



# Nonpoint Source Pollution Reduction Efforts in the Gallatin Watershed

Nonpoint source pollution occurs when rain or melting snow runs over or through the ground surface, picking up natural and human-caused pollutants, and depositing them into surface water.

Examples of nonpoint source pollution include:

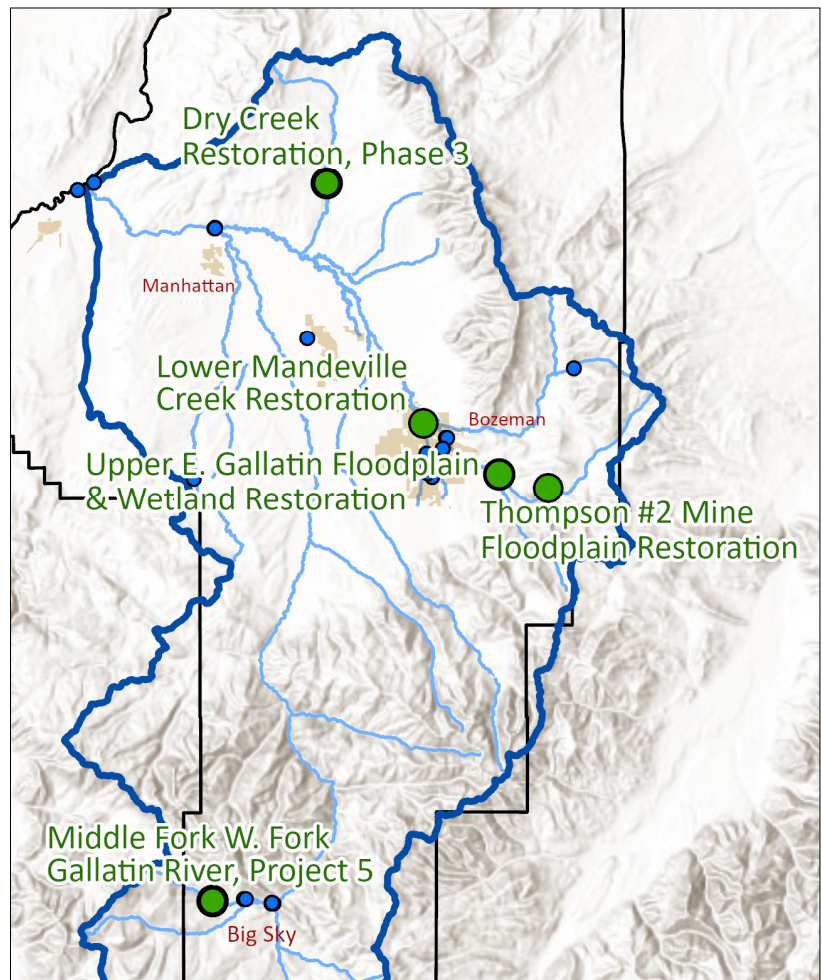
- Chemicals from urban areas
- Fertilizers from residential or agricultural land
- Sediment from eroding land and streambanks
- Bacteria & nutrients from animal & human waste

The Montana Department of Environmental Quality (DEQ) awards approximately \$1 million annually through Section 319 of the Federal Clean Water Act to implement projects that address nonpoint sources of pollution in streams, lakes, and wetlands throughout the state.

The rapidly growing Gallatin Watershed has 23 streams with at least one segment that has been designated as impaired. In this context, impaired means one or more pollutants are preventing that stream from achieving its intended uses. Examples of these uses include recreation, drinking water, and agriculture. The most common pollutants within the watershed are sediment and nutrients (nitrogen and phosphorus).

Fortunately, several organized and capable stakeholder groups work within the Gallatin Watershed. These groups effectively leverage DEQ funding by matching it with other funding sources to plan and implement projects that improve water quality in partnership with willing landowners. In part because of this capacity, DEQ plans to focus the majority of available funding in the Lower Gallatin Watershed for the next several years.

There are currently five projects being planned or implemented within the Gallatin Watershed (see map, right). The pages that follow highlight the goals, benefits, and partnerships at each project site.



Map of projects supported in part with financial assistance from DEQ. Larger green dots represent projects currently being planned or implemented, while smaller blue dots represent projects that are already complete. The Gallatin Watershed boundary and major streams are shown in blue. Gallatin County lines are shown in black.



