies				
Miscellaneous	\$1710	lump		\$1,710
<i>Supplies subtotal</i>				\$1,710
Contractual				
RCWG Website	\$5,000	lump		\$5,000
RCWG Pamphlets	\$2,000	lump		\$2,000
Working group facilitator	\$5,000	4	meetings	\$20,000
Sample analyses	\$100	80	samples	\$8,000
Advertisements	Varies (\$5-250)	15-20	ad	\$2,000
<i>Contractual subtotal</i>				\$37,000
Other Direct Costs				
RCWG Insurance	\$500	3	year	\$1,500
Pamphlet printing	\$500	lump		\$500
Facility rental for technical working group meetings	\$200	5	# of meetings	\$1,000
<i>Other direct costs subtotal</i>				\$3,000
Indirect Costs				
UM NICRA rate (Other-Sponsored Programs)	39%			\$59,766
TOTAL				\$213,014

Budget Narrative

Salaries and wages- Matt Trentman, OCRMW Associate Director and PI, will manage the grant, supervise OCRMW staff, and coordinate with RCWG and the watershed stakeholders for a total of 104 hours total, or ~0.2 months of his total time per year. Two yet to be determined OCRMW staff members will contribute a total of 14 months to the project over the three-year grant; a majority of this work will occur in Years 1 and 2 of the grant. OCRMW has multiple qualified employees with BA's or MS's in aquatic ecology, botany, or similar natural resource fields to fill these roles. We will recruit one or more undergraduate students to assist with baseline data collection and/or historical and cultural documentation of the Rattlesnake water resources for this grant. We will recruit undergraduate students from the Wilderness Institute, the Public History Program at UM, and/or the College of Forestry. We are budgeting 500 hours of paid undergraduate student involvement.

Travel- We have budgeted funds for travel for fieldwork and stakeholder meetings. Travel for fieldwork will be between the University of Montana and the Rattlesnake Creek watershed. We budgeted funds for 84 full person-days of fieldwork across all participants (PI, staff aquatic ecologists/botanists, undergraduates). Note that we may also conduct shorter field days (e.g., water quality grab sample collection) on top of the 84 full field days. Travel will occur with a rented heavy-duty truck or rental car depending on need. We anticipate some travel for stakeholder meetings within the watershed or on adjacent Tribal land, and budget per diem and rental cars for 8 participants over 4 meetings.

Materials and supplies- Funds from the grant will be used for miscellaneous consumable supplies for field work (e.g., nitrile gloves) and materials for citizen science and outreach events.

Contractual- Contractor funds will be used to fund a third-party website developer for RCWG and a graphic designer for RCWG pamphlets and brochures. Funds will also be used to hire a facilitator for four of the five technical working group meetings (Each of the individual technical working groups in Year 1, n=3; and an all-hands stakeholder meeting in Year 2). The facilitator will assist with planning and preparing for technical group meetings to make the most efficient use of time. The PI will be involved with preparing the facilitator prior to the meetings. We will collect approximately 80 water quality samples and/or algal biomass samples (for species identification) that will be sent to third party contractors for analyses. Finally, we will use funds to advertise for each of the annual public meetings, and citizen science and outreach events.

Other direct costs- Funds will be used to pay for RCWG liability insurance, which is required for the group to hold events on city or county property in the watershed. Funds will be used to print pamphlets and brochures that will be provided to realtors and local businesses. Finally, funds will be used for facility rental and coffee for the five technical group meetings at UM.

Third-Party In-Kind- Third-party in-kind support is likely for this project through RCWG board member and other volunteers, but at this time we cannot specify the exact nature of that support nor quantify the value. Therefore, it has not been included in this proposal budget.

Indirect Costs- The University of Montana has a federally negotiated rate of 39% for other sponsored programs that is applied to the total direct costs of the project.

Environmental and Cultural Resources Compliance

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

The baseline data collection will have minimal effect on the water and soils in the watershed. All sample protocols will be approved by the relevant land management agency prior to the initiation of data collection.

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?

Yes. Bull trout are listed as federally endangered fish species in Rattlesnake Creek. We do not anticipate baseline data collection impacting these fish or their habitat. All stream data collection will be approved by MT Fish, Wildlife, and Parks project manager Ladd Knotek, an engaged stakeholder with the proposal.

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, please describe and estimate any impacts the proposed project may have.

Yes. Our work will not have an impact on any of these waterways.

When was the water delivery system constructed?

Much of the water infrastructure was built in the late 1800's and early 1900's.

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.

