2023 319 Application Form - General and Focus Watershed

General Information

Project Name: Teton Spring Creek Restoration Project

Sponsor Name: Montana Freshwater Partners

Registered with the Secretary of State? Y

Registered with SAM? Y

UEI #: 45-2804436

Does your organization have liability insurance? Y

Primary Contact: Ashton Bunce

Title: Project Manager

Address: 215 E Lewis, Room 207

City: Livingston State: MT Zip Code: 59047

Phone Number: 406-223-1992

Email Address: abunce@freshwaterpartners.org

Signature: Ashton Bunce Digitally signed by Ashton Bunce Date: 2022.09.22 12:54:51 -06'00'

Signatory: Wendy Weaver

Title: Executive Director

Address: PO Box 338

City: Livingston State: MT Zip Code: 59047

Phone Number: 406-579-2355

Email Address: wweaver@freshwaterpartners.org

Signature: Wendy Weaver Digitally signed by Wendy Weaver Date: 2022.10.07 14:32:50 -06'00'

Technical and Administrative Qualifications

Over the past 11 years, Montana Freshwater Partners has demonstrated the technical expertise, experience and relationships with partners to take on and lead this project. We have developed credibility across the state of Montana in working with private landowners and agency partners through our compensatory wetland and stream mitigation projects as well as our technical fee-for-service work for various clients including Trout Unlimited, Sacajawea Audubon Society and the Natural Resources Damage Program. Our staff and Board of Directors are a diverse team of highly-skilled and experienced professionals in the fields of economics, small business, hydrology, fluvial geomorphology, fish and wildlife biology, wetland science, accounting, law, engineering and policy. Our three project managers bring decades of experience in GIS, stream and wetland science, habitat assessment, fish and wildlife biology, restoration, monitoring, stakeholder coordination and regulatory experience. Our finance and administration manager, Lori Harvey, draws from 20 years of professional financial expertise, ranging from Controller of a financial institution to owning her own business. Lori has a certificate in bookkeeping and accounting, is a Certified QuickBooks Pro Advisor, and is a member of the American Institute of Professional Bookkeepers. We are also contracting with Ryan Richardson to assist with the design of this project; Ryan is a fluvial geomorphologist who was with River Design Group when he became involved with the project, but has since transitioned to a position as a senior geomorphologist with the Barn Group. Ryan holds a MS in Geography and Water Resources from the University of Wyoming and has ample experience designing and implementing BDA projects.

Budget Summary: *Fields outlined in **black** on this page will auto-populate from other sections of the application form. Fields outlined in **red** on this page will not auto-populate. You must manually input the information for fields outlined in **red**.*

	319 Funding Request	Non-Federal Match	Other Funding	Total Cost
Education and Outreach Project	$ 2,000	$ 0	$ 0	$ 2,000
Administration	$ 4,547	$ 0	$ 0	$ 4,547
Project 1 Name	Teton Spring Creek Restoration Project			
Project Planning	$ 6,500	$ 10,000	$ 0	$ 16,500
Landowner Agreements	$ 400	$ 0	$ 0	$ 400
Project Implementation	$ 33,570	$ 34,570	$ 0	$ 68,140
Project Effectiveness Monitoring	$ 3,000	$ 26,000	$ 0	$ 29,000
Total	$ 43,470	$ 70,570	$ 0	$ 114,040
Project 2 Name				
Project Planning				$ 0
Landowner Agreements				$ 0
Project Implementation Project				$ 0
Effectiveness Monitoring				$ 0
Total	$ 0	$ 0	$ 0	$ 0
Project 3 Name				
Project Planning				$ 0
Landowner Agreements				$ 0
Project Implementation Project				$ 0
Effectiveness Monitoring				$ 0
Total	$ 0	$ 0	$ 0	$ 0
Project 4 Name				
Project Planning				$ 0
Landowner Agreements				$ 0
Project Implementation Project				$ 0
Effectiveness Monitoring				$ 0
Total	$ 0	$ 0	$ 0	$ 0
Grand Total	$ 50,017	$ 70,570	$ 0	$ 120,587

Education and Outreach

Developing good projects often requires a considerable amount of time and effort up front to build relationships and trust with individual landowners and stakeholder groups. It also requires adequate training for project sponsor staff (e.g., technical training, project management, public procurement, technical writing, etc).To promote the development of future projects, DEQ is encouraging project sponsors to use up to $5,000 in 319 funding for education and outreach to develop and capitalize on critical relationships and to improve organizational capacity. DEQ also encourages applicants to incorporate on-the-ground projects into education and outreach efforts through on-site demonstrations and project tours. 319 funding may not be used to pay for food and beverages, or for honorariums and gifts.

Activity (method of delivery)	MFP would like to utilize the project for outreach and education purposes with local landowners. We would work with the Teton Conservation District to host local agency partners, landowners, (especially those with small creeks running through their property) and other interested stakeholders for a site tour of the project post-construction.
Target Audience	Local landowners, Teton CD, natural resource agencies and other NGOs
Goals	1) To demonstrate Beaver Dam Analogs as a potential restoration technique on smaller streams and to showcase their benefits in raising the water table, improving water storage and water quality, and allowing riparian vegetation to flourish. 2) To use the site tour to demonstrate to local farmers/ranchers the benefits of having beaver on the landscape.
Effectiveness Evaluation	We would evaluate the effectiveness of this outreach event based on the number of attendees at the site tour. Further success could be evaluated by the number of interested stakeholders that follow up with us after the site tour and are interested in working to implement a project like this elsewhere.