## Middle Fork West Fork Gallatin River, Project 5

**Project Contractor:** Gallatin River Task Force

**319 Funds:** \$28,000

**Matching Funds:** \$167,340

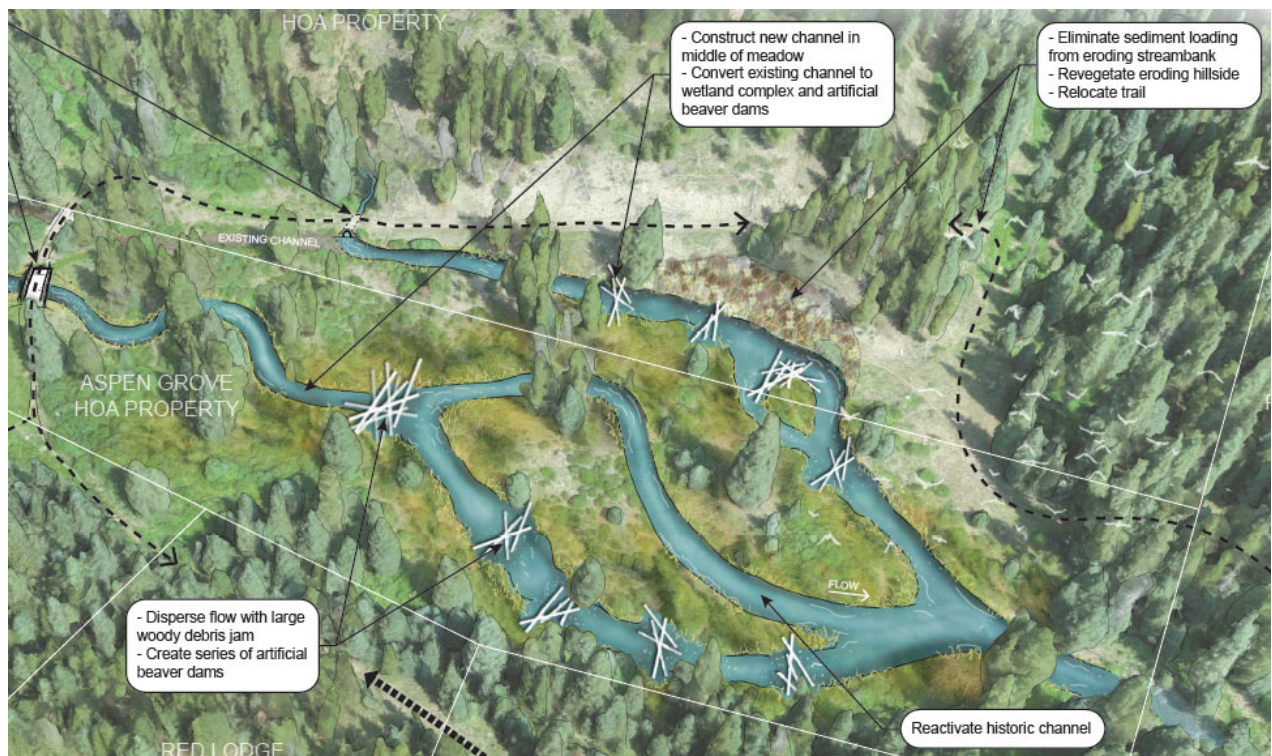
**Impairment Causes:** Sediment, *E. coli* & fecal coliform bacteria, Nitrate/Nitrite, alteration in streamside cover

**Project Goals:** Restore eroding streambanks to reduce sediment loading; restore stream processes to attenuate sediment; improve conditions for aquatic life

**Project Benefits:** Landowner support for similar projects within the community; anticipated beaver recolonization will minimize long-term maintenance



Drone image of eroding bank in project area. (Photo: WGM Group)



(Project Conceptual Design: WGM Group)