This work may include *planning* for alterations to the current irrigation systems but will not result in direct manipulation.

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.

To our knowledge, no. This proposal will not result in on-the-ground changes to the irrigation system.

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

Possibly. However, baseline data collection will not involve disturbing the soil.

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?

Studying the presence and abundance of noxious and non-native invasive species is a core tenant of this proposal. Field crews will use best practices to ensure that they are not aiding in the spread of these plant species.

Required Permits & Approvals

None required at this time. The US Forest Service is an engaged stakeholder and will be consulted for permits for data collection on USFS land, including the wilderness area, as needed.

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Rattlesnake Creek Watershed Group

P.O. Box 8293, Missoula, MT 59807

email: rattlesnakecreek.watershedgroup@gmail.com

web: <http://rattlesnakecreekwatershedgroup.org>

November 25, 2023

US Bureau of Reclamation
Water Resources and Planning Office
Robin Graver, Program Coordinator, Cooperative Watershed Management Program

Re: Support for UM/RCWG application for WaterSMART Cooperative Watershed Management Program

Dear Ms. Graver,

The Rattlesnake Creek Watershed Group Board of Directors fully supports the University of Montana and RCWG's application for a Bureau of Reclamation WaterSMART Cooperative Watershed Management program grant. The Board voted unanimously to pursue this funding.

Our group has been working to preserve and protect the watershed and foster care and connection among its inhabitants and visitors. We aim to serve an increased watershed clearinghouse role, support the work of other organizations, and expand our outreach. We are excited to work with UM's O'Connor Center for the Rocky Mountain West which has the technical expertise to act as a fiscal sponsor and coordinator for the project.

The application includes more details about RCWG's recent work. We are an all-volunteer organization without any paid staff. Grant funding and successful completion of the project elements will allow us to identify and meet the needs of the watershed more effectively.

We look forward to the proposed work which will contribute to a better understanding of the state of the watershed, changing conditions, and ongoing challenges. The project will identify focused actions needed to best restore and preserve the watershed's rich and diverse resources.

We encourage you to fund this proposal.

Thank you for your consideration.

Sincerely,

Nancy Heil
President, Rattlesnake Creek Watershed Group Board of Directors

November 27, 2023

US Bureau of Reclamation
Water Resources and Planning Office
Robin Graver, Program Coordinator, Cooperative Watershed Management Program



Re: Support for UM/RCWG application for WaterSMART Cooperative Watershed Management Program

Dear Ms. Graver,

I am writing on behalf of Climate Smart Missoula, a local nonprofit organization whose mission is to build and accelerate climate solutions for Missoula and beyond. Our organization is writing in support of the University of Montana and Rattlesnake Creek Watershed Group's (RCWG) application for a Bureau of Reclamation WaterSMART Cooperative Watershed Management program grant.

We appreciate RCWG's efforts to serve in a watershed clearinghouse role and its intention to foster connections, support the work of other organizations, and link communities. Likewise, the O'Connor Center for the Rocky Mountain West at the University of Montana has the technical expertise to act as a fiscal sponsor and coordinator for all stakeholders.

Climate Smart e co-lead the development of the Climate Ready Missoula resiliency plan, passed by Missoula County and the City of Missoula in 2020. This plan highlights the need for a watershed approach to protecting and enhancing our local ecosystems, given the current and anticipated impacts of our changing climate. It calls for monitoring, citizen science, and collaboration among myriad stakeholders. This grant is exactly the type of program identified in the Climate Ready plan and we are excited to be of assistance.

We look forward to participating in the proposed work to bring together the many stakeholders working in the Rattlesnake Creek watershed around the topics of water, weeds, and climate. The results will be valuable contributions to understanding and protecting this valuable watershed. The project will also increase and focus dialogue about how to best restore and preserve its resources, something that will have lasting positive impact beyond the program grant.

We strongly encourage you to fund this proposal.

Thank you for your consideration.

Sincerely,

A handwritten signature in cursive script that reads "Amy Cilimburg".

Amy Cilimburg
Executive Director, Climate Smart Missoula

DEPARTMENT OF PLANNING, DEVELOPMENT & SUSTAINABILITY

Mailing: 200 W. Broadway
Physical: 127 E. Main, Suite 2
Missoula, MT 59802
P: 406.258.4657 | F: 406.258.3920
E: pds@missoulacounty.us



November 27, 2023

US Bureau of Reclamation
Water Resources and Planning Office
Robin Graver, Program Coordinator, Cooperative Watershed Management Program

Re: Support for UM/RCWG application for WaterSMART Cooperative Watershed Management Program

Dear Ms. Graver,

I am writing on behalf of Missoula County's Climate Action Program in support of the University of Montana and Rattlesnake Creek Watershed Group's application for a Bureau of Reclamation WaterSMART Cooperative Watershed Management program grant.

