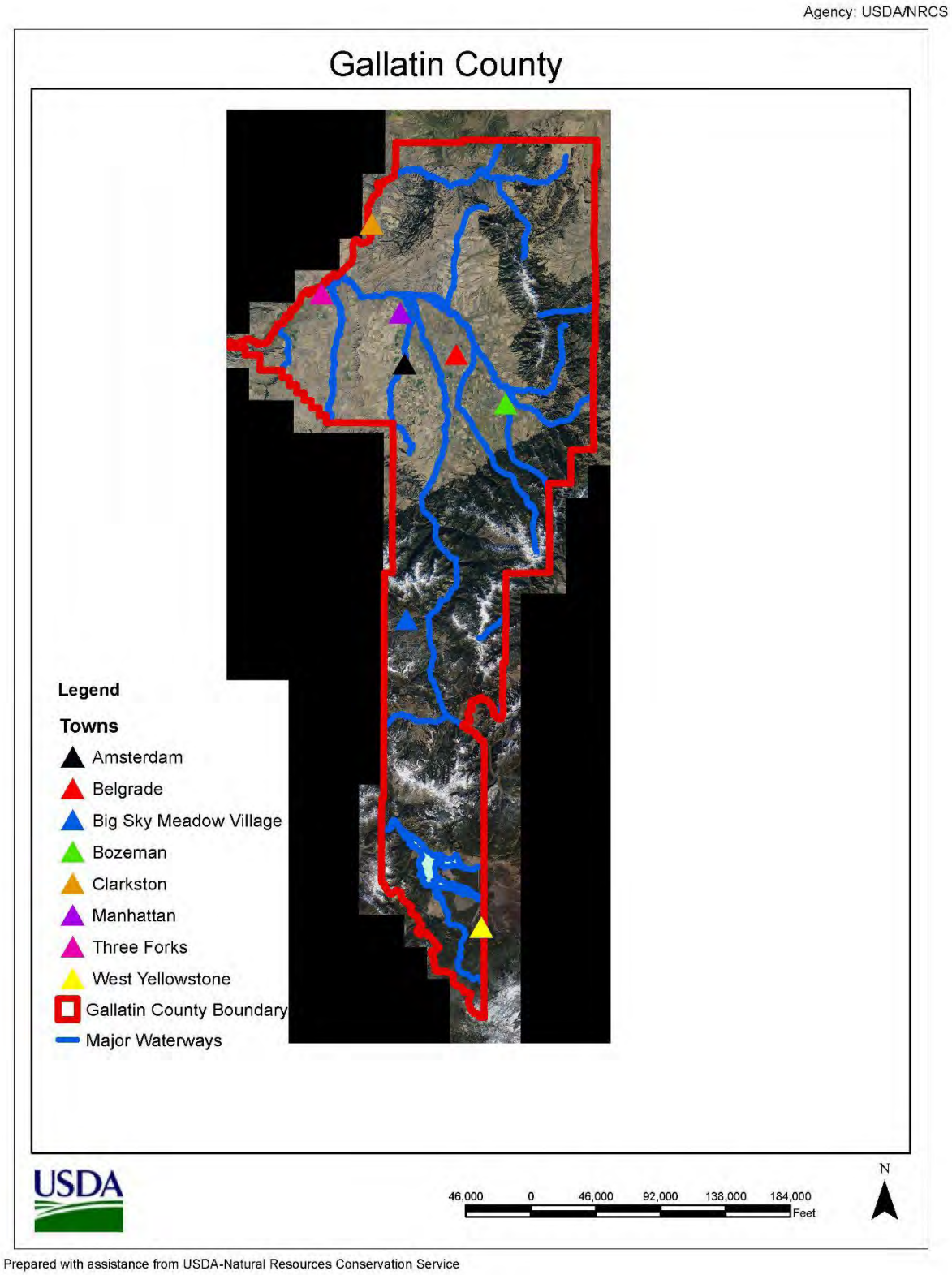
Long Range Conservation Strategy



I. Introduction:

This strategic plan is a summation of resources in Gallatin County to provide a guiding document to the Natural Resources Conservation Service and its partners. This tool will provide a synopsis of the county, where current conservation activities are taking place, where untreated resource concerns remain and where future efforts might target. The plan will be used in Gallatin County to analyze funding priorities in the future and continue a broad partnership with the common goal of strategically installing conservation practices on the ground.

This Natural Resource Long Range Strategy covers the period from 2019–2024. The strategy will serve as the guiding document for NRCS decisions regarding delivery of financial and technical assistance and administration of Farm Bill programs. This is a living document, intended to be updated and modified, as appropriate, to account for emerging issues.

II. History

Located in a valley in the heart of the Rocky Mountains, Gallatin County is the most populated and fastest growing county in southwest Montana. The County Seat of Bozeman at large encompasses over 50,000 people. Located in a spectacular Rocky Mountain setting, it is close to world-class downhill skiing, blue ribbon trout streams, Yellowstone National Park and a multitude of other outdoor activities in the nearby wilderness areas. Gallatin County covers over 2,500 square miles of mountain lands varying in topography and climate from temperate river valleys to snow-capped peaks and open ranch lands. Nearly half of all the land in Gallatin County is under public ownership administrated by the Gallatin National Forest, State of Montana, Bureau of Land Management, or the National Park Service (See Figure 1).

Gallatin County, named after President Thomas Jefferson and President James Madison's Secretary of the Treasury, Albert Gallatin, is full of history. The area within Gallatin County has been inhabited by native peoples dating back thousands of years. Tribal bands including the Shoshone, Nez Perce, Blackfeet, Flathead, and Sioux. The area was rich with game, water, and plants used by the natives. The Lewis and Clark Expedition left the first written description of the valley in both 1805 and 1806 during their epic journey. The Bozeman Trail was the northernspur off of the Oregon Trail. When gold was discovered 80 miles to the west of Bozeman, the rush was on over the new Bozeman Trail, established by John Bozeman. Many who followed this trail for gold returned to the Gallatin Valley to take up farming and business and as a result the town of Bozeman was formed in 1864. In 1883 the Northern Pacific Railway finished its pathway to Bozeman through what is now known as Bozeman Pass. This route paralleled the Bozeman Trail and is now Interstate 90. The town grew slowly, reaching a population of 3,500 by 1900. The Northern Pacific Railroad had completed its line through the town in 1883, and Montana Agricultural College held its first classes in 1893.

Established in 1863, Gallatin County is located in the southwest part of Montana. Gallatin County encompasses 2,500 square miles. Much of the private land is fertile farm fields, whileover 40% is managed by the U.S. Forest Service. (Figure 1. Public land in Gallatin County).

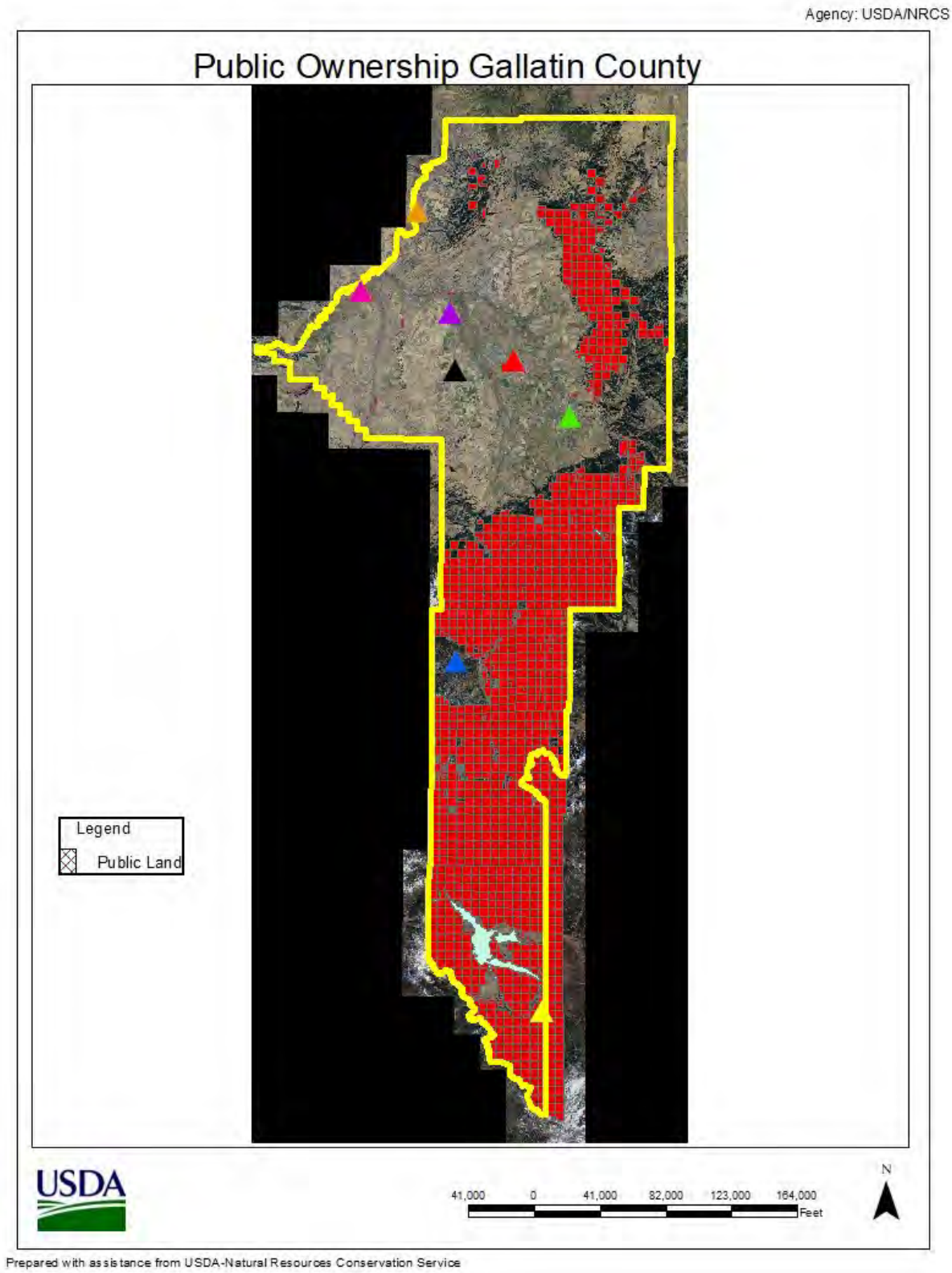


Figure 1**;** Public land in Gallatin County

Owner	Acres
US Government	6.6
US Bureau of Land Management	7248.8
US Fish and Wildlife Service	174.2
National Park Service	64579.6
US Forest Service	653163.5
State of Montana	149
Montana State Trust Lands	49874.6
Montana Fish, Wildlife, and Parks	11425.5
Montana University System	2273.5
Montana Dept of Transportation	155.8
Montana Dept of Natural Resources Water Projects	72.5
County Government	1157.3
City Government	4211.6

Table 1; Acres in Public land (Gallatin County Website)

Yellowstone National Park came about after the establishment of Fort Ellis in the Gallatin Valley and the quieting of political turbulence in the Gallatin area. Rumors coming out of nearby Yellowstone Valley prompted a group of leading citizens to explore the region. This group of men, known as the Washburn-Langford-Doane Expedition, brought about the establishment of Yellowstone National Park on March 2, 1872. It was the United States' first National Park.

Today, Gallatin County, Montana 's estimated population is 107,810 with a growth rate of 3.59% in the past year according to the most recent United States census data. Gallatin County, Montana is the 3rd most populous county in Montana. The major communities are Bozeman, Belgrade, Three Forks, Big Sky, West Yellowstone, and Manhattan.

III. Climate

The continental divide, west of Gallatin County has a considerable effect on the climate of Gallatin County, with the divide restricting the flow of warmer Pacific air from moving east, and drier continental air moving west. Consequently, the climate of Gallatin Valley is semiarid with cold winters and short cool summers (Hackett, O.M., et al 1960). Bozeman's average yearly temperature is 56 degrees with the average growing season approximately 107 days at an elevation of 4793'. The average temperature is 13 degrees in January and the mean temperature in August is 81 degrees with average mean snowfall at 73.1 inches. (Gallatin County Website; https:/gallatin.mt.gov).

The current collection of global climate models generally agree that Montana temperatures will continue to increase through the 21st century. (Whitlock C, et al., 2017). Rising temperatures will reduce snowpack, shift historical patterns of streamflow in Montana, and likely result in additional stress on Montana's water supply, particularly during summer and early fall.
Montana's growing season length is also increasing, due to the earlier onset of spring and more

extended summers; we are also experiencing more warm days and fewer cool nights. From 1951-2010, the growing season increased by 12 days. In addition, the annual number of warm days has increased by 2.0% and the annual number of cool nights has decreased by 4.6% over this period (Whitlock C, et al., 2017).

With increased temperatures and the observational record confirming that the average annual snowpack has declined in large portions of the American west (Mote 2003) and will likely continue to decline, due to more precipitation falling as rain rather than snow. Less surface water will be available in summer and late fall in the snowpack driven watershed of Gallatin County. Additionally, historical observations show a shift to earlier snowmelt and peak runoff in snowpack driven watersheds common in Gallatin County (Pederson et al. 2011a). This snowpack acts as a natural reservoir, slowly releasing water during the spring and early summer, sustaining approximately 2 million acres of irrigated farmland in Montana (Pierce et al. 2008).
Peak flows in local streams and rivers usually occur in May and June, as snow melts in the high elevation areas and precipitation falls in the form of rain (Gallatin Watershed Sourcebook: A Resident's Guide, 3rd ed). Snowpack from the Gallatin and Madison Ranges contributes runoff to streams later in the season than does snowpack from Bridger Mountains due to the deeper snowpack and higher elevations and as a result is a more dependable source for late-summer irrigation. Consequently, with less snowpack coming into the irrigation season and earlier runoff, agricultural producers will need to find alternatives to addressing less water availability later in the irrigation season than in the past. Efforts to improve the water holding capacity of soils by increasing the organic matter level is ongoing, however these efforts are localized, take a long time and are somewhat constrained by the existing soils present. Irrigation efficiency has also increased with the conversion of flood, handlines and wheel lines to pivot irrigation systems.While providing irrigated crops with the right amount of water at the right time, this conversion to more efficient irrigation systems may also negatively affect groundwater supplies by reducing the amount of irrigation water that had supplemented ground water or recharged aquifers.

Montana receives significant spring precipitation, with a statewide average of 5.8 inches (14.7 cm) (Whitlock C, et al. 2017). This spring precipitation contributes to the recharge of shallow soil moisture and groundwater supplies an important part in Montana's water cycle by releasing water slowly throughout the summer. Convective thunderstorms are responsible for most of the summer precipitation across the state and at times may produce large amounts of damaging hail (Whitlock C, et al., 2017).

Ground water utilization will likely increase as elevated temperatures and changing seasonal surface water availability will force users to seek alternatives. In a typical year, the majority of western Montana's precipitation falls as winter snow (62-65%) of total annual precipitation (Serreze et al. 1999). This natural bank of water supports Montana's ecosystems and economiesas it melts in the higher elevations and then flows east or west off the Continental Divide. Reductions in recharge are expected for mountain aquifer systems because of decreased snowpack and changes to patterns of infiltration. Snowmelt is more favorable to infiltration thanrainfall events; therefore, as an increasing percent of precipitation falls as rain instead of snow, infiltration is likely to decrease.

Efforts to increase irrigation efficiency, improve the water holding capacity of soils, exploring water storage options and other efforts to more effectively manage surface water resources by water right holders will reduce the percentage of water use by agriculture, which is currently 12.4% of the total water use within Montana (MT DNRC, 2015.). Development and population growth will add additional pressure on water resources in Gallatin County as both Bozeman and Big Sky are looking for additional water supplies as they also seek to increase water use efficiency as they seek to balance the demands of a growing population and existing resources.

Precipitation

	Jan	**Feb**	**Mar**	**Apr**	**May**	**Jun**
Average high in °F:	35	38	47	56	65	73
Average low in °F:	14	17	24	30	38	44
Av. precipitation in inch:	0.55	0.6	1.02	1.8	2.8	2.8
Average snowfall in inch:	9	6	8	4	1	0

	Jul	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**
Average high in °F:	83	82	72	58	43	33
Average low in °F:	50	48	40	32	21	12
Av. precipitation in inch:	1.42	1.2	1.26	1.4	0.91	0.6
Average snowfall in inch:	0	0	0	3	8	11

Table 2; From U.S. Climate Data
(https://www.usclimatedata.com/climate/bozeman/montana/united-states/usmt0040

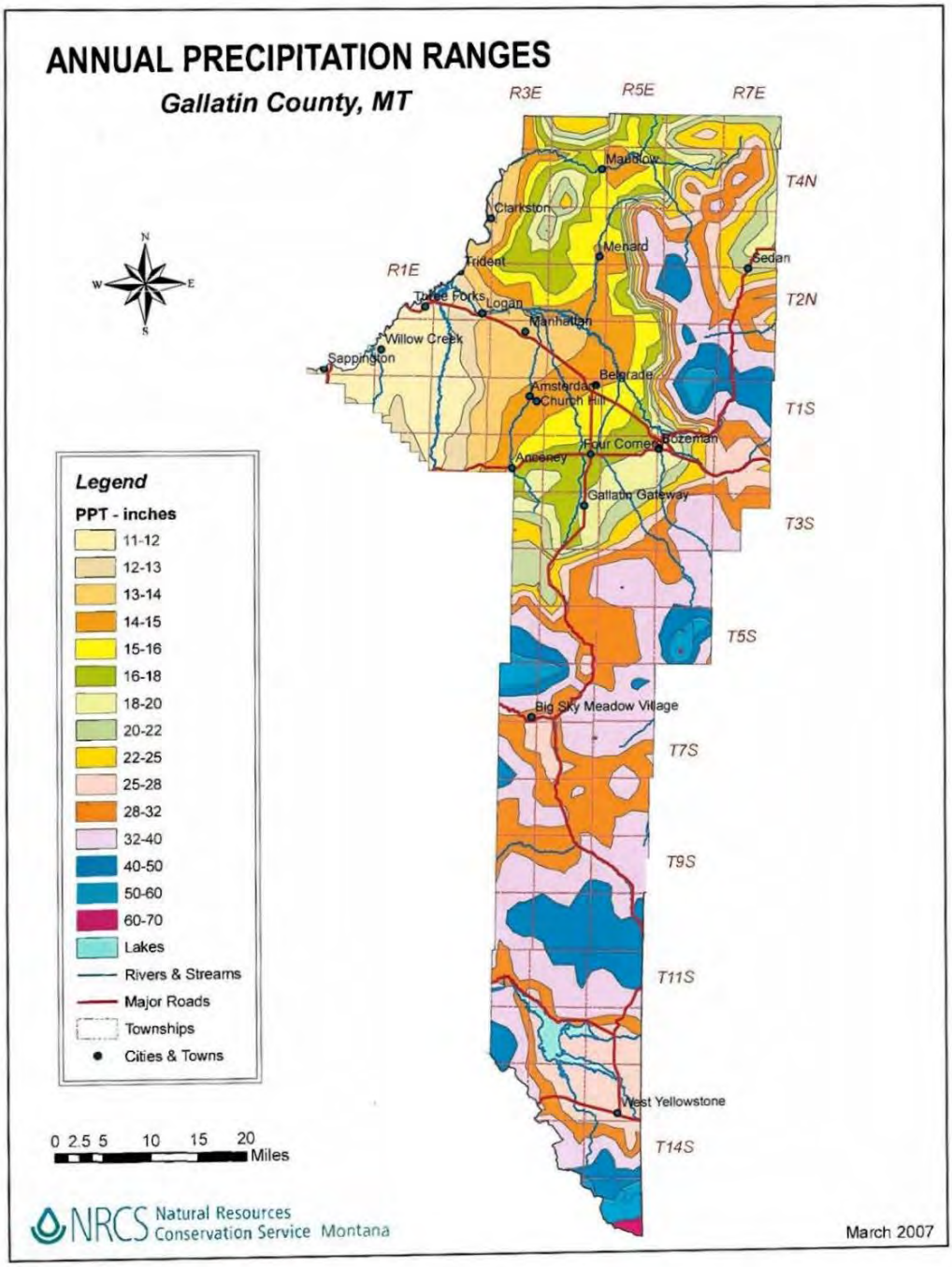


Figure 2; Annual Precipitation in Gallatin County

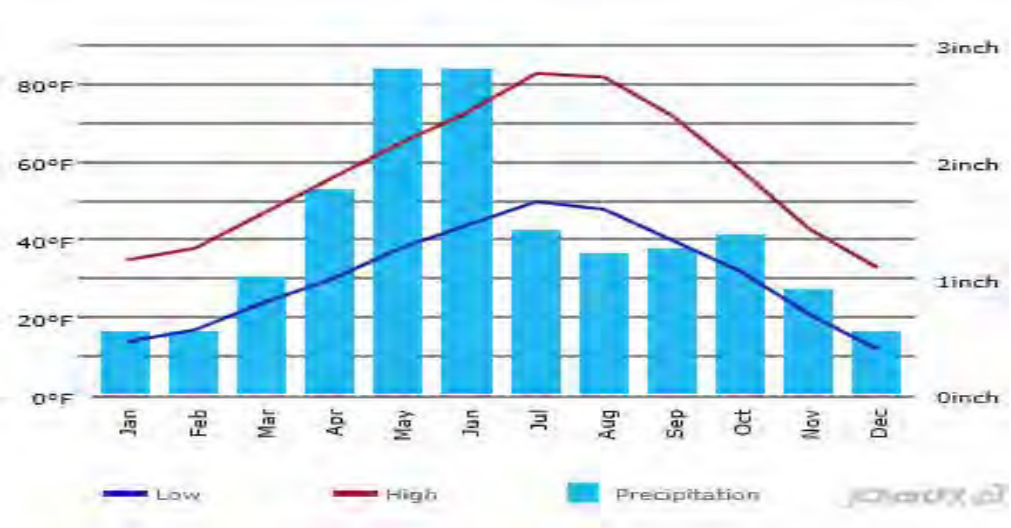


Figure 3; From U.S. Climate Data
(https://www.usclimatedata.com/climate/bozeman/montana/united-states/usmt0040)

IV. Natural Resource Inventory

This section of the Gallatin County Long Range Conservation Strategy examines the current natural resources in the county. Resource concerns have been divided into the categories of Soil, Water, Plants, Animals, Air, Energy and Human. Demographics for the county are under the human category. Information gathered to compile this portion of the Strategy was obtained from numerous sources, including but not limited to the U.S. Department of Commerce, Headwaters Economics, Montana Natural Heritage program, U.S. Department of Agriculture National Agricultural Statistics Service.

The information contained in the natural resource inventory, past conservation efforts and from data presented within this document will focus our future conservation efforts with our partners to address resource concerns.

A. Resource Concern-Human

Although agriculture still dominates parts of the Gallatin Valley landscape, its contribution to the overall local economy is declining, not because farming or ranching has not been profitable but because of the increase in non-farm earnings relative to on farm earnings. While agriculture is a smaller component of Gallatin County's overall economic base, it does provide important contributions to the county in the form of economic diversity, open space and culture. Total net income from farming and ranching dropped from $31.1 million in 1970, to $2.4 million in 1985, and to $7.1 million in 2000 (Gallatin County Growth Policy April 15, 2003). Recent numbers from the 2018 NASS (National Agricultural Statistics Service) report indicate that net farm income for 2016 had risen back to $68.6 million. Such drastic reductions and fluctuations have impacted local land use, especially with volatile agricultural markets that fluctuate widely depending upon the year, climate factors, politics, natural disasters, etc. In many cases, it has become more profitable to subdivide the land for housing rather than farm or ranch. This trend has contributed to an outward expansion of development, challenging the communities to further define appropriate growth and prompting much debate over terms like leapfrog development and

sprawl. The proportion of people living in incorporated areas peaked in 1970 at 70 percent, dropping to 58 percent by 1990.

The majority of residents (62%) are between the ages of 18 and 65 in Gallatin County, with 26% below the age of 18 and a median age of 32. Ninety five percent of the population is white with 48% of the population female (United States Census). Gallatin County's population has doubled since 1990 with a current population of approximately 111,876 (U.S. Census)

Population Change 2000-2015

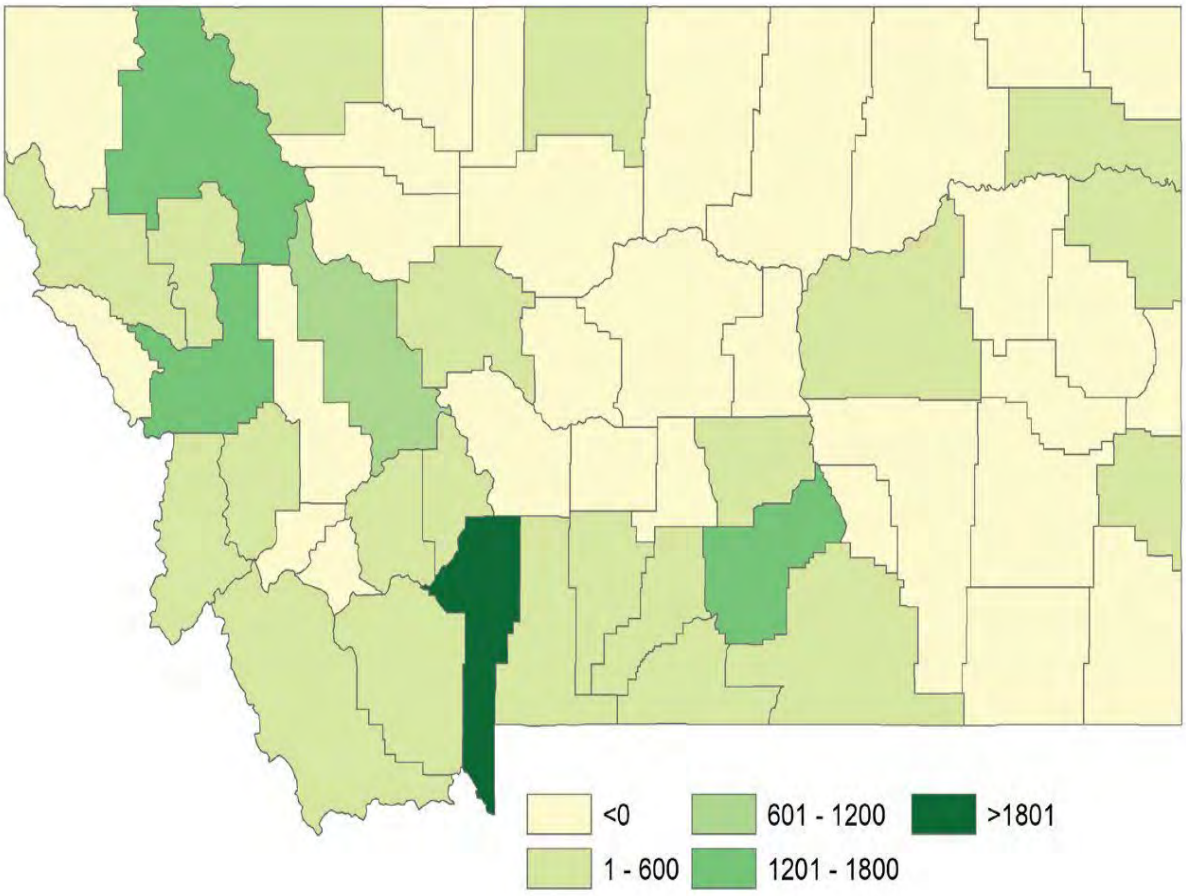


Figure 4; From Headwaters Economics

Farming is the only sector that lost jobs since 2001. Every other industry is growing. Professional and technical services, real estate and rental and leasing, accommodation and foodservices, health care and social assistance, and retail trade are growing the fastest (HeadwatersEconomics 2018).

Gallatin County continues to be one of the most economically stable counties in the State of Montana. The basis for the stability is in part due to Montana State University and United States Department of Agricultural being based in Bozeman, but also due to continued presence of tourists. Located near Yellowstone National Park, two destination ski areas, andrivers full of trout, tourism has played a significant role in helping maintain local economic stability.

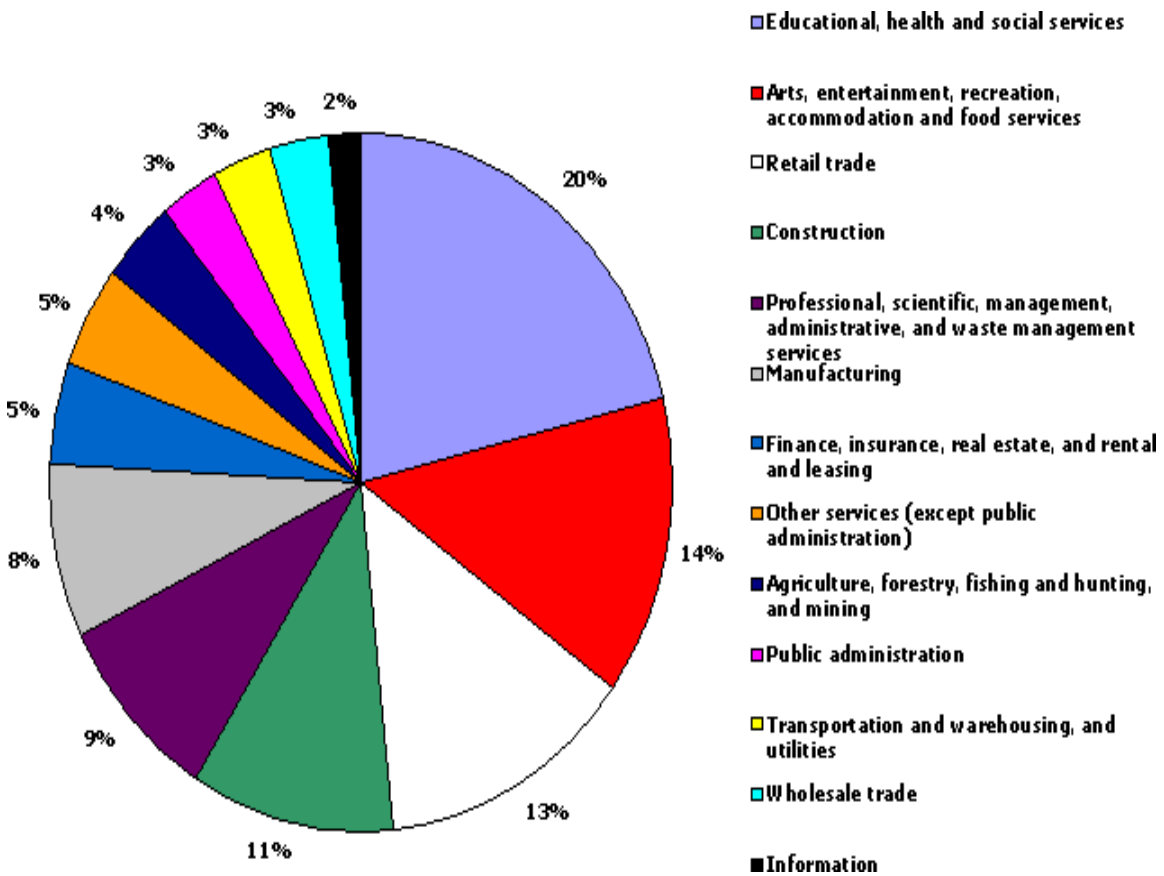


Figure 5; From Gallatin County, Montana website

Gallatin County	2007	2012	% Change
Number of Farms	1071	1163	8
Land in Farms (ac)	776868	702713	-11
Average Size of Farm	725	604	-17

Table 3; From Montana Agricultural Statistics 2018

Retaining viable working farms and ranches though conservation easements has contributed to maintaining a healthy agricultural economy in Gallatin County. Through the efforts of land trusts, NRCS, and Gallatin County, a significant amount of land is protected from developmentthrough the strategic establishment and purchase of conservation easements.

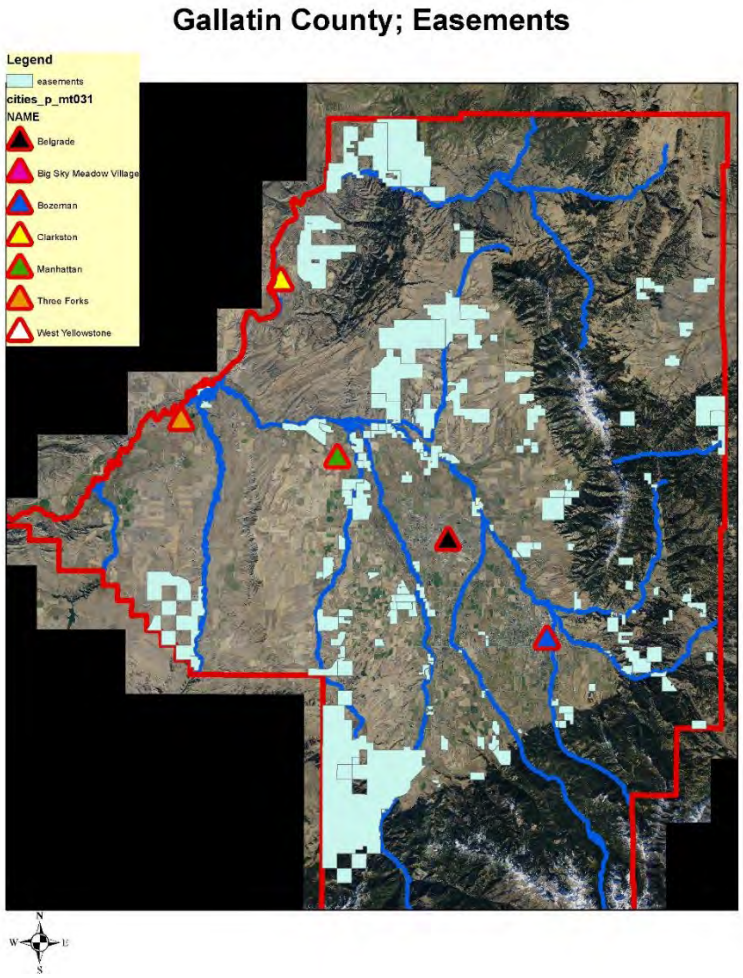


Figure 6; Easements in Gallatin County; NRCS data

B. Resource Concern-Plants

Gallatin County can be divided into three distinct regions. The first is the national forest managed by the U.S. Forest Service, which is largely above 5500' and forested with Douglas fir,lodgepole pine, Engelmann spruce, subalpine fir, white bark pine, limber pine, and aspen. The second region is the developed land, housing, streets, and urban areas. The third region is the working lands, including pasture, forest, range and cropland, both irrigated and dryland. The principal crops grown in the county are winter wheat, spring wheat, alfalfa, grass hay, barley, oats, peas, canola, chickpeas, potatoes and some silage corn. This report will focus on the private working lands portion of the county since this is the area that aligns within the scope of the Natural Resources Conservation Service mission of 'helping people help the land'. There is a federally listed plant species, *Ute Ladies' Tresses* listed as threatened by the United States Department of the Interior; Fish and Wildlife Service. The plant species of concern list for Gallatin County is included in Appendix D.

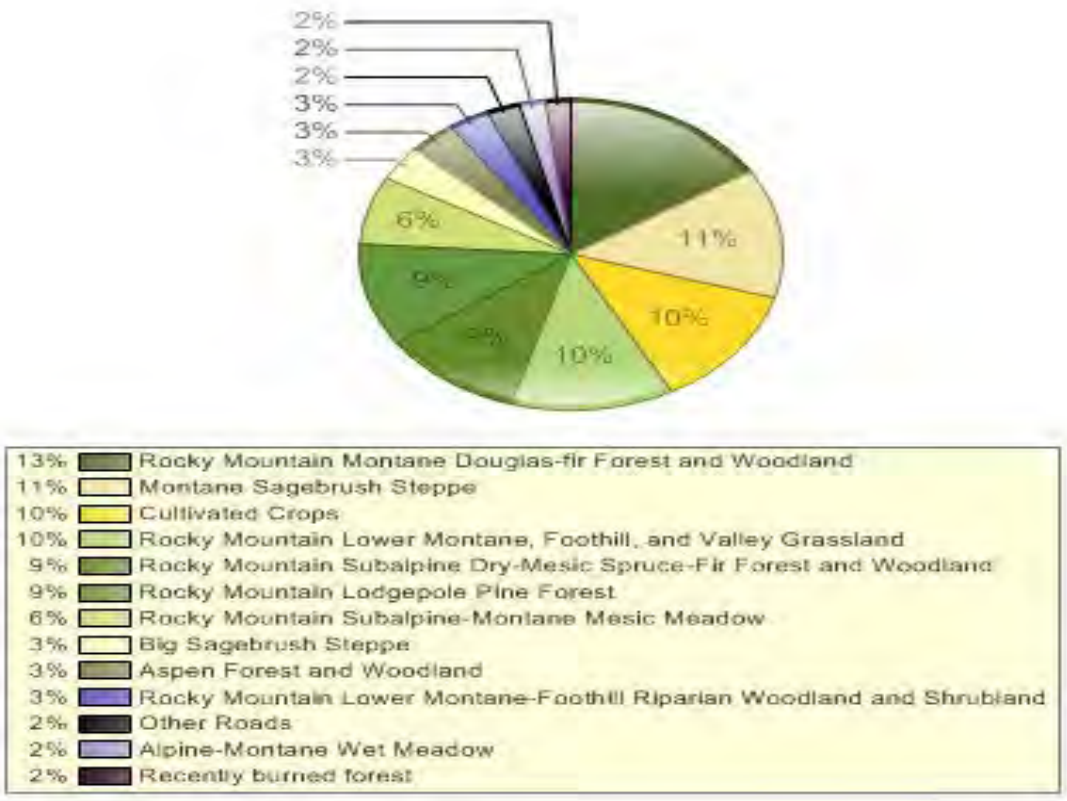


Figure 7; Gallatin County is comprised of multiple land cover types. From Montana Natural Heritage Program

Working lands

- Pasture

  There is limited and shrinking acres in pasture within Gallatin County due to a number of reasons. First, given the amount of population growth, there has been a tremendous amount of

land conversion within the past 10 to 20 years from open space (i.e. pasture) to developed land. Additionally, with less total land available for pasture the remaining acres tend to be overgrazed. Some of the remaining pasture land has been subdivided into small pastures that tend to be stocked with horses, not confined, where often the pasture becomes degraded from season long overgrazing. Weeds are able to invade, persist and expand on these smaller pastures when these areas have been overgrazed. Smooth brome, timothy and creeping foxtail, and other non-native grasses, dominate many of the smaller acreage pastures associated with horses in the county. To address resource concerns on pasture land a system of structural practices including but not limited to cross fencing, water development, improved forage species mix, weed control and management strategies such as prescribed grazing may be necessary in whole or part.

- Range

  The rangeland within Gallatin County is also losing acres due to land conversion/development. Coinciding with land development is the issue of access to rangeland. With limited access and a shrinking land base of native rangeland, overgrazing and weed infestation have become resource concerns on some acres of rangeland. Wildlife are also a concern given the limited amount of space available for animals given the amount of land development in the Gallatin Valley and competition for the limited resources remaining with domestic animals.

  Historically the native plant community was dominated by cool-season perennial bunchgrass species, primarily (bluebunch) wheatgrass, some tall needlegrasses and a few rhizomatous mid-sized grasses, such as western or thickspike wheatgrass and short grasses with minor components of perennial forbs and low growing shrubs.

  Traditionally, fire played an important role in ecosystem composition and distribution (Bond et al. 2005). Historic fire regimes for this major land resource area (Northern Rocky Mountain Valleys) is approximately 35 years, while it also notes that in localized areas the interval was likely shorter in some areas, if within a drier moisture regime. (USDA; Ecological site description, Droughty Steep). Trees and non-sprouting shrubs were restricted to small areas that may have had additional moisture, such as draws or around springs, while bunchgrasses generally recovered quickly, from fire, and were able to fuel future fires, suppressing woody species (Arno and Gruell, 1983).

  Degradation in the historic climax plant community has moved much of the plant community toward smaller, early seral, less palatable species, largely due to lack of fire and long term heavy continuous grazing. Juniper expansion across the landscape, moving out from those traditionally more protected areas or areas with additional moisture, has created a dangerous situation if fire was to return. Juniper is not fire resistant and contains flammable volatile oils that can increase fire severity. In addition to the danger to lives and homes from increased fire danger, associated with increased juniper densities, juniper will reduce the biomass and productivity of understory vegetation. (Vaitkus and Eddleman, 1987) Finally, there is some evidence that indicates that less water demanding vegetation (grasses), likely will reduce the amount and depth of water that is lost to transpiration from juniper (Wilcox, 2002). Conifer removal, specifically juniper is a valuable tool in managing fire risk, increasing grassland vegetation while potentially increasing water availability.

  Wet meadows and riparian areas tend to be in native vegetation due to the difficulty of operating

machinery on wet soils. These areas are typically the most biologically diverse and important as they can provide sanctuary and are utilized as travel corridors. These ecotypes are generally fairly productive, consequently they are often over utilized which can lead to degraded streambanks and negative impacts to water quality.

To address resource concerns on rangeland, a system of structural practices that could include cross fencing, water development, native plant enhancement, and weed control along with prescribed grazing may be necessary.

- Forest

Fire suppression, past forest management, land use decisions and other forest stressors have generated dense overcrowded forest stands, leading to declining tree vigor, and placing the oldest and most structurally valuable trees at risk of high-intensity wildfire. Disease and insects, such as western bark beetle and spruce budworm are able to establish in these dense stands as a result of stress on the forest. Concurrent with declining forest health are other natural resource concerns such as altered water quality and quantity, air quality, degraded fish and wildlife habitat, and reduced biodiversity and ecosystem resilience.

According to the 2017 Final Timber Report for the Custer Gallatin National Forest approximately 13.6% of the total county acreage (221,300) is suitable for timber production. The most common tree species within Gallatin county are Douglas fir, subalpine fir, lodgepole pine, Engelmann spruce, limber pine, aspen and white bark pine. Spruce and aspen are typicallyfound in wetter areas, with the white bark pine only at higher elevations within the National Forest. Excluding riparian areas, aspen communities are considered the most biologically diverse ecosystems in the Intermountain West (Kay 1997). Aspen decline in the intermountain west may be attributed to a number of factors, including successional to conifers, disease, browsing, and a decrease in available water (Bartos, D. L. 2001). Limber pine can be found in some of the drier areas within the county and lodgepole pine is scattered across the county with large stands around the towns of West Yellowstone and Big Sky. Douglas fir and subalpine fir may also be found throughout the county above 5,000 feet where most of the coniferous forest begins.

To address resource concerns on the private forested land within Gallatin County, a robust program of pre-commercial thinning, fuels reduction, weed control, native grass and forb enhancement, water development, cross fencing and prescribed grazing (if grazed) may be necessary. These are all tools and should be evaluated together individually and as a system to determine if natural resource goals are being accomplished.

- Irrigated Cropland

In general, crops grown on irrigated land include, spring wheat, barley, alfalfa, potatoes, and some corn and canola. The seed potato industry within Gallatin County has a reputation for growing some of the “cleanest” certified seed potatoes in the country. Gallatin County is uniquely suited for seed potato production, given that potatoes are highly susceptible to disease,because the of the high altitude, cold temperatures and the strict regulations and testing throughthe Montana State Potato lab. Soil erosion can be an issue with potato production given the amount of soil

disturbance and lack of vegetative cover when preparing the ground for seeding and after harvest. Several farms within Gallatin County have upgraded their irrigation systems from flood irrigation to wheel lines and hand lines and finally to center pivots over the past fewyears, although there are still many irrigation systems that could be upgraded to increase water use efficiency. In those areas where irrigation efficiency has increased dramatically there has been some negative consequences where the water table has dropped considerably.

While irrigation efficiency has improved, irrigation water can become scarce as stream flowsdrop during the summer. There is excess water during spring runoff but no way to store the water off farm for later use other than Hyalite Reservoir, which services a limited amount of irrigation systems.

Land conversion from farmland to developed land has presented a number of unique challengesfor irrigators. One such issue is the ability to deliver water to all users and water rights holders on some ditches. When farmland is developed and the water is no longer utilized for irrigation there may no longer be enough diverted water in the canal or ditch to reach the end users. Additionally, canals or diches may be negatively affected as they pass through development from either illegal use, blockage or from general lack of knowledge of laws governing canals and ditches as they pass through private property on easements.

Weed issues on irrigated cropland are generally low due to the ability of farmers to control weeds through several strategies, including herbicide spraying and tillage. There have been some undocumented reports of chemical resistant weeds in the county including but not limitedto wild oats.

Fertility on irrigated land is an important issue in the county given that a number of streams have been designated as impaired due to high levels of nitrogen and phosphorus, see figure 10. Given that irrigation water may be lost later in the growing season, many producers apply extra water earlier in the season to bank the water in the soil. Over irrigating however, may drive nitrogen down through the root zone where it can enter groundwater sources. Also, phosphorus may be lost from cropland fields as surface runoff where it can enter streams, ditches or other water bodies.

To address resource concerns on irrigated cropland, irrigation infrastructure, specifically the delivery and application of irrigation water in an efficient timely manner is critical in addressing resource concerns on irrigated cropland. Irrigation pipelines, pumps, water control structures and sprinkler systems used with irrigation water management will provide adequate water to plants when necessary. While some irrigation conveyance is shut down earlier in the growing season, having an efficient irrigation system along with maintaining or improving the organic matter in the soil will increase the amount of water available for crop production. Nutrient and pest management are also critical in irrigated systems where excess water may encourage diseaseor insect outbreaks and where nutrients applied for crop growth may be lost via runoff or deep percolation. Crop rotation is important in reducing pests and disease and in some cases may be able to access nutrients and water from the soil profile that previous crops were unable to access. Fall seeded cover crops may be able to help reduce soil erosion from ephemeral gullies that appear in the spring. Farmland that has a limited amount of residue remaining from previous crops and are on fields with undulating terrain, with steeper slopes are more likely to experience ephemeral gullies.

- Dryland Cropland

Typically, dry cropland acres have been in a crop fallow rotation with spring wheat, malt barley, and winter wheat as the primary commodity crops grown. This leads to a widow of increased soil erosion via wind and decreased soil quality (soil health) resulting in decreased soil organic matter, water holding capacity and infiltration rates. However, this has been evolving over the past few years with producers trying cover crops as a fallow replacement or moving toward continuous cropping at least 2 out of 3 years. With more dryland acreage moving toward having some cover most of the time, wind erosion has decreased. Tillage after harvest and during the fallow years has decreased with the adoption of chemical fallowing the land. The lack of crop diversity on dryland has led to an increase in weed resistance, however, and has forced some producers to utilize tillage toreduce weed populations.

Dry cropland is more apt to become developed due to the limited amount of infrastructure related to irrigation and to the reduced potential profitability of dryland compared to irrigated land. Land conversion from agriculture to developed land is a serious concern as mentioned above. Many of the most productive soils in Gallatin Valley have already been converted to developments. However, increasing the viability of dryland farming would enhance the abilityof these producers to maintain farming in a fast evolving and growing community.

To address resource concerns on dryland cropland a system of practices including crop rotation, soil fertility and the utilization of cover crops, where appropriate, may be necessary to make these operations more economically viable thereby reducing the potential for land conversion. Soil fertility issues related to dryland farming can be an issue if fields are fertilized for a particular yield goal and not enough moisture is received to meet that goal, leaving excess fertilizer in the fields. This results in excess fertilizer (particularly nitrogen) left in the soil whereit poses a risk to ground water or can lead to soil acidification over time. Continuous farming or utilizing cover crops in lieu of fallow will aid in utilizing any excess fertilizer from the prior cashcrop. Crop rotation can be an important tool on dryland where a crop with lower moisture requirements may be harvested.

Weeds

Noxious weeds are destructive to Montana's landscape and the livelihood of ranchers, farmers, recreationists and others by displacing native plants, increasing soil erosion, decreasing wildlife habitat, diminishing water quality, reducing forage for livestock and reducing real estate values. Noxious weeds are non-native plants that compete with desirable plants for water, nutrients, light and space. Noxious weeds are a serious problem in Gallatin County with over 40 noxious weedson the State of Montana and Gallatin County Noxious Weed List, as well as five regulated plants, three of which are aquatic invasive plant species. Gallatin County has seen a dramatic increase in small acreage landowners, many of which are not familiar with noxious weeds or their impacts.

While there are over 40 listed noxious weeds in Gallatin County, the type of land use largely determines what weed issues you might have on your property. For instance, cheatgrass is highly invasive in range and pasture land settings but is largely controlled in cropland settings. Understanding the lifecycle and habitats of these weeds aids in preventing initial infestations and

controlling established stands of weeds. Once established these weeds are difficult to manage and when a new weed appears a concerted effort is made to eradicate it as quickly as possible to prevent its spread. For instance, Ventenata is a major concern in Gallatin County and has only been identified within the county in the past few years. Ventenata is a highly invasive annual grass that has virtually no forage value for livestock. Ventenata has the potential to cause impacts to grazing, haying and wildlife habitat. Weeds are a common problem on almost all landuses including forest, and residential properties. Implementation of an effective noxious weed management plan across large areas is necessary to prevent further deterioration of the forage base.

C. Resource Concern-Soil/Geology (Most of the following information is taken from the Soil Survey Manuscript and Geology and Ground-Water Resources of The Gallatin Valley, Gallatin County, Montana and from Kari Scannella, NRCS state geologist

Soils support terrestrial life by providing nutrients for plant growth through their ability to allow air and water to enter through the soil surface and percolate through the soil profile, the ability to store water for plant use while also allowing for the drainage of excess water, the ability to buffer the soil pH and detoxify contaminates, the ability to limit both wind and water erosion, and the ability to support micro and macro soil organisms. Soil quality is a function of the soil's inherent potential and the effects of management actions on the soil.

Gallatin Valley is an intermontane basin, or a wide valley set between several mountain ranges. The valley is approximately 25 miles long, 20 miles wide, and filled with approximately 25 to 400-feet-thick alluvial deposits. Underlying alluvium is bedrock. The Bridger and Gallatin Mountains flank the valley on the east and south, the Horseshoe Hills on the north, and the Tobaccos Root Mountains on the west.

The oldest rocks in the valley, referred to as basement rock, date back to the early Precambrian(4.5 billion years ago to 541 million years ago). Basement rocks consist mostly of hard, coarse-grained gneiss, schist, and quartzite that are hosts to a variety of economically significant minerals, such as lead, zinc, silver, copper, and gold.

During the Paleozoic (541 mya to 251.9 mya) most of Montana was slightly below sea level. Lower elevations became submerged by water and accumulated thick sequences of marine sand, mud, and lime mud that would later lithify into sandstone, mudstone, and limestone. Whereas, landforms above sea level became islands or coastal plains. Gallatin Valley at that time was analogous to the present-day Caribbean, warm and tropical. Cambrian (541-485.4 Mya), Devonian (419.2 -358.9 Mya), Carboniferous (358.9 – 298.9 Mya) and possibly Permian (298.9 – 251.90 Mya) age rocks are present in the valley.

From the Precambrian to the beginning of the Mesozoic (240 to 66.0 mya), shallow seas advanced and retreated, depositing thick sequences of mostly marine sediments, evidenced byabout 10,000-feet-thick marine limestones and dolomites and non-marine shale, mudstone, siltstone, and sandstone rocks.

By the Late Mesozoic (Late Cretaceous Period, 100.5 to 66.0 mya), the environment became more

dynamic as the seaway retreated for the last time. Intense folding and faulting occurred around 66 million years ago due to crustal collisions to the west. Belt Supergroup rocks in western Montana faulted and shifted eastward to where they currently are exposed in northernGallatin County. Tectonism uplifted and folded older rocks to form the ancestral Rocky Mountains. Mesozoic aged rocks are approximately 5,280 feet or one mile thick and make up approximately 55 percent of the state.

Early to middle Tertiary (Eocene, 66.0 to 33.9 mya) was dominated by crustal stability and long, quiet erosional periods that sculpted and shaped the topography. During this time, the Three Forks Basin dropped while the Bridger Mountains uplifted. From late Tertiary to present day, erosion produced sediment which deposited into basins. Simultaneous to the erosion, intense volcanic activity dominated and formed the Boulder Batholith to the west and the Absaroka- Gallatin Volcanic Field to the east.The Three Forks structural basin, where Gallatin County is located, was formed as the result of crustal movements in early Tertiary time. The basin was filled to a depth of 4,000 feet with volcanic ash, sand, silt and clay. Precambrian metamorphic rocks and sedimentary rocks are theoldest rocks exposed in the valley. The metamorphic rocks are varieties of gneiss, in general.
The sedimentary rocks belong to the Belt series and consist of sandstone, conglomerate, andslate.

Alluvial fans extend into the Gallatin Valley from the foot of the Gallatin and Bridger ranges. Loess, calcareous silt is widely present within Gallatin County and has contributed to the productivity of land within the county, although this soil is highly erosive.

In Gallatin County soil disturbance, i.e. tillage, is still widely practiced especially on irrigated cropland. Tillage and fallow have decreased in the county in the past few years,

The survey area for Gallatin County, Montana includes forested land, generally above 5000 feetin elevation, the transitional area between the mountains and valleys and the valley floor. The Soil survey of the Gallatin National Forest includes the Bridger range which consists of a long narrow limestone ridge flanked by foothills and the Gallatin and Madison ranges which containsridges, steep stream-cut and glacial valleys and broad, sloping valleys. In general, the soils of the Gallatin Valley are fine-textured, heavy alluvial or silty loams.

Many of the important agricultural soils in the Gallatin Valley are formed in calcareous loess. Soils formed in loess include the Amsterdam, Bigbear, Blackdog, Brocko, Danvers, Kelstrup, and Quagle series. Some soils formed in recent alluvium are the Attewan, Beaverell, Beaverton, Beavwan, Chinook, Hyalite, Kalsted, and Turner series.

The mountains and bedrock-controlled hills may have soils formed in one of the following parent materials: limestone, gneiss and schist, quartzite, argillite, sandstone, shale, or igneous volcanics. A single parent material under the influence of varying precipitation amounts exhibits marked changes in soil development. Generally silty soils that formed in loess, such as Blackmore and Brocko soils, are examples of this principle. Other examples are generally loamy and high in rock fragment content and formed in limestone, such as Crago and Hanson. Generally sandy soils formed from gneiss and schist, such as Barbarela and Nuley soils, and generally clayey soils are found in shale, such as Bangtail and Tanna soils. Many of the soils in the survey area have accumulated lime from the parent material. The presence, depth, and amount of lime varies with

parent materials and amount of precipitation in the specific area. The majority of soils within the county are slightly basic, above 7.0, with values typically around 7.8 to 8.2.

Wind erosion is a concern along the western side of the county due to the type of soil, lack of rainfall and types of crops grown, specifically prior to planting potatoes when the soil is largely barren in the spring due to the soil preparation necessary for a successful crop. Organic matter depletion has occurred across most of the annually cropped fields as a result of traditional farming practices that disturbed the soil, limited the amount of surface residue and reduced the amount of time living roots are in the soil. Reduced levels of organic matter in the soil have important negative repercussions related to water holding capacity and fertility of the soil resource.

Water erosion is a concern as well, although most erosion occurs within a field and soil is not moved off site. Early spring typically has the most water erosion due to more rainfall and less residue cover to protect the soil. Seeding these areas into permanent vegetative cover, i.e. grassed waterways, could drastically reduce the amount of water erosion occurring within Gallatin County. It is critical to provide residue cover following potatoes to reduce erosion.
From a producer standpoint this may not seem practical, but a winter cover crop can help to reduce erosion Many producers will prepare their fields for potatoes by hilling the field in the fall and planting in the spring when soil temperatures reach 55 degrees Fahrenheit. Unfortunately, the soil is typically more susceptible to water and wind erosion early in the spring. Therefore, delaying hilling until spring and seeding quickly behind the hilling operation may reduce the amount of time the soil is exposed, thereby reducing the potential for erosion.

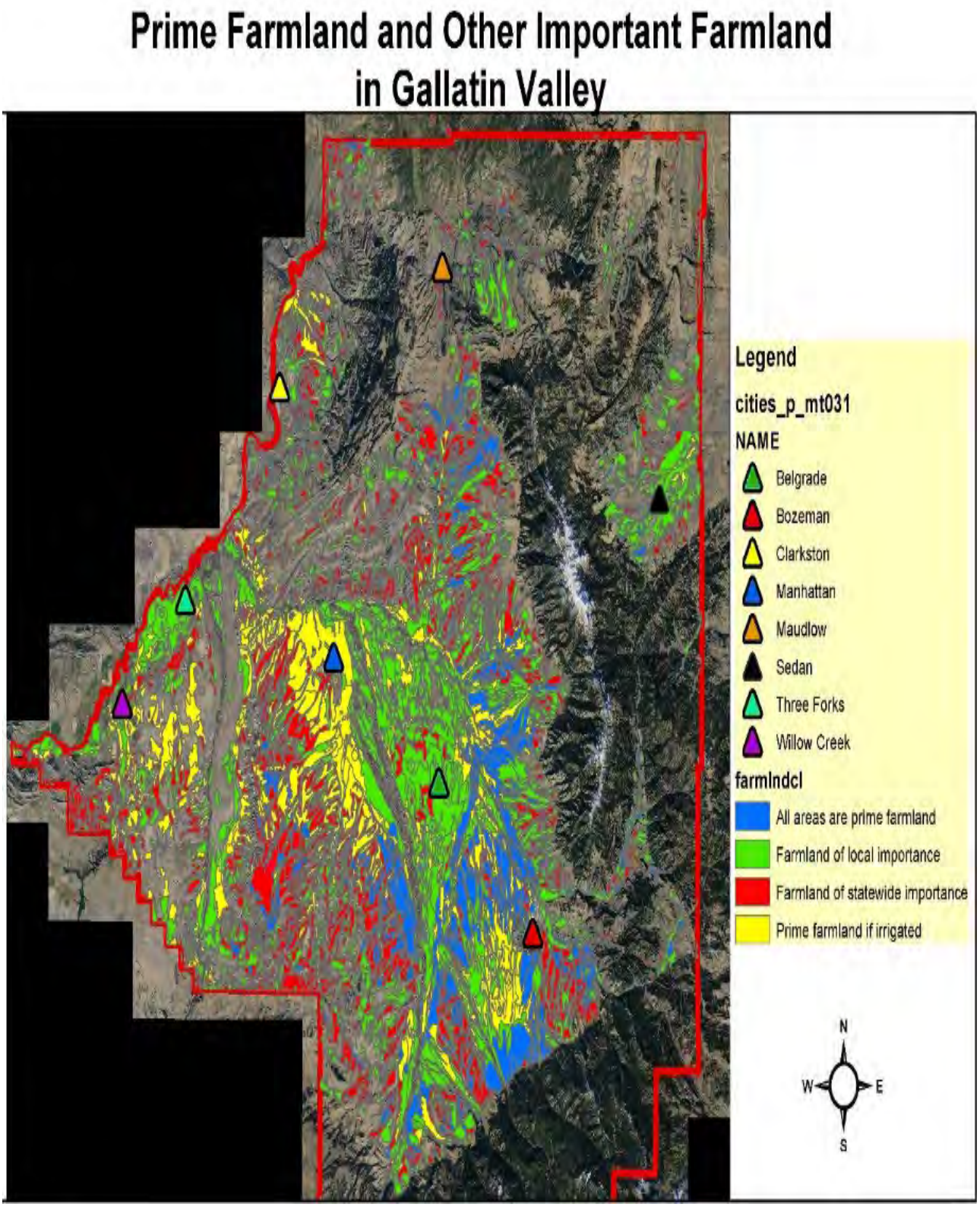


Figure 8; Prime Farmland and other important farmland in Gallatin Valley

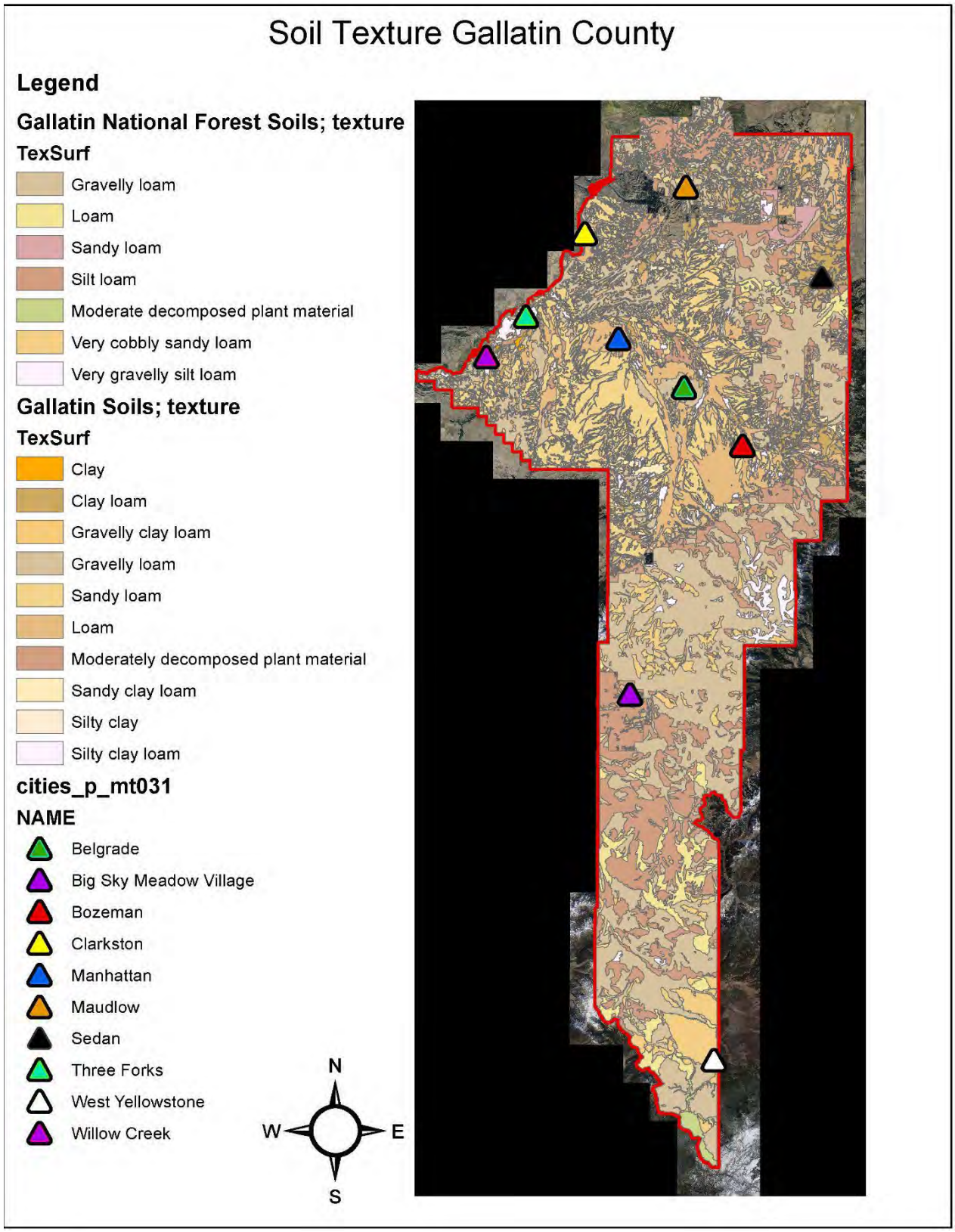


Figure 9; Soil Texture in Gallatin County

C. Resource Concern-Water

The free-flowing Gallatin River originates at Gallatin Lake in Yellowstone National Park at an elevation of 8,834 ft. It flows north for 115 miles to Three Forks, Montana, where it joins the Madison and Jefferson Rivers to form the Missouri River. From the Park boundary, the river flows about 44 miles through the narrow Gallatin Canyon, and then enters the broad Gallatin Valley, where it flows an additional 45 miles to its mouth. Much of the Gallatin River is classified "Blue Ribbon" by Montana Fish, Wildlife and Parks (FWP) in recognition of its high recreational, fishery, and aesthetic values (Figure 9). The west Gallatin River, which flows out of Yellowstone national park, then north through Gallatin Canyon, provides most of the water forirrigation within Gallatin County. The east Gallatin River, originating on Bozeman pass (divide between Gallatin and Park counties) and the Bear Creek area south and east of Bozeman along with other smaller streams provide additional opportunities for irrigation throughout the county. Along the east border of the county drainage flows down into Park County and the Yellowstone River.

In a typical year, most western Montana's precipitation falls as winter snow (62-65%) of the total annual precipitation (Serreze et al. 1999), consequently snowpack is the main driver of water resources in Gallatin County.

There are 33 natural lakes and reservoirs in the Gallatin River drainage, totaling 434 surface acres. Most natural lakes are mountain lakes in the headwaters of the Gallatin River. The largestreservoir in the drainage is Hyalite Reservoir south of Bozeman, which together with Bozeman Creek and Lyman spring supply Bozeman's, Gallatin Counties largest town, drinking water.
Lowland lakes in the valley bottom support urban fisheries which consist of rainbow trout, brown trout and illegally introduced warm water fish of various species. High mountain lake fisheries are either stocked on a regular basis or contain self-supporting populations of westslopecutthroat trout, brook trout, golden trout, or arctic grayling.

FISHERIES MANAGEMENT
The Gallatin drainage is home to a variety of native fish species including mountain whitefish, longnose dace, longnose suckers, Rocky Mountain sculpin, mountain sucker,
white sucker, and westslope cutthroat trout. Several nonnative fish species are also found in the drainage and include brown trout, brook trout, rainbow trout and Yellowstone cutthroat trout. Most streams in the drainage are managed for nonnative self-sustaining wild trout fisheries. These trout populations are currently stable from year to year. Only one pure population of native westslope cutthroat trout exists in the drainage. Hybridized (westslope cutthroat withrainbow trout) populations exist in a few headwaters streams.

A decline in westslope and Yellowstone cutthroat trout numbers has occurred during the past several decades due primarily to invasive species, habitat alteration and changes in climate. Stream flow alterations have occurred throughout the county and has resulted in some habitat degradation leading to dewatering critical habitats, stream alterations and decreased low flows during critical times.

The U.S. Fish and Wildlife Service's Bozeman National Fish Hatchery was established in 1892 for production and stocking of trout in Montana and surrounding states. In 1983 the facility was designated as a Fish Technology Center to conduct research and provide technical assistance ona number of aquatic resource issues, such as whirling disease.

The Gallatin River drainage is also home to several conservation populations of westslope cutthroat trout providing opportunities to conserve this native species in the drainage. The long-term goal of cutthroat conservation in the Gallatin River drainage is to have approximately 20% of the historically occupied habitat restored to secure conservation populations of cutthroat trout.

SPECIAL MANAGEMENT ISSUES

Gallatin County is a closed basin to appropriate water with some exceptions, mainly related to residential development. A number of ground water studies and geologic mapping activities have occurred within the county over the years and are continuing around the Belgrade, Manhattan and Big Sky areas. Due to the valley's size and the complexity of the deposits of sediments within the valley boundary there is not a single aquifer but more of an aquifer system(Evaluation of Potential High-yield groundwater development in the Gallatin Valley, Gallatin County, Montana; Montana Bureau of Mines and Geology, File report 698).

Hyalite Reservoir, Lyman Spring and Bozeman Creek provide municipal water for the City of Bozeman. Expansion of the human population in Bozeman and the surrounding area has caused concern over the ability of existing sources (primarily Hyalite Reservoir) to satisfy municipal demand of water. Possible solutions include the development of additional water storage for municipal use, diverting some irrigation water and injecting into ground water for later use, along with a number of other ideas are currently being discussed

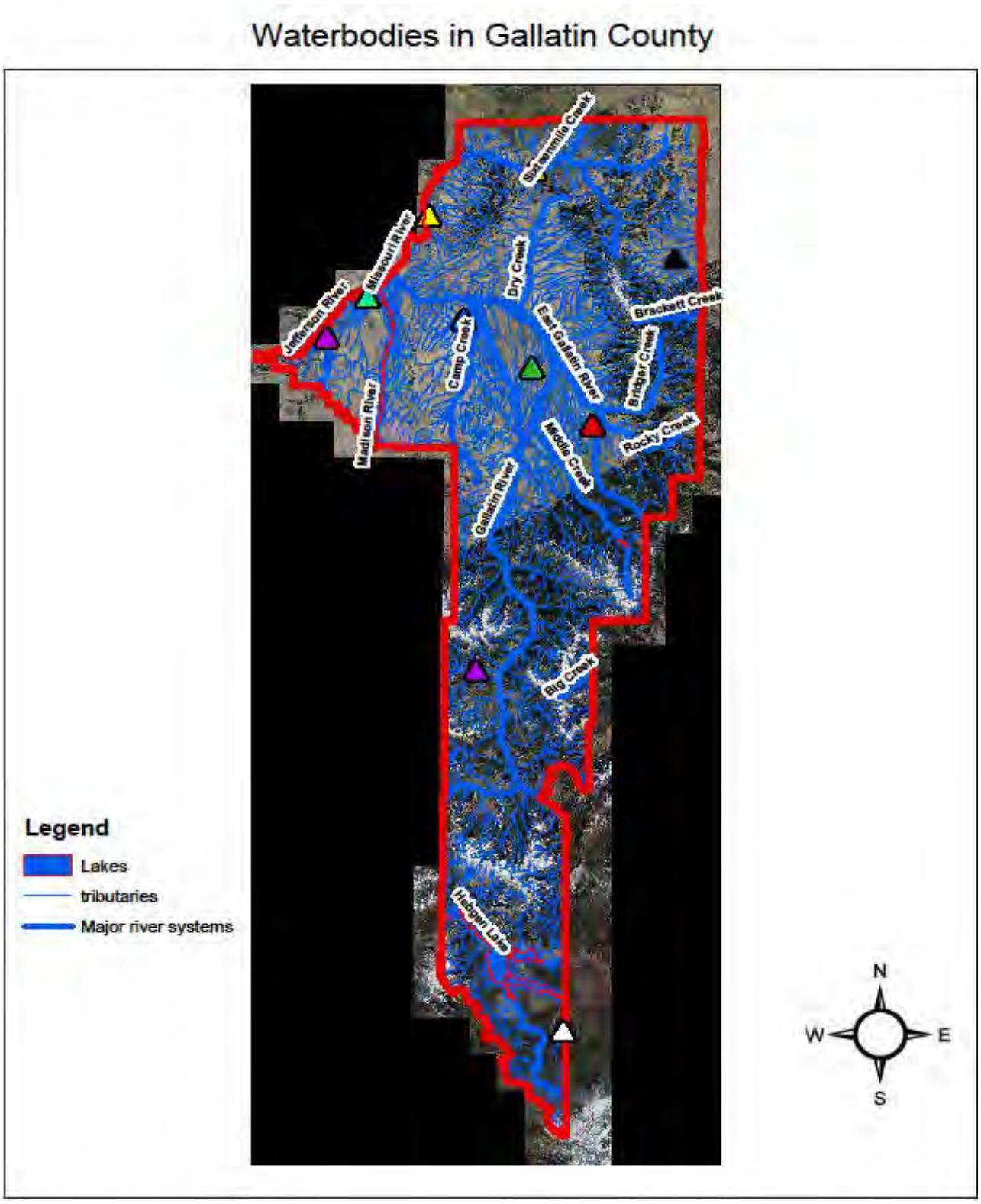


Figure 10; Waterbodies in Gallatin County

Fifteen separate streams were listed as impaired by the Montana Department of Environmental Quality as not meeting state water quality standards (see Appendix C). These streams are considered “impaired” because they contain sediment, nutrients and or E. coli at levels that impair the use of that water for beneficial purposes such as irrigation or recreation.
Implementation of a surface water monitoring program from which data can be used to evaluate the status and long-term trends in water quality within Gallatin County would help to target conservation efforts to improve water quality.

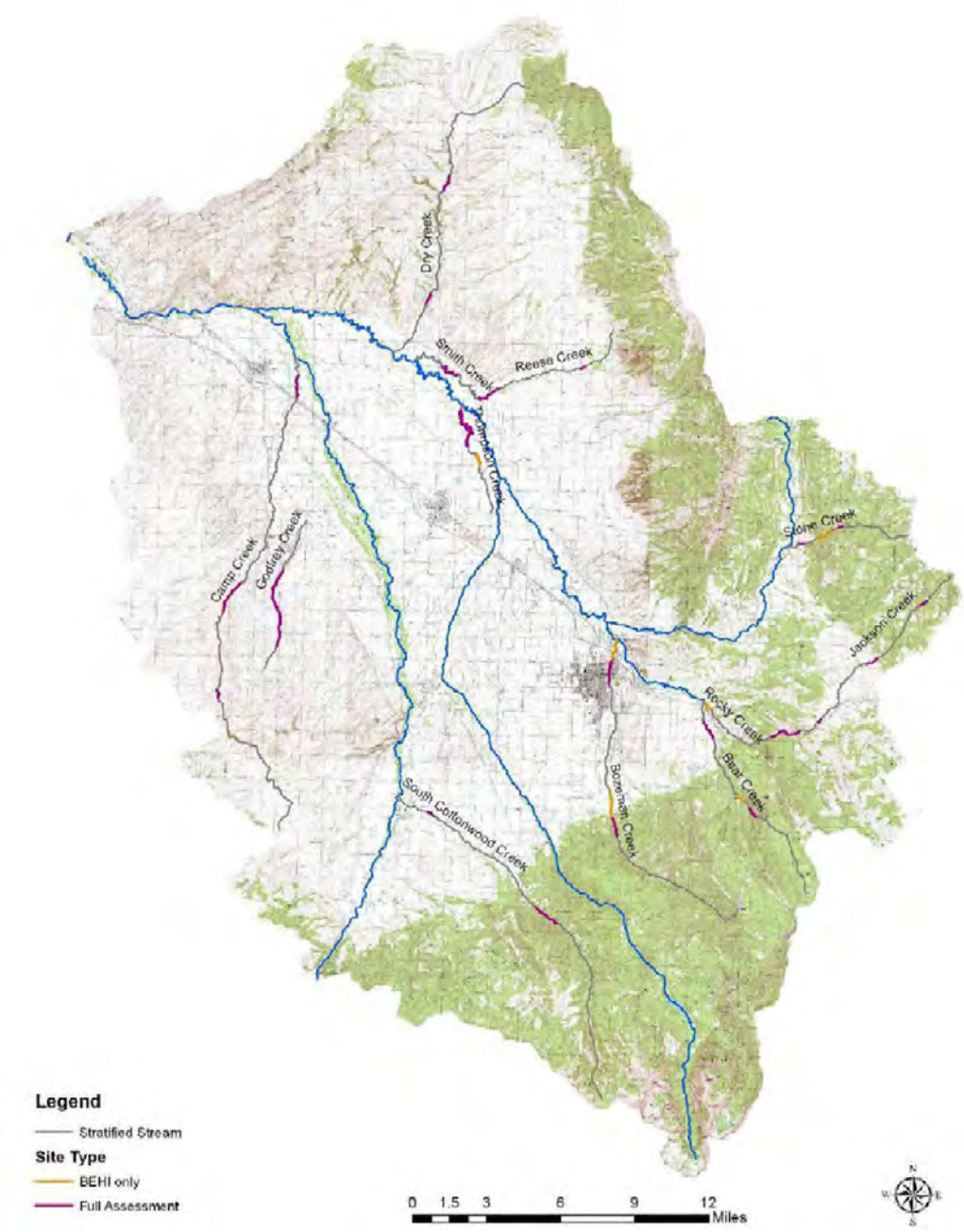


Figure 11; Impaired streams Gallatin County (MT Dept of Environmental Quality)

Irrigation

With over 62 named diches and canals, water conveyance in Gallatin County is vital to agriculture and groundwater/aquifer recharge. The complete picture of how surface water (canals, ditches) influences groundwater and where this occurs is less well known. Canals and ditches divert water from the West and East Gallatin River, Bozeman Creek and Hyalite reservoir. The Jefferson and Missouri rivers form the northwest boundary of Gallatin County, with Sand Creek and Willow Creek contributing irrigation water on the western boundary of the county. Sixteen Mile Creek contributes a small amount of irrigation water in the northeastern portion of the county with Flathead Creek providing some irrigation water to Gallatin County along the east slope of the Bridger Mountain Range. Some of these canals were in place prior to Montana becoming a state. A number of irrigation canals are shut down due to low flows in the Gallatin River after runoff and are considered to be "flood rights". Water storage for late seasonirrigation is lacking within the county.

D. Resource Concern-AnimalsDomestic Animals

With approximately 50,000 cows and calves in the county (from Montana Agricultural Statistics, 2018) and a growing residential base with land development at an all time high there is a shortage of available summer pasture. Additionally, locating suitable winter feeding or animal confinement areas for livestock is a challenge in Gallatin County, given the severity of winters and amount of snowfall. Winter feeding areas in riparian areas, specifically along the west fork of the Gallatin River is an issue given the amount of potential runoff from these fields adjacent tothe Gallatin River. Finding suitable winter-feeding areas that provide shelter and ease of access for providing hay is critical to alleviating the input of manure into waterways from riparian pastures that are utilized for winter feeding. Calving in late winter can be risky given the amountof snow, cold temperatures, lack of shelter and reliance on hay. Alternatively, calving later in the spring has shown that for similar pregnancies, calving, weaning rates, post weaning average daily gains, higher birth weights and a tighter calving period make this a viable alternative to latewinter or very early spring calving. (Pang et al. 1998). Sheep production at approximately 1900animals is also under strain to find enough pasture to effectively graze animals through the growing season. Gallatin County ranks number 1 for the number of horses with over 6,288 in Montana (https://www.nass.usda.gov/Publications/AgCensus/2012/Online_Resources/County_Profiles/Montana/cp30031.pdf) and has a small acreage overgrazing issue related to pasturing horses. Small acreage landowner education was identified during both the 2016 and 2019 local working group meetings as an important tool to address resource concerns on smaller acreage properties.

Livestock water is an issue in certain areas around the county especially in the Dry Creek area. There are fewer perennial streams in this area and as a result, animals generally travel a fair amount to gain access to water. Also, the Dry Creek area tends to receive less rainfall than some other areas of the county, (see county precipitation map; figure 2). Additionally, there are several larger ranches and cattle operations in this portion of the county with acreages that could

benefit from additional watering facilities and cross fencing to more evenly distributing grazing across the landscape while maintain the integrity of the few perennial streams that are found in this area. Another benefit of additional livestock water in these areas is that the land could be more effectively managed to be more resilient to weed infestation.

Wildlife

There are 53 animal Species of Concern in Gallatin County with 10 mammals, 29 bird species, 1 reptile, 1 amphibian, 2 fish species and 10 invertebrate species with 6 insects and 4 mollusk species (See appendix E). The Species of Concern list is produced jointly by the Montana Natural Heritage Program and Montana Department of Fish, Wildlife and Parks. Species of Concern are native Montana animals that are considered to be "at risk" due to declining population trends, threats to their habitats and restricted distribution. Status determinations are made by Montana Natural Heritage Program and Montana Fish, Wildlife and Park biologists in consultation with representatives of the Montana Chapter of the Wildlife Society, the Montana Chapter of the American Fisheries Society and other experts. The U.S. Fish and Wildlife Servicehas two species listed as threatened in Gallatin County, the Canada lynx and grizzly bear, and one species proposed to be listed, the wolverine. The Canada lynx, grizzly bear, and wolverine are also included in the Species of Concern list. Actions taken within potential lynx habitat undergo additional scrutiny and are subjected to additional limitations based on consultation withthe U.S. Fish and Wildlife Service.

Grizzly bears are present in Gallatin County, with the majority occurring south of the I-90 interstate corridor. Wolves and bison are also present in Gallatin County. Wolves are present mainly on National Forest land although a pack is thought to be present on private land that runs across the southwest corner of the county and is adjacent to the National Forest. There have been reports of calf losses due to wolf predation around Willow Creek and a number of producers have had to adjust their grazing rotations to better protect calves. Bison and elk are another concern within the county due to their ability to transmit brucellosis, a disease that causes cattle to abort their calves. Wild bison are generally present in the West Yellowstone areaand are not in direct competition with cattle for grazing. Elk, however are more widespread throughout the county and are known to carry brucellosis, and as a result all cattle producers withfemale cattle or domestic bison must vaccinate against brucellosis.

The increasing size of elk herds in the county have led to some negative consequences for producers, specifically with maintaining fences. Elk have been more prevalent in the valley thanin years past, especially during the fall and winter, which has negatively impacted some producers along the valley fringes where hay stacks and other stockpiled forage for domestic animals have been impacted by elk.

Mountain lions are also present in Gallatin County, with the largest population in the Bridger Mountains, just north and east of town, although there have been very limited interactions between the animal and humans to date.

A number of conservation measures specifically for wildlife might include: converting marginal cropland to perennial vegetation, utilizing wildlife friendly fences in wildlife corridors, increasing pollinator plantings, prescribed grazing and providing off stream watering facilities.

E. Resource Concern-Air

Clean air is important not only to support life but also because it contributes to clean water, healthy fisheries, soils and ecosystems in general. Air quality, in Gallatin County, is monitored and regulated by the Montana Department of Environmental Quality (MTDEQ) as required by the Environmental Protection Agency and the Clean Air Act. The Gallatin City-County Health Services offers information and educational support to the community on some air quality issues. Typically, Gallatin County has good air quality. Poor air quality in Gallatin County is generally associated with forest fires, although there are times when field burning has been an issue in the past. Generally, field burning is no longer practiced except in a few cases when producers are concerned by the amount of residue in the field. Prescribed burning in forests and rangelands must be managed to coincide with conditions within the county and adjacent counties to minimize negative effects related to air quality.

F. Resource Concerns-Energy

Agricultural energy consumption includes energy needed to grow and harvest crops and energy needed to grow livestock. Crop operations consume much more energy than livestock operations, and energy expenditures for crops account for a higher percentage of farm operating costs.

Energy consumption includes both direct and indirect costs such as the production and transportof fertilizer. This report will focus mainly on the direct energy costs of operating an agricultural operation in Gallatin County, Montana.

Fuel is the major costs related to direct energy consumption on farm. In addition to operating tractors in the field, fuel is also necessary to get crops to market. Another major energy cost is related to supplying water to fields, which is largely accomplished by utilizing electricity to pump water.

Reducing tillage operations, which have been shown to increase some of the benefits related to soil health also reduces direct fuel costs. Some of the lower costs associated with reduced tillage, however, may be displaced by the increased costs of chemical applications necessary to reduce weeds. Utilizing gravity to supply irrigation water to fields is another avenue for farmersand ranchers to employ in order to reduce energy costs, however, not all operations have the potential for gravity assisted production

V. Conservation Activity Analysis

In 2015 a Gallatin County local working group meeting was convened at the Conservation District office in Manhattan, MT. Multiple maps were displayed with 9 ten-digit hydrologic watersheds represented. Since the southern half of the county is largely federal land, the area ofinterest was focused on the northern portion of the county. The two top resource concerns wereidentified for each watershed. An initial discussion and vote determined to address resource

concerns by watershed not by land use. However, for cropland, soil quality degradation was identified as the top resource concern with the greater Camp Creek/Godfrey Creek watershed identified as the primary watershed. See Appendix A: 2015 Local Working group meeting minutes

In 2019 another local working group meeting was convened at the conservation district office in Manhattan, MT. Participants of the LWG were the Natural Resources Conservation Service, Gallatin Agricultural Irrigators, Gallatin Valley Land Trust, Trout Unlimited, Conservation District, Montana Land Reliance, Department of Natural Resources, Gallatin Invasive species alliance, Gallatin County weed district, Montana State University extension, Farm Service Agency, Gallatin River Task force, Greater Gallatin Watershed Council, Trust for Public Lands, Gallatin Local Water Quality district, U.S. Forest Service, Greater Yellowstone Coalition, Stockman bank, Pheasants Forever and some local producers.

Initial discussion focused on the purpose of a long range plan and how the targeted implementation plans will come out of the long range plan. The 2019 local working group went through each watershed and listed resource concerns, participants then ranked the resource concerns throughout the county and discussed the opportunities for collaborating on projects and given the chance to speak of some of their accomplishments to date.

The 2019 local working group discussed the 2016 local working group meeting and the results of that meeting where Camp and Godfrey Creeks were designated as the priority one watersheds for Gallatin County. Briefly discussed the strategy of planning by watershed versus land use or some other alternative.

The 2019 local working group reviewed the forest health Targeted Implementation Plan for the group as an example of how NRCS will be targeting specific resource concerns in particular locations. See Appendix B: 2019 Local Working Group Minutes (4/3/2019)

In 2022 another local working group meeting was convened at the conservation district office on 2/16/2022. See Appendix C: 2022 Local Working Group Minutes (2/16/2022)

Since 2015, three national programs were funded within Gallatin County in addition to the Bozeman area EQIP funds, these programs include the RCPP (Regional Conservation Partnership Program), NWQI (National Water Quality Initiative) and the Missouri HeadwatersDrought Resilience program.

Regional Conservation Partnership Program RCPP

A partnership of agricultural and conservation groups in the Gallatin Valley of Montana was approved for $3.7M in funding through the Regional Conservation Partnership Program (RCPP) of the Natural Resource Conservation Service (NRCS) in 2015. This program creates a special 5-year funding pool for conservation projects in the Gallatin Valley and promotes coordination between NRCS and local partners to deliver conservation assistance to producers and landowners. The funding was used for two purposes:

1. To compensate landowners for conservation easements on important agricultural properties; ($3.2 Million); to date the RCPP program has accomplished the following

- 7 ACEP/ALE Conservation Easements that protected 2602 acres of prime andsignificant farmlands
- 13 other conservation easement projects were funded within the region's boundary from other funding sources that protected an additional 5391 acres ofprime and significant farmlands
- Total RCPP dollars spent plus match and other local cash sources resulted innearly $28 million in conservation spending within the RCPP boundary

2. The RCPP award also went to implement farming and ranching practices that protect and enhance water quality, soil health and water quantity ($500,000).

- EQIP project, 2016; Obstruction removal, water gap, fencing, weed control, irrigation water management, irrigation infrastructure improvements, energyefficiency improvements (pumps)
- EQIP project, 2017; Irrigation water management, irrigation infrastructure improvements, nutrient management, energy efficiency improvements (pumps)
- EQIP project, 2019; Cover crops, pollinator friendly planting

RCPP - Geographic Focus

The project area includes the entire Gallatin Valley (see map below). Within this larger region, projects were prioritized that:

- Adjoin or are close to designated "impaired water bodies" (especially Camp Creek, the East Gallatin River and their tributaries)
- Are adjacent to or on protected lands (private conserved lands or public lands)
- Have prime, important or unique agricultural soils.

The RCPP program has allowed the project partners to address rapid land use conversion andurban sprawl through the acquisition of conservation easements that protect private farmlands from subdivision and development.

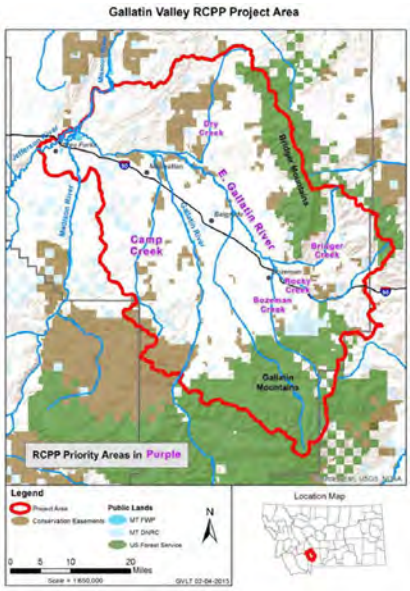


Figure 12; RCPP boundary

Headwaters Drought Initiative

The USDA Natural Resources Conservation Service (NRCS) offered a localized initiative addressing water conservation and drought resiliency in the Missouri Headwaters Basin of Southwestern Montana. NRCS worked with landowners in the Missouri Headwaters Basin to increase water conservation; improve riparian, floodplain, and water management; and promote upland management conservation to help mitigate the effects of drought. Here are the projects that were completed through the initiative:

- EQIP projects 2016; $700,000 obligated; prescribed grazing, fence, water gap, irrigation infrastructure improvements, seeding highly erodible land (HEL) groundto permanent grass, animal confinement relocation, energy efficiency improvements (pumps), cover crops, Irrigation water management, tree and shrub establishment
- EQIP projects 2017; $185,000 obligated; Forest stand improvement, woody residue treatment, herbaceous weed control, irrigation infrastructure improvements, energyefficiency improvements (pumps), no-till, weed control, seeding HEL cropland to permanent grass.

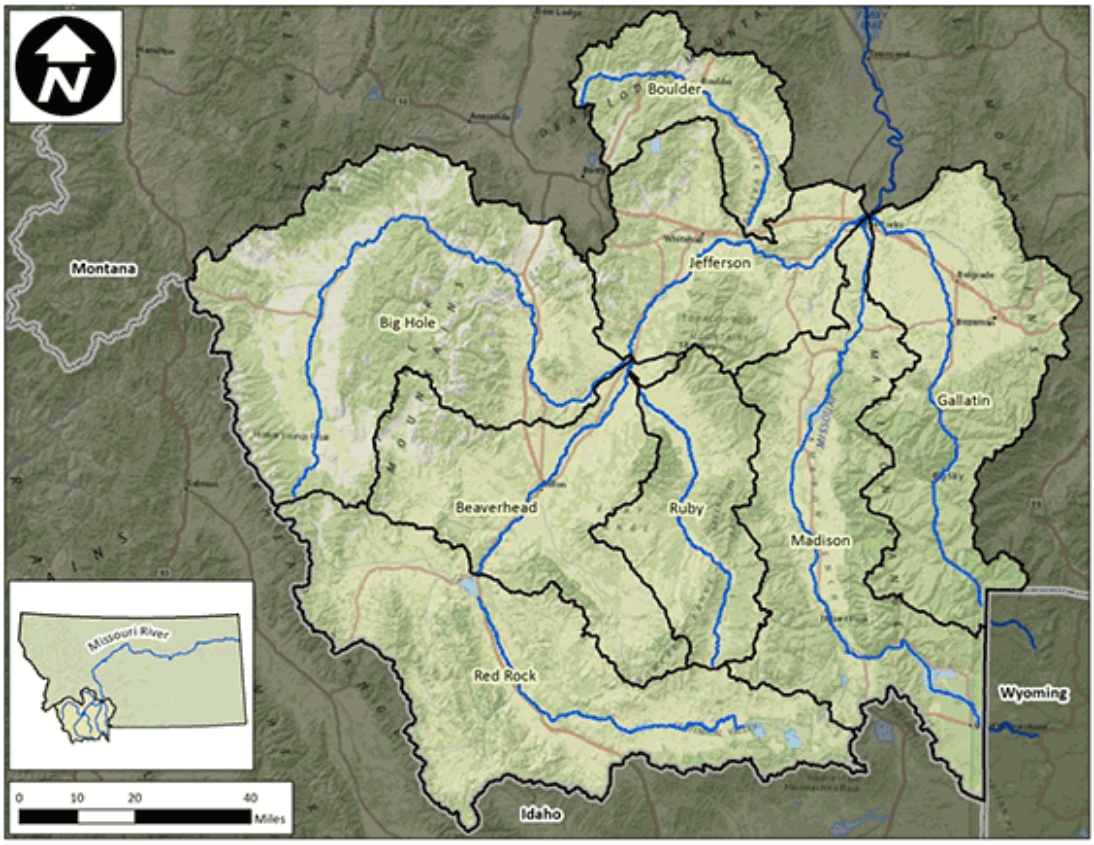


Figure 13; Headwaters Drought project area

National Water Quality Initiative (NWQI)

The National Water Quality Initiative is a partnership among NRCS, state water quality agencies and the U.S. Environmental Protection Agency to identify and address impaired water bodies through voluntary conservation. NRCS provides targeted funding for financial and technical assistance in small watersheds most in need and where farmers can use conservation practices to make a difference. Here are the projects that were completed through this initiative:

- EQIP 2017; $595,271 obligated; Animal confinement relocation, fence, irrigation water management, irrigation infrastructure improvements, nutrient management, energy efficiency improvements (pumps), cover crops, watering facility, livestock pipelines, andprescribed grazing
- EQIP 2018; $710,014 obligated; Well, watering facility, irrigation water management, irrigation infrastructure improvements, fence, energy efficiency improvements (pumps), cover crops, seeding HEL cropland back to grass, tree and shrub establishment, and weedcontrol
- EQIP 2019; $1,080,013 obligated; Irrigation infrastructure improvements, energy efficiency improvements (pumps), cover crops, irrigation water management, weedcontrol, and seeding HEL cropland back to grass.

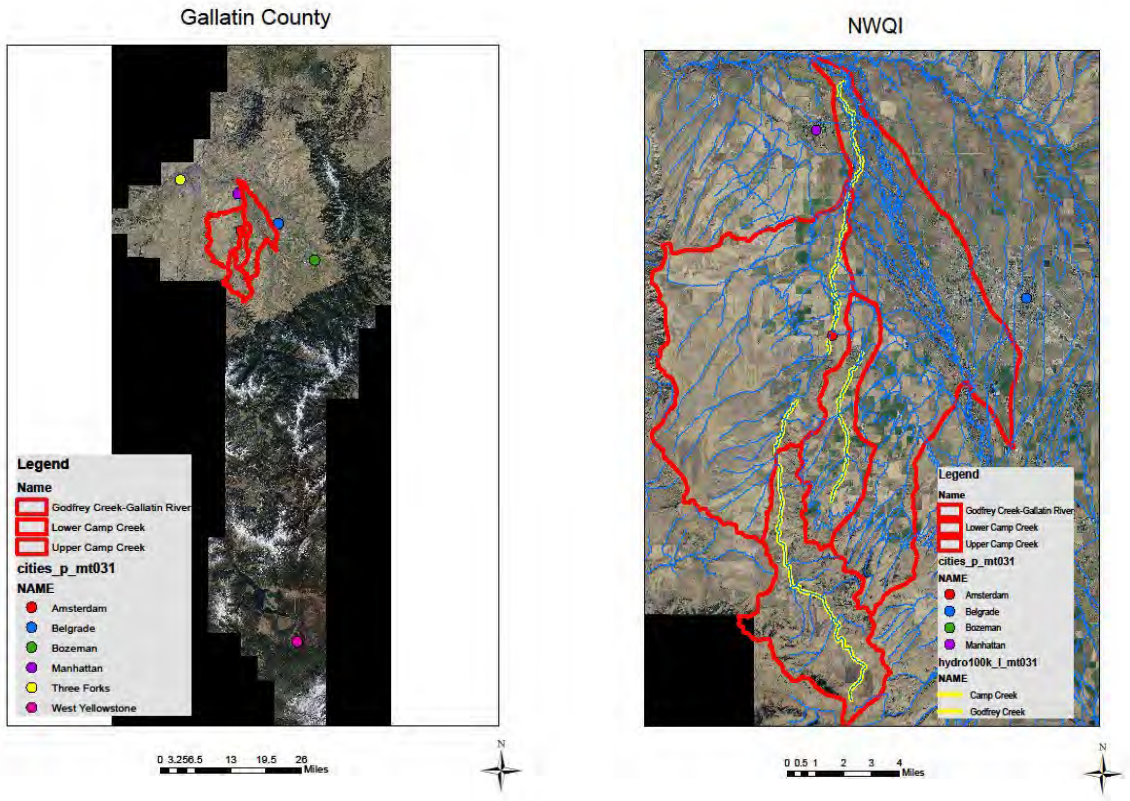


Figure 14; National Water Quality Initiative boundaries (NWQI)

The NRCS in Gallatin county plans to work cooperatively with others to promote andencourage conservation, with past partners that include:

- Gallatin Valley Land Trust (GVLT)
- Association of Gallatin Agricultural irrigators
- Gallatin Conservation District
- Montana State University Extension
- Gallatin National Forest
- Gallatin Local Water Quality District
- City of Bozeman
- Montana Department of Natural Resources and Conservation
- Montana Fish, Wildlife & Parks
- Montana Land Reliance
- Trout Unlimited
- The Trust for Public Land
- Gallatin County
- Greater Gallatin Watershed Council
- Pheasants Forever

VI. Prioritization of Natural Resource Problems and Desired Future Outcomes

The Gallatin County Local Working Group met in February 2022, April of 2019 and in 2015 to discuss and prioritize Gallatin County resource concerns. The group prioritized Gallatin County resource concerns based on a watershed approach. The watershed approach allowed participants to identify specific resource concerns based on the local conditions within the watershed (see attached local working group minutes from 2015 and 2019), which dovetails nicely with the focused conservation strategy related to the targeted implementation plans. The county was divided into 12 distinct watersheds. The following resource concerns were identified in the 12 watersheds as one of two priority resource concerns for each watershed, the Dry Creek watershed only had one resource concern identified during the local working group meetings.

A. *Water Quantity*; was identified in 66% of the watersheds as a priority resource concern. The NRCS continues to support projects that increase irrigation efficiency through both the existing NWQI program and through the RCPP program. Future TIPs will be proposed to further increase irrigation efficiency where possible.

Partner contribution; The Greater Gallatin Watershed Council, Trout Unlimited, Gallatin Local Water Quality district, Gallatin County Conservation District, Association of Gallatin agricultural irrigators, Gallatin River Task Force, among others, are willing agencies and organizations to partner with the NRCS to improve water quantity.

Success will be measured by stream flows and length of irrigation season. When irrigation efficiency increases more water should remain in streams and irrigators should be able to irrigate later in the season given the increased duration of adequate stream flow.

B. *Urban Sprawl*; was identified in 50% of the watersheds as a priority resource concern. The Regional Conservation Partnership Program (RCPP) with the Gallatin Valley Land Trust (GVLT) has been extended for another year with an additional renewal approved for future funding. NRCS will continue to support the funding of this program to protect prime farmlandfrom development, with cost share available to applicants within this program.

Partner contributions; GVLT and the Montana Land reliance along with NRCS easement programs continue to protect land from development on prime soils or on working farms. In 2019 Gallatin Valley Land Trust renewed their RCPP program for another 5 years within Gallatin County to protect land with prime soils from development. In 2018, Gallatin Countyapproved 20 million dollars for an open lands bond to purchase development rights so that working farms and ranches remain in agriculture.

Success; Farming will continue in the county

C. *Soil Erosion*; was identified in 33% of the watersheds as a priority resource concern. Soil erosion, whether it is wind or water induced is and has traditionally been a focus of the NRCS. Highly erodible land conservation plans are developed as requested by the Farm Service Agency (FSA) to address wind and water erosion on land that has not had a land determination. Additionally, multiple practices including but not limited to cover crops and residue management have greatly reduced soil erosion in the county and are available through all programs and technical assistance. There, however, is a period prior to planting and just after harvest on potato ground that is susceptible to soil erosion. A TIP is in development to address these critical periods during soil preparation and after harvest for potato fields.

Partner contributions; the Gallatin agricultural irrigators, GVLT, Gallatin county extension, Gallatin county conservation district, producers, Montana Land Reliance and others continue to provide education and outreach to landowners related to reducing erosion.

Success; Reduced sediment loading in streams with the possible removal of sediment from list of impairments on a number of impaired streams within the county. Elimination of dust storms in fall and spring. Reduced washing in fields during spring runoff.

D. *Plant Productivity*; specifically weeds, were identified in 25% of the watersheds as a priority resource concern. Ventenata, recently identified in Gallatin County is a highly invasive grass species that has recently raised alarms through much of the west given that it is beginning to replace perennial grasses while having minimal forage value for livestock or wildlife. Other weeds, such as Canada thistle, Russian thistle, knapweed and leafy spurge are present and efforts are continuing to address these plants, largely on pastureland and rangeland settings. Juniper encroachment on rangelands is compromising ecosystem functions on rangelands, especially in the drier portions of the county north of the East Gallatin River.

Partner contributions; Gallatin County Weed District, Montana State University, Gallatin County

Invasive Species Alliance, Gallatin County Extension, Gallatin County Conservation District, other federal and state agencies, along with others will continue to educate, supply cost share, identify and map invasive weeds within the county.

Success; Reduction of weeds present on private and public land within the county will be difficult given the amount of development and traffic on waterways and roads. However, given the quality of mapping from Montana State University and the Gallatin County Weed District wecan target new infestations prior to them becoming established on the landscape if identified early. Raising awareness with landowners on the cost of weed infestation, such as reduced biodiversity, decreased production, nutrient depletion, shading desirable species and water use may increase the amount of acres treated for weeds.

E. *Forest Health*; was identified in only 10% of the watersheds but forest are not present in most watersheds. A TIP was submitted to address fuel loading on private forested land within the Bridger Mountain/Bangtail Mountains to coincide with a United States Forest Service project that is currently ongoing within this area on public land. A future TIP or Two Chiefs proposal will address forest health in the North Gallatin range, the location of the water supply for the City of Bozeman.

Partner contributions; the USFS is currently conducting a fuels reduction project in the Bridger mountain range. Montana Extension has completed a number of outreach events throughout the county to educate the public about fuels reduction and fire safety as it relates to property ownership. The City of Bozeman is also involved in forest health education as they work to thin some trees on city land within the city water supply basin (Sourdough area of the north Gallatin Range) to reduce the risk of a catastrophic fire that would negatively impact the City's ability to provide safe drinking water to the City of Bozeman.

Success; Reduce excessive fuel loading on forested land.

F. *Animal health,* specifically, inadequate feed and forage, was identified in approximately 10% of the watersheds as a priority resource concern. The loss of adequate pastureland and rangeland due to land development has been a serious concern in the county. Land development and urban sprawl continue to reduce the amount of open space available for livestock grazing. Consequently, the remaining undeveloped pasture and rangeland tend to be overstocked given the lack of available grazingland to graze livestock. Easement programs through the NRCS continue to be utilized to protect some of these areas from development. Some marginal cropland has been seeded back to grass and the adoption of cover crops, especially in place of fallow, has reduced some of the grazing pressure on the remaining pasture and rangeland.

Partner contributions; Gallatin Valley Land Trust and Montana Land Reliance along with Gallatin County have protected many acres in Gallatin County from development. The Gallatin Conservation district along with others have promoted the easement program with the goal of protecting agriculture in the Gallatin Valley.

Success; Success may be measured by the number of medium to large agricultural operations within the county and the quality and quantity of livestock shipped to market.

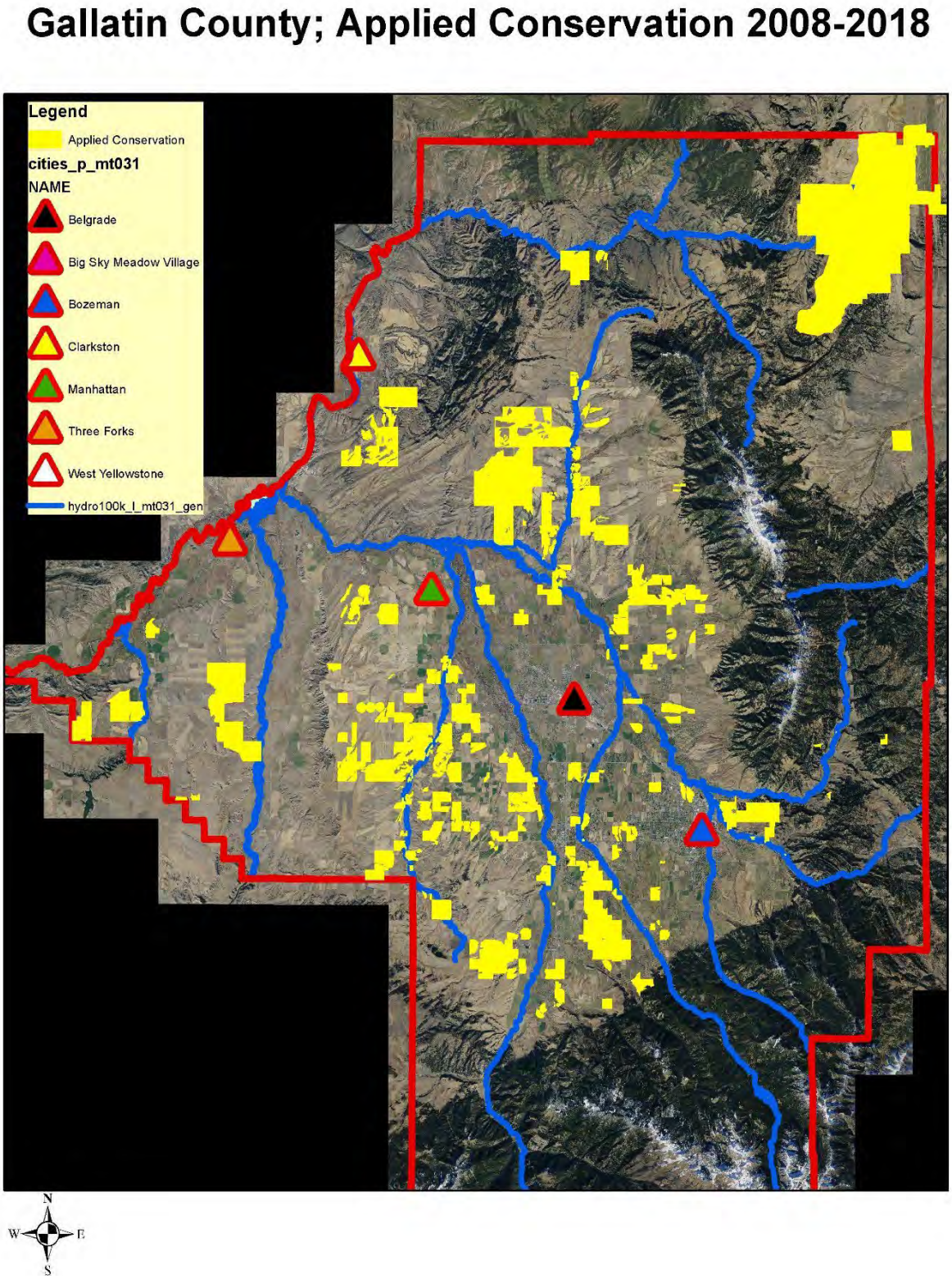


Figure 15; Applied Conservation, Gallatin County

Appendix A: 2015 Local Working group meeting minutes

Gallatin County Local Working Group Gallatin Conservation District Meeting Room120 S 5th Street Ste B102, Manhattan February 19, 2015, 2:30 p.m.

The meeting was convened by John Venhuizen, Chairman of the Gallatin Conservation District,at 2:30 pm. He called for a role call then turned the meeting over to Justin Meissner who facilitated the meeting.

Those in attendance were John Venhuizen, John Schutter, Sherwin Leap, Jason Camp, Bill Wright – Gallatin Conservation District; Marcie Murnion- GCD Administrator; Peter Brown- Gallatin Valley Land Trust; Walt Sales -Association of Gallatin Agricultural Irrigators; Brad Bauer-MSU Extension; Keri Bilbo -NRCS Bozeman Area ASTC-FO; Kale Gullett-NRCS StateResource Conservationist; Justin Meissner-NRCS District Conservationist; Maureen Meagher- NRCS District Resource Conservationist; Chris Mahony-NRCS Soil Conservationist; Marvin Hansen-NRCS Soil Conservation Technician; Susan Duncan-Upper Creamer Ditch; Marcia Youngman-Greater Gallatin Watershed Council; Michael Bertrand-CD Staff.

Justin provided instructions on what the purpose of the LWG was and that all entities were allowed one voting representative with the exception of the conservation district where each supervisor was allowed to vote independently as the each represent a portion of Gallatin County.

Multiple maps were displayed showing the 10 digit Hydrologic Unit Codes overlaying the 2013 aerial photo of Gallatin County. Due to the southern half of Gallatin County being dominated by federal land the area of interest was focused on the northern portion of the county.

Discussion was led on identifying the top two resource concerns for the nine 10 Digit HUC watersheds that lie within the Gallatin Valley RCPP boundary, (Bridger Creek (44,142 acres), Camp Creek (47,591 acres), Dry Creek (67,535 acres), Gallatin River-Gallatin Gateway (131,445 acres), Hyalie Creek (69,359 acres), Lower East Gallatin River (78,975 acres), LowerGallatin River (66,727 acres), and Smith Creek (54,312 acres), Upper Ease Gallatin River (96,804 acres).

Bridger Creek Watershed

1) Human- Urban Sprawl (water treatment / water quality)
2) Soil Erosion – Shoreline, Bank and Channel Erosion

Camp Creek Watershed

1) Soil Erosion – Shoreline, Bank and Channel Erosion
2) Water Qauntity; Excess/ Insufficient Water – Inefficient Use of Irrigation Water (Infrastructure)

Dry Creek Watershed

1) Soil Erosion – Shoreline, Bank and Channel Erosion
2) Animal –Feed and Forage

Gallatin River-Gallatin Gateway Watershed

1) Human – Urban Sprawl (Small Acre Education)
2) Water Quantity; Excess / Insufficient Water Inefficient Use of Irrigation Water (Infrastructure)

Hyalite Creek Watershed

1) Human – Urban Sprawl Human (Small Acre Education / Changing Landuse)
2) Water Quantity; Excess / Insufficient Water Inefficient Use of Irrigation Water (Infrastructure)

Lower East Gallatin River Watershed

1) Human – Urban Sprawl Human (Small Acre Education / Changing Landuse)
2) Water Quality Degradation – (Nutrients, sediment & temperatures)

Lower Gallatin Watershed

1) Water Quantity; Excess / Insufficient Water 0Inefficient Use of Irrigation Water (Infrastructure)
2) Plant Health – (Plant productivity and Health / Structure and Composition)

Smith Creek Watershed

1) Water Quantity; Excess / Insufficient Water (Insufficient Use of Irrigation Water (Infrastructure)
2) Human – Urban Sprawl (Small Acre Education)

Upper East Gallatin River Watershed

1) Human- Urban Sprawl (water treatment / water quality)
2) Soil Erosion – Shoreline, Bank and Channel Erosion

** Note ** All watersheds where Excess /Insufficient Water / irrigation infrastructure was documented as a primary resource concern, ENERGY was also noted specifically for Irrigation Pumps and potential for re-organization **

After detailed conversations on all watersheds the following was brought to the group for a unanimous decision:

1) Primary One Resource Concern (County Wide): None Identified
2) Land Use (Cropland- Soil Quality Degradation)
3) Watershed (greater Camp Creek Watershed – includes Godfrey Creek) All Land uses AllResource Concerns.

The initial vote was 4 for watershed and 4 for land use. After polling the voting members fortheir reasons for their vote a second vote was taken with a consensus towards identifying the primary one watershed as the greater camp Creek Watershed for the 2016 Gallatin County LocalWorking Group Recommendation.

The LWG was adjourned by the Chairman Venhuizen.

Appendix B: 2019 Local Working Group Minutes (4/3/2019)

Present

Natural Resources Conservation Service, Gallatin Agricultural Irrigators, Gallatin Valley Land Trust, Trout Unlimited, Conservation district, Montana Land Reliance, Department of Natural Resources, Gallatin Invasive species alliance, Gallatin County weed district, Montana State University extension, Farm Service Agency, Gallatin River Task force, Greater Gallatin Watershed Council, Trust for Public Lands, Gallatin Local Water Quality district, U.S. Forest Service, Greater Yellowstone Coalition, Stockman bank, Pheasants Forever and some local producers.

Initial discussion focused on the purpose of a long range plan and how the targeted implementation plans come out of the long range plan. New way of doing business for NRCS, targeting areas for specific resource concerns. Each group was given the opportunity to discuss some of their accomplishments addressing natural resource concerns in the county.

Discussed the 2016 local working group meeting and the results of that meeting where Camp and Godfrey creek were designated as the priority one watersheds for Gallatin County. Briefly discussed the strategy of planning by watershed versus land use or some other alternative.

Reviewed the forest health tip for the group as an example of how NRCS will be targetingresource concerns in particular locations.

Reviewed resource concerns and discussed potential opportunities for collaborating on projects.

Went through each watershed and listed resource concerns, participants than ranked the resource concerns though out the county.

Bridger Creek/Upper East Gallatin Watershed

3) Human- Urban Sprawl *(water treatment / water quality)*
4) Soil Erosion – Shoreline, Bank and Channel Erosion

Madison River/Three Forks/Willow Creek Watershed

1) Water Quantity
2) Soil Erosion- Streambank

Missouri Headwaters Watershed

1) Human- Urban Sprawl
2) Water Quantity- flooding; clay soils

Flathead Creek Watershed

1) Forest Health
2) Plant health and productivity

Camp Creek Watershed

3) Soil Erosion – Shoreline, Bank and Channel Erosion
4) Excess/ Insufficient Water – Inefficient Use of Irrigation Water *(Infrastructure)*

Sixteenmile Creek Watershed

1) Plant Structure and Composition; weeds

Dry Creek Watershed

3) Soil Erosion – Shoreline, Bank and Channel Erosion
4) Animal –Feed and Forage

Gallatin River-Gallatin Gateway Watershed

3) Human – Urban Sprawl (Small Acre Education/land use change)
4) Water quantity; Excess / Insufficient Water Inefficient Use of Irrigation Water (Infrastructure)

Hyalite Creek Watershed

3) Human – Urban Sprawl Human (Small Acre Education / Changing Landuse)
4) Water Quantity; Excess / Insufficient Water Inefficient Use of Irrigation Water *(Infrastructure)*

Lower East Gallatin River Watershed

3) Human – Urban Sprawl Human (Small Acre Education / Changing Landuse)
4) Water Quality Degradation – (*Nutrients, sediment & temperatures*)

Lower Gallatin Watershed

3) Excess / Insufficient Water 0Inefficient Use of Irrigation Water *(Infrastructure)*
4) Plant Health – *(Plant productivity and Health / Structure and Composition),Weeds*

Smith Creek Watershed

3) Water Quantity; Excess / Insufficient Water (Insufficient Use of Irrigation Water *(Infrastructure)*
4) Human – Urban Sprawl *(Small Acre Education)*

Appendix C: 2022 Local Working Group Minutes (2/16/2022)

Due to Covid in person seating was limited. There was a zoom link and options for folks online to vote for their watershed and top resource concerns. These comments were added to in person comments.

12 Watersheds in the Lower Gallatin were evaluated. A local working group meeting or some public meeting will be conducted in the near future for folks in the upper watershed where most of the land is public, excluding Big Sky and West Yellowstone.

Human impacts related to urban sprawl were identified for most watersheds as a priority resource concern. Easement programs are the only tool available to NRCS to address urban sprawl so we asked folks to identify other resource concerns that might be addressed more immediately through a targeted implementation plan (for some watersheds other resource concerns were then identified as priorities).

Bridger Creek/Upper East Gallatin Watershed

1) Human- Urban Sprawl (water treatment / water quality)
2) Aquatic habitat
3) Soil Erosion – Shoreline, Bank and Channel Erosion
   -Field Sediment, nutrient and pathogen loss were added as resource concerns

Madison River/Three Forks/Willow Creek Watershed

1) Water Quantity
2) Soil Erosion- Streambank
   -Added Field sediment, nutrient and pathogen loss, wildlife impacts

Missouri Headwaters Watershed

1) Human- Urban Sprawl
2) Water Quantity- flooding; clay soils
   -Added degraded plant condition (Plant structure and composition; juniper encroachment)

Flathead Creek Watershed

1) Forest Health
2) Plant health and productivity (weeds, specifically hoary alyssum, oxeye daisy and Vententa (identified by weed district)
   -Fire Management added as a resource concern

Camp Creek Watershed

1) Soil Erosion – Shoreline, Bank and Channel Erosion
2) Excess/ Insufficient Water – Inefficient Use of Irrigation Water (Infrastructure)
   -Wildlife impacts (damage to ag land, not a NRCS resource concern but worth noting)

Sixteenmile Creek Watershed

1) Plant Structure and Composition and Plant Health and Productivity were both identified as equal natural resource concerns-weeds, conifer encroachment

2) Aquatic Habitat; fisheries, especially south fork of Sixteen mile creek
-fire management and forest health were added as additional resource concerns

Dry Creek Watershed

1) Wind and Water Erosion
2) Animal –Feed and Forage
-Degraded plant condition and source water depletion were added as resource concerns

Gallatin River-Gallatin Gateway (Big Bear) Watershed

1) Human – Urban Sprawl (Small Acre Education/land use change)
2) Source Water Depletion
-Field sediment, nutrient and pathogen loss, fire management, degraded plant condition (weeds) and storage and handling of pollutants

Hyalite Creek Watershed

1) Human – Urban Sprawl Human (Small Acre Education / Changing Landuse)
2) Water Quantity; Excess / Insufficient Water Inefficient Use of Irrigation Water (Infrastructure)
-Fire management and source water depletion were added as additional resource concerns

Lower East Gallatin River Watershed

1) Human – Urban Sprawl Human (Small Acre Education / Changing Landuse)
2) Water Quality Degradation – (Nutrients, sediment & temperatures)
-Fire management, storage and handling of pollutants were added as resource conerns

Lower Gallatin Watershed

1) Water Quantity; Excess / Insufficient Water Inefficient Use of Irrigation Water (Infrastructure)
2) Plant Health – (Plant productivity and Health / Structure and Composition),Weeds

Smith Creek Watershed

1) Water Quantity; Excess / Insufficient Water (Insufficient Use of Irrigation Water (Infrastructure)
2) Human – Urban Sprawl (Small Acre Education)
-Field sediment, nutrient and pathogen loss were added as resource concerns

Appendix D: Table of Impaired Streams in Gallatin County (MT DEQ)

Stream	Nutrient Concerns	Sediment Concerns	*E. coli* Concerns
Bear Creek	X	X	
Bozeman Creek	X	X	X
Bridger Creek	X		
Camp Creek	X	X	X
Dry Creek	X	X	
East Gallatin River	X		
Godfrey Creek	X	X	X
Hyaite Creek	X		
Jackson Creek	X		
Mandeville Creek	X		
Reese Creek	X	X	X
Rocky Creek		X	
Smith Creek	X	X	X
Stone Creek		X	
Thompson Creek	X	X	

Montana Natural Heritage - SOC Report Species List Last Updated **10/31/2019**

Plant Species of Concern

40 Species of Concern
6 Potential Species of Concern - Species Occurrences are not maintained for Animal PSOC, therefore we cannot filter these species geographically
Filtered by the following criteria:
County = Gallatin (based on mapped Species Occurrences)

MONTANA Natural Heritage Program

A program of the Montana State Library's Natural Resource Information System operated by the University of Montana.

Expand All | Collapse All

⊞ Introduction

⊟ Species of Concern

Species of Concern
40 Species
Filtered by the following criteria:
County = Gallatin (based on mapped **Species Occurrences**)

FERNS AND FERN ALLIES (PTERIDOPHYTA)

1 SPECIES
COUNTY = GALLATIN (based on mapped Species Occurrences)

SCIENTIFIC NAME COMMON NAME TAXA SORT	OTHER NAMES	FAMILY (SCIENTIFIC) FAMILY (COMMON)	GLOBAL RANK	STATE RANK	USFWS	USFS	BLM	MNPS THREAT CATEGORY	HABITAT
Polystichum kruckebergii Kruckeberg's Swordfern	Kruckeberg's Hollyfern	**Dryopteridaceae** Wood Fern Family	G4	S2S3					Alpine
			Species Occurrences verified in these Counties: Deer Lodge, Flathead, Gallatin, Lake **State Rank Reason:** Sparsely distributed across western Montana on alpine and subalpine cliffs and talus slopes. Very little data are available for the locations in Montana, though the habitats occupied by the species are not generally impacted by human activities or disturbance. Additional survey and monitoring data are needed.						

GYMNOSPERM (CONIFERS)

1 SPECIES
COUNTY = GALLATIN (based on mapped Species Occurrences)

SCIENTIFIC NAME COMMON NAME TAXA SORT	OTHER NAMES	FAMILY (SCIENTIFIC) FAMILY (COMMON)	GLOBAL RANK	STATE RANK	USFWS	USFS	BLM	MNPS THREAT CATEGORY	HABITAT
Pinus albicaulis Whitebark Pine		**Pinaceae** Fir / Hemlock / Larch / Pine / Spruce	G3?	S3	C	Candidate on Forests (BD, BRT, CG, HLC, KOOT, LOLO)	SENSITIVE		Subalpine forest, timbertine
			Species Occurrences verified in these Counties: Beaverhead, Broadwater, Carbon, Cascade, Deer Lodge, Fergus, Flathead, Gallatin, Glacier, Granite, Jefferson, Judith Basin, Lake, Lewis and Clark, Liberty, Lincoln, Madison, Meagher, Mineral, Missoula, Park, Pondera, Powell, Ravalli, Sanders, Silver Bow, Stillwater, Sweet Grass, Teton, Toole, Wheatland **State Rank Reason:** Whitebark pine is a common component of subalpine forests and a dominant species of treeline and krummholtz habitats. It occurs in almost all major mountain ranges of western and central Montana. Populations of whitebark pine in Montana and across most of western North America have been severely impacted by past mountain pine beetle outbreaks and by the introduced pathogen, white pine blister rust. The results of which have been major declines in whitebark pine populations across large areas of its range. Additionally, negative impacts associated with encroachment and increased competition from other trees, primarily subalpine fir have occurred as a result of fire suppression in subalpine habitats.						

FLOWERING PLANTS - DICOTS (MAGNOLIOPSIDA)

23 SPECIES
COUNTY = GALLATIN (based on mapped Species Occurrences)

SCIENTIFIC NAME COMMON NAME TAXA SORT	OTHER NAMES	FAMILY (SCIENTIFIC) FAMILY (COMMON)	GLOBAL RANK	STATE RANK	USFWS	USFS	BLM	MNPS THREAT CATEGORY	HABITAT

Astragalus terminalis Railhead Milkvetch		**Fabaceae** Pea Family	G3	S2S3			SENSITIVE	3	Sagebrush steppe
			Species Occurrences verified in these Counties: Beaverhead, Gallatin, Madison **State Rank Reason:** *Astragalus terminalus* is a regional endemic known from southwest Montana, east-central Idaho and northwest Wyoming. In Montana it is documented from Beaverhead County and the Upper Madison River Valley. The species appears to be vulnerable to intensive grazing and competition from noxious weeds, at least in low-elevation areas.						
Castilleja exilis Annual Indian Paintbrush	Castilleja minor ssp. minor	**Orobanchaceae** Broomrape Family	G5T5	S2				2	Wetland/Riparian
			Species Occurrences verified in these Counties: Broadwater, Deer Lodge, Fergus, Gallatin, Jefferson, Madison, Park **State Rank Reason:** Annual Indian Paintbrush is known from a half dozen counties in southwest Montana with the majority of documented locations on private lands. Many areas of suitable habitat have been converted to agricultural uses and/or are used for livestock grazing. Additionally, populations are susceptible to hydrologic changes and may negatively impacted by invasive weeds.						
Castilleja gracillima Slender Indian Paintbrush	Castilleja miniata ssp. miniata	**Orobanchaceae** Broomrape Family	G3G4	S2					Wetland/Riparian
			Species Occurrences verified in these Counties: Beaverhead, Cascade, Fergus, Gallatin, Madison, Meagher, Park, Sweet Grass **State Rank Reason:** This plant is a regional endemic, known in Montana from a limited number of populations, with most being relatively small. No threats have been observed, though it could be vulnerable to hydrologic alterations or noxious weeds.						
Cryptantha fendleri Fendler Cat's-eye		**Boraginaceae** Borage Family	G5	S2			SENSITIVE	2	Sandy sites
			Species Occurrences verified in these Counties: Beaverhead, Gallatin, Sheridan **State Rank Reason:** Fendler cat's-eye is restricted to very localized sandhills habitat in the far southwestern and northeastern corners of Montana where it is known from a total of three moderate to large-sized populations. It responds positively to disturbance that maintains its sparsely vegetated habitat. Fire suppression and dune stabilization efforts have likely had an adverse effect on populations of this species.						
Draba densifolia Dense-leaf Draba		**Brassicaceae** Mustards	G5	S2				2	Alpine
			Species Occurrences verified in these Counties: Beaverhead, Flathead, Gallatin, Glacier, Granite, Jefferson, Lewis and Clark, Park, Pondera, Powell, Ravalli, Silver Bow, Sweet Grass **State Rank Reason:** *Draba densifolia* is distributed in the western half of the state in four moderate to large populations, six small occurrences and nine historical or poorly documented occurrences. Occupied habitats are at moderate to high elevation which help to minimize disturbance to some of the populations. However, livestock grazing, invasive weeds and off-road ATV use impact some populations.						
Ericameria discoidea var. discoidea Whitestem Goldenbush	Haplopappus macronema var. macronema	**Asteraceae** Aster/Sunflowers	G4G5T4	S2		Sensitive - Known on Forests (BD, CG) Sensitive - Suspected on Forests (BRT)		3	Rock/Talus
			Species Occurrences verified in these Counties: Beaverhead, Gallatin **State Rank Reason:** Rare in Montana where it is only known from a couple of sites in the southwest corner of the state. Population levels are poorly documented. One site is relatively inaccessible and not likely to be threatened by human impacts.						
Eriogonum crosbyae Crosby's Buckwheat	Eriogonum capistratum var. muhlickii, Eriogonum chrysops [misapplied]	**Polygonaceae** Buckwheat Family	G4	S3					Alpine
			Species Occurrences verified in these Counties: Deer Lodge, Gallatin, Granite, Ravalli **State Rank Reason:** Rare to Uncommon. This entity is restricted to high elevation sites in the Bitterroot Range and in the Anaconda-Pintlers, where it may be locally common in some areas. Good population data are lacking for most occurrences, though it's long-term viability does not appear to be a major concern at this time due, in part, to the remoteness of its habitat.						
Gymnosteris parvula Small-flower Gymnosteris		**Polemoniaceae** Phlox Family	G4	S2				3	Grasslands/Sagebrush steppe
			Species Occurrences verified in these Counties: Beaverhead, Gallatin **State Rank Reason:** Known in Montana from one 1932 collection near West Yellowstone and one recent collection from Beaverhead County.						
Impatiens aurelia Pale-yellow Jewel-weed		**Balsaminaceae** Impatiens	G4	S3					riparian
			Species Occurrences verified in these Counties: Cascade, Flathead, Gallatin, Jefferson, Lake, Lewis and Clark, Mineral, Missoula, Sanders **State Rank Reason:** *Impatiens aurelia* is known from about 20 locations documented from 1886 to 2016. It is considered uncommon in Lake and Flathead Counties, where the majority of observations have been found, and rare in other counties of western Montana. It grows in wet, often organic soil in both disturbed and undisturbed wetlands, and rarely appears abundant. However, it may require or persist better with some hydrological disturbance. Revisits to known locations and more surveys are needed to better document locations, population sizes, and threats.						
Mimulus nanus Dwarf Purple Monkeyflower		**Phrymaceae** Lopseed Family	G5	S2S3		Sensitive - Known on Forests (BRT, CG)		2	Open slopes (low-elevation)
			Species Occurrences verified in these Counties: Gallatin, Ravalli **State Rank Reason:** *Mimulus nanus* is only known from a few extent occurrences in the state, plus two historical collections. Populations are generally small and in habitats susceptible to weed invasion. At least a few of the occurrences contain scattered spotted knapweed plants.						

Mimulus primuloides Primrose Monkeyflower		**Phrymaceae** Lopseed Family	G4	S3		Sensitive - Known on Forests (BD, BRT)		3	Fens and wet meadows
			Species Occurrences verified in these Counties: Beaverhead, Deer Lodge, Gallatin, Ravalli **State Rank Reason:** Known from several watersheds in southwest Montana, occurring almost entirely on National Forest lands. Eight of the occurrences are moderate to large-sized populations. Two historical locations are also known. Fire may adversely impact *M. primuloides* though more study is needed. It is also vulnerable to changes in hydrology and one population could be adversely affected by activity at an adjacent ski area.						
Myriophyllum quitense Andean Water-milfoil		**Haloragaceae** Water Milfoils	G4?	S3					
			Species Occurrences verified in these Counties: Broadwater, Gallatin, Madison **State Rank Reason:** *Myriophyllum quitense* is an aquatic plant that has recently (2008-2016) been found in three waterbodies of Montana. Plants are found in slow-moving rivers that vary in water quality from the Madison River in Yellowstone National Park to Toston Reservoir on the Missouri River. These locations represent a very narrow geographical portion of Montana. Proper identification of *Myriophyllum* species require careful collections to obtain flowering or fruiting structures, use of an appropriate and current taxonomic key, and time spent studying the specimen. More surveys are greatly needed to assess the true abundance and distribution of *Myriophyllum quitense* in Montana.						
Oxytropis deflexa var. foliolosa Nodding Locoweed		**Fabaceae** Pea Family	G5T5	S2S3				3	Alpine
			Species Occurrences verified in these Counties: Beaverhead, Gallatin, Madison, Park **State Rank Reason:** Rare in Montana, where it has been documented from a few, high-elevation sites in the mountains of the southwest portion of the state.						
Pedicularis pulchella Mountain Lousewort		**Orobanchaceae** Broomrape Family	G3	S3					Alpine
			Species Occurrences verified in these Counties: Carbon, Deer Lodge, Gallatin, Granite, Madison, Park, Powell **State Rank Reason:** Restricted to high elevation areas of southern Montana. Limited data are available for the species and it may be more common than the few collections indicate.						
Penstemon humilis Low Beardtongue		**Plantaginaceae** Plantain Family	G5	S1S3					Sagebrush steppe (Montane)
			Species Occurrences verified in these Counties: Beaverhead, Gallatin, Lewis and Clark, Lincoln, Madison, Meagher, Missoula, Park, Powell, Ravalli **State Rank Reason:** Known in Montana from 1 collection from Beaverhead County						
Penstemon whippleanus Whipple's Beardtongue		**Plantaginaceae** Plantain Family	G5	S2					Open areas (subalpine and alpine)
			Species Occurrences verified in these Counties: Beaverhead, Gallatin, Madison **State Rank Reason:** Whipple's beardtongue occurs at the edge of its range in Montana, and is known here from just two collections, only one of which is recent. The species occupies high elevation, rocky habitat that is relatively unthreatened.						
Physaria saximontana var. dentata Rocky Mountain Twinpod		**Brassicaceae** Mustards	G3T3	S3					Gravelly slopes/talus (Montane/subalpine)
			Species Occurrences verified in these Counties: Beaverhead, Broadwater, Carbon, Chouteau, Fergus, Flathead, Gallatin, Glacier, Lewis and Clark, Madison, Park, Pondera, Powell, Silver Bow, Sweet Grass, Teton **State Rank Reason:** State endemic known from several counties across central and southern Montana mountain ranges.						
Primula incana Mealy Primrose		**Primulaceae** Primrose Family	G5	S3		Sensitive - Known on Forests (BD) Sensitive - Historically known, not recently documented on Forests (CG)		2	Wetland/Riparian
			Species Occurrences verified in these Counties: Beaverhead, Broadwater, Carbon, Deer Lodge, Gallatin, Jefferson, Madison, Meagher, Powell, Sheridan, Silver Bow, Teton **State Rank Reason:** *Primula incana* is known from a few dozen extant occurrences in Montana, including several moderate to large populations. However, most known populations are small, and the status of several populations is uncertain. Ownership of the occupied areas is varied and includes federal, state and private lands, including several locations managed or protected for their conservation values. However, unprotected private lands host many occurrences. Cattle grazing may have some negative effects on the species including the direct effects of herbivory and trampling. The species is also vulnerable to activities that alter the hydrology of the wetlands it occupies. Continued threats and potentially declining trends, particularly in regards to habitat quality make the species vulnerable to local extirpation.						
Senecio hydrophilus Alkali-marsh Ragwort		**Asteraceae** Aster/Sunflowers	G5	S3					
			Species Occurrences verified in these Counties: Beaverhead, Broadwater, Flathead, Gallatin, Madison, Missoula, Park, Powell **State Rank Reason:** Senecio hydrophilus is present in alkaline habitats within a portion of southwest Montana. Plants are not that common, and occur in low-elevation wetlands that can be victum to dewatering.						

Sidalcea oregana Oregon Checker-mallow		**Malvaceae** Mallow Family	G5	S2S3				1	Grasslands (low-elevation)
			Species Occurrences verified in these Counties: Gallatin, Lake **State Rank Reason:** Known from two widely separate sites in Gallatin and Lake counties. Habitats occupied by the species are susceptible to weed invasion and both locations have a large component of weedy species. However, *S. oregana* appears capable of tolerating at least some competition from these weedy species. The Lake County population occurs near and along Highway 93 and has the potential to be significantly negatively impacted by highway construction.						
Thelypodium paniculatum Northwestern Thelypody	**Thelypodium sagittatum var. crassicarpum**	**Brassicaceae** Mustards	G2	SH					Wetland/Riparian
			Species Occurrences verified in these Counties: Beaverhead, Gallatin, Madison **State Rank Reason:** Known only from an 1899 collection in Beaverhead County, although Dorn (1984) also reports it for Madison County.						
Thelypodium sagittatum Slender Thelypody		**Brassicaceae** Mustards	G4	S2				3	Alkaline meadows (Valleys and Montane)
			Species Occurrences verified in these Counties: Beaverhead, Gallatin **State Rank Reason:** Known from numerous occurrences in extreme southwestern Montana.						
Viguiera multiflora Many-flowered Viguiera	**Helomeris multiflora**	**Asteraceae** Aster/Sunflowers	G4G5	S2S3				3	Aspen woodlands
			Species Occurrences verified in these Counties: Beaverhead, Carbon, Cascade, Gallatin, Madison **State Rank Reason:** Known from one extant occurrence in Beaverhead County and four historical collections from Beaverhead, Gallatin and Madison Counties.						

FLOWERING PLANTS - MONOCOTS (LILIOPSIDA)

14 SPECIES

COUNTY = GALLATIN (based on mapped Species Occurrences)

SCIENTIFIC NAME COMMON NAME TAXA SORT	OTHER NAMES	FAMILY (SCIENTIFIC) FAMILY (COMMON)	GLOBAL RANK	STATE RANK	USFWS	USFS	BLM	MNPS THREAT CATEGORY	HABITAT
Allium simillimum Dwarf Onion		**Liliaceae** Lillies	G4	S2?					Mesic Grasslands-Meadows
			Species Occurrences verified in these Counties: Gallatin, Lincoln, Ravalli **State Rank Reason:** Rare in Montana, where it is known from only a few locations in the southwest portion of the state near the Idaho border. Available survey data are limited for the species in Montana.						
Carex idahoa Idaho Sedge	**Carex parryana ssp. idahoa**	**Cyperaceae** Sedges	G3	S3		Sensitive - Known on Forests (BD)	SENSITIVE	2	Wetland/Riparian
			Species Occurrences verified in these Counties: Beaverhead, Broadwater, Deer Lodge, Gallatin, Madison, Powell, Silver Bow **State Rank Reason:** Idaho sedge is a regional endemic known from several dozen sites in Montana which cluster into approx 15-20 populations, most on public lands. The estimated number of stems is in the tens of thousands, but total occupied habitat has been estimated at less than 200 acres. The species is palatable, and populations may be affected by heavy grazing. Other risks are competition from exotic species, hydrologic alterations, agricultural development and road construction/maintenance. Updated population data and related site information are needed.						
Carex multicostata Many-ribbed Sedge		**Cyperaceae** Sedges	G5	S2S3					Grasslands (Montane)
			Species Occurrences verified in these Counties: Beaverhead, Carbon, Gallatin, Granite, Missoula, Park, Ravalli **State Rank Reason:** A rare species in Montana, scattered in the mountains of the southwest and south-central portions of the state. Very little data are available for the species in Montana. However, the potential for negative impacts to the popoulations appears to be low.						
Carex occidentalis Western Sedge		**Cyperaceae** Sedges	G4	SH					Dry, montane to alpine
			Species Occurrences verified in these Counties: Beaverhead, Gallatin, Silver Bow **State Rank Reason:** Known in Montana from an 1887 collection by Tweedy near "Boulder Creek" and a 1930 collection on Willow Creek in Beaverhead County.						
Carex rostrata Glaucus Beaked Sedge		**Cyperaceae** Sedges	G5	S2S3		Sensitive - Known on Forests (KOOT, LOLO)		3	Fens
			Species Occurrences verified in these Counties: Flathead, Gallatin, Lincoln, Missoula, Stillwater **State Rank Reason:** This is a rare species in Montana, not to be confused with the more common *Carex utriculata*, which had been mistakenly treated under the name *Carex rostrata* in many past Floras.						
Carex stenoptila Small-winged Sedge		**Cyperaceae** Sedges	G3	S2S3					Grasslands (Montane)
			Species Occurrences verified in these Counties: Carbon, Gallatin, Madison, Mineral, Park, Ravalli, Sheridan, Stillwater, Sweet Grass, Teton **State Rank Reason:** A globally rare species, which is known from several widely scattered locations in Montana. Very little data are available for the species in Montana, as the sites are known only from specimen collections with sparse information.						

Eleocharis rostellata Beaked Spikerush		**Cyperaceae** Sedges	G5	S3		Sensitive - Known on Forests (BD, CG, HLC) Species of Conservation Concern on Forests (FLAT)		3	Wetlands (Alkaline)
			Species Occurrences verified in these Counties: Carbon, Flathead, Gallatin, Lake, Lewis and Clark, Lincoln, Madison, Meagher, Park, Sanders, Sweet Grass, Teton **State Rank Reason:** Known from over a dozen extant sites and a few historical locations. Private and state lands host many occurrences that are vital to the viability of the species in the state. The species is vulnerable to hydrologic alteration and development.						
Eriophorum gracile Slender Cottongrass		**Cyperaceae** Sedges	G5	S3		Sensitive - Known on Forests (CG, KOOT) Species of Conservation Concern on Forests (FLAT)		2	Fens
			Species Occurrences verified in these Counties: Flathead, Gallatin, Lake, Lincoln, Madison, Missoula, Park, Powell **State Rank Reason:** Known from a very few large populations, several smaller populations and a half dozen historical or poorly documented locations. Populations occur on a mix of federal, state and private ownerships in northwest Montana at low to moderate elevations. Populations are vulnerable to any activities that may alter the hydrology of occupied sites.						
Muhlenbergia andina Foxtail Muhly		**Poaceae** Grasses	G4	S2S3					
			Species Occurrences verified in these Counties: Broadwater, Carbon, Cascade, Gallatin, Granite, Lake, Lewis and Clark, Madison, Park **State Rank Reason:** *Muhlenbergia andina* occurs widely scattered in western and south-central Montana. It grows in damp places, but often with well-drained soils. It can be found along streams, in wet meadows and seeps, and around hot springs. The low number of collections in combination with limited habitat and/or specific micro-habitat characteristics indicates it is either rare, declining, or over-looked in floristic surveys. Current data on locations, population sizes, habitat, and threats is greatly needed to better assess its status in Montana.						
Muhlenbergia minutissima Annual Muhly		**Poaceae** Grasses	G5	S3					
			Species Occurrences verified in these Counties: Beaverhead, Gallatin, Madison, Missoula, Ravalli, Silver Bow **State Rank Reason:** *Muhlenbergia minutissima* is known from 7 locations observed from 1895 to 2015 in central and western Montana. It is also reported to occur in northeast Montana, but specimens have not been located (Peterson *in* FNA 2003). A 1941 occurrence near Belgrade has been searched for in recent decades, but not re-located (Matt Lavin personal communication). Plants can occupy disturbed areas, yet populations may not be persisting. Surveys that bring forth current data on locations, populations sizes, habitat requirements, or threats is needed.						
Spiranthes diluvialis Ute ladies'-tresses	Ute Lady's-tresses	**Orchidaceae** Orchids	G2G3	S1S2	LT			2	Wetland/Riparian
			Species Occurrences verified in these Counties: Beaverhead, Broadwater, Gallatin, Jefferson, Madison **State Rank Reason:** *Spiranthes diluvialis* (Ute ladies'-tresses) is known from only a handful of occurrences in southwest and south-central Montana in the Missouri, Jefferson, Beaverhead, Ruby and Madison River drainages. *S. diluvialis* is restricted in area by specific hydrologic requirements. Many populations have less than 100 individuals, though a couple have over 500 plants. Sites are susceptible to hydrologic changes and weed invasion. Large areas of habitat have been converted to agricultural uses. Livestock grazing is also a common use of these habitats. Two populations occur along highway right-of-ways. Most populations occur on private lands and only one occurrence is currently provided some potential protection or management for its conservation value.						
Sporobolus neglectus Small Dropseed		**Poaceae** Grasses	G5	S1S2					Grasslands (low-elevation)
			Species Occurrences verified in these Counties: Gallatin, Sanders, Wheatland **State Rank Reason:** Rare in Montana, where it is known from a few widely scattered and poorly documented sites.						
Stipa lettermanii Letterman's Needlegrass	Achnatherum lettermanii	**Poaceae** Grasses	G5	S1S3					Talus and Grasslands (low-elevation)
			Species Occurrences verified in these Counties: Beaverhead, Big Horn, Carbon, Gallatin, Madison, Mineral, Park, Powell **State Rank Reason:** Documented from several locations in the southern portion of the state. However, population levels, site characteristics and related information needed to determine the species' status are lacking.						
Veratrum californicum California False-hellebore		**Liliaceae** Lillies	G5	S2		Sensitive - Known on Forests (BD, BRT) Sensitive - Suspected on Forests (CG, HLC)			Wetland/Riparian
			Species Occurrences verified in these Counties: Gallatin, Granite, Lewis and Clark, Lincoln, Meagher, Powell, Ravalli **State Rank Reason:** Rare in Montana, where it is known from a very localized area in the southwestern corner of the state.						

BRYOPHYTES (BRYOPHYTA)

1 SPECIES
COUNTY = GALLATIN (based on mapped Species Occurrences)

SCIENTIFIC NAME COMMON NAME TAXA SORT	OTHER NAMES	FAMILY (SCIENTIFIC) FAMILY (COMMON)	GLOBAL RANK	STATE RANK	USFWS	USFS	BLM	MNPS THREAT CATEGORY	HABITAT
Scorpidium revolvens Limprichtia Moss	Drepanocladus revolvens, Limprichtia revolvens	Amblystegiaceae	G5	S1					
			Species Occurrences verified in these Counties: Flathead, Gallatin, Glacier, Lake, Missoula, Sanders, Stillwater, Teton						

Potential Species of Concern

Potential Species of Concern
6 Species
Filtered by the following criteria:
County = Gallatin (based on mapped **Species Occurrences**)

FLOWERING PLANTS - DICOTS (MAGNOLIOPSIDA)

4 SPECIES
COUNTY = GALLATIN (based on mapped Species Occurrences)

SCIENTIFIC NAME COMMON NAME TAXA SORT	OTHER NAMES	FAMILY (SCIENTIFIC) FAMILY (COMMON)	GLOBAL RANK	STATE RANK	USFWS	USFS	BLM	MNPS THREAT CATEGORY	HABITAT
Agoseris lackschewitzii Pink Agoseris	Agoseris aurantiaca var. aurantiaca, Agoseris carnea	Asteraceae Aster/Sunflowers	G4Q	S3S4					
			Species Occurrences verified in these Counties: Beaverhead, Carbon, Cascade, Deer Lodge, Gallatin, Granite, Judith Basin, Liberty, Madison, Meagher, Park, Silver Bow, Sweet Grass **State Rank Reason:** See rank details.						
Balsamorhiza macrophylla Large-leaved Balsamroot		Asteraceae Aster/Sunflowers	G3G5	S3S4		Sensitive - Known on Forests (BD, CG)		3	Sagebrush-grassland
			Species Occurrences verified in these Counties: Beaverhead, Gallatin, Madison **State Rank Reason:** This species occurs in Montana at the edge of its range where it is known from three southwestern Montana mountain ranges. Most of the known populations are moderate to large in size and in generally good-quality habitat. One occurrence in Gallatin County is only known from a 1931 collection. Invasive weeds are not a problem at sites occupied by *Balsamorhiza macrophylla* and livestock grazing at some of the sites does not appear to be negatively impacting the species.						
Mimulus suksdorfii Suksdorf Monkeyflower		Phrymaceae Lopseed Family	G4	S3S4					
			Species Occurrences verified in these Counties: Beaverhead, Carbon, Gallatin, Lewis and Clark, Madison, Missoula, Park, Rosebud, Silver Bow						
Ranunculus hyperboreus High Northern Buttercup	Ranunculus natans	Ranunculaceae Buttercup Family	G5	S3S4					Wetland/Riparian (Montane)
			Species Occurrences verified in these Counties: Beaverhead, Carbon, Deer Lodge, Gallatin, Jefferson, Madison, Missoula, Silver Bow, Valley **State Rank Reason:** Known from several southwest and south-central counties in Montana. See rank details for additional information.						

FLOWERING PLANTS - MONOCOTS (LILIOPSIDA)

2 SPECIES
COUNTY = GALLATIN (based on mapped Species Occurrences)

SCIENTIFIC NAME COMMON NAME TAXA SORT	OTHER NAMES	FAMILY (SCIENTIFIC) FAMILY (COMMON)	GLOBAL RANK	STATE RANK	USFWS	USFS	BLM	MNPS THREAT CATEGORY	HABITAT

Cypripedium parviflorum Small Yellow Lady's-slipper	Cypripedium calceolus	**Orchidaceae** Orchids	G5	S3S4		Sensitive - Known on Forests (CG, HLC, KOOT, LOLO) Sensitive - Suspected on Forests (BRT)		2	
			Species Occurrences verified in these Counties: Big Horn, Carter, Flathead, Gallatin, Granite, Jefferson, Judith Basin, Lake, Lewis and Clark, Lincoln, Missoula, Pondera, Stillwater, Sweet Grass, Teton **State Rank Reason:** Many occurrences known from the western half of the state, including a dozen or so historical or poorly documented sites. Many occurrences have small population numbers, though approximately two dozen occurrences are moderate to large populations. Populations occur on variety of federal, state and private ownerships with varied land uses and management. A variety of land uses and activities, including development, livestock grazing and timber harvesting may have detrimental impacts to populations. However, yellow lady's-slipper appears to be tolerant to some disturbances at low levels and the number of populations scattered over a wide area reduces the risk to the species. A loss of populations or a significant decline in numbers may warrant a re-listing as a Species of Concern in Montana, and populations should continue to be monitored on a semi-regular basis. Moderate to large occurrences should be managed to maintain habitat and viable population numbers.					
Sphenopholis intermedia Slender Wedgegrass	Sphenopholis obtusata var. major	**Poaceae** Grasses	G5	S3S4					Mesic sites (low-elevation)
			Species Occurrences verified in these Counties: Big Horn, Broadwater, Fergus, Flathead, Gallatin, Judith Basin, Lake, Lewis and Clark, Phillips, Wheatland **State Rank Reason:** Rare in Montana, where it has only been documented from a very few collections, though the population data required to more precisely assign a conservation rank are lacking.						

⊞ **Special Status Species**

⊞ **Additions To Statewide List**

⊞ **Species Removed From Statewide List**

Citation for data on this website:
Montana Plant Species of Concern Report. Montana Natural Heritage Program. Retrieved on 1/8/2020, from http://mtnhp.org/SpeciesOfConcern/?AorP=p

Montana Natural Heritage - SOC Report Species List Last Updated **10/31/2019**

Animal Species of Concern

53 Species of Concern
1 Special Status Species
Filtered by the following criteria:
County = Gallatin (based on mapped Species Occurrences)

MONTANA Natural Heritage Program

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⊞ Introduction

⊟ Species of Concern

Species of Concern
53 Species
Filtered by the following criteria:
County = Gallatin (based on mapped **Species Occurrences**)

MAMMALS (MAMMALIA) — 10 SPECIES — COUNTY = GALLATIN (based on mapped Species Occurrences)

SCIENTIFIC NAME / COMMON NAME / TAXA SORT	FAMILY (SCIENTIFIC) / FAMILY (COMMON)	GLOBAL RANK	STATE RANK	USFWS	USFS	BLM	FWP SWAP	% OF GLOBAL BREEDING RANGE IN MT	% OF MT THAT IS BREEDING RANGE	HABITAT
Bos bison Bison	Bovidae Bison / Goat / Sheep	G4	S2				SGCN2	4%	1%	Grasslands
		Species Occurrences verified in these Counties: Carbon, Gallatin, Lake, Madison, Park, Sanders, Stillwater, Sweet Grass								
Corynorhinus townsendii Townsend's Big-eared Bat	Vespertilionidae Bats	G4	S3		Sensitive - Known on Forests (BD, BRT, CG, HLC, KOOT, LOLO)	SENSITIVE	SGCN3	5%	87%	Caves in forested habitats
		Species Occurrences verified in these Counties: Beaverhead, Big Horn, Blaine, Broadwater, Carbon, Carter, Cascade, Chouteau, Custer, Fergus, Flathead, Gallatin, Garfield, Granite, Jefferson, Judith Basin, Lake, Lewis and Clark, Lincoln, Madison, Mccone, Meagher, Mineral, Missoula, Musselshell, Park, Phillips, Powder River, Powell, Prairie, Ravalli, Richland, Roosevelt, Rosebud, Sanders, Silver Bow, Stillwater, Treasure, Valley, Yellowstone **State Rank Reason:** Species is widespread, but uncommon and appears to occur at low densities. Disturbance of cave and mine roosts and the hard closure of occupied mines threaten long-term persistence.								
Euderma maculatum Spotted Bat	Vespertilionidae Bats	G4	S3		Sensitive - Known on Forests (BD, CG)	SENSITIVE	SGCN3, SGIN	5%	27%	Cliffs with rock crevices
		Species Occurrences verified in these Counties: Beaverhead, Big Horn, Blaine, Broadwater, Carbon, Cascade, Chouteau, Dawson, Fergus, Gallatin, Jefferson, Judith Basin, Lewis and Clark, Madison, Musselshell, Phillips, Powder River, Richland, Rosebud, Silver Bow, Stillwater, Treasure, Yellowstone **State Rank Reason:** Little is known about this species in Montana. Although widely distributed, the species is quite rare in almost all of its range. Little is known about treats, trends in abundance or occupancy, or life history.								
Gulo gulo Wolverine	Mustelidae Weasels	G4	S3	P	Proposed on Forests (BD, BRT, CG, HLC, KOOT, LOLO)	SENSITIVE	SGCN3	0%	37%	Boreal Forest and Alpine Habitats
		Species Occurrences verified in these Counties: Beaverhead, Broadwater, Carbon, Cascade, Deer Lodge, Flathead, Gallatin, Glacier, Granite, Jefferson, Judith Basin, Lake, Lewis and Clark, Lincoln, Madison, Meagher, Mineral, Missoula, Park, Pondera, Powell, Ravalli, Sanders, Silver Bow, Stillwater, Sweet Grass, Teton, Wheatland								
Lasiurus cinereus Hoary Bat	Vespertilionidae Bats	G3G4	S3				SGCN3	2%	100%	Riparian and forest
		Species Occurrences verified in these Counties: Beaverhead, Big Horn, Blaine, Broadwater, Carbon, Carter, Cascade, Chouteau, Custer, Daniels, Dawson, Deer Lodge, Fallon, Fergus, Flathead, Gallatin, Garfield, Glacier, Golden Valley, Granite, Hill, Jefferson, Judith Basin, Lake, Lewis and Clark, Liberty, Lincoln, Madison, Mccone, Meagher, Mineral, Missoula, Musselshell, Park, Petroleum, Phillips, Pondera, Powder River, Powell, Prairie, Ravalli, Richland, Roosevelt, Rosebud, Sanders, Sheridan, Silver Bow, Stillwater, Sweet Grass, Teton, Toole, Treasure, Valley, Wheatland, Wibaux, Yellowstone								

Lynx canadensis Canada Lynx	**Felidae** Cats	G5	S3	LT; CH	Threatened on Forests (BD, BRT) Threatened, Critical Habitat on Forests (CG, HLC, KOOT, LOLO)	THREATENED	SGCN3	1%	40%	Subalpine conifer forest
		Species Occurrences verified in these Counties: Carbon, Flathead, Gallatin, Glacier, Granite, Lake, Lewis and Clark, Lincoln, Missoula, Park, Pondera, Powell, Stillwater, Sweet Grass, Teton								
Myotis lucifugus Little Brown Myotis	**Vespertilionidae** Bats	G3	S3				SGCN3	3%	100%	Generalist
		Species Occurrences verified in these Counties: Beaverhead, Big Horn, Blaine, Broadwater, Carbon, Carter, Cascade, Chouteau, Custer, Daniels, Dawson, Deer Lodge, Fallon, Fergus, Flathead, Gallatin, Garfield, Glacier, Golden Valley, Granite, Hill, Jefferson, Judith Basin, Lake, Lewis and Clark, Lincoln, Madison, Mccone, Meagher, Mineral, Missoula, Musselshell, Park, Petroleum, Phillips, Pondera, Powder River, Powell, Prairie, Ravalli, Richland, Roosevelt, Rosebud, Sanders, Sheridan, Silver Bow, Stillwater, Sweet Grass, Teton, Toole, Treasure, Valley, Wheatland, Wibaux, Yellowstone **State Rank Reason:** Species is common and widespread, but under significant threat of catastrophic declines due to White-Nose Syndrome, a fungal disease responsible for the collapse of populations of this species in the eastern US.								
Myotis thysanodes Fringed Myotis	**Vespertilionidae** Bats	G4	S3			SENSITIVE	SGCN3	0%	64%	Riparian and dry mixed conifer forest
		Species Occurrences verified in these Counties: Beaverhead, Big Horn, Blaine, Broadwater, Carbon, Carter, Cascade, Custer, Deer Lodge, Fergus, Flathead, Gallatin, Granite, Jefferson, Judith Basin, Lake, Lewis and Clark, Lincoln, Madison, Meagher, Mineral, Missoula, Powder River, Powell, Prairie, Ravalli, Rosebud, Sanders, Silver Bow, Teton, Treasure **State Rank Reason:** Although this species is distributed across much of Montana, recent surveys have found it to be uncommon within range. Species occasionally uses caves to over-winter so threats to persistence from White-Nose Syndrome are a concern, but due to its western distribution the extent of impacts are as yet unknown.								
Sorex preblei Preble's Shrew	**Soricidae** Shrews	G4	S3				SGCN3	28%	79%	Sagebrush grassland
		Species Occurrences verified in these Counties: Beaverhead, Big Horn, Chouteau, Dawson, Deer Lodge, Fergus, Gallatin, Golden Valley, Granite, Judith Basin, Lewis and Clark, Lincoln, Madison, Missoula, Phillips, Powell, Ravalli, Sheridan, Silver Bow, Sweet Grass, Teton, Valley, Wheatland **State Rank Reason:** Observations of this species are infrequent resulting in limited data to assess threats. Species may only breed once in its brief life, so is more vulnerable than many small mammal species.								
Ursus arctos Grizzly Bear	**Ursidae** Bears	G4	S2S3	PS: LT; XN	Threatened on Forests (BD, CG, HLC, KOOT, LOLO)	THREATENED	SGCN2-3	1%	22%	Conifer forest
		Species Occurrences verified in these Counties: Beaverhead, Carbon, Cascade, Chouteau, Deer Lodge, Flathead, Gallatin, Glacier, Granite, Jefferson, Lake, Lewis and Clark, Liberty, Lincoln, Madison, Mineral, Missoula, Park, Pondera, Powell, Ravalli, Sanders, Silver Bow, Stillwater, Sweet Grass, Teton, Toole								

BIRDS (AVES)									29 SPECIES COUNTY = GALLATIN (based on mapped [illegible])	
SCIENTIFIC NAME COMMON NAME TAXA SORT	FAMILY (SCIENTIFIC) FAMILY (COMMON)	GLOBAL RANK	STATE RANK	USFWS	USFS	BLM	FWP SWAP	% OF GLOBAL BREEDING RANGE IN MT	% OF MT THAT IS BREEDING RANGE	HABITAT
Accipiter gentilis Northern Goshawk	**Accipitridae** Hawks / Kites / Eagles	G5	S3	MBTA			SGCN3	2%	68%	Mixed conifer forests
		Species Occurrences verified in these Counties: Beaverhead, Big Horn, Broadwater, Carbon, Carter, Cascade, Deer Lodge, Fergus, Flathead, Gallatin, Glacier, Granite, Jefferson, Judith Basin, Lake, Lewis and Clark, Liberty, Lincoln, Madison, Meagher, Mineral, Missoula, Park, Pondera, Powder River, Powell, Ravalli, Rosebud, Sanders, Silver Bow, Stillwater, Sweet Grass, Teton, Wheatland								
Anthus spragueii Sprague's Pipit	**Motacillidae** Pipits	G3G4	S3B	MBTA; BCC11; BCC17		SENSITIVE	SGCN3	18%	67%	Grasslands
		Species Occurrences verified in these Counties: Blaine, Carter, Cascade, Chouteau, Custer, Daniels, Dawson, Fallon, Fergus, Gallatin, Garfield, Glacier, Golden Valley, Hill, Judith Basin, Lewis and Clark, Liberty, Madison, Mccone, Meagher, Musselshell, Park, Petroleum, Phillips, Pondera, Prairie, Richland, Roosevelt, Rosebud, Sheridan, Stillwater, Sweet Grass, Teton, Toole, Valley, Wheatland, Wibaux **State Rank Reason:** Although population trends in Montana appear to be relatively stable in recent years, populations have been in decline over the long run and the species faces threats from covertype conversion, overgrazing, exotic plant invasions, altered fire regimes, and mowing prior to fledging of young.								
Aquila chrysaetos Golden Eagle	**Accipitridae** Hawks / Kites / Eagles	G5	S3	BGEPA; MBTA; BCC17		SENSITIVE	SGCN3	3%	100%	Grasslands
		Species Occurrences verified in these Counties: Beaverhead, Big Horn, Blaine, Broadwater, Carbon, Carter, Cascade, Chouteau, Custer, Dawson, Deer Lodge, Fallon, Fergus, Flathead, Gallatin, Garfield, Glacier, Golden Valley, Granite, Hill, Jefferson, Judith Basin, Lake, Lewis and Clark, Liberty, Lincoln, Madison, Mccone, Meagher, Missoula, Musselshell, Park, Petroleum, Phillips, Pondera, Powder River, Powell, Prairie, Ravalli, Richland, Roosevelt, Rosebud, Sanders, Sheridan, Silver Bow, Stillwater, Sweet Grass, Teton, Toole, Treasure, Valley, Wheatland, Wibaux, Yellowstone								

Ardea herodias Great Blue Heron	Ardeidae Bitterns / Egrets / Herons / Night-Herons	G5	S3	MBTA			SGCN3	3%	100%	Riparian forest
		Species Occurrences verified in these Counties: Beaverhead, Big Horn, Blaine, Broadwater, Carbon, Carter, Cascade, Chouteau, Custer, Dawson, Deer Lodge, Fallon, Fergus, Flathead, Gallatin, Garfield, Glacier, Golden Valley, Granite, Hill, Jefferson, Judith Basin, Lake, Lewis and Clark, Liberty, Lincoln, Madison, Mccone, Meagher, Mineral, Missoula, Musselshell, Park, Petroleum, Phillips, Pondera, Powder River, Powell, Prairie, Ravalli, Richland, Roosevelt, Rosebud, Sanders, Sheridan, Silver Bow, Stillwater, Sweet Grass, Teton, Treasure, Valley, Wheatland, Wibaux, Yellowstone **State Rank Reason:** Small breeding population size, evidence of recent declines, and declining regeneration of riparian cottonwood forests due to altered hydrology and grazing.								
Artemisiospiza nevadensis Sagebrush Sparrow	Passerellidae New World Sparrows	G5	S3B	MBTA; BCC10; BCC17		SENSITIVE	SGCN3	0%	13%	Sagebrush
		Species Occurrences verified in these Counties: Beaverhead, Carbon, Gallatin, Meagher, Park, Ravalli								
Athene cunicularia Burrowing Owl	Strigidae Owls	G4	S3B	MBTA; BCC17	Sensitive - Known on Forests (CG) Sensitive - Suspected on Forests (HLC)	SENSITIVE	SGCN3	2%	82%	Grasslands
		Species Occurrences verified in these Counties: Beaverhead, Big Horn, Blaine, Broadwater, Carbon, Carter, Cascade, Chouteau, Custer, Dawson, Fallon, Fergus, Gallatin, Garfield, Glacier, Golden Valley, Hill, Jefferson, Lewis and Clark, Liberty, Madison, Mccone, Musselshell, Petroleum, Phillips, Pondera, Powder River, Prairie, Ravalli, Roosevelt, Rosebud, Sheridan, Stillwater, Teton, Toole, Treasure, Valley, Wheatland, Yellowstone **State Rank Reason:** Species has a negative short-term population trend.								
Buteo regalis Ferruginous Hawk	Accipitridae Hawks / Kites / Eagles	G4	S3B	MBTA; BCC10; BCC17		SENSITIVE	SGCN3	11%	95%	Sagebrush grassland
		Species Occurrences verified in these Counties: Beaverhead, Blaine, Broadwater, Carter, Cascade, Chouteau, Custer, Daniels, Dawson, Fallon, Fergus, Gallatin, Garfield, Glacier, Golden Valley, Hill, Jefferson, Judith Basin, Lewis and Clark, Liberty, Madison, Mccone, Meagher, Musselshell, Park, Petroleum, Phillips, Pondera, Powder River, Prairie, Roosevelt, Rosebud, Sheridan, Stillwater, Teton, Toole, Valley, Wheatland, Wibaux, Yellowstone								
Catharus fuscescens Veery	Turdidae Thrushes	G5	S3B	MBTA		SENSITIVE	SGCN3	6%	100%	Riparian forest
		Species Occurrences verified in these Counties: Beaverhead, Big Horn, Blaine, Broadwater, Carbon, Cascade, Chouteau, Custer, Deer Lodge, Fergus, Flathead, Gallatin, Glacier, Granite, Hill, Jefferson, Lake, Lewis and Clark, Liberty, Lincoln, Madison, Mccone, Meagher, Mineral, Missoula, Musselshell, Park, Petroleum, Phillips, Pondera, Powder River, Powell, Ravalli, Richland, Roosevelt, Rosebud, Sanders, Silver Bow, Stillwater, Sweet Grass, Teton, Wheatland, Yellowstone								
Centrocercus urophasianus Greater Sage-Grouse	Phasianidae Upland Game Birds	G3G4	S2		Sensitive - Known on Forests (BD) Sensitive - Suspected on Forests (CG, HLC)	SENSITIVE	SGCN2	17%	75%	Sagebrush
		Species Occurrences verified in these Counties: Beaverhead, Big Horn, Blaine, Broadwater, Carbon, Carter, Chouteau, Custer, Dawson, Deer Lodge, Fallon, Fergus, Gallatin, Garfield, Golden Valley, Hill, Madison, Mccone, Meagher, Musselshell, Park, Petroleum, Phillips, Powder River, Prairie, Rosebud, Silver Bow, Stillwater, Sweet Grass, Treasure, Valley, Wheatland, Wibaux, Yellowstone								
Certhia americana Brown Creeper	Certhiidae Creepers	G5	S3	MBTA			SGCN3	4%	53%	Moist conifer forests
		Species Occurrences verified in these Counties: Beaverhead, Broadwater, Carbon, Carter, Cascade, Chouteau, Deer Lodge, Fergus, Flathead, Gallatin, Glacier, Golden Valley, Granite, Jefferson, Judith Basin, Lake, Lewis and Clark, Lincoln, Madison, Meagher, Mineral, Missoula, Park, Powder River, Powell, Ravalli, Rosebud, Sanders, Silver Bow, Stillwater, Sweet Grass, Teton, Wheatland								
Coccothraustes vespertinus Evening Grosbeak	Fringillidae Finches	G5	S3	MBTA			SGCN3	3%	100%	Conifer forest
		Species Occurrences verified in these Counties: Beaverhead, Broadwater, Carbon, Carter, Cascade, Chouteau, Fergus, Flathead, Gallatin, Glacier, Golden Valley, Granite, Jefferson, Judith Basin, Lake, Lewis and Clark, Lincoln, Madison, Meagher, Mineral, Missoula, Musselshell, Park, Pondera, Powder River, Powell, Ravalli, Sanders, Silver Bow, Stillwater, Sweet Grass, Teton, Wheatland **State Rank Reason:** Populations in Montana and across North America have experienced rangewide declines, although the causes of these declines are unclear (Bonter and Harvey 2008).								
Coccyzus americanus Yellow-billed Cuckoo	Cuculidae Cuckoos	G5	S3B	PS: LT; MBTA; BCC10	Threatened on Forests (BRT, LOLO)	SENSITIVE	SGCN3, SGIN	1%	50%	Prairie riparian forest
		Species Occurrences verified in these Counties: Big Horn, Carbon, Carter, Chouteau, Custer, Gallatin, Lake, Madison, Missoula, Phillips, Powder River, Richland, Rosebud, Stillwater, Wibaux, Yellowstone								
Dolichonyx oryzivorus Bobolink	Icteridae Blackbirds	G5	S3B	MBTA			SGCN3	9%	100%	Moist grasslands
		Species Occurrences verified in these Counties: Beaverhead, Big Horn, Blaine, Broadwater, Carbon, Carter, Cascade, Chouteau, Custer, Daniels, Dawson, Fallon, Fergus, Flathead, Gallatin, Garfield, Glacier, Granite, Hill, Jefferson, Judith Basin, Lake, Lewis and Clark, Liberty, Madison, Mccone, Meagher, Missoula, Musselshell, Park, Petroleum, Phillips, Powder River, Powell, Prairie, Ravalli, Richland, Roosevelt, Rosebud, Sanders, Sheridan, Stillwater, Sweet Grass, Teton, Valley, Wheatland, Wibaux, Yellowstone **State Rank Reason:** Species has undergone recent large population declines in Montana and a patchwork of declines and increases have been documented in surrounding states and provinces.								

Dryocopus pileatus Pileated Woodpecker	**Picidae** Woodpeckers	G5	S3	MBTA			SGCN3	1%	27%	Moist conifer forests
		Species Occurrences verified in these Counties: Beaverhead, Broadwater, Cascade, Deer Lodge, Flathead, Gallatin, Glacier, Granite, Jefferson, Lake, Lewis and Clark, Lincoln, Madison, Meagher, Mineral, Missoula, Park, Powell, Ