2022 319 Application Form - General and Focus Watershed

**********REVISED 10/22/2021**********

General Information

Project Name: Middle Fork West Fork Gallatin River - Project 5

Sponsor Name: Gallatin River Task Force

Registered with the Secretary of State? Y

Registered with SAM? Y

Duns #: 010769366

Does your organization have liability insurance? Y

Primary Contact: Emily O'Connor

Signatory: Kristin Gardner

Title: Conservation Director

Title: Chief Executive and Science Officer

Address: PO Box 160513

Address: PO Box 160513

City: Big Sky State: MT Zip Code: 59716

City: Big Sky State: MT Zip Code: 59716

Phone Number: 406-548-8111

Phone Number: 406-995-2519

Email Address: emily@gallatinrivertaskforce.org

Email Address: kristin@gallatinrivertaskforce.org

Signature

Signature

Technical and Administrative Qualifications

Technical and administrative support for this project will be provided by the Gallatin River Task Force (Task Force) and WGM Group, an engineering, planning, and design firm. Task Force staff supporting this project includes Chief Executive and Science Officer, Kristin Gardner, Managing Director, Ryan Newcomb, and Conservation Director Emily O'Connor. Jeff Dunn, Water Resource Specialist with WGM is leading the design, permitting, and construction oversight for the project.

Past Projects

Project Name	Grant or Contract Amount	Funding Entity *(entity name/program, contact person, phone, email)*	Completion Date
Middle Fork West Fork Gallatin River Restoration Project 3	$ 25,000.00	Montana Watershed Coordination Council Terri Nichols, (406) 210-1217, terri@mtwatersheds.org	October 2021
Upper Deer Creek River Access Improvement Project	$ 350,000.00	Custer Gallatin National Forest Recreation Program Wendi Urie, 406-587-6757, wendi.urie@usda.gov	Construction - October 2020 Revegetation - May 2021
Moose Creek Flat River Access Improvement Project	$ 220,000.00	Custer Gallatin National Forest Recreation Program Wendi Urie, 406-587-6757, wendi.urie@usda.gov	May 2018

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**.*

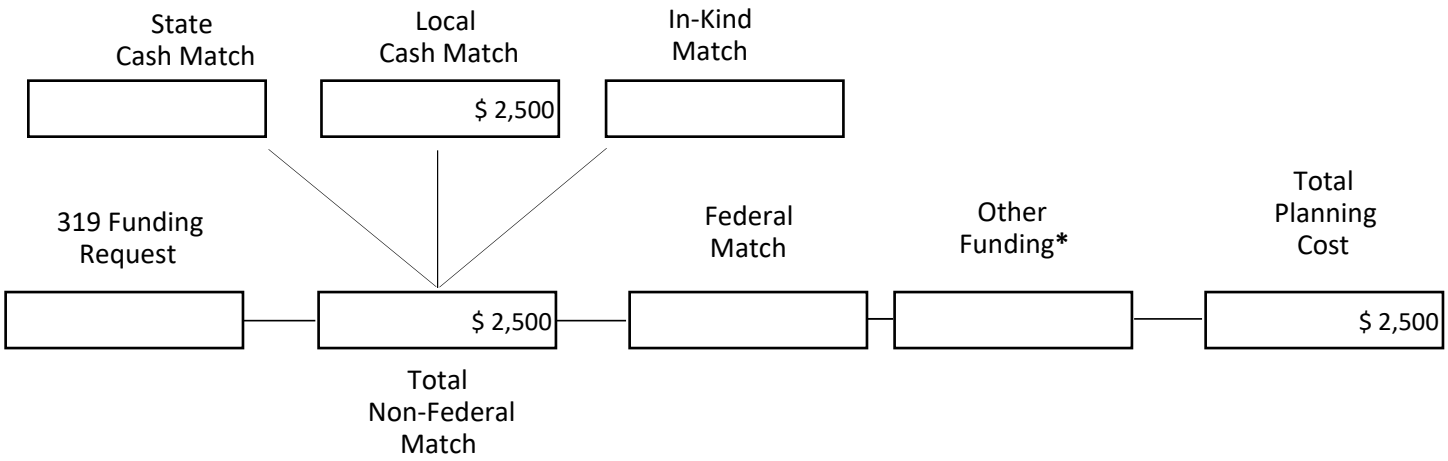
	319 Funding Request	Non-Federal Match	Federal Match	Other Funding	Total Cost
Education and Outreach Project	$ 0	$ 2,500	$ 0	$ 0	$ 2,500
Administration	$ 0	$ 1,670	$ 0	$ 0	$ 1,670
Project 1 Name	Middle Fork West Fork Gallatin River Restoration - Project 5				
Project Planning & Oversight	$ 0	$ 59,000	$ 0	$ 0	$ 59,000
Landowner Agreements, O & M	$ 0	$ 1,670	$ 0	$ 0	$ 1,670
Project Implementation	$ 25,000	$ 100,000	$ 0	$ 0	$ 125,000
Other Activities	$ 0	$ 0	$ 0	$ 0	$ 0
Project Effectiveness Monitoring	$ 2,500	$ 2,500	$ 0	$ 0	$ 5,000
Total	$ 27,500	$ 163,170	$ 0	$ 0	$ 190,670
Project 2 Name					
Project Planning & Oversight					$ 0
Landowner Agreements, O & M					$ 0
Project Implementation					$ 0
Other Activities					$ 0
Project Effectiveness Monitoring					$ 0
Total	$ 0	$ 0	$ 0	$ 0	$ 0
Project 3 Name					
Project Planning & Oversight					$ 0
Landowner Agreements, O & M					$ 0
Project Implementation					$ 0
Other Activities					$ 0
Project Effectiveness Monitoring					$ 0
Total	$ 0	$ 0	$ 0	$ 0	$ 0
Project 4 Name					
Project Planning & Oversight					$ 0
Landowner Agreements, O & M					$ 0
Project Implementation					$ 0
Other Activities					$ 0
Project Effectiveness Monitoring					$ 0
Total	$ 0	$ 0	$ 0	$ 0	$ 0
Grand Total	$ 27,500	$ 167,340	$ 0	$ 0	$ 194,840

Education and Outreach

DEQ recognizes that 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. 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 these critical relationships. DEQ 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. Education and outreach activities funded by 319 or used as match for 319 funding must adhere to all of the eligibility requirements outlined in the annual Call for Applications document.

Education and Outreach Deliverables *(Identify the education and outreach activities you will engage in and methods you will use to document their completion.)*

Education and outreach activities will target Big Sky residents, businesses, visitors, land developers, and community stakeholders. We will highlight project implementation while also building knowledge of local water quality issues and actions individuals and businesses can take to prevent non-point source pollution including septic maintenance and Trout-Friendly Landscaping, a Task Force program that advocates for water-wise landscaping. The Task Force will plan and implement in-person outreach as well as traditional and digital media campaigns to capture a broad audience. Activities and methods used to document include:
1) Signs/Displays - Photo/informational display at Lone Mountain Ranch and/or interpretive signage at restoration (Documentation: photos of displays/signage).
2) Digital/Print Media - Paid social media posts, Water Wisdom column in Explore Big Sky newspaper; press release to media contact list, website project page, blog posts, Task Force and community e-newsletters (Documentation: copies of print and web material, tags on social media).
3) Volunteer Engagement Opportunities - All projects have opportunities for volunteers to get involved in project implementation and maintenance. We anticipate hosting 50-100 volunteers total (Documentation: photos, report).
4) Site Tours - Site tours hosted upon project completion. The initial site tour will be widely publicized with additional site tours as requested and/or when relevant to other restoration efforts (Documentation: event invites and photo documentation).



Match Source	Big Sky Resort Area District FY22 ($500)	Secured	✔
Match Source	Big Sky Resort Area District FY23 ($2,000)	Secured	
Match Source		Secured	
Match Source		Secured	

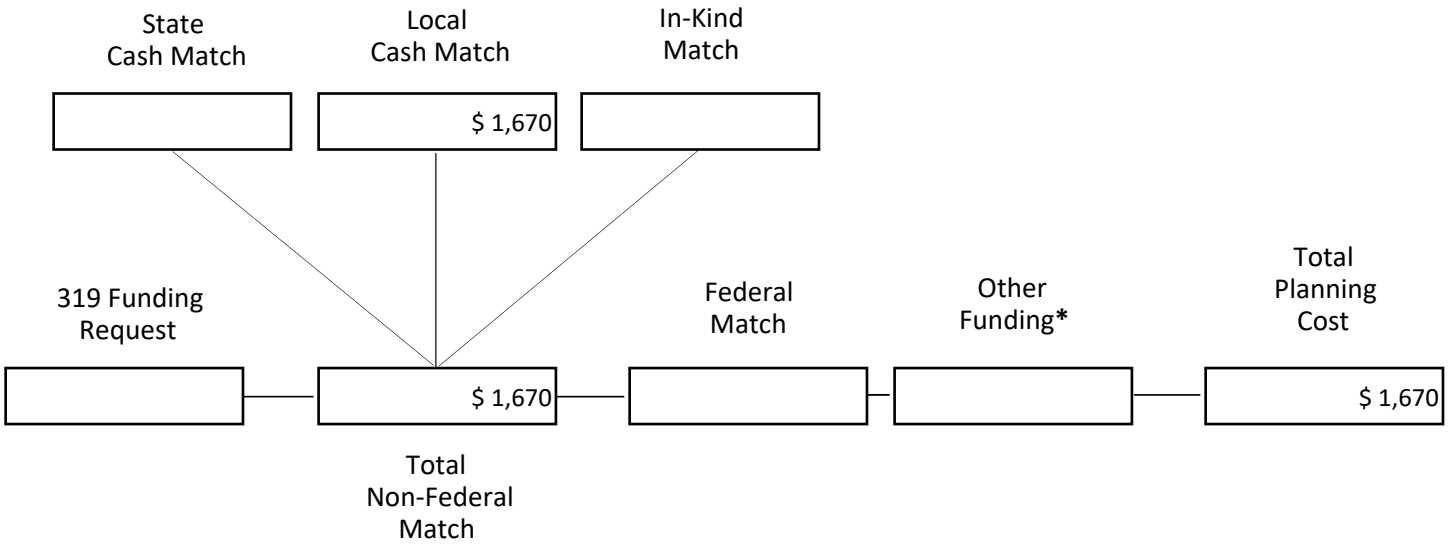
***Use this space to record any funding that will be used to support creation of the task deliverables, but will not be reported as match. The purpose of this information is to give application reviewers a clearer understanding of the total amount of funding required to complete a task.*

Project Administration

Project administration includes book keeping, invoicing, interim/annual/final report preparation, office supplies, rent, communications, etc. Up to 10% of the total requested 319 funds for your entire application can be used to pay for project administration. However, like all other tasks, payment is by reimbursement for actual expenses incurred.

Project Administration Deliverables *(Include interim/mid-year, annual, and final reports, as well as invoicing and office necessities.)*

The Task Force will oversee and be accountable for all project administration tasks including preparing and submitting billing statements, status reports, annual reports, and a final report. The Task Force shall maintain regular contact with the DEQ project manager.



Match Source	Big Sky Resort Area District	Secured	✔
Match Source	Gallatin River Task Force Operating Funds	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 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 406-465-0039.

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	Middle Fork West Fork Gallatin River Restoration - Project 5

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

Upper Gallatin River - Gallatin River Task Force

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

The Gallatin River Task Force authored the Upper Gallatin Watershed Plan (2012) under it's previous name as the Blue Water Task Force.

Waterbody name from 2020 List of Impaired Waters	Middle Fork West Fork Gallatin River
Probable causes of impairment to be addressed	sedimentation/siltation, nitrate+nitrite, E. coli
Waterbody name from 2020 List of Impaired Waters	
Probable causes of impairment to be addressed	

OR*

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	

**While the majority of the available 319 project funding is dedicated to addressing known impairments, EPA is allowing states to use a limited amount of funding to protect non-impaired waters (healthy waters) from becoming impaired.*

Project 1 Location

Upstream End	Latitude	45.268054	Longitude	-111.334703
Downstream End	Latitude	45.267973	Longitude	-111.332648
Centerpoint	Latitude	45.268189	Longitude	-111.333641

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	100200080202

☑ Project site map(s) attached, showing the location of all proposed on-the-grount restoration activities?