We appreciate RCWG's efforts to serve in a watershed clearinghouse role and its intention to foster connections, support the work of other organizations, and link communities. Likewise, the O'Connor Center for the Rocky Mountain West at the University of Montana has the technical expertise to act as a fiscal sponsor and coordinator for all stakeholders.

Watershed health is a key part of our county-wide climate resiliency plan, *Climate Ready Missoula*, which was adopted unanimously in May of 2020. Our plan identifies several goals that are relevant to this proposal, including:

- Build understanding of forest, terrestrial and aquatic ecosystems and appropriate site/landscape specific management options that account for climate change.
- Enhance water storage opportunities and infrastructure to reduce incidence and impact of flooding and low-streamflow events.

This proposal also advances two of our guiding principles: collaborate and think holistically, and act with, not for. We look forward to participating in the proposed work to bring together the many stakeholders working in the Rattlesnake Creek watershed around the topics of water, weeds, and climate. The result will be a valuable contribution to understanding and protecting the watershed. The project will also increase and focus dialogue about how to best restore and preserve its resources.

We encourage you to fund this proposal. Thank you for your consideration.

Sincerely,

Caroline Bean
Climate Action Program Manager



November 29th, 2023

US Bureau of Reclamation
Water Resources and Planning Office
Robin Graver, Program Coordinator, Cooperative Watershed Management Program

Re: Support for UM/RCWG application for WaterSMART Cooperative Watershed Management Program

Dear Ms. Graver:

I am writing on behalf of the Missoula County Department of Ecology & Extension to express our support of the University of Montana and Rattlesnake Creek Watershed Group's application for a Bureau of Reclamation WaterSMART Cooperative Watershed Management program grant.

We appreciate RCWG's efforts to serve in a watershed clearinghouse role and its intention to foster connections, support the work of other organizations, and link communities. We are also excited about the involvement of the O'Connor Center for the Rocky Mountain West at the University of Montana, which has the technical expertise to act as both a fiscal sponsor and coordinator for all participating stakeholders.

We look forward to participating in the proposed work to bring together the many stakeholders working in the Rattlesnake Creek watershed around the topics of water, invasives, and climate. The result will be a valuable contribution to understanding and protecting the watershed and a huge asset to our community as a whole. The project will also increase and focus dialogue about how to best restore and preserve its resources. We encourage you to fund this proposal.

Thank you for your consideration.

Sincerely,

A handwritten signature in blue ink that reads "Bryce Christiaens". The signature is written in a cursive, flowing style.

Bryce Christiaens, Director
Missoula County Dept. of
Ecology & Extension



PUBLIC WORKS & MOBILITY DEPARTMENT – STORMWATER

1345 W. Broadway • Missoula, Montana 59802 • (406) 552-6379

November 16, 2023

US Bureau of Reclamation
Water Resources and Planning Office
Robin Graver, Program Coordinator, Cooperative Watershed Management Program

Re: Support for UM/RCWG application for WaterSMART Cooperative Watershed Management Program

Dear Ms. Graver:

The City of Missoula Stormwater Utility is writing in support of the University of Montana and Rattlesnake Creek Watershed Group's (RCWG) application for a Bureau of Reclamation WaterSMART Cooperative Watershed Management Program grant.

We appreciate RCWG's efforts to serve in a watershed clearinghouse role and its intention to foster connections, support the work of other organizations, and link communities. Likewise, the O'Connor Center for the Rocky Mountain West at the University of Montana has the technical expertise to act as a fiscal sponsor and coordinator for all stakeholders.

The City of Missoula Stormwater Utility recognizes the importance of monitoring and maintaining water quality in Rattlesnake Creek. There are 12 documented stormwater outfalls and 346 dry wells that discharge untreated stormwater runoff directly to the creek and shallow aquifer. Stormwater is also known as nonpoint source pollution, and it is the leading cause of water quality impairment in Montana. We are interested in learning more about the impact of stormwater on Rattlesnake Creek, to inform improvement projects like green infrastructure. We seek to implement design principles that use natural processes, like bioretention, to mitigate flooding and treat stormwater. With climate change, we are also observing more intense storms, particularly in the local drainages, like Rattlesnake. The current stormwater infrastructure was not designed to handle these storms and improvements are urgently needed to reduce flood risk and protect properties.

We look forward to participating in the proposed work to bring together the many stakeholders working in the Rattlesnake Creek watershed around the topics of water, weeds, and climate. The result will be a valuable contribution to understanding and protecting the watershed. The project will also increase and focus dialogue about how to best restore and preserve its resources.

We encourage you to fund this proposal.

Thank you for your consideration.

Sincerely,

Tracy Campbell
Superintendent

December, 4 2023

US Bureau of Reclamation
Water Resources and Planning Office
Robin Graver, Program Coordinator, Cooperative Watershed Management Program

Re: Support for UM/RCWG application for WaterSMART Cooperative Watershed Management Program

Dear Ms. Graver,

I'm writing on behalf of MTB Missoula, a local trail building and stewardship association with over 500 dues-paying members. MTB Missoula supports for the University of Montana and Rattlesnake Creek Watershed Group's application for a Bureau of Reclamation WaterSMART Cooperative Watershed Management program grant.

We appreciate RCWG's efforts to serve in a watershed clearinghouse role and its intention to foster connections, support the work of other organizations, and link communities. Likewise, the O'Connor Center for the Rocky Mountain West at the University of Montana has the technical expertise to act as a fiscal sponsor and coordinator for all stakeholders.

Our community is deeply concerned about the welfare of the Rattlesnake Watershed and that includes considering impacts from recreation. These impacts not only affect our community's recreation experience in the watershed but have the potential to degrade water quality and wildlife habitat.

MTB Missoula has the capacity and interest to do our part in protecting these resources not only for our community's benefit but for the benefit of the watershed as a whole. As such, we want to remain engaged in the project and explore meaningful actions to encourage responsible use of the resource.

We look forward to participating in the proposed work to bring together the many stakeholders working in the Rattlesnake Creek watershed around the topics of water, weeds, and climate. The result will be a valuable contribution to understanding and protecting the watershed. The project will also increase and focus dialogue about how to best restore and preserve its resources.

We encourage you to fund this proposal and appreciate your consideration.

Sincerely,



John Stegmaier
Executive Director
MTB Missoula





Nov 20, 2023
US Bureau of Reclamation
Water Resources and Planning Office
Robin Graver, Program Coordinator, Cooperative Watershed Management Program

Re: Support for UM/RCWG application for WaterSMART Cooperative Watershed Management Program

Dear Ms. Graver,

Our organization, the Franke College of Forestry and Conservation's Wilderness Institute (WI), is writing in support of the University of Montana and Rattlesnake Creek Watershed Group's application for a Bureau of Reclamation WaterSMART Cooperative Watershed Management program grant.

We value and support RCWG's efforts to serve in a watershed clearinghouse role. We share an interest in the RCWG's goals of fostering connections, supporting the work of other organizations, and linking communities. Likewise, the O'Connor Center for the Rocky Mountain West at the University of Montana has the technical expertise to act as a fiscal sponsor and coordinator for all stakeholders.

Our interest in the Rattlesnake Watershed is focused on the role that the the federally designated Rattlesnake Wilderness, along with its alpine lakes and miles of tributary streams, play in watershed health. The average elevation of the Wilderness area as well as its extensive drainage area provides a climate refuge for native aquatic species as well as a consistent source of cold water for downstream biotic communities. This ecosystem service is increasingly important as climate change warms surface waters and contributes to drought conditions periodically. The Wilderness area is of great importance to the WI as a classroom for our University of Montana students studying the role of Wilderness in human communities.

We look forward to participating in the proposed work to bring together the many stakeholders working in the Rattlesnake Creek watershed around the topics of water, weeds, and climate. The result will be a valuable contribution to understanding and protecting the watershed. The project will also increase and focus dialogue about how to best restore and preserve its resources.

We encourage you to fund this proposal.
Thank you for your consideration.

Sincerely,
Andrea Stephens
Director of Undergraduate and Field Experience
Wilderness Institute

Wilderness Institute

UH 303 | Missoula, Montana 59812 | P: 406.243.5361 | E: wi@cfc.umt.edu

November 15, 2023

Robin Graver, Program Coordinator, Cooperative Watershed Management Program
US Bureau of Reclamation
Water Resources and Planning Office

Re: WaterSMART Cooperative Watershed Management Program – Rattlesnake
Creek/University of Montana Application

Dear Ms. Graver,

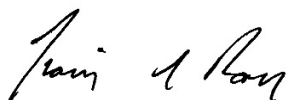
The Missoula Valley Water Quality District is a local government entity established for the purpose of protection and improvement of water quality within the Missoula Valley. On behalf of the District, I am writing to convey our support of the University of Montana and Rattlesnake Creek Watershed Group's application for a Bureau of Reclamation WaterSMART Cooperative Watershed Management program grant.