Activity (method of delivery)	
Target Audience	
Goals	
Effectiveness Evaluation	

Activity (method of delivery)	
Target Audience	
Goals	
Effectiveness Evaluation	

319 Funding Request	Non-Federal Match	Other Funding*	Total
$ 2,000	$ 0		$ 2,000

Match Source _____ Secured ☐

Match Source _____ Secured ☐

Match Source _____ Secured ☐

**Use this space to record any funding that will be used to support creation of the task deliverables, but will not be reported as match. The purpose of this information is to give application reviewers a clearer understanding of the total amount of funding required to complete a task.*

Project Administration

Project administration includes book keeping, invoicing, interim/annual/final report preparation, office supplies, rent, communications, etc. 319 funding applied to this task must not exceed 10% of the total amount of 319 funding requested, or $12,000, **whichever is lower**. Like all other tasks, payment is by reimbursement for actual expenses incurred.

319 Funding Request	Non-Federal Match	Other Funding*	Total Cost
$ 4,547			$ 4,547

Match Source _____ Secured ☐

Match Source _____ Secured ☐

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Project 1

Project Form

A separate Project Form ***(including providing separate attachments)*** must be submitted for each project included in your application. Use the following examples to help determine when to lump and when to split projects. For additional assistance, contact Mark Ockey at mockey@mt.gov or 406-444-5351.

Splitting Examples (fill out multiple Project Forms)

- Stream restoration work occurring on two separate streams, on parcels owned by two separate individuals
- Two projects with significantly different sets of project partners
- Two projects that address substantially different pollution sources (e.g., one project moves a corral off of a streambank, and another removes mine tailings, with both projects being on the same property)

Lumping Examples

- Contiguous stream restoration work spanning multiple land parcels
- 3 projects that address similar sources of pollution on a single land parcel (e.g., moving a corral off a stream, implementing a grazing management plan, and relocating a manure storage facility out of the floodplain, all on the same ranch)

Project 1 Name Teton Spring Creek Restoration Project

Project 1 - Problem Description

Select the watershed restoration plan (WRP) that your project will help implement.

Teton River - Teton Watershed Group

N — Letter of support from author entity attached? *(If no, explain why below.)*

The Teton Watershed Group hasn't been meeting for years and is defunct, but we reached out to the Teton CD in its absence, and they were supportive of the project. A letter of support from the Teton CD is pending.

Waterbody name from the 2020 List of Impaired Waters	Upper Teton Spring Creek
Probable causes of impairment to be addressed	Alteration in stream-side vegetative cover, flow, sedimentation/siltation and temperature.
Waterbody name from the 2020 List of Impaired Waters	
Probable causes of impairment to be addressed	
Name of healthy waterbody to be protected	
Description of identified threat to non-impairment status	
Name of healthy waterbody to be protected	
Description of identified threat to non-impairment status	

Detailed Problem Description

Provide a detailed description of the nonpoint source pollution problem you are attempting to address. Be sure to include the following:

- Identify the primary types of pollution
- Identify the primary sources of the pollution
- Identify the root causes of the pollution
- Describe any previous work done to address the problem (who, what, where, when)
- Describe the impacts of the problem (who, what, where)

See Appendix A for Answer.

Project 1 - Solution Description

Provide a detailed description of the solution you are proposing to implement to address the nonpoint source pollution problem described in the previous section. Be sure to include the following:

- Describe the range of options available for solving the problem, including a no-action alternative
- Describe the practices you intend to design and/or implement to solve the problem (what, where, when, how much or how many)
- Explain why the chosen alternative is the best alternative
- Describe any pre-project planning that has already taken place (e.g., design work, permitting consultation, Endangered Species Act consultation, wetland delineations, landowner agreements, community outreach)
- Describe the anticipated maintenance needs (what, where, who, how long)

See Appendix A for Answer.

Project 1 - Goals and Effectiveness Evaluation

List the specific, measurable nonpoint source goals for your project.

MFP plans to install up to 25 BDAs (this number will be refined after the final design). This will improve hydrology and channel morphology for 4398 ft of stream and will improve an estimated 24 acres of riparian buffer. The BDAs will also trap fine sediment and improve water quality; fine sediment accumulation will be directly measured and then extrapolated once construction is complete (as per the below description for the next question).

Explain how you will determine whether the you have met the goals described above. Identify any data you intend to collect, calculations you'll make, or methods you intend to use.

MFP will approximate the amount of sediment/silt trapped above each BDA structure post-construction by installing a t-post upstream of a subset of the BDAs (5 of 25, so every 5th BDA) with markings on it to measure sediment accumulation to the nearest half foot. We can then estimate the area of effect upstream and the channel width using annual drone photos, which coupled with channel slope (from the lidar) can be used to estimate the amount of sediment trapped above each of the 5 structures.

We will also document the changes to the extent and quality of the riparian buffer along the stream corridor over the 2-year monitoring period using aerial drone photos and ground photopoints. We expect to see evidence of side channel development, improved channel morphology, increased surface and subsurface water and in turn more rigorous herbaceous and woody species.