Community Participation and Support

Landowner	Contributions to Project	Letter of Support Attached?
Aspen Groves Homeowners Association	Funding contributions via a donation appeal to all homeowners in the HOA. So far $3,000 has been raised. Will also contribute volunteer labor.	☑
Antler Ridge Homeowners Association	Funding contributions via a donation appeal. Additionally, the HOA would like to help with volunteer labor and material from their fuels reduction work.	☑
		☐
		☐

Partner	Role	Letter of Support Attached?
Lone Mountain Ranch	The ranch will be contributing toward the bridge replacement as well as labor to rebuild the bridge.	☑
Trout Unlimited	The Trout Unlimited HRI Projects Manager has been helping with project implementation and outreach efforts for the Middle Fork Projects. We plan to submit a grant application to the Madision-Gallatin Chapter of TU for funding support.	☑
		☐
		☐

Other Community/Stakeholder Support

The Moonlight Community Foundation, Spanish Peaks Community Foundation, and the Knight Foundation have helped fund planning and design work. We have also received funding from the Big Sky Resort Tax District. The project aligns with the Big Sky Resort Tax's "Our Big Sky Community Vision & Strategy" to fund initiatives that protect and enhance the communities water resources.

We are working with the two homeowners associations adjacent to the project on targeted donation appeals for homeowners to contribute to the project and started to receive donations toward project implementation.

Project Description

Describe the nature and extent of the nonpoint source problem you are trying to address, the root causes of the problem, and your proposed solution.

Nature and Extent of the Problem: The Middle Fork West Fork Gallatin River is a tributary to the West Fork Gallatin River flowing approximately 6 miles from its headwaters on Lone Mountain to its confluence with the North Fork West Fork Gallatin River. In 2010, The West Fork Gallatin River Watershed Total Maximum Daily Loads (TMDLs) and Framework Watershed Water Quality Improvement Plan (DEQ 2010) provided TMDLs for sediment, nitrate+nitrite (NO^3+NO^2) and E. coli in the Middle Fork West Fork.

Root Causes of the Problem: Excess sediment is contributed from upland and bank erosion (i.e. roads, resort development, recreation) and historic riparian vegetation removal. Sediment impairments, including the non-pollutant "alteration in stream-side or littoral vegetation covers" impairment, are described in the TMDL document as decreased pool and large woody debris (LWD) frequency downstream of Lake Levinsky. Excess nutrients are derived from vegetation clearing, landscape maintenance, and sewer or service line failures or leaks. Excess pathogens (E. coli) are derived from domestic pets, waterfowl, wildlife, and refuse from impervious services, and sewer line failures or leaks. Note, there is no wastewater reuse occurring adjacent to the Middle Fork.

Proposed Solution: The proposed solution for water quality improvement measures requires a suite of improvement activities and voluntary actions from watershed stakeholders. The Task Force manages several outreach programs (i.e. Trout-Friendly Landscapes, Annual Dog Poop Clean Up, etc.) to educate the community on landscape maintenance and water stewardship practices that protect water quality. Residential and commercial developments adjacent to the Middle Fork are connected to the Big Sky Water & Sewer District or the Antler Ridge community septic system, any sewer line failures and leaks are fixed by the district or Antler Ridge. Working in partnership with Trout Unlimited, the Task Force developed the Middle Fork West Fork Gallatin River Restoration Plan to outline on-the-ground restoration projects within five discreet project areas from the headwaters on Lone Mountain to the confluence with the North Fork West Fork Gallatin River. The TMDL indicates that controlling and limiting nitrate +nitrite from lands in the developed areas upstream are the focus of nutrient load reduction (projects 1 and 2 of the restoration plan). The proposed downstream projects (3,4, and 5) are aimed at reducing sediment loading, increasing the pool and LWD frequency, and addressing alterations to stream-side vegetation cover. In October 2021, the Task Force worked with Big Sky Resort, Trout Unlimited, WGM, and Montana State University to complete Project 3. We are now working with community stakeholders to complete Project 5 from the restoration plan.

Project 5 primarily addresses sediment impairments, including "alteration in stream-side or littoral vegetation covers", by reducing streambank erosion, enhancing the riparian buffer, reconnecting the floodplain, and improving in-stream habitat. The riparian buffer enhancements will also help reduce nitrate+nitrate and E. coli contributions from surface runoff and shallow groundwater. Projected quantifiable activities and impacts include: installation of 25-30 beaver dam analog structures and woody debris jams, 1 upgraded culvert, 1 relocated and upgraded trail bridge, 250 feet of trail relocated off of eroding streambank, 1,200 square feet of streambank revegetated, 4 acres of wetland/riparian area made more resilient, 1,200 feet of stream channel restored and reactivated, 26.2 tons of sediment per year prevented from entering the river.

Is this project a continuation of a previous project? If so, please explain the connection.

The project is part of a larger planning effort to address water resource concerns in the Upper Gallatin Watershed. The project was identified in the Big Sky Area Wetland and Riparian Mapping: Restoration and Conservation Opportunities report completed in 2018 and was further developed in the Middle Fork West Fork Gallatin River Restoration Plan (2019) to provide a holistic approach for addressing water quality impairments within the Middle Fork West Fork Gallatin River watershed. The project also implements recommendations provided in the Big Sky Area Sustainable Watershed Stewardship Plan completed in 2018, specifically the action items for watershed conservation and restoration and for providing shallow groundwater recharge by slowing the flow of water within the watershed.

Water Quality Benefits and Sustainability

Explain why the project is an appropriate next step for making progress towards removing a pollutant/waterbody combination from Montana's 2020 Impaired Waters List or preventing a healthy waterbody from becoming impaired?

The five restoration projects identified in the Middle Fork West Fork Gallatin River Restoration Plan are the on-the-ground solutions that collectively work towards removing the pollutants identified in the 2010 TMDL document. Sediment impacts the entire length of the stream. The TMDL identifies a 29% sediment reduction goal. Project 1 and 5 are the two projects identified in the plan that will address the largest sediment inputs. Project 1, which we plan to implement at a later date, focuses on road crossing and traction sand improvements. Project 5 will address sediment impairments, including the non-pollutant "alteration in stream-side or littoral vegetation covers"while also eliminating sediment loading from the single largest eroding streambank. In addition, riparian buffer enhancements will benefit nitrate+nitrite and E. coli impairments by filtering surface water runoff and shallow groundwater.

Will your project address a major local source of nonpoint source pollution? Explain.

Yes, this project will address sediment inputs from streambank erosion and upland erosion by enhancing pool and large woody debris frequency and eliminating sediment loading from a large eroding streambank. The TMDL identified approximately 26.2 tons of sediment from this reach. The project will remove 90% of the sediment inputs.

The project will also address residential/commercial vegetation clearing and residential/commercial landscape maintenance by enhancing the riparian buffer to aid in filtering surface water runoff and shallow groundwater. Additionally, the project provides an opportunity to work with landowners adjacent to the Middle Fork on Trout-Friendly landscaping practices that protect water quality by controlling erosion and limiting chemical use.

Will the project create long-term, sustainable reductions in NPS pollution? Explain.

Yes, the project will contribute to long-term, sustainable reductions in nonpoint source pollution by addressing historic environmental impacts incurred during logging activities and resort development. Floodplain reconnection, large woody debris placement, and riparian buffer enhancements are intended to recreate a naturally functioning stream system with a sufficient riparian buffer that will be resilient to future development activities and climate variability.

Describe how the project will promote self-maintaining, natural, ecological and social processes that protect water quality?

Floodplain reconnection, large woody debris placement, and riparian buffer enhancements are intended to recreate a naturally functioning stream system with a sufficient riparian buffer in which natural ecological processes lead to woody debris inputs and pool formation, which creates diverse habitat conditions for fish and aquatic life. Project 5 will promote self-maintaining natural processes that protect water quality by creating a riparian buffer using native vegetation and removing a large streambank erosion sediment source.

Nonpoint Source Goals and Success Metrics

Nonpoint source pollution goal	Action that will be taken to reach the goal	Metrics used to measure success
29% reduction in sediment	Floodplain reconnection, BDA's and large woody debris placement, relocation of channel away from large eroding streambank, and revegetation/stabilization of eroding streambank.	Elimination of sediment loading from large eroding streambank in Project 5 by relocating the stream away from the bank. Photo and drone documentation. Feet of stream channel restored. Tons per year of sediment prevented from entering the river.
33% reduction in nitrate + nitrite	Floodplain reconnection, BDA's and large woody debris placement, riparian buffer enhancements.	Measured using length (ft) and width (ft) of riparian buffer enhancement. Acres of wetland/riparian area made more resilient.

Project Education and Outreach

Describe the educational benefits of your project. Will the project inspire additional nonpoint source pollution prevention work within the watershed?

We will utilize these projects as a platform to inform the Big Sky community about the threats facing the watershed and ways people can incorporate watershed stewardship actions in their homes and businesses. Although our digital and print outreach will be broad reaching, we will take this opportunity to focus our outreach on landowners and businesses directly adjacent to the Middle Fork. We envision letter writing and phone campaigns to inform adjacent landowners about the impairment status, what we are doing as a local watershed group, and ask them to personally invest in protecting the river by engaging in stewardship practices that address nonpoint source pollution. We would like to utilize this method of using restoration projects to highlight watershed threats followed by a call to action to inspire pollution prevent work throughout the watershed.

Bigger Picture Benefits

NPS pollution projects often have benefits that go beyond simply cleaning up Montana's lakes and streams. Describe your project's benefits to each of the items below. If there are no associated benefits, type "NA" for "not applicable".

Environmental Justice (EJ)

Will the project improve or create public access to a healthy environment?

Yes, currently there is a multi-use trail adjacent to the restoration project that is in need of repair. A section of the trail is directly on top of the eroding streambank and there is a bridge crossing that is need of repair. The project will improve public access and safety by relocating the dangerous section of trail and relocating/rebuilding the bridge crossing.

Will the project have a public benefit in a county where 15% or more of the population lives below the poverty level? Counties include: Big Horn, Blaine, Chouteau, Deer Lodge, Garfield, Glacier, Golden Valley, Hill, Lake, Liberty, Lincoln, Meagher, Mineral, Musselshell, Pondera, Powell, Roosevelt, Rosebud, Sanders, Silver Bow, Toole and Wheatland.

No

Will the project benefit historically underserved populations (e.g. minority populations, people with disabilities)?

No

Climate Change

Will the project improve climate change resilience for communities, native plants, wildlife or ecosystems?

Yes, the project will improve climate change resiliency and adaptation by reconnecting the Middle Fork West Fork Gallatin River with it's floodplain, expanding the potential for natural water storage in high-elevation meadows in the headwaters of the Missouri River system, and slowing the flow of water through the system.

Reactivating the historic channel and installing beaver dam analog structures will enhance the wetland/riparian area and bolster the productivity and ecosystem services provided including water quality, erosion control, carbon sequestration, and wildife/plant habitat.

Will the project restore or protect cool, late-season flow?

Yes, the floodplain reconnection and wetland enhancements will slow the waters momentum and allow for groundwater recharge, which contributes to base flow to surface waters during dry periods.

Impacts to Downstream Communities

Will the project reduce pollutant loading above a permitted point source discharge in a way that could increase assimilative capacity in the the receiving water?

Yes, the project will store water for late season release that will benefit the West Fork Gallatin River during low flow periods and will provide a source of clean water to the shallow groundwater system in the West Fork that has nutrient impairments from land application of treated wastewater.

Will the project help protect a drinking water source?

The primary drinking water source for the Big Sky County Water and Sewer District (BSCWSD) is the shallow alluvial Meadow Village Aquifer located under the West Fork Gallatin River, to which the Middle Fork West Fork Gallatin River is a major tributary. The Meadow Village Aquifer is recharged from surface water and groundwater interactions and is hydrologically connected to the West Fork Gallatin River. Thus, improving surface water quality in the Middle Fork West Fork Gallatin River provides improved water quality in surface water contributions recharging the Meadow Village aquifer. As a headwaters community numerous municipalities downstream benefit from water quality work in the Upper Gallatin watershed.

Tasks and Budget

DEQ uses a standard template to develop scopes of work for 319 contracts. The tasks below match up with DEQ standard scope of work template. Some tasks might not be applicable to your project. Please leave the non-applicable tasks blank. If your project doesn't fit the task outline, use the task labeled "Other" to describe your project.

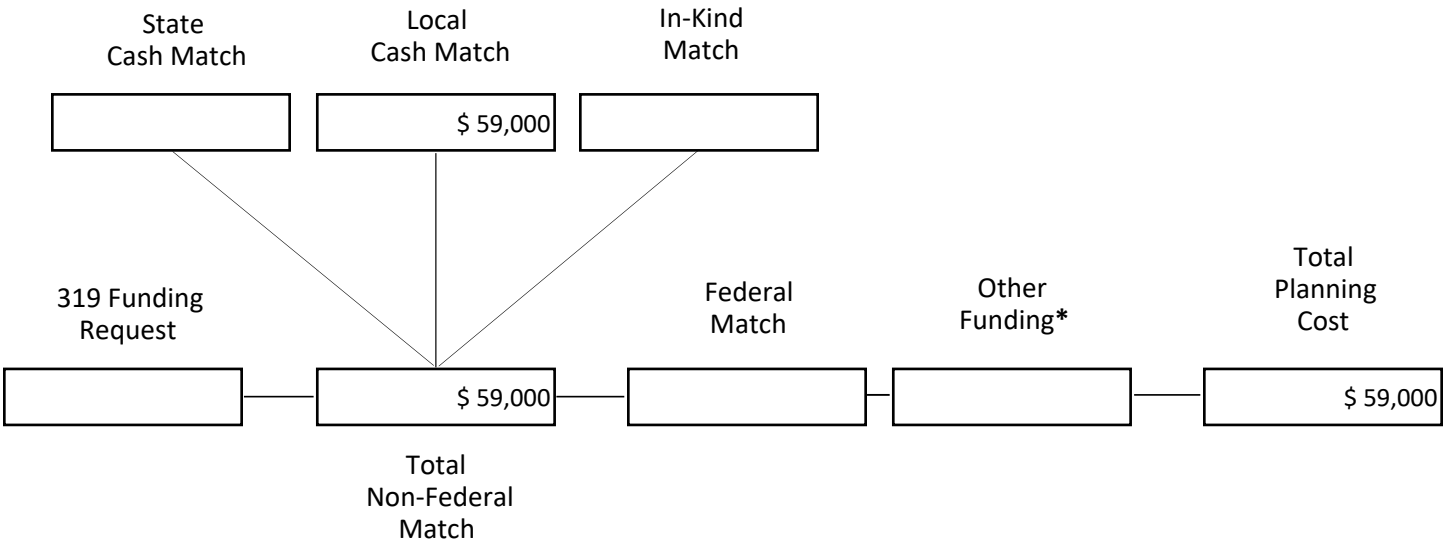
Task 1 - Project Planning Deliverables *(Include such things as completing project designs, conducting site evaluations, obtaining permits, organizing volunteers, conducting scoping meetings, etc. Identify specific deliverables that will be submitted.)*

The Task Force has been working with two homeowners associations (HOA) and the Lone Mountain Ranch who operates the adjacent recreational trail system to develop and fund the project. We have had multiple phone, video, and on-site planning meetings starting in September 2019. We have hired the engineering firm WGM to assist with design, permitting, and construction oversight. A conceptual design has been created to assist with outreach and fundraising efforts. A donation appeal has been sent to adjacent landowners. The Army Corps of Engineers has been out to the site to discuss permitting needs.

Project planning completed to date includes: 1) Development of Middle Fork West Fork Gallatin River Restoration Plan completed June 2019. 2) Wetland Delineation Report completed June 2020. 3) Conceptual design completed September 2021. 4) 75% design plans are in progress and anticipated for February/March 2022.

Project planning to be completed includes: 1) Final Designs. 2) Permitting - Joint Application for Proposed Work in Montana's Stream, Wetlands, Floodplains, and other Water Bodies will be prepared by WGM. 3) WGM will be hired to assist with project bidding and construction oversight. Construction will involve a mix contracted labor and volunteer labor. 4) The Task Force will handle all volunteer coordination including volunteer day preparation, on-site coordination and oversight.

Deliverables will include: conceptual designs, project reports, final designs, photographic documentation



Match Source	Big Sky Resort Tax FY22	Secured	✔
Match Source	Moonlight Community Foundation (Fall 2020)	Secured	✔
Match Source	Knight Foundation	Secured	✔
Match Source	Spanish Peaks Community Foundation	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.*

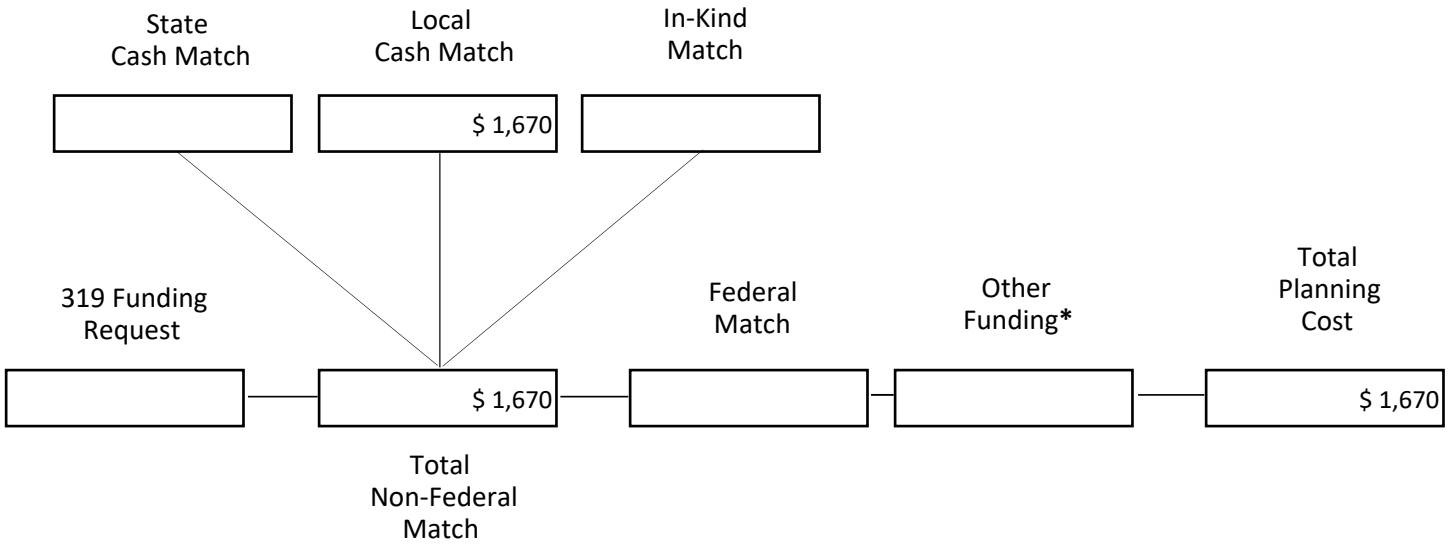
Landowner Agreements, Operation and Maintenance

This task only applies to projects involving on-the-ground activities. DEQ periodically evaluates the effectiveness of each on-the-ground project. To accomplish this, DEQ requires a process be in place to allow periodic access to the project site. The landowner agreement should also specify the roles of each project partner in the design, implementation and continued operation of on-the-ground pollution prevention practices. DEQ does not require the use of a specific landowner agreement template. In some situations, existing agreements between the project sponsor and the landowner may be sufficient.

Task 2 - Landowner Agreements, Operation and Maintenance Deliverables *(Include such things as landowner/ sponsor communication, and draft and final agreements.*

The Task Force has a standard agreement template including (but not limited to): project purpose, term of agreement, identification of project liaisons, laws governing the agreement, project design (facilitated by the Task Force, approved by landowner), revegetation of disturbed areas (Task Force responsible), operation & maintenance (Task Force responsible for project; landowner responsible to ensure their own land activities do not negatively impact the project/water quality benefits), land access provided to Task Force, contractors, DEQ, volunteers with prior notice.

Landowner communication has already occurred on several occasions and will be ongoing throughout the project planning and implementation process. A site walk with the landowners (i.e. HOA board of Directors) was conducted in August 2021. A presentation was give to each HOA during their annual board meetings. A landowner agreement template has been provided via email. Once the parties agree to the project design and agreement terms we will executed a final agreement. Deliverables will include 6 separate landowner agreement documents - Antler Ridge and Aspen Groves HOA's for project work, Hogan, Red Lodge LLC and Anderson for construction access, and Lone Mountain Ranch for bridge funding and construction.



Match Source	Big Sky Resort Tax FY22	Secured	✔
Match Source	Gallatin River Task Force Operating Funds	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

Task 3 - Project Implementation Deliverables *(Include such things as construction oversight, implementation of on-the-ground restoration practices, preparation and submittal of as-built drawings, etc.)*

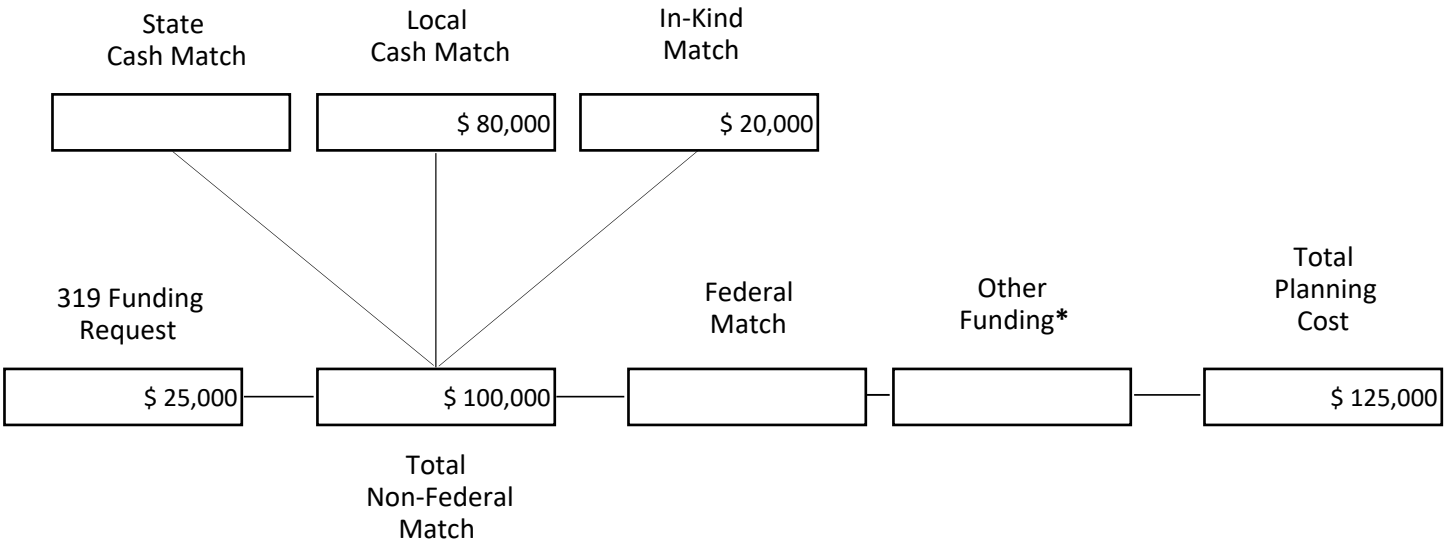
Construction will include a mix of contracted labor, in-kind donation of labor, and volunteers. Implementation of on-the-ground restoration practices and who will be responsible is as follows:

1) Contracted Labor - Channel relocation, including some excavation work to redirect the stream into a historic channel, restoring approx. 1,200 feet of stream channel in the adjacent meadow, installation of low-tech, process based restoration activities including large woody debris structures, beaver dam analog structures, and riparian plantings.

2) In-Kind Labor - Lone Mountain Ranch will provide in-kind labor to assist with the recreational trail and bridge relocation and rebuild the bridge over the new channel.

3) Volunteer Labor - Volunteers will assist with installation of the low-tech, process based restoration activities including installation of large woody debris structures, beaver dam analog structures, and riparian planting. The contractor will likely complete any heavy labor (i.e. auger holes for planting, installing posts to anchor structures, etc.) needed to get the project ready for volunteer assistance.

Construction oversight will be provided by WGM. The Task Force will provide volunteer oversight and partner/landowner coordination. Preparation of as-built drawings will be completed by the project engineer (WGM) and will be submitted to DEQ by the Task Force. Originally this project was anticipated to cost approximately $50-80K for construction. Relocating the recreational bridge will allow for an increased project benefit but has increased the projected project costs. Much of the increased costs will be covered directly by Lone Mountain Ranch via a cash donation and in-kind labor. Volunteer labor will also contribute to an in-kind match.



Match Source	Big Sky Area Resort Tax FY23	Secured	☐
Match Source	Moonlight and Spanish Peaks Community Foundation (Spring 2022)	Secured	☐
Match Source	Lone Mountain Ranch (Bridge Replacement)	Secured	☑
Match Source	Antler Ridge and Aspen Groves Homeowners Private Donations (partially secured)	Secured	☑

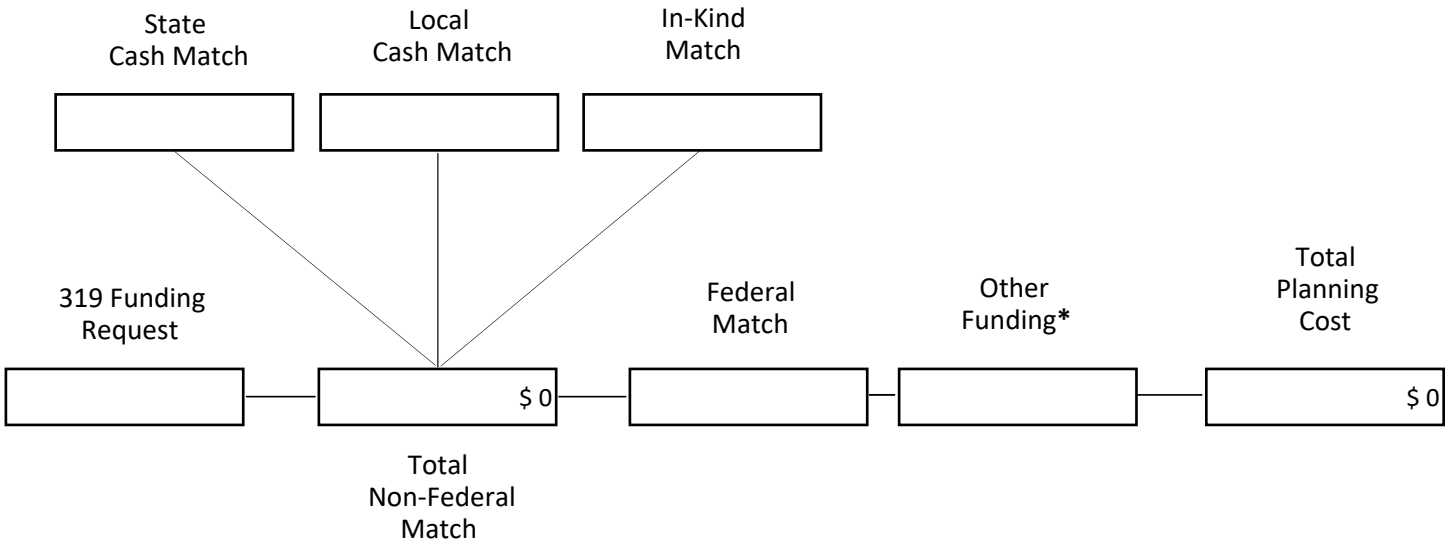
**Use this space to record any funding that will be used to support creation of the task deliverables, but will not be reported as match. The purpose of this information is to give application reviewers a clearer understanding of the total amount of funding required to complete a task.*

Other Activities

Use this task if the activities you are proposing are outside the scope of the typical design/implement/monitor process. Provide sufficient details to enable application reviewers to successfully compare the nonpoint source pollution reduction benefits of your project to those of other projects in the applicant pool.

Task 4 - Project Deliverables *(Include activities you will complete and the products you will submit to demonstrate completion.)*

N/A



Match Source _____ Secured ☐

Match Source _____ Secured ☐

Match Source _____ Secured ☐

Match Source _____ Secured ☐

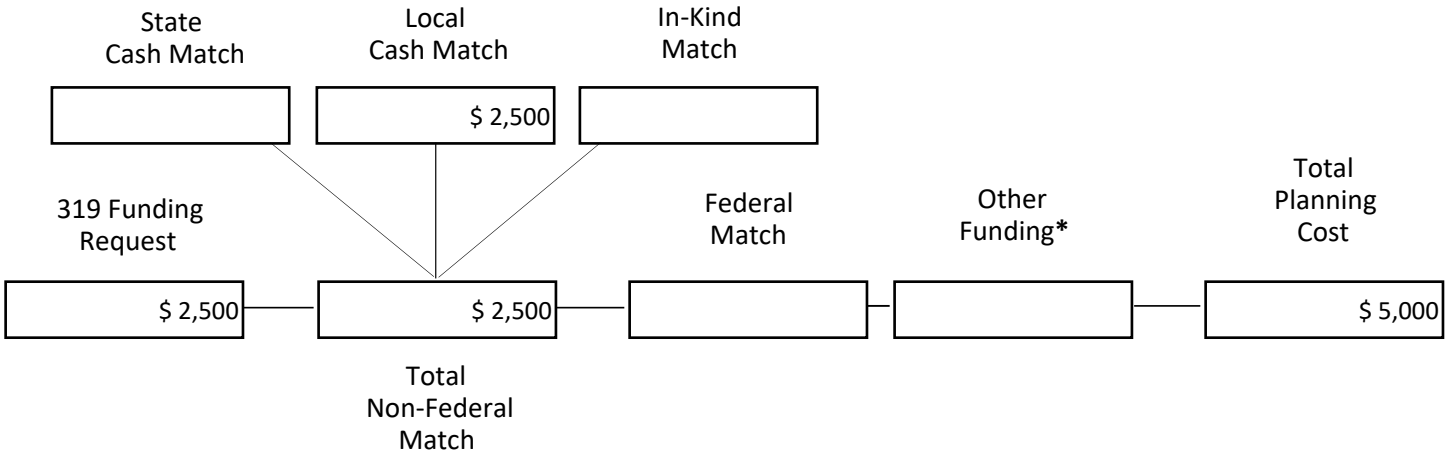
***Use this space to record any funding that will be used to support creation of the task deliverables, but will not be reported as match. The purpose of this information is to give application reviewers a clearer understanding of the total amount of funding required to complete a task.*

Project Effectiveness Monitoring

The short duration (1-3 years) and limited spatial extent (often just a few hundred yards) of most 319-funded projects frequently precludes the use of traditional water chemistry monitoring as a means of evaluating project effectiveness. Instead, DEQ encourages project sponsors to use simpler, more qualitative tools. Typically, this will include pre- and post-construction photo point monitoring, vegetation mortality measurements, and perhaps modeling to estimate pollution load reductions. Please contact one of the DEQ Nonpoint Source Program staff for guidance relative to your specific project.

Task 5 - Project Effectiveness Monitoring Deliverables *(Identify the specific tools and products you will use to evaluate and demonstrate the effectiveness of your project in reducing nonpoint source pollution.)*

Project effectiveness evaluation will include as written summary and photo documentation of monitoring results including: photo-point monitoring with before and after photos, pollutant load reduction estimates, and monitoring of constructed stream and wetland features to document the increase in wetland and riparian function. Monitoring will be conducted primarily by WGM with support from the Task Force (Deliverables = Monitoring Report Document).



Match Source	Big Sky Resort Area District (FY23)	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.*

Additional Attachments

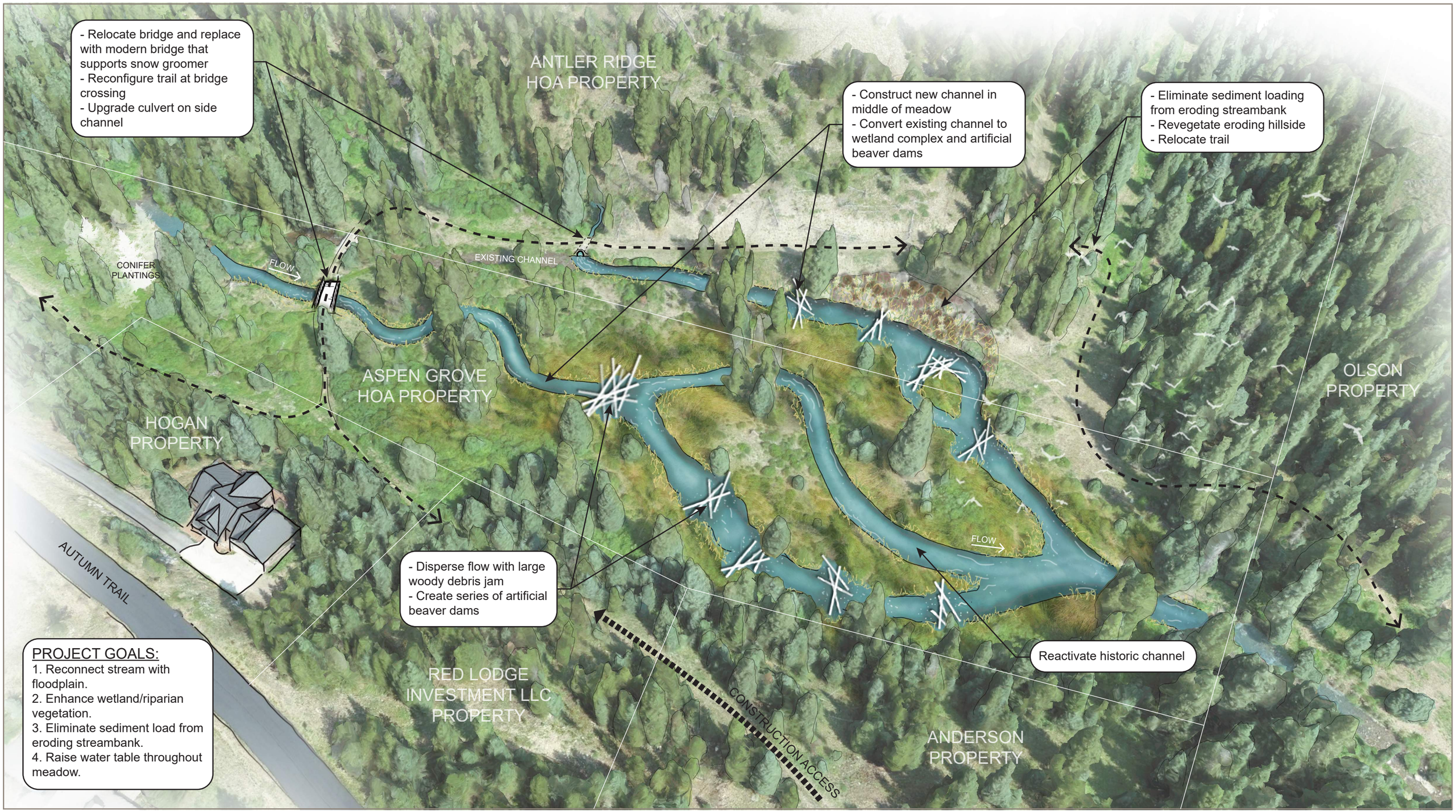
Attach additional items that could help reviewers better understand your project. Items could include site photos, design drawings, site evaluations, permits, etc. Please be conscious of reviewers' time, as they may not have time to read lengthy studies and reports. List all additional attachments below.

- [x] Middle Fork Project Overview & Project 5 Conceptual Design
- [x] Middle Fork Project 5 Overview (Outreach Materials)
- [x] Trout-Friendly Landscape Pledge (Outreach Materials)
- [x] Middle Fork West Fork Gallatin River Restoration Plan
- [ ]
- [ ]

Additional information that could assist reviewers in evaluating the project's potential impact on NPS pollution.

Project Map

Figure 1. Project Area Overview



WGMGROUP
Community Values. Inspired Futures.

GALLATIN RIVER TASK FORCE

MIDDLE FORK WEST FORK GALLATIN RIVER

Project 5 Stream Restoration Conceptual

Project Number: 210621
September 10, 2021

NORTH

Letters Of Support

Alan Johnson, Treasurer
Aspen Groves Owners Association
PO Box 161473
Big Sky, Montana 59716

October 21, 2021

319 Application Agency Review Panel
Montana Department of Environmental Quality
1520 E. Sixth Avenue
P.O. Box 200901
Helena, MT 59620-0901

RE: Gallatin River Task Force 319 Grant Application Support Letter – Middle Fork Project 5

Dear 319 Review Panel:

I am writing on behalf of Aspen Groves Owners Association to ask for your support for the Gallatin River Task Force 319 application, *"Middle Fork Restoration – Project 5"*. This project will improve and protect water quality in the Middle Fork and prevent further degradation of downstream waters in the West Fork and Gallatin mainstem.

As residents of Big Sky, we are keenly aware of the critical importance our rivers and streams have for quality of life in Montana. The Middle Fork project will help improve and sustain clean water in this beautiful stream that runs through our neighborhood on its way to the Gallatin River. The project is adjacent to a popular trail used for hiking, horseback riding, and cross-country skiing. As such, the project will improve the recreational uses of the stream corridor and will serve as an important educational opportunity for the community.

In August 2021, property owners in Aspen Groves attended a site walk with the Task Force to review project details and opportunities to get involved. We are currently working with the Task Force on a Middle Fork Restoration 5 fundraising campaign that will be sent to all Aspen Groves owners, explaining the benefits of the project, and requesting that owners donate to help fund project implementation.

I have made a personal donation to this important project and the community of Big Sky is rallying to improve and protect the Middle Fork West Fork Gallatin River. We strongly urge the DEQ to join us in funding the project. Thank you for your consideration.

Sincerely,

Alan Johnson
Treasurer, Aspen Groves Owners Association

ANTLER RIDGE
PO Box 160251, Big Sky, Montana 59716-0251

Antler Ridge
Home Owners Association Board of Directors

October 26, 2021

319 Application Agency Review Panel
Montana Department of Environmental Quality
1520 E. Sixth Avenue
P.O. Box 200901
Helena, MT 59620-0901

RE: Gallatin River Task Force 319 Grant Application Support Letter – Middle Fork Project 5

Dear 319 Review Panel:

The Antler Ridge Home Owners Association Board of Directors is writing to express support for the Gallatin River Task Force 319 application, "*Middle Fork Restoration – Project 5*". We believe that these projects can improve and protect water quality in the Middle Fork and prevent further degradation of downstream waters in the West Fork and Gallatin mainstream.

We have had productive discussions with the Gallatin River Task Force and are particularly interested in looking at ways that wetland restoration could be further increased, by utilizing all existing channels within the Antler Ridge and Aspen Grove park areas to produce not only sediment control but improved water quality treatment.

As Antler Ridge builds out, the Board have been focusing on how we can best steward, maintain and protect Antler Ridge's extensive open spaces and parkland while also meeting homeowner needs. We are working on management within our community to minimize and reroute unauthorized bicycle and pedestrian traffic along the river except for passive recreational uses which should help further the effort of minimizing sediment transport. We are

reinforcing our architectural guidelines to require implementation of best management practices. For the past three years we have worked with the Gallatin Invasive Species Alliance putting weed management controls in place (with a plan to expand that activity to the park space) and are also working with the fire department on wildfire mitigation actions that need to be taken by homeowners and in the open areas/park space.

In terms of support, while a financial contribution from our HOA operating budget would be difficult, are talking with the Task Force about a private donation appeal to our homeowners so that individuals who are willing and able can contribute financially to the project. Additionally, we can offer a significant number of volunteers (boots on the ground) to help implement Project #5. We also have a lot of fallen trees close to the old logging trail that leads down to the project area that can be used as needed to create dams, etc.

The Antler Ridge Board of Directors strongly urge you to fund the Gallatin River Task Force
319 application. Thank you for your consideration.

Sincerely and on behalf of the Antler Ridge Board of Directors,

Michelle Kristula-Green
Communications Director, Antler Board of Directors

Lone Mountain Ranch
750 Lone Mountain Ranch Road
PO Box 160069
Big Sky, Montana 59716

October 26, 2021

319 Application Agency Review Panel
Montana Department of Environmental Quality
1520 E. Sixth Avenue
P.O. Box 200901
Helena, MT 59620-0901

RE: Gallatin River Task Force 319 Grant Application Support Letter – Middle Fork Project 5

Dear 319 Review Panel:

Lone Mountain Ranch is writing to express support for the Gallatin River Task Force 319 application, "*Middle Fork Restoration – Project 5*". We believe this project can improve and protect water quality in the Middle Fork and prevent further degradation of downstream waters in the West Fork and Gallatin mainstream.

Lone Mountain Ranch holds trail easements within the Middle Fork drainage for our horse outfitter and cross-country skiing operations. We have had several discussions with the Gallatin River Task Force regarding the opportunity to relocate one of the trails and recreational bridge crossings to accommodate the proposed restoration project. In terms of financial support, Lone Mountain Ranch is able to provide partial funding and labor to assist with rebuilding the bridge.

We strongly urge you to fund the Gallatin River Task Force 319 application. Thank you for your consideration.

Sincerely,

Ryan Kunz
General Manager

DocuSigned by:
Ryan Kunz
89471E3E446A442...

Connor Parrish, Project Manager, Gallatin Home River Initiative

October 27, 2021

319 Application Agency Review Panel
Montana Department of Environmental Quality
1520 E. Sixth Avenue
P.O. Box 200901
Helena, MT 59620-0901

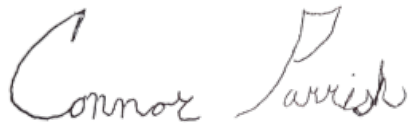
RE: Gallatin River Task Force 319 Grant Application Support Letter – Middle Fork Project 5

Dear 319 Review Panel:

Trout Unlimited is writing to express support for the Gallatin River Task Force 319 application, "*Middle Fork Restoration – Project 5*". This fall, TU assisted GRTF with the successful implementation of Project 3 from the Middle Fork West Fork Gallatin River Restoration Plan. We strongly believe Project 5 will build upon the success of previous work in the watershed and continue to can improve and protect water quality in the Middle Fork and prevent further degradation of downstream waters in the West Fork and Gallatin mainstem.

The Gallatin River Task Force is a valued conservation organization who has a consistent track record of implementing effective projects in the Upper Gallatin Watershed that have a positive impact on water quality, fish, wildlife, and the local community. As the Trout Unlimited project manager focused on water quality issues facing the Gallatin watershed I strongly urge you to fund the Gallatin River Task Force 319 application. Thank you for your consideration.

Sincerely,



Connor Parrish
Project Manager, Gallatin Home Rivers Initiative

Supplemental Information

GALLATIN RIVER
TASK FORCE

Middle Fork Restoration

BACKGROUND

The Gallatin River and its tributaries provide world renowned cutthroat trout fisheries, wildlife habitat, and an incredible array of recreational opportunities. Additionally, the watershed provides drinking water for Big Sky and communities downstream. While the blue-ribbon-waterways may appear pristine, they are under tremendous pressure from increased growth and development.

The Middle Fork of the West Fork of the Gallatin River (Middle Fork) is one of six tributaries of the Gallatin River that does not meet state water quality standards. Resource concerns include erosion, vegetation loss, and river pollution, which impact the aquatic life, cold water fishery, and recreational uses.

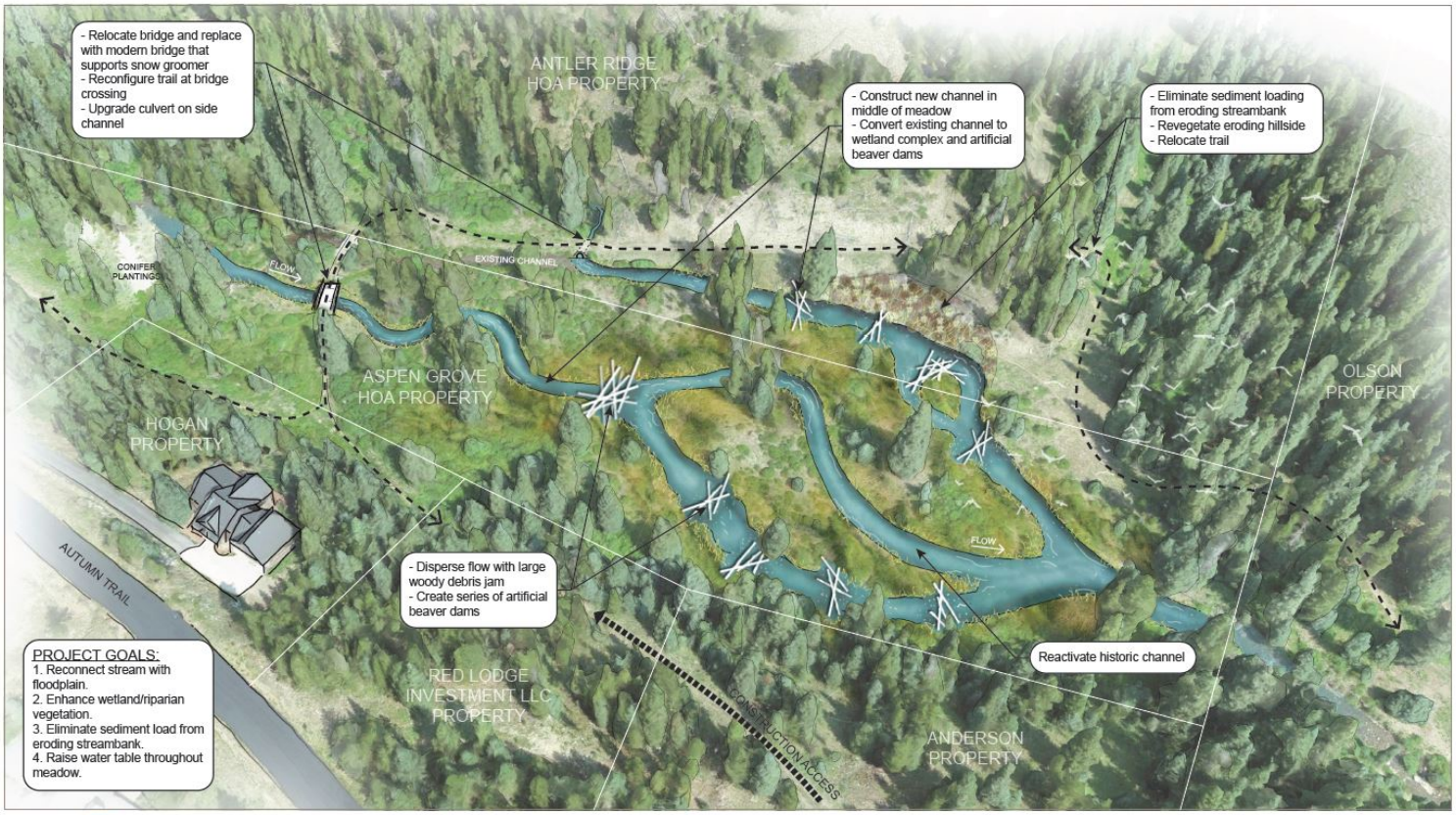
As the only watershed conservation nonprofit working in the Upper Gallatin Watershed, the Gallatin River Task Force is committed to improving river health and encouraging watershed stewardship in Big Sky. In 2018, we worked with Trout Unlimited to develop the ***Middle Fork West Fork Gallatin River Restoration Plan***, one of several road-maps for improving the health of our rivers.

Photos: Project 5 Overview and Historic Channel Location to be Restored

Photo: Project 5 Streambank erosion

Five water quality improvement projects are proposed from the headwaters on Lone Mountain to the confluence with the North Fork West Fork Gallatin River:

- Project 1 - Road Sediment BMPs
- Project 2 - Riparian Enhancement at Lake Levinsky
- Project 3 - Restoration Downstream of Lake Levinsky (Completed October 2021)
- Project 4 - Restoration at Lone Moose Meadows
- Project 5 - Restoration in Aspen Groves/Antler Ridge



WGMGROUP

GALLATIN RIVER TASK FORCE

MIDDLE FORK WEST FORK GALLATIN RIVER

Project 5 Stream Restoration Conceptual

Project Number: 210621

September 10, 2021

PROJECT 5 DESCRIPTION

A 2008 sediment and habitat assessment determined that streambank erosion contributes 26.2 tons/year of sediment to the river. In addition, the channel along the eroding streambank is a continuous riffle lacking diverse in-stream habitat. Project 5 entails channel relocation away from the eroding streambank and restoration into a historic channel.

Restoration work proposed for Project 5 includes restoring the channel into the center of the meadow, riparian plantings, wetland creation, and side channel reconnection.

The project will increase the water level within the meadow through floodplain reconnection which will enhance natural water storage. Improvements to the trail and bridge crossing will enhance user safety and reduce long-term impacts to the stream channel and riparian corridor.

IMPORTANCE OF WETLANDS

Wetlands are highly productive and biologically diverse systems that enhance water quality, control erosion, maintain stream flows, sequester carbon, and provide a home to at least one third of all threatened and endangered species.

Wetlands are indispensable for the benefits or "ecosystem services" that they provide, including freshwater supply and climate change mitigation.

Wetlands function like natural tubs or sponges, storing water and slowly releasing it. This process slows the water's momentum and erosive potential, reduces flood heights, and allows for ground water recharge, which contributes to base flow to surface waters during dry periods.

An acre of wetland is estimated to store 1–1.5 million gallons of water.