The Rattlesnake Watershed is a valuable resource. Its headwaters served as the water supply for much of the early history of the city of Missoula and supports a complex and healthy ecosystem and land uses. The Rattlesnake Watershed Group works to serve as a watershed clearinghouse role and stewardship hub. Likewise, the O'Connor Center for the Rocky Mountain West at the University of Montana has the technical expertise to act as a fiscal sponsor and coordinator.

The Missoula Valley Water Quality District has been monitoring surface and groundwater quality in this watershed for 30 years; advocating for policies and projects that protect the watershed and values it supports. We appreciate the partnership of the watershed group and look forward to participating in the proposed work to bring together the many stakeholders working in the Rattlesnake Creek watershed around the topics of water, weeds, and climate. The result will be a valuable contribution to understanding and protecting the watershed. The project will also increase and focus dialogue about how to best restore and preserve its resources. We encourage you to fund this proposal.

Thank you for your consideration.

Sincerely,



Travis Ross
Water Quality Specialist



Utility Operations & Maintenance Division

1345 W. Broadway • Missoula, Montana 59802 • (406) 552-6769

October 24, 2023

US Bureau of Reclamation
Water Resources and Planning Office
Robin Graver, Program Coordinator, Cooperative Watershed Management Program

Re: Support for UM/RCWG application for WaterSMART Cooperative Watershed Management Program

Dear Ms. Graver,

Our organization is writing in support of the University of Montana and Rattlesnake Creek Watershed Group's application for a Bureau of Reclamation WaterSMART Cooperative Watershed Management program grant.

We appreciate RCWG's efforts to serve in a watershed clearinghouse role and its intention to foster connections, support the work of other organizations, and link communities. Likewise, the O'Connor Center for the Rocky Mountain West at the University of Montana has the technical expertise to act as a fiscal sponsor and coordinator for all stakeholders.

The City of Missoula is working with a number of partners on a long-term plan to decommission or rehabilitate all of our high elevation dams in the Rattlesnake Creek watershed. These dams could function in the future as a long term supply of cold water to sustain Rattlesnake Creek through periods of low water. We also control the largest and most senior water rights in the Rattlesnake Creek watershed and thus are an important stakeholder in the future of the watershed.

We look forward to participating in the proposed work to bring together the many stakeholders working in the Rattlesnake Creek watershed around the topics of water, weeds, and climate. The result will be a valuable contribution to understanding and protecting the watershed. The project will also increase and focus dialogue about how to best restore and preserve its resources.

We encourage you to fund this proposal.

Thank you for your consideration.

Sincerely,

A handwritten signature in blue ink that reads "Logan McInnis".

Logan McInnis
Deputy Public Works Director—Utilities

200 West Broadway
Missoula, MT 59802-4292
countyparks@missoulacounty.us



November 6, 2023

US Bureau of Reclamation
Water Resources and Planning Office
Robin Graver, Program Coordinator, Cooperative Watershed Management Program

Re: Support for UM/RCWG application for WaterSMART Cooperative Watershed Management Program

Dear Ms. Graver,

Our organization is writing in support of the University of Montana and Rattlesnake Creek Watershed Group's (RCWG) application for a Bureau of Reclamation WaterSMART Cooperative Watershed Management program grant.

We appreciate RCWG's efforts to serve in a watershed clearinghouse role and its intention to foster connections, support the work of other organizations, and link communities. Likewise, the O'Connor Center for the Rocky Mountain West at the University of Montana has the technical expertise to act as a fiscal sponsor and coordinator for all stakeholders.

The Missoula County Parks, Trails, and Open Lands program manages three natural areas in the Rattlesnake watershed, and two of these are along Rattlesnake Creek and contain significant riparian areas and habitat. Management of these natural areas pertains to the three issues that were of most interest to the stakeholders surveyed by the group: weeds, water, and climate. The work that would be done under this proposal would provide valuable resources we could use to help guide our management of these important natural areas, as well as increase community engagement.

We support the proposed work to bring together the many stakeholders working in the Rattlesnake Creek watershed around the topics of water, weeds, and climate. The result will be a valuable contribution to understanding and protecting the watershed. The project will also increase and focus dialogue about how to best restore and preserve its resources.

We encourage you to fund this proposal.

Thank you for your consideration.

Sincerely,

Kali Becher

Kali Becher