Project 1 - Location

Upstream End	Latitude	47.860328	Longitude	-112.222356
Downstream End	Latitude	47.852906	Longitude	-112.215203
Centerpoint	Latitude	47.857213	Longitude	-112.218509
Upstream End	Latitude		Longitude	
Downstream End	Latitude		Longitude	
Centerpoint	Latitude		Longitude	
Upstream End	Latitude		Longitude	
Downstream End	Latitude		Longitude	
Centerpoint	Latitude		Longitude	

List the 12-digit Hydrologic Unit Code(s) (HUCs) in which the project area is located: 100302050405

☑ **Detailed Project site map(s)** Attach a map or set of maps showing the location and size of proposed activity. The map scale must be between 1:1,000 and 1:12,500. The map(s) must have an aerial photo background (e.g., USDA NAIP photography, Google Earth imagery, etc.). The map(s) must show the latitude, longitude, site name, and landowner for the activity site. The map(s) should also identify waterbodies affected by the pollution that the activity is designed to address.

Other Attachments - *(These documents are not required, but may be submitted to provide more specific details about a project or to demonstrate adequate planning and preparation; please, however, be respectful of the amount of time it will take an application reviewer to find relevant information within a document and use excerpts where appropriate; do not attach WRPs, TMDLs or other large-scale planning documents)*

- ☑ Photos of project area
- ☑ Photos of reference site just downstream of project area
- ☑ Addendum A with overflow from application answers
- ☑ Letter of support from landowner
- ☐

Project 1 - Partners

Identify each of the project partners and describe their contribution to the project. Include landowners, land managers, project designers, funders, and your own organization. Indicate whether each partner, other than your organization, has provided a letter of support. (*Note: each landowner must provide a letter of support.*)

Landowner	Contributions to Project	Letter of Support Attached?
Blair Patton	Committed to allowing MFP to do project on his property; has also taken drone imagery of project area for MFP as part of our baseline assessment.	☑
		☐
		☐
		☐

Project Partner	Contributions to Project	Letter of Support Attached?
Teton Conservation District	Teton CD helped MFP to network in the Marias Watershed to find local landowners interested in doing restoration on their properties.	☐
Ryan Richardson, Geomorphologist with The Barn Group	MFP contracted with Ryan/RDG to have Ryan walk the site with MFP in June of 2022 to discuss restion alternatives and collect drone imagery. MFP plans to continue contracting Ryan to develop a final design for the project and provide some assistance with construction oversight.	☐
Ashton Bunce, Project Manager with Montana Freshwater Partners	MFP is providing non-federal matching funds and is responsible for developing, managing & implementing the project w/help from the MFP Technical Advisory Group. Also responsible for landowner outreach, project development, permitting, implementation, monitoring/reporting, & long-term management.	☐
		☐
		☐

Project 1 - Budget

Use the space below to outline your project budget.

Project Planning This includes costs for surveying, engineering, permitting, procurement, construction oversight, and overall coordination of the proposed project. This does not include things like reporting, book keeping, communications, office space, or utilities, which are all covered in the Project Administration budget.

319 Funding Request	Non-Federal Match	Other Funding*	Total Cost
$ 6,500	$ 10,000		$ 16,500

Match Source	MFP In-Lieu Fee Compensatory Mitigation Program	Secured ☑
Match Source		Secured ☐
Match Source		Secured ☐
Match Source		Secured ☐

**Use this space to record any funding that will be used to support creation of the task deliverables, but will not be reported as match. The purpose of this information is to give application reviewers a clearer understanding of the total amount of funding required to complete a task.*

Landowner Agreements This includes costs for developing and managing landowner agreements. The landowner agreement(s) must verify that Contractor and DEQ staff may access the project site, at reasonable times and with prior notification, for the purposes of project planning, implementation, and post-implementation monitoring. The agreement(s) must ensure appropriate operation and maintenance of all structures, vegetation, and management measures for the life of the project. If grazing will be allowed within the project area, the agreement(s) must include a sustainable management plan for livestock grazing, designed to protect and enhance riparian function.

319 Funding Request	Non-Federal Match	Other Funding*	Total Cost
$ 400			$ 400

Match Source		Secured ☐
Match Source		Secured ☐
Match Source		Secured ☐
Match Source		Secured ☐

**Use this space to record any funding that will be used to support creation of the task deliverables, but will not be reported as match. The purpose of this information is to give application reviewers a clearer understanding of the total amount of funding required to complete a task.*

Project Implementation This includes costs for all materials, labor, equipment, and as-built surveys associated with implementing the plans developed under the Project Planning task. If you are requesting funding for design only, leave this task blank.

319 Funding Request	Non-Federal Match	Other Funding*	Total Cost
$ 33,570	$ 34,570		$ 68,140

Match Source	MFP In-Lieu Fee Compensatory Mitigation Program	Secured	☑
Match Source		Secured	☐
Match Source		Secured	☐
Match Source		Secured	☐

**Use this space to record any funding that will be used to support creation of the task deliverables, but will not be reported as match. The purpose of this information is to give application reviewers a clearer understanding of the total amount of funding required to complete a task.*

Project Effectiveness Monitoring This includes costs for developing and implementing a reasonable method or set of methods for evaluating and reporting on the effectiveness of the project in achieving NPS pollution goals. It includes preparation and implementation of a monitoring plan, and preparation of a monitoring report. If the project goals include reducing sediment, nitrogen and/or phosphorus, this task will also include calculation of annual load reduction estimates. Photo-point monitoring is also a standard requirement for this task. If you are requesting funding for design only, you may either leave this task blank or request funding for plan development and pre-project monitoring.