## Dry Creek Restoration, Phase 3

**Project Contractor:** Trout Unlimited (TU)

**319 Funds:** \$115,000

**Matching Funds:** \$77,700

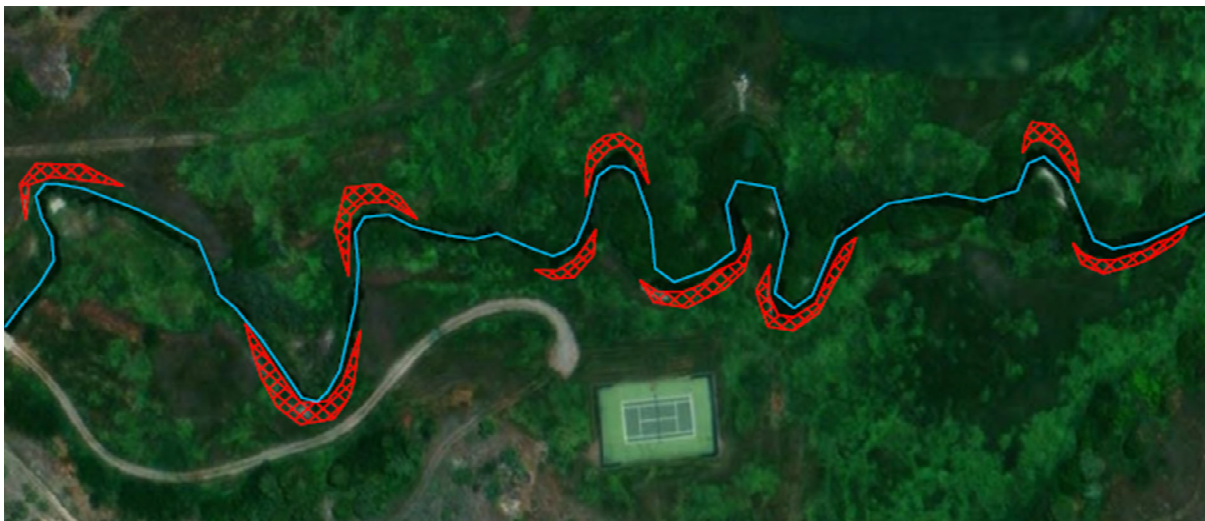
**Impairment Causes:** Sediment, Total Nitrogen, Total Phosphorus, chlorophyll-a (algae), alteration in streamside cover, physical substrate habitat alterations

**Project Goals:** Restore eroding streambanks to reduce sediment loading on 2000' of channel; restore stream processes and provide flood resilience; improve riparian and in-stream conditions to restore lost habitat

**Project Benefits:** Landowner support for similar projects within the community; post-9/11 combat veterans will contribute labor to the restoration efforts through a partnership with the non-profit Warriors on Quiet Waters



Before & after from Phase 1 of Dry Creek Restoration. (Photos: TU)



Phase 3 project. Eroding streambank zones on approximately 2000' of Dry Creek are highlighted in red. (Image: TU)



## Upper East Gallatin Floodplain & Wetland Restoration

**Project Contractor:** Gallatin Watershed Council (GWC)

**319 Funds:** \$305,450 (total for design & implementation)

**Matching Funds:** \$220,750

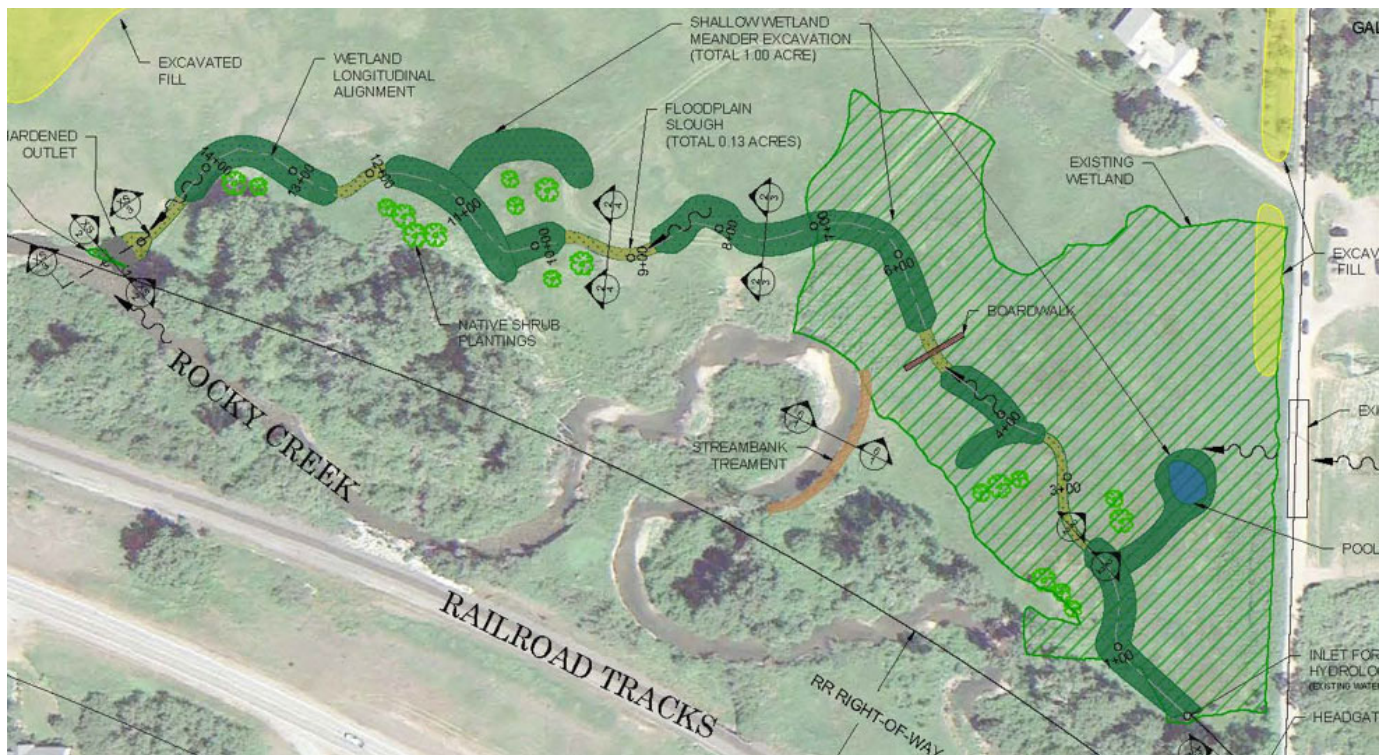
**Impairment Causes:** Total Nitrogen, Total Phosphorus