Take the Trout-Friendly Pledge

Water-Wise Landscaping for a Healthy Community and Gallatin River

Property Type: Residential | Commercial
*For properties in the Big Sky area

Name: _____
Date: _____
Physical Address:
_____
City/State:_____Zip:_____
Phone:_____
Email:_____

Are you interested in placing a Trout-Friendly sign in your landscape to show your commitment to watershed stewardship? Yes No

If you hire a professional landscaping company to care for your property, please provide their business name
_____

☐ My landscape is already trout-friendly

Select a level:
☐ Standard (at least 2 boxes/category)
☐ Gold (at least 5 boxes/category)

☐ I want to create a trout-friendly landscape (select the landscape practices you hope to achieve and the Task Force will assist you in reaching your goals)

Native plants are beautiful, water-wise, and attract pollinators and wildlife, creating a thriving ecosystem in your yard!

Landscape Design & Plant Selection

☐ The landscape incorporates plants that are suitable for Big Sky including native, drought-tolerant, low-water use, fire resistant, and cold-hardy species.
☐ Plants are grouped according to the microclimates on the property (i.e. moisture, sun, shade, wind, heat) and can thrive in these zones without much watering.
☐ Permeable hardscape such as pebble, rock, gravel pathways, rock terraces, and large boulders are utilized to minimize the amount of plant material needed, reduce erosion, and improve fire defensible space.
☐ The landscape does not incorporate any turfgrass and/or only utilizes native grass species.
☐ Turf areas and/or water-intensive plants have been removed and replaced with native/drought-tolerant species or permeable hardscape.
☐ Turf size and placement is practical (i.e. 30% or less of total landscape and surrounding structures to create fire defensible space).
☐ Steep or barren slopes are revegetated in order to prevent erosion and sediment runoff.
☐ For properties with a steam, river, or wetland on site – 5-20ft of unmanicured landscaping, native plants, shrubs, and trees is left as a buffer around the water resource.
☐Other:_____

By following every Trout-Friendly water conservation guideline, you could save 1,204 gallons of water each week - that's almost a ton of water every single day!

Water Conservation

☐ Watering occurs between 6:00 AM to 8:00 AM or 9:00 PM to 11:00 PM to reduce water loss from wind and heat (saves 20 gallons/day).

☐ Smart irrigation controllers are installed to automatically adjust watering times based on weather conditions (saves 40 gallons/day).

☐ Sprinklers do not overspray onto sidewalks, driveways, etc. (saves 20 gallons/day).

☐ Irrigation equipment including pipes, sprinkler heads, and hose bids are regularly inspected and repaired (saves 20 gallons/day).

☐ Drip irrigation has been installed for flower beds, shrubs, and trees to reduce evaporation and weeds (saves 20 gallons/day).

☐ Irrigation time has been reduced by 2 minutes or one irrigation cycle per week (saves 14 gallons/day).

☐ Mulch has been added (2-3") around trees and plants to retain moisture and minimize evaporation (saves 25 gallons/day per 1,000 sq. ft.).

☐ A rain gauge is placed in the landscape and the watering schedule is adjusted based on weekly rainfall (1inch water/1000sqft = 13 gallons per day).

☐ Other:_____

Being conscious of what pesticides, herbicides, and fertilizers you use can help prevent toxic algal blooms in the Gallatin River

Chemical Reduction

☐ A variety of non-chemical techniques (mowing, hand pulling, native vegetation) are utilized to manage weeds.

☐ A soil test has been conducted to determine what proportion of nutrients the landscape needs and soil amendments have been added as recommend by the test.

☐ The Gallatin Invasive Species Alliance has completed a free site assessment and the recommendations are being followed.

☐ Only natural herbicides and pesticides are used (i.e. Burn Out, clove oil, A.D.I.O.S.).

☐ If synthetic pesticide is used – it is only applied for state and county listed noxious weeds, using spot spraying or mechanical removal techniques (no broadcast applications).

☐ Only organic fertilizers such as compost, compost tea, etc. are used.

☐ If synthetic fertilizer is used – only slow release or organic fertilizer is applied, not to exceed 2 pounds of nitrogen per 1,000 square feet of yard per year.

☐ Watering after application of fertilizer or pesticides does not occur and is not applied before rainstorms.

☐ Application methods - watering after application of fertilizer or pesticides does not occur before rainstorms and is not applied within 20 feet of waterways.

☐Other:_____

Return to: Gallatin River Task Force
P.O Box 160513, Big Sky, MT 59716

Email: mark@gallatinrivertaskforce.org

Certify online at:
www.gallatinrivertaskforce.org

GALLATIN RIVER
TASK FORCE

Middle Fork West Fork Gallatin River Restoration Project Plan

June 28, 2019

MIDDLE FORK WEST FORK GALLATIN RIVER RESTORATION PROJECT PLAN

by

Jeff Dunn, Upper Missouri / Yellowstone Project Manager
321 E. Main Street, Suite 411
Bozeman, Montana 59715

Prepared in partnership with

32 Market Place, Suite 6 | PO Box 160513
Big Sky, MT 59716

June 28, 2019

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

ATTACHMENTS

INTRODUCTION

The *Middle Fork West Fork Gallatin River Restoration Plan* examines water quality improvement projects for the Middle Fork West Fork Gallatin River in five discreet project areas extending from the headwaters on Lone Mountain downstream to the confluence with the North Fork West Fork Gallatin River. Projects include:

- Project 1 - Upper Middle Fork West Fork Road Sediment BMPs
- Project 2 - Upper Middle Fork West Fork Riparian Buffer Enhancement around Lake Levinsky
- Project 3 - Middle Fork West Fork Restoration downstream of Lake Levinsky
- Project 4 - Middle Fork West Fork Restoration in Lone Moose Meadows
- Project 5 - Middle Fork West Fork Restoration in Aspen Groves/Antler Ridge

The *Middle Fork West Fork Gallatin River Restoration Plan* provides a foundation for an application to the Montana Department of Environmental Quality's (DEQ) 319 grant program to address identified water quality impairments and improve conditions so that the Middle Fork West Fork Gallatin River meets water quality standards and fully supports the aquatic life and primary contact recreation beneficial uses, which are currently only partially supported. The *Middle Fork West Fork Gallatin River Restoration Plan* provides a holistic approach for addressing water quality impairments within the Middle Fork West Fork Gallatin River watershed, while also promoting natural stream and riparian processes. Additional opportunities for watershed improvements are discussed within the "future opportunities" section at the end of this report.

PROBLEM DESCRIPTION

The Middle Fork West Fork Gallatin River is a tributary to the West Fork Gallatin River flowing approximately 6 miles from its headwaters on Lone Mountain to its confluence with the North Fork West Fork Gallatin River. The Middle Fork West Fork Gallatin River watershed is effectively divided into "upper" and "lower" segments by Lake Levinsky, which is a man-made impoundment in the Mountain Village that provides water storage for snowmaking at Big Sky Resort. The 2008 303(d) List of Impaired Waterbodies identified solids (suspended/bedload), alteration in stream-side or littoral vegetation covers, nitrate/nitrite, and fecal coliform as causes for impairment in the Middle Fork West Fork Gallatin River, which impact the aquatic life, cold water fishery, and primary contact recreation beneficial uses (DEQ 2010). In 2010, *The West Fork Gallatin River Watershed Total Maximum Daily Loads (TMDLs) and Framework Watershed Water Quality Improvement Plan* (DEQ 2010) provided TMDLs for sediment, nitrate+nitrite (NO^3+NO^2) and *E. coli* in the Middle Fork West Fork Gallatin River.

Pollutants identified in the 2010 TMDL document leading to water quality impairments in the Middle Fork West Fork Gallatin River include sediment, nutrients, and pathogens. Excess sediment is contributed from roads, resort development, recreation, and historic riparian vegetation removal. Sediment impairments, including the non-pollutant "alteration in stream-side or littoral vegetation covers" impairment, are described in the TMDL document as excess fine sediment in riffles and pool tails and low residual pool depths upstream of Lake Levinsky and decreased pool and large woody debris frequency downstream of Lake Levinsky. Excess nutrients (nitrate+nitrite) are identified in the TMDL document as derived from residential and resort land and vegetation clearing, residential and commercial landscape and maintenance and management, and sewer or service line failures or leaks.

The TMDL document indicates that controlling and limiting nitrate+nitrite from lands in the developed and residential areas upstream of Lake Levinsky are the focus of nutrient load reductions. Excess pathogens *(E. coli*) are identified in the TMDL document as derived from domestic pets, geese and waterfowl, wildlife, and refuse and runoff from streets, parking lots and other impervious surfaces in the developed area, along with sewer line failures or leaks, particularly downstream of Lake Levinsky. Percent reductions in pollutant loading necessary to meet water quality standards and restore full support of beneficial uses are presented in **Table 1**.

Table 1. Middle Fork West Fork Gallatin River TMDL Percent Reductions

Pollutant	Stream Segment	Percent Reduction	Anthropogenic Source Categories
Sediment	entire length	29%	road crossings, traction sand, streambank erosion, upland erosion, point sources
Nitrate+nitrite	upper	33%	residential and resort landscape management and maintenance, on-site septic systems
	lower	0%	
E. coli	entire length	55%	wastewater, residential and recreational land uses

In 2012, the Blue Water Task Force, which is now the Gallatin River Task Force (Task Force), prepared the *Upper Gallatin Watershed Restoration Plan* (BWTF 2012), which outlines a restoration strategy for addressing the identified water quality impairments in the West Fork Gallatin River watershed. In 2018, the Task Force, in partnership with a diverse group of stakeholders comprising the Big Sky Sustainable Water Solutions Forum, completed the *Big Sky Area Sustainable Watershed Stewardship Plan* (Dunn et al. 2018). The Watershed Stewardship Plan identifies action items for sustaining the ecological health of the river systems, water supply and availability, and wastewater treatment and reuse. The Task Force also recently completed the *Big Sky Area Wetland and Riparian Mapping* (Dunn and Pettit 2018) report, which identifies wetland and riparian restoration and conservation priorities based on natural resource and conservation values, along with wetland and riparian areas with a high potential for impacts from infrastructure and development.

PROJECT LOCATION AND IMPAIRMENT CAUSE ADDRESSED

The five proposed projects on the Middle Fork West Fork Gallatin River are within the West Fork Gallatin River HUC12 (100200080202) in the Upper Gallatin TMDL Planning Area in Madison (Projects 1, 2 and 3) and Gallatin (Projects 4 and 5) counties. Projects address sediment, nutrient and pathogen inputs, with specific project areas presented in **Figure 1** and the water quality impairment cause addressed presented in **Table 2**. In addition, Projects 1, 2, 3 and 5 are located within wetland and riparian priority areas identified in the 2018 *Big Sky Area Wetland and Riparian Mapping* report (**Figure 1**).

Table 2. Middle Fork West Fork Gallatin River Project Impairment Addressed

Project	Impairment Cause Addressed	Latitude	Longitude
1	Sediment, (*E. coli*, nitrate+nitrite)	45.29192	-111.40438
2	Nitrate+nitrite, (sediment, *E. coli*)	45.28904	-111.39657
3	Sediment, alteration in stream-side or littoral vegetation covers	45.28729	-111.39264
4	Sediment, alteration in stream-side or littoral vegetation covers	45.27927	-111.36258
5	Sediment, alteration in stream-side or littoral vegetation covers	45.26795	-111.33333

Parentheses indicate secondary benefits of the project

Figure 1. Project Area Overview

PROJECT 1 - UPPER MIDDLE FORK WEST FORK ROAD SEDIMENT BMPS

Project 1 Description:

Project 1 addresses sediment inputs from the road network within the headwaters of the Middle Fork West Fork Gallatin River watershed, with additional potential to reduce nutrient and pathogen inputs. Sediment contributions addressed in Project 1 include runoff from unpaved roads, along with traction sand inputs from both paved and unpaved roads. Project 1 sites include road crossings and near-stream road segments on the Middle Fork West Fork Gallatin River and its tributary streams in the headwaters of the Middle Fork West Fork Gallatin River watershed upstream of Lake Levinsky in the Big Sky Resort base area. Project 1 involves implementation of Best Management Practices (BMPs) by installation of barriers to sediment contributions and recontouring road shoulders where possible. A summary of Project 1 sites is provided in **Table 3** and **Figure 2**, with photographs of each site presented in **Attachment A – Road Sediment Reduction Sites**.

Project 1 Goal and Objectives:

The goal of Project 1 is to reduce sediment loading to streams at road crossings and near-stream road segments in the headwaters of the Middle Fork West Fork Gallatin River watershed upstream of Lake Levinsky. To attain this goal, the following objectives will be accomplished: 1) install and maintain BMPs at 16 road crossings and near-stream road segments on the Middle Fork West Fork Gallatin River (4 sites) and its tributaries (12 sites) upstream of Lake Levinsky (**Table 3** and **Figure 2**).

Project 1 Partners:

Potential Project 1 partners include the Gallatin River Task Force, Trout Unlimited, Big Sky Resort, Moonlight Basin, Montana Department of Transportation, Madison County, and private landowners.

Project 1 Methods:

To address sediment inputs at road crossings, coir wattles will be installed, and the road shoulder will be recontoured where possible. Sites will be maintained annually, and long-term solutions will be developed where possible to reduce the risk of sediment inputs due to culvert failures, enhance fish passage, and improve connectivity within the upper Middle Fork West Fork Gallatin River watershed.

Project 1 Ownership and Access:

Ownership is primarily Big Sky Resort LLC / Boyne Resorts Inc. and Moonlight Basin, along with the Montana Department of Transportation and private landowners (Quam Jay M, Harbaugh Darla L Trust). (**Table 3**). Access is provided by adjacent roadways.

Table 3. Project 1 Road Crossings

Site	Stream	Road Name	Road Surface	Ownership / Responsibility	Latitude	Longitude
MFX-01	tributary	Turkey Leg Road	Gravel	Big Sky Resort LLC	45.29021	-111.39948
MFX-02	Middle Fork	Sitting Bull Road	Paved	Big Sky Resort LLC	45.29211	-111.39796
MFX-03	tributary	Sitting Bull Road	Gravel	Big Sky Resort LLC	45.29030	-111.40294
MFX-04	tributary	Rising Bull Road	Paved	Big Sky Resort LLC / Boyne Properties Inc	45.29176	-111.40469
MFX-05	tributary	unnamed	Gravel	Big Sky Resort LLC	45.29011	-111.40097
MFX-06	tributary	Lone Mountain Trail (HWY64)	Paved	Montana Department of Transportation	45.29224	-111.39460
MFX-07	tributary	White Otter Road	Paved	Quam Jay M / Harbaugh Darla L Trust	45.29474	-111.40415
MFX-08	Middle Fork	White Otter Chair Lift Access	Gravel	Big Sky Resort LLC	45.29405	-111.40513
MFX-09	tributary	Rising Bull Road	Gravel	Big Sky Resort LLC	45.29745	-111.41301
MFX-10	Middle Fork	Rising Bull Road	Gravel	Boyne Properties Inc	45.29400	-111.41309
MFX-11	tributary	Mountain Loop Road	Paved	MB MT Acquisition LLC	45.29918	-111.41557
MFX-12	tributary	Mountain Loop Road	Paved	MB MT Acquisition LLC	45.29707	-111.41735
MFX-13	Middle Fork	Mountain Loop Road	Paved	MB MT Acquisition LLC	45.29408	-111.41632
MFX-14	tributary	Big Sky Resort Road	Paved	Big Sky Resort LLC	45.28449	-111.39906
MFX-15	tributary	parking lot	Gravel	Big Sky Resort LLC	45.29021	-111.39700
MFX-16	tributary	Lone Mountain Trail (HWY64)	Paved	Montana Department of Transportation	45.29580	-111.40402

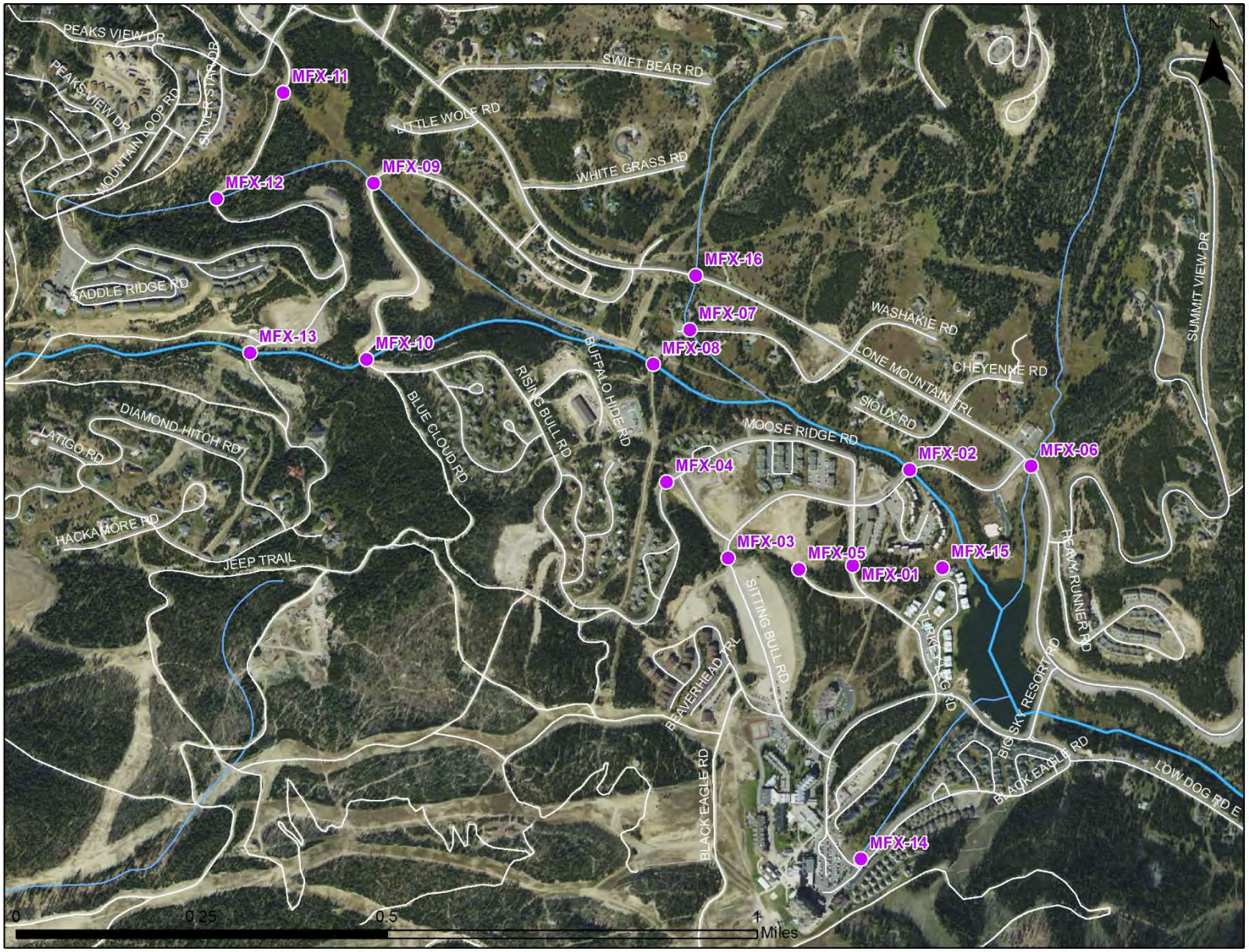


Figure 2. Project 1 Road Crossings

PROJECT 2 - UPPER MIDDLE FORK WEST FORK RIPARIAN BUFFER

Project 2 Description:

Project 2 addresses nutrient inputs along the margin of Lake Levinsky, with additional potential to reduce sediment and pathogen inputs. Project 2 entails planting riparian shrubs and conifers to enhance the riparian buffer along Lake Levinsky, which is an impoundment on the Middle Fork West Fork Gallatin River. Riparian buffer enhancement will filter surface and subsurface runoff from adjacent areas. Project 2 specifies 0.43 acres of riparian buffer enhancement along Lake Levinsky at five sites (**Figures 3** and **4**).

Project 2 Goal and Objectives:

The goal of Project 2 is to reduce nutrient loading to Lake Levinsky, which is an impoundment on the Middle Fork West Fork Gallatin River. To attain this goal, the following objectives will be accomplished: 1) install riparian shrubs and conifers at five sites totaling 0.43 acres.

Project 2 Partners:

Potential project partners include the Gallatin River Task Force, Trout Unlimited, Big Sky Resort, and Montana Department of Transportation, along with homeowners in the Lake Condominiums.

Project 2 Methods:

To address nutrient inputs, riparian shrubs and conifers will be planted to enhance the riparian buffer.

Project 2 Ownership and Access:

Ownership is primarily Big Sky Resort LLC and Big Sky Montana Inc. and access is provided by adjacent roadways.

Figure 3. Project 2 Existing Conditions along Lake Levinsky

Figure 4. Project 2 Riparian Buffer Enhancement Areas

PROJECT 3 - MIDDLE FORK WEST FORK RESTORATION DOWNSTREAM OF LAKE LEVINSKY

Project 3 Description:

Project 3 addresses sediment impairments, including "alteration in stream-side or littoral vegetation covers", in the Middle Fork West Fork Gallatin River by improving in-stream habitat in a channelized reach downstream of Lake Levinsky. Project 3 entails stream channel restoration and floodplain reconnection along approximately 420 feet of stream channel as depicted in **Figures 5** through **8** and **Attachment B – Projects 3 and 5 Conceptual Design Drawings**.

Project 3 Goal and Objectives:

The goal of Project 3 is to address sediment impairments by improving in-stream habitat within a channelized reach downstream of Lake Levinsky. To attain this goal, the following objectives will be accomplished: 1) approximately 420 feet of stream will be restored to a natural meandering riffle-pool sequence with increased floodplain connectivity and 2) develop wetland features and natural water storage within the existing channel.

Project 3 Partners:

Potential project partners include the Gallatin River Task Force, Trout Unlimited, and Big Sky Resort.

Project 3 Methods:

To address sediment and "alteration in stream-side or littoral vegetation covers" impairments, bioengineering techniques will be used to restore a natural meandering riffle-pool sequence with increased floodplain connectivity, including wetland creation and natural water storage features. Restoration will utilize native materials harvested on-site and appropriate to the landscape setting. Channel data collected within the project reach at monitoring site MFWF04-01 during the 2008 sediment and habitat assessment conducted by DEQ and the Task Force as presented in the *Upper Gallatin Base Parameter Report* (PBS&J 2009a) will provide a starting point for channel design (**Table 4**).

Table 4. 2008 Stream Channel Survey Data Summary for Monitoring Site MFWF04-01

Reach ID	Bankfull Channel Width (Feet)	Cross-Sectional Area (Square Feet)	Bankfull Mean Depth (Feet)	Width / Depth Ratio	Field Slope (Percent)	GIS Calculated Sinuosity	Riffle Pebble Count D50 (mm)	Mean Residual Pool Depth (Feet)	Number of Pools per 1000 Feet	Total Number of LWD per 1000 Feet
MFWF04-01	17.8	20.1	1.1	15.7	3.5	1.14	61	1.1	15	100
MFWF04-01	16.0	21.0	1.3	12.2	3.5	1.14	27			
MFWF04-01	21.2	19.8	0.9	22.7	3.5	1.14	55			

Project 3 Ownership and Access:

Ownership is primarily Big Sky Resort LLC, along with private landowners (Cliffhanger #9 LLC, Behm's Big Dog Lodge LLC). The site can be accessed from the downstream side of the dam at Lake Levinsky.

Figure 5. Project 3 Existing Channel Conditions within Project Reach

Figure 6. Project 3 Existing Conditions within Restored Channel Location

Figure 7. Project 3 Potential Natural Conditions Observed Downstream of Project Reach

Figure 8. Project 3 Channel Restoration Conceptual Design

PROJECT 4 - MIDDLE FORK WEST FORK RESTORATION IN LONE MOOSE MEADOWS

Project 4 Description:

Project 4 addresses sediment impairments, including "alteration in stream-side or littoral vegetation cover", in the Middle Fork West Fork Gallatin River by reducing streambank erosion, enhancing the riparian buffer, and improving in-stream habitat through the addition of large woody debris along approximately 1.3 miles of a historically logged reach. Project 4 entails riparian shrub and conifer plantings in historically logged areas along the channel, along with large woody debris placement as depicted in **Figures 9** through **12**.

Project 4 Goal and Objectives:

The goal of Project 4 is to address sediment impairments by enhancing the riparian buffer and improving in-stream habitat within a historically logged reach of the Middle Fork West Fork Gallatin River. To attain this goal, the following objectives will be accomplished: 1) riparian shrub and conifer plantings in historically logged areas within 50 feet of the channel margin and 2) large woody debris additions, including approximately six large woody debris clusters, along with the addition of individual trees. Riparian shrubs and conifers will be planted in open areas within 50 feet of the channel margin to reduce streambank erosion, increase streamside shading, and restore natural rates of large woody debris recruitment. Approximately 1.3 miles of stream will be addressed by Project 4.

Project 4 Partners:

Potential Project 4 partners include the Gallatin River Task Force, Trout Unlimited, and the Lone Moose Meadow Home Owners Association (HOA).

Project 4 Methods:

To address sediment and "alteration in stream-side or littoral vegetation covers" impairments, riparian shrubs and conifers will be planted along the channel margin and adjacent areas and large woody debris will be added along approximately 1.3 miles of stream, including large woody debris clusters and the addition of individual trees. Large woody debris will be obtained from development-related clearing the Big Sky area and from on-site as opportunities arise. Large woody debris targets presented in the 2010 TMDL document, along with data and observations from reference reaches in the North Fork West Fork Gallatin River (**Figure 11**), will provide a starting point for project design. Riparian plantings will include shrubs along the channel margin and conifers within 50 feet of the channel margin and will be targeted to enhance areas currently lacking natural regeneration post-logging.

Project 4 Ownership and Access:

Ownership is primarily Lone Moose Meadows and access is provided by adjacent roadways.

Figure 9. Project 4 Degraded Riparian Conditions in Monitoring Reach MFWF07-02

Figure 10. Project 4 Degraded Riparian Conditions in Monitoring Reach MFWF08-01

Figure 11. Project 4 Potential Natural Conditions Observed in the North Fork West Fork Gallatin River

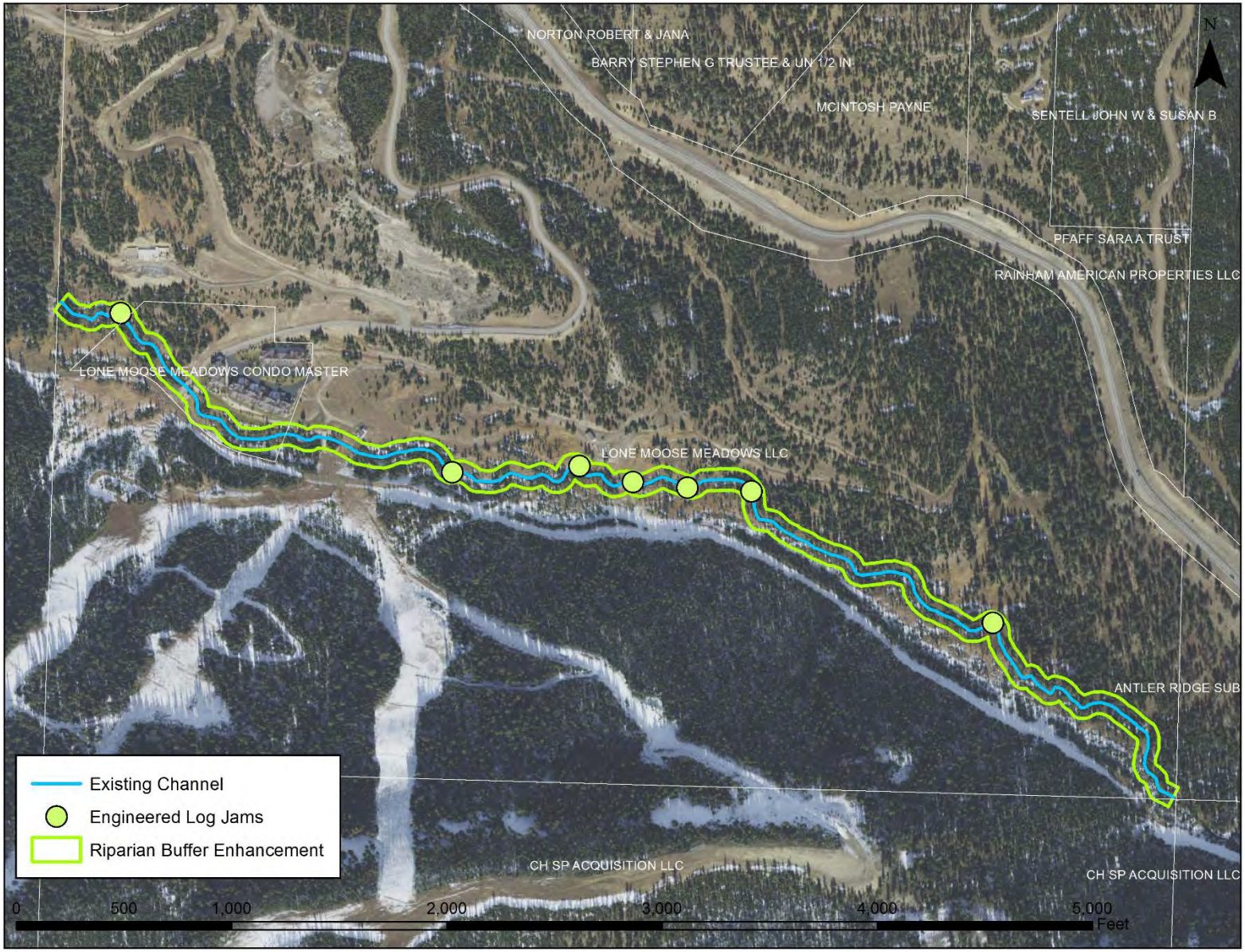


Figure 12. Project 4 Riparian Buffer Enhancement and Large Woody Debris Placement Conceptual Design

PROJECT 5 - MIDDLE FORK WEST FORK RESTORATION IN ASPEN GROVES/ANTLER RIDGE

Project 5 Description:

Project 5 addresses sediment impairments, including "alteration in stream-side or littoral vegetation covers", in the Middle Fork West Fork Gallatin River by reducing streambank erosion and improving in-stream habitat. Project 5 entails channel relocation away from a large eroding streambank and restoration into a historic channel within the center of the meadow. Within the project reach, a large streambank is eroding along the toe of an abandoned logging road that has been converted to a hiking and biking trail that is located within designated parkland in the Big Sky Area. There is silt fence hanging from the top of the streambank into the channel, indicating previous efforts to reduce sediment contributions at the site. The project reach was evaluated during the 2008 sediment and habitat assessment conducted by DEQ and the Task Force and streambank erosion was determined to contribute 26.2 tons/year (PBS&J 2009b). In addition, the channel along the eroding streambank is a continuous riffle lacking diverse in-stream habitat. Project 5 will restore approximately 540 feet of channel into the center of the meadow and will be accompanied by riparian plantings, wetland creation, and side channel-reconnection as depicted in **Figures 13** through **16**. This project is anticipated to increase the water level within the meadow through floodplain reconnection and wetland creation, which will enhance the potential for natural water storage. In addition, improvements to the trail and bridge crossing could be performed, which will enhance user safety and reduce long-term impacts to the stream channel and riparian corridor.

Project 5 Goal and Objectives:

The goal of Project 5 is to address sediment impairments by reducing sediment loading from streambank erosion and improving in-stream habitat. To attain this goal, the following objectives will be accomplished: 1) relocate the channel away from a large eroding streambank and restore the channel into a historic channel in the center of the meadow, totaling approximately 540 feet of restored channel, 2) enhance the riparian buffer, totaling approximately 1 acre, and 3) develop wetland features and natural water storage within existing channel.

Project 5 Partners:

Potential Project 5 partners include the Gallatin River Task Force, Trout Unlimited, Antler Ridge HOA, and Aspen Groves HOA.

Project 5 Methods:

To address sediment and "alteration in stream-side or littoral vegetation covers" impairments, bioengineering techniques will be used to restore a natural meandering riffle-pool sequence with increased floodplain connectivity. Restoration will utilize native materials appropriate to the landscape setting. Channel data collected within the project reach at monitoring site MFWF09-01 and immediately downstream in MFWF09-02 during the 2008 sediment and habitat assessment conducted by DEQ and the Task Force as presented in the *Upper Gallatin Base Parameter Report* (PBS&J 2009a) will provide a starting point for restoration design (**Table 5**).

Table 5. 2008 Stream Channel Survey Data Summary for Monitoring Sites MFWF09-01 and 02

Reach ID	Bankfull Channel Width (Feet)	Cross-Sectional Area (Square Feet)	Bankfull Mean Depth (Feet)	Width / Depth Ratio	Field Slope (Percent)	GIS Calculated Sinuosity	Riffle Pebble Count D50 (mm)	Mean Residual Pool Depth (Feet)	Number of Pools per 1000 Feet	Total Number of LWD per 1000 Feet
MFWF09-02	25.7	32.0	1.2	20.7	1.2	1.29	28	1.9	9	15
MFWF09-02	20.2	29.8	1.5	13.7	1.2	1.29				
MFWF09-02	28.5	36.4	1.3	22.3	1.2	1.29	69			
MFWF09-02	20.8	30.7	1.5	14.1	1.2	1.29				
MFWF09-02	31.8	40.8	1.3	24.8	1.2	1.29	51			
MFWF09-01	18.6	24.9	1.3	13.9	2.3	1.24	73	1.3	4	34
MFWF09-01	19.1	28.1	1.5	13.0	2.3	1.24				
MFWF09-01	24.3	34.3	1.4	17.2	2.3	1.24	47			
MFWF09-01	28.4	29.6	1.0	27.3	2.3	1.24				
MFWF09-01	22.9	30.3	1.3	17.3	2.3	1.24	76			

Project 5 Ownership and Access:

Ownership is Aspen Groves Development Corp and Antler Ridge Homeowners Assoc Inc, with access on abandoned logging roads that have been converted to a trail system that includes several private landowners (Olson John L and Marilyn J, Anderson Aileen &, Shnider Robert and Amy, and Hogan Jedediah K and Elizabeth A). The project is located within designated parklands in the Big Sky area.

Figure 13. Streambank Erosion along Former Logging Road and Current Trail

Figure 14. Streambank Erosion and Culvert along Former Logging Road and Current Trail

Figure 15. Project 5 Reach Overview and Historic Channel Location to be Restored

Figure 16. Project 5 Channel Restoration and Riparian Buffer Enhancement Conceptual Design

FUTURE OPPORTUNITIES IN THE MIDDLE FORK WEST FORK GALLATIN RIVER WATERSHED

1) Identify road crossing sites in Project 1 that may benefit from culvert removal and replacement with structures that facilitate fish passage to enhance connectivity.
2) Map and evaluate unassessed road and trail crossings on Big Sky Resort ski runs.
3) Address Low Dog Road (aka "Poop Chute") crossing at the base of Thunder Wolf chair lift.
4) Identify areas for wetland and riparian enhancement and the creation of natural water storage features on Big Sky Resort ski runs.
5) Evaluate opportunity to restore native Westslope Cutthroat Trout in the upper Middle Fork West Fork Gallatin River upstream of Lake Levinsky.
6) Improve stormwater management during construction activities and post-construction
7) Convert to making snow with treated wastewater effluent instead of water from the Middle Fork West Fork Gallatin River.
8) Examine the potential to convert Lake Levinsky into a lined storage pond to store treated wastewater effluent for use during snowmaking and restore the Middle Fork West Fork to a naturally flowing stream around the storage pond.
9) Identify additional opportunities for wetland and riparian conservation and restoration for priority sites and priority areas identified in the 2018 *Big Sky Area Wetland and Riparian Mapping* report.

REFERENCES

Blue Water Task Force, 2012. *Upper Gallatin River Watershed Restoration Plan*, prepared by the Blue Water Task Force Inc., Big Sky, MT.

Dunn, J., Filipovich K., Ingman, G., Benn, T., and Collins, Z., 2018. *Big Sky Area Sustainable Watershed Stewardship Plan*. Prepared for Gallatin River Task Force and Big Sky Sustainable Water Solutions Forum.

Dunn, J., Pettit M., 2018. *Big Sky Area Wetland and Riparian Mapping: Restoration and Conservation Opportunities*. Prepared for Gallatin River Task Force.

Montana Department of Environmental Quality, 2010. *The West Fork Gallatin River Watershed Total Maximum Daily Loads (TMDLs) and Framework Watershed Water Quality Improvement Plan*, prepared by the Montana Department of Environmental Quality, MO5-TMDL-01A-F.

PBS&J, 2009a. *Base Parameter Report: Upper Gallatin TMDL Planning Area.* Prepare for Montana Department of Environmental Quality.

PBS&J, 2009b. *Streambank Erosion Source Assessment: Upper Gallatin TMDL Planning Area.* Prepare for Montana Department of Environmental Quality.