319 Funding Request	Non-Federal Match	Other Funding*	Total Cost
$ 3,000	$ 26,000		$ 29,000

Match Source	MFP In-Lieu Fee Compensatory Mitigation Program	Secured	☑
Match Source		Secured	☐
Match Source		Secured	☐
Match Source		Secured	☐

**Use this space to record any funding that will be used to support creation of the task deliverables, but will not be reported as match. The purpose of this information is to give application reviewers a clearer understanding of the total amount of funding required to complete a task.*

Project 1 - Project Timeline

Task Description	3Q 2023	4Q 2023	1Q 2024	2Q 2024	3Q 2024	4Q 2024	1Q 2025	2Q 2025	3Q 2025	4Q 2025	1Q 2026	2Q 2026
Obtain landowner agreement	✓											
Complete final designs	✓											
Permitting	✓											
Implementation		✓										
Project Administration	✓	✓	✓	✓	✓	✓	✓	✓	✓			
Monitoring & Reporting				✓				✓				
Site Tour								✓				

Project 1 - Bigger Picture Benefits

Environmental Justice

Explain how your project incorporates disadvantaged community populations and priorities, Tribal and community leader engagement, or socioeconomic barriers in the context of equal protection and access to a healthy environment.

In locating a project site within the Marias Watershed, MFP reached out to local partners in the watershed including the Teton CD, Blackfeet Environmental Office, The Nature Conservancy and Pheasants Forever and toured seven potential project sites on across the watershed before choosing the Teton Spring Creek site, particularly due to its high restoration potential.
Ultimately, the site MFP selected is in Choteau, a small farming and ranching community, east of the Rocky Mountain Front and Glacier National Park. Because of it's remote nature and small size, there are limited resources for this rural agricultural community.

Climate Change/Resilience

How will your project improve climate change resilience for communities, native plants, wildlife, or ecosystems?

BDAs are an excellent restoration tools for climate resiliency; BDAs act to aggrade the stream channel and check up water, raising the water table not only within the stream channel, but on the adjacent floodplain, allowing native vegetation to flourish. With increased overbank flows, BDAs allow for increased opportunities for water storage on adjacent floodplains, which can help to supplement streamflows later on in the summer when water is more scarce and drought conditions are more common. BDAs can therefore provide more water for plants and animals throughout the year and more surface and subsurface water for stream-adjacent crops and pastures. BDAs are so effective a slowing down/spreading out water and increasing water storage that stream reaches treated with BDAs in other parts of the country have even served as fire breaks during wildfires.

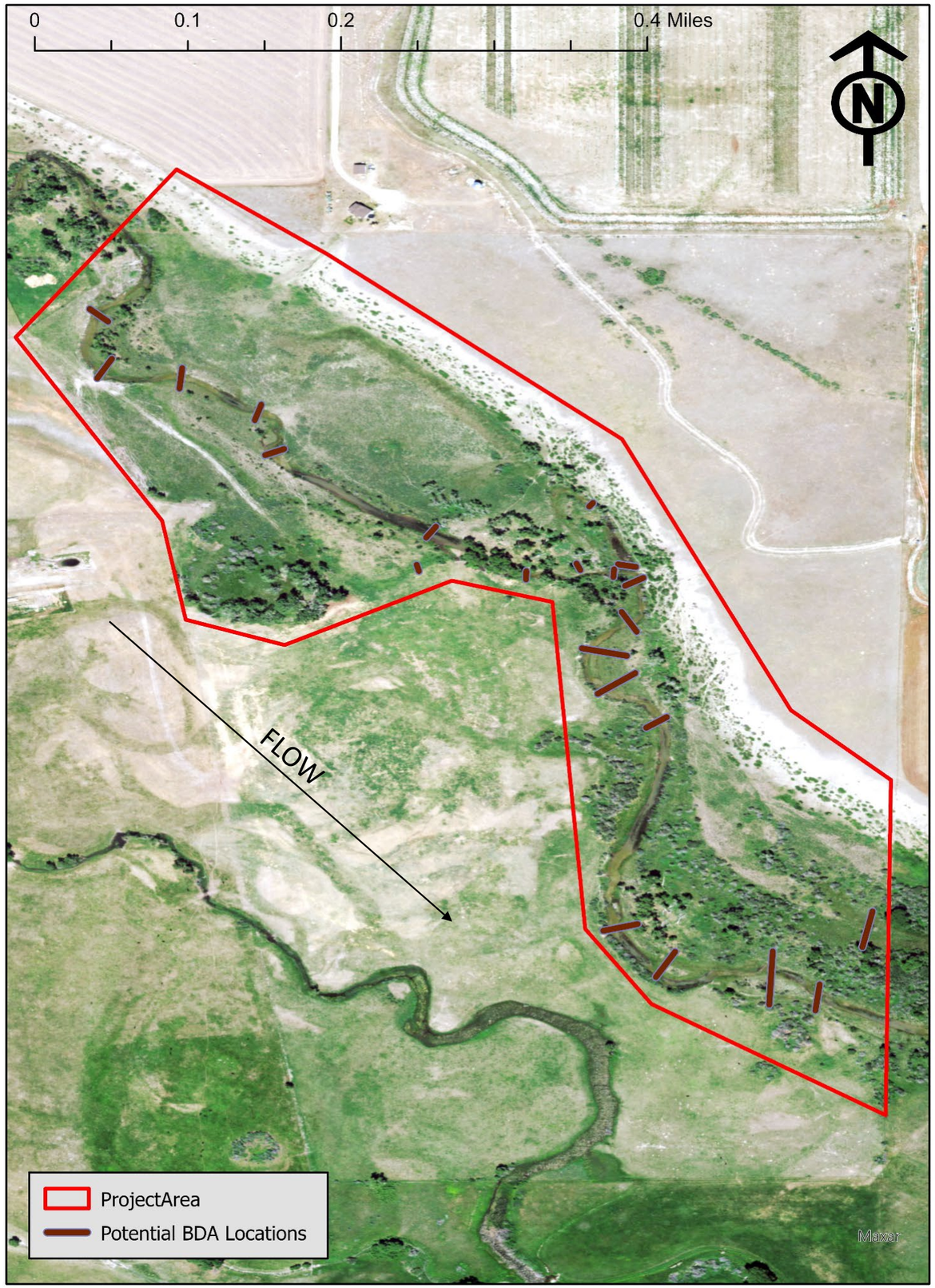
Impacts to Downstream Human, Plant and Animal Communities

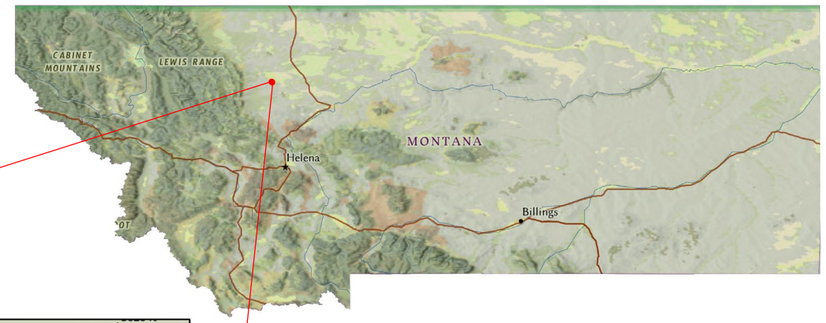
What sort of an impact will your project have on downstream human, plant or animal communities?

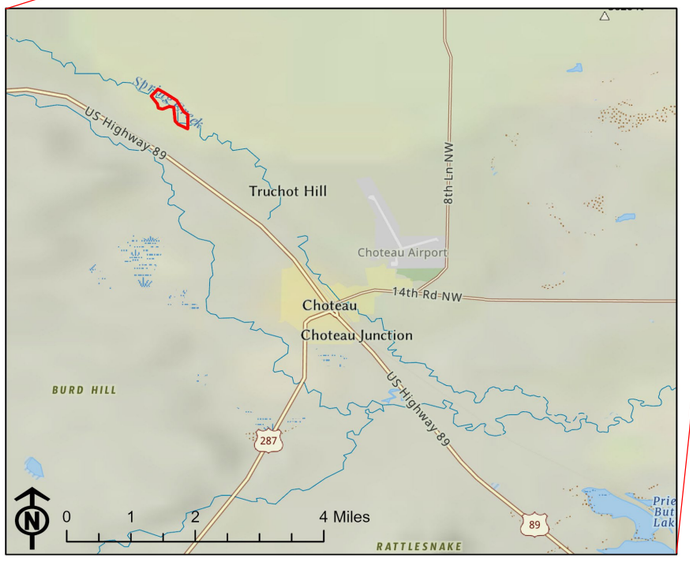
The project area is within Rocky Mountain Lower Montane/Montane-Foothill Riparian Woodland and Shrubland habitat types (Montana National Heritage program web mapper, accessed December 2021) and provides habitat for several listed threatened species and Montana species of concern including the Long-billed Curlew (Numenius americanus); Ferruginous Hawk (Buteo regalis); Grizzly Bear (Ursus arctos); and Great Blue Heron (Ardea Herodias) among others. Spring Creek also provides habitat to a variety of fish species including Brook Trout, Longnose Dace, Longnose Sucker, Mottled Sculpin, Mountain Sucker, Rainbow Trout and White Sucker. The project will improve instream habitat complexity and water quality for fish species and will help to revitalize the riparian corridor and riverine wetland habitat for wildlife and avian species. Additionally, downstream of the proposed project area is the City of Choteau, which lies immediately between the mainstem Teton River and Teton Spring Creek. The City of Choteau obtains its water supply from this shared aquifer, providing water to roughly 1,730 residents. Spring Creek also runs through the downtown, including through the city park, before meeting up with the Teton River. By reducing sediment and improving overall water quality and water storage through floodplain connectivity, this project will provide numerous benefits to the community.

Map

TETON SPRING CREEK RESTORATION CONCEPT





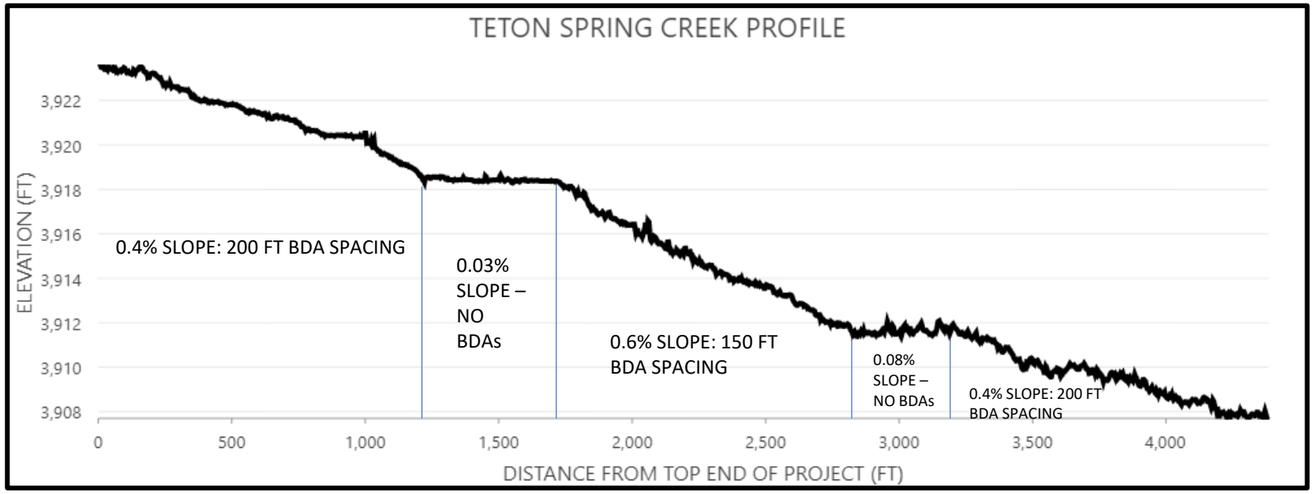


IMPAIRED WATERBODY: UPPER TETON SPRING CREEK

UPSTREAM COORDINATES: 47.860328, -112.222356

DOWNSTREAM COORDINATES: 47.852906, -112.215203

LANDOWNER: BLAIR PATTON



Letters of Support

October 3, 2022

MT Dept. of Environmental Quality
319 Nonpoint Source Program
1520 E. Sixth Avenue
P.O. Box 200901
Helena, MT 59620-0901

To Members of the 319 Nonpoint Source Funding Review Panel:

I am writing to express support for Montana Freshwater Partner's (MFP's) proposal to improve water quality on Teton Spring Creek with assistance from the 319 Grant Program. The portion of Teton Spring Creek that is flowing through our property has suffered from historic overgrazing and trampling by cattle. It is lacking in trees and shrubs along the stream corridor due to browse by both cattle and wildlife and is also over-widened in areas.

My family and I are committed to restoring the creek and have been working over the past decade to fence cattle out from the creek and allow the vegetation to come back. However, it has been responding slowly in areas where we have fenced out cattle. The proposal that MFP has put forward for beaver dam analogs is intended to check up water and make more water available on the floodplain, which could really help the existing vegetation to recover and new seedlings to establish. On our downstream neighbor's property, there are a lot of young willow and cottonwood seedlings coming in where beavers have been successful at building dams and checking up water. We hope that this project is able to create some of the same benefits on our property.

Thank you for considering this request for funding.

Sincerely,

Blair Patton

Supplemental Attachment 1

Appendix A - Answers for 319 Application

Detailed Problem Description

Provide a detailed description of the nonpoint source pollution problem you are attempting to address. Be sure t include the following:

- Identify the primary types of pollution
- Identify the primary sources of the pollution
- Identify the root causes of the pollution
- Describe any previous work done to address the problem (who, what, where, when)
- Describe the impacts of the problem (who, what, where)

Teton Spring Creek is a tributary to the Teton River that drains 10.4 square miles. The creek flows primarily through agricultural lands and the city of Choteau before emptying into the Teton River. Spring Creek rises out of the aquifer of the Teton River, fed mostly by groundwater and to a lesser extent local precipitation and irrigation return flow. Because of this, the hydrograph of Upper Spring Creek is closely related to that of the Teton River.

Water quality for Spring Creek was assessed in 2001 and Upper Teton Spring Creek (above Choteau) was listed in the Montana Department of Environmental Quality (MT DEQ) 303d database for water quality impairments including alteration of streamside vegetative cover, flow, temperature and sedimentation/siltation. Potential causes for these impairments include water diversions, impacts from hydrostructure flow regulation/modification and loss of riparian habitat. A 2003 MT DEQ report also notes that Upper Spring Creek was historically a type "E" Rosgen stream, with a narrow and deep channel, but much of its riparian corridor has been removed through anthropogenic development and the channel has become over-widened in many locations. Because of this, the stream was classified as a type "C" Rosgen channel at the time of assessment, with width to depth ratios >12. Additionally, up until as recently as 2017, portions of Spring Creek dewatered and were intermittent during the summer months. The key changes during the 2017 irrigation season that returned perennial flow to the creek include: 1) enforcement of the Teton River Distribution Project, which sets target flows that guide the distribution of water according to priority date of water rights, by a Chief Water Commissioner and 2) the abatement of the Bateman Ditch, which was previously used to bypass the Springhill Reach of the Teton River to deliver water to a local ranch.

Montana Freshwater Partners (MFP) has been working on the project concept and development plans since 2020 after we received funding through our In-Lieu Fee Mitigation Program to develop a project in the Marias Watershed. We began with an extensive outreach effort with our contacts at the Teton Conservation District, The Nature Conservancy, Blackfeet Environmental Office, and Pheasants Forever to network and toured several potential restoration sites in the Marias Watershed. Ultimately after visiting seven different properties, MFP selected the project site on Upper Teton Spring Creek due to its high restoration potential, conservation-minded landowner, and unique habitat values. MFP has completed the majority of the project planning tasks including a full baseline assessment of the project area to characterize the existing condition of the spring creek, define wetland and upland boundaries, characterize vegetation communities, and capture drone imagery that will provide topographic surfaces and high-resolution imagery for the project design plans. Our In-Lieu Fee Mitigation Program funding is secured to cover the non-federal match dollars for this project.

The proposed project site is located on a 737.4-acre private ranch approximately 3 miles north/northwest of Choteau on the northeast side of highway 89. Teton Spring Creek flows southeast through the ranch towards the city of Choteau. The current landowner's father acquired the ranch in

the 1970s and cattle were allowed to roam around the property, including unrestricted access to Teton Spring Creek. Within the project area, Teton Spring Creek has suffered a long legacy of intensive overgrazing and active clearing of riparian vegetation, reducing streambank stability and riparian shading, and causing Spring Creek to widen unnaturally and accumulate fine sediments. This spring-fed tributary now lacks a woody riparian corridor throughout much of the project area and is unnaturally wide and shallow in several areas. Cottonwood stands are either decadent or have been excessively browsed to <2 ft in height. Cottonwood and willow regeneration and recruitment are very limited within the project area.

For the past 8 years the landowner has been working on improving the conditions of the spring creek on the upper half of the property, upstream of MFP's project area. Improvements include limiting the cattle's access to the stream with fencing and allowing the stream to restore its natural channel morphology and riparian vegetation over time. The landowner also upgraded a culvert on Teton Spring Creek to a bridge with assistance from Montana Fish, Wildlife and Parks, and has plans to replace a second culvert with a bridge with FWP's assistance sometime this year. Downstream of these efforts, in the section that MFP plans to restore, the stream is still heavily impaired and livestock are currently able to access the riparian area and stream.

Project 1 - Solution Description

Provide a detailed description of the solution you are proposing to implement to address the nonpoint source pollution problem described in the previous section. Be sure to include the following:

- Describe the range of options available for solving the problem, including a no-action alternative
- Describe the practices you intend to design and/or implement to solve the problem (what, where, when, how much or how many)
- Explain why the chosen alternative is the best alternative
- Describe any pre-project planning that has already taken place (e.g., design work, permitting consultation, Endangered Species Act consultation, wetland delineations, landowner agreements, community outreach)
- Describe the anticipated maintenance needs (what, where, who, how long)

Montana Freshwater Partners initially visited the Teton Spring Creek property in July of 2021 and walked the stream corridor, noting general information about legacy impacts, channel morphology, riparian vegetation, and weeds. MFP returned to the site in April of 2022 with Ryan Richardson of River Design Group to collect drone imagery and walk the site to discuss restoration alternatives. We also talked through many of the identified restoration alternatives with our technical advisory group, a voluntary group composed of hydrologists, geomorphologists, ecologists, engineers, and conservation attorneys that helps our organization with various technical expertise on projects. For this project, we considered multiple alternatives such as reconstructing the channel on an adjacent floodplain, in a historic flow path, with a narrower channel width and increased sinuosity. We also considered scalping sod from the floodplain and using it to narrow the channel in places where it was over-widened. Lastly, we considered focusing our project budget entirely on fencing out cattle and treating weed infestations while the stream naturally recovers over time.

In June 2022, we returned to the site to conduct a baseline assessment to help inform our design approach. The baseline assessment included a wetland delineation and collecting pebble count data, photopoints, more drone imagery, noxious weed transect surveys, and bankfull widths throughout the project. We also used this opportunity to visit the downstream neighbor's property, which we believed

would be an excellent reference site for the project since it has remained relatively intact, particularly on the upstream end of the property. As we walked onto the neighbor's property, we immediately noticed how wet the ground was and that cottonwood and willow seedlings were coming up everywhere. We quickly ascertained that beaver were in the area and discovered multiple dams that were effectively checking up Teton Spring Creek and allowing floodplain vegetation to thrive (see the attached "Reference Site Photos"). Because it was so wet, weed density was lower in these areas as well. As we moved towards the portions of the neighbor's property where there was less beaver presence and the stream was a single-thread channel, native floodplain vegetation was less successful and weeds were more abundant, much like what we were seeing upstream in the proposed project area. After seeing how successful these beavers were, we decided that Beaver Dam Analogs (BDAs) were an excellent approach for the project area. Both the sod mats and channel re-route that we were considering would be very costly, while simply fencing cattle out and treating weeds or doing nothing and allowing the creek to recover in its own time would put the creek on a very slow trajectory for recovery. However, BDAs are cost-effective and the beavers showed us how effective this approach could be on the neighbor's property. When we talked to the landowner about our observations on the neighbor's property, he mentioned that his dad historically removed some of the beaver dams that were built within the project area, which provides further evidence that the BDA approach is appropriate and can be a successful restoration tool for this property.

We believe the use of BDAs is a cost-effective tool to restore hydrology, channel morphology and riparian habitat while also trapping excess sediments and improving water quality and storage, which is why MFP has selected this low-tech approach to restore stream channel function and enhance riparian habitat on Teton Spring Creek. Through the placement of up to 25 Beaver Dam Analogs (BDAs) within a ~0.8 mile reach, the restoration project will aggrade the stream channel, trapping excess fine sediments from moving downstream, checking up water and raising the water table within the stream channel and on the adjacent floodplain. This will help native riparian and riverine wetland vegetation flourish and drown out non-natives and noxious weeds that typically thrive in drier conditions. The BDAs will increase stream-floodplain connectivity by increasing overbank flows, allowing floodplain vegetation to filter out harmful nutrients, toxics and excess sediments, thereby improving water quality. Additionally, this increased connectivity will allow for increased water storage. By slowing down and spreading out water, BDAs can improve late summer streamflows, which is typically the time of the year when water is most scarce.

MFP will contract with Montana Conservation Corps (MCC) in the late summer/fall of 2023 to implement this project. MFP contacted MCC and they will have two statewide crews in 2023 dedicated to installing beaver dam analogs that have availability for next summer. MFP is able to borrow a hydraulic post-pounder from the Trout Unlimited Western Waters Program and source willows locally for free. The main cost associated with the construction of the BDAs will be the MCC labor crew, particularly because this stream is so over-widened that BDAs will range from approximately 15-30 ft in width, and will be time consuming to construct. Besides labor, the other main construction cost associated with the BDAs is the cost for 2” untreated wood posts.

MFP anticipates some level of maintenance with the project over the first 2-3 years and has set aside funding in the budget to use staff time to repair structures for the first few years as necessary. However, since it is a groundwater-fed system, streamflow is moderated and more consistent throughout the year, with peak flows on Upper Teton Spring ranging from 10-25 CFS at the DNRC StAGE site upstream of the project area. Because of the lack of extreme peak flow events, it is unlikely that flows would wipe out these structures. Ultimately, the goal is for beavers to move in and take over

long-term maintenance, which seems likely given that they have been observed a few hundred yards downstream of the project area. Currently, it appears that food is the limiting factor for beaver within the project area, but as the BDAs work to increase the water table and increase riparian forage, this should no longer be a limiting factor.

The landowner is conservation-minded and is very enthusiastic about the project. He is supportive of the BDAs, and understands that they will encourage beavers to move back onto his property. His only concern with this was that he doesn't want to see all of his mature cottonwood trees cut down by beaver. Because of this, MFP is including funding for materials and MCC crew time to install fencing material around a subset of his mature cottonwood trees, following guidelines from the Beaver Institute.

Additionally, MFP originally planned to include a fencing component with a off-channel watering source for cattle as part of the project. However, the landowner recently notified MFP that he is currently working to sell off all but 10-15 head of cattle in November of 2022 and convert to farming his fields for hay and alfalfa. He plans to keep the remaining 10-15 head of cattle year-round in pastures on the upstream portion of his property where there is already fencing to keep them out of the creek. Therefore, MFP is focusing the project budget on active stream and floodplain restoration. As the landowner transitions to farming, the project will benefit adjacent farmlands by providing increased subsurface water for crop and forage growth.

Lastly, MFP plans to use a portion of the project budget to manage weeds within the property. During the baseline assessment, MFP walked 5 evenly spaced transects throughout the project area and documented noxious weed cover across transects. Noxious weeds observed included leafy spurge, hounds tongue, Canada thistle and knapweed. MFP will contract with local weed control services to help manage these noxious weeds throughout the duration of the project.

Supplemental Attachment 2

Teton Spring Creek Photo Log

TETON SPRING CREEK PHOTO LOG – JULY 2021 and JUNE 2022

The following photos showcase the effect of cattle in over-widening the creek, trampling the banks and overgrazing the riparian area within the proposed project area. Shrubby cinquefoil was the only woody shrub that remained in areas, which is very unpalatable to livestock. There was also knapweed, hounds' tongue, Canada thistle and leafy spurge infestations along the riparian corridor.

TETON SPRING CREEK PHOTO LOG – JULY 2021 and JUNE 2022

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Supplemental Attachment 3

Reference Site Photo Log

REFERENCE SITE PHOTO LOG – JUNE 2022

Drone image showing one of multiple beaver dams in the reference site. The floodplain upstream of the beaver dam was extremely wet and as a result, vegetation was thriving as can be seen in the below photos.

Close-up of a beaver dam within the reference site.

REFERENCE SITE PHOTO LOG – JUNE 2022

Cottonwood and willow seedlings were abundant throughout the areas with moist soils due to beaver dams.

REFERENCE SITE PHOTO LOG – JUNE 2022

View (looking downstream) at uppermost beaver dam. Teton Spring Creek was impounded upstream of this beaver dam, with multiple inundated overflow channels out on the floodplain.

REFERENCE SITE PHOTO LOG – JUNE 2022

Floodplain within the reference site. The main channel of Spring Creek is on the left side of the photo and multiple overflow channels can be seen through the grass and sedge communities due to the high water table on the right side of the photo. Numerous young cottonwood trees can be seen in the background.

REFERENCE SITE PHOTO LOG – JUNE 2022

Juvenile willows.

Overflow channels inundated on the floodplain.

REFERENCE SITE PHOTO LOG – JUNE 2022

Young cottonwood trees and seedlings were abundant in areas where beaver dams were checking up water.

REFERENCE SITE PHOTO LOG – JUNE 2022

The stream channel had much higher sinuosity and increased complexity in the reference site as compared to the project reach and bankfull widths were narrower overall. There were also discrete patches of cattails interspersed along the stream.