**Project Goals:** Restore wetland and riparian processes to attenuate sediment and nutrients; reduce streambank erosion; improve riparian and instream habitat

**Project Benefits:** Landowner support for similar projects within the stream reach; improves flood storage capacity to reduce downstream flooding; GWC will use the project site as a classroom to demonstrate the benefits of stream restoration and nonpoint source pollution reduction; habitat monitoring will be conducted by volunteers led in partnership with the Sacajawea Audubon Society



Eroding bank with shallow rooted vegetation at project site. (Photo: GWC)



GWC is designing an off-channel slough and wetland complex (green areas) and treatment of a 200' section of the E. Gallatin River streambank (orange area) that is migrating into the planned slough and wetland complex. Work is scheduled to begin in the fall of 2024. Note: This stretch of the E. Gallatin River is locally known as Rocky Creek. (Conceptual Designs: Confluence Consulting)



## Thompson #2 Mine Floodplain Restoration

**Project Contractor:** Gallatin Watershed Council

**319 Funds:** \$43,450

**Matching Funds:** \$37,700

**Impairment Causes:** Alteration in streamside vegetative cover, substrate alterations, sedimentation

**Project Goals:** Restore wetland and riparian processes to attenuate sediment on three spring creek tributaries to Rocky Creek; restore floodplain connectivity to channel complexity to improve groundwater recharge

**Project Benefits:** Landowner support for similar projects; coordination with DEQ's Abandoned Mine Lands Program; habitat monitoring and revegetation work will be conducted by volunteers led in partnership with the Sacajawea Audubon Society



A GWC staff member stands in an incised channel cross-section. Incision is preventing the stream from flowing out onto its floodplain. (Photo: GWC)



The channel flows through coal mine tailings as it enters GWC's project area. DEQ's Abandoned Mine Lands program is removing mine waste from the drainage to a new, upland repository site, and reconstructing the stream channel on native bed material prior to implementation of GWC's work. (Photo: GWC)



## Lower Mandeville Creek Restoration

**Project Contractor:** Trout Unlimited (TU)

**319 Funds:** \$183,076

**Matching Funds:** \$122,051

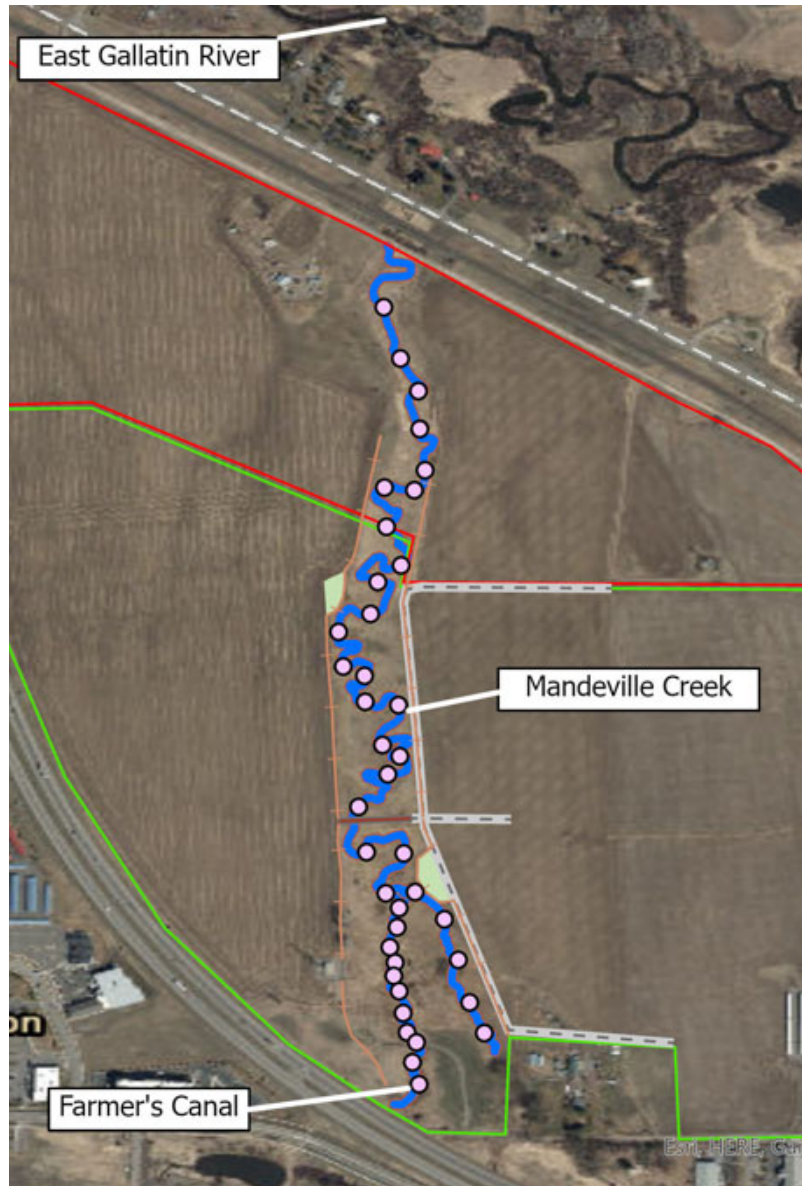
### Mandeville Creek Impairment Causes:

Total Nitrogen, Total Phosphorus

**Project Goals:** Attenuate sediment and nutrients and reduce water temperature; restore natural stream processes; improve riparian and instream habitat

**Project Benefits:** Boardwalks with educational signage will discuss the role of low-tech instream structures in cost-effective restoration of trout habitat and nonpoint source pollution reduction; anticipated beaver recolonization will minimize long-term maintenance

TU will install a series of beaver dam analogues and post-assisted log structures (pink dots), and restore native woody riparian vegetation along 1.2 miles of Mandeville Creek and 350 feet of Farmer's Canal. Viewing platforms with educational signage (light green areas) will be connected by a system of boardwalks. (Project Conceptual Design: TU)



Stakeholders tour the project area, where riparian vegetation is currently absent. (Photo: TU)



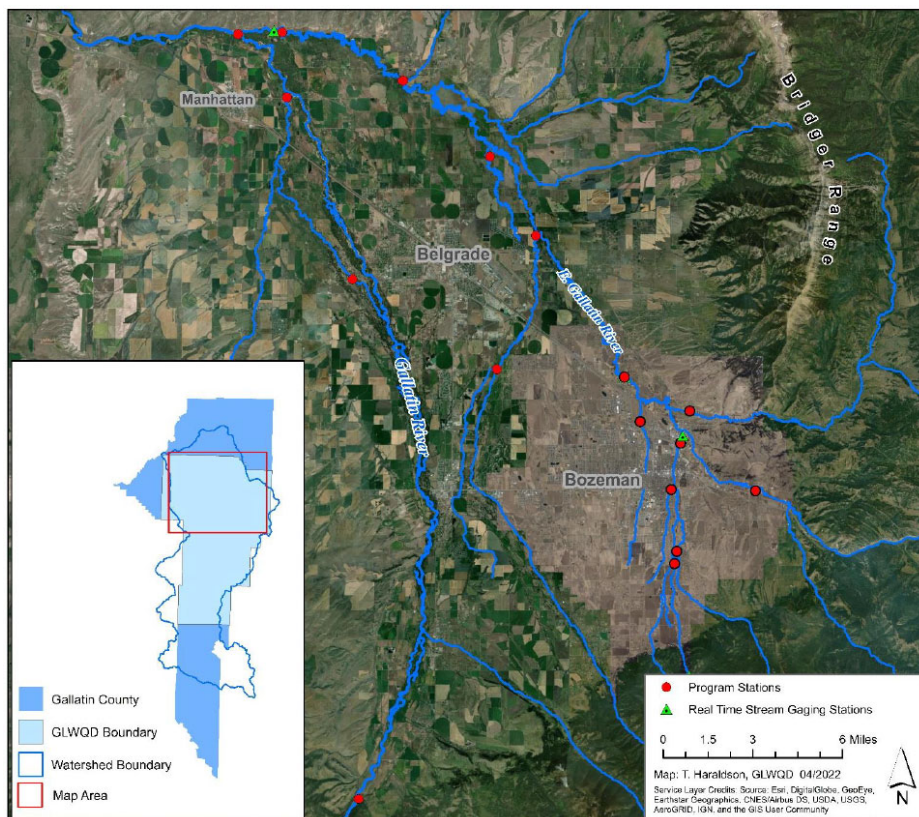
In addition to 319-funded projects, DEQ provides technical and financial support for many other initiatives aimed at effective management of nonpoint source pollution within the Gallatin Watershed:

## Gallatin Surface Water Monitoring Network

**Project Partner:** Gallatin Local Water Quality District

**DEQ support:** ~\$7,000/year lab analysis cost share, 2021-2023

**Program Goals:** The Gallatin Local Water Quality District collects consistent, long-term surface water quality and quantity data. Their network includes 17 monitoring stations on 12 streams in the northern portion of Gallatin County (see map, right). Data collection at these stations began in 2018 and will be used by the District to assess trends in parameters commonly associated with nonpoint source pollution. By providing financial support for lab analysis, DEQ is able to bolster partner capacity while expanding the watershed dataset available for DEQ's assessment purposes.



**Project Benefits:** Partnerships between the District and the Gallatin Watershed Council have incorporated volunteer monitoring for local community members to get involved.

## Wetland Restoration Effectiveness Monitoring



**Project Partners:** Trout Unlimited, Gallatin Watershed Council

**Program Goals:** DEQ is developing methodology to better quantify the nutrient and sediment reductions associated with wetland restoration by monitoring ground and surface water at 319 project sites with a wetland restoration component. DEQ staff will be monitoring before and after implementation at the Lower Mandeville Creek Restoration and the Upper East Gallatin Floodplain and Wetland Restoration sites.



## Noteworthy Partner Initiatives:

### Gallatin River Task Force

- The Gallatin River Task Force has been a key advocate for the formation of the Gallatin Canyon County Water and Sewer District, which will provide municipal sewage treatment to many homes currently served by old and failing septic systems within Gallatin Canyon.



- The annual Runoff Cleanoff/Dog-Waste Pickup Event removes over 100 pounds of pet waste and other trash from the parks and trails of the Big Sky area each spring.
- The Big Sky Water Conservation Program aims to reduce Big Sky's overall water use through community education, outreach, and voluntary action. This program promotes sustainable, native-focused landscaping practices that reduce water and fertilizer use that contribute to nonpoint source pollution.

### Gallatin Watershed Council

- The Gallatin Watershed Council formed the Gallatin Water Collaborative in 2020 to unify local efforts surrounding water quality and quantity in the Lower Gallatin Watershed. More than 35 stakeholder groups representing conservation organizations, government agencies, scientists, agricultural producers, recreationists and developers come together to restore and enhance water resources.



- The Gallatin Watershed Council and the City of Bozeman Forestry Division have partnered to develop Branch Out Bozeman Program, which aims to increase Bozeman's tree canopy and develop tools that guide tree planting in priority areas. In 2022 and 2023, 130 trees will be planted across the watershed.
- The Gallatin Watershed Council mobilizes the community to address nonpoint source pollution through a centralized volunteer program that is shared across multiple local conservation organizations, and focuses on training community members to complete tasks related to stream restoration, tree planting, water monitoring, bird surveys, weed pulls, and more. Over 80 community members have engaged in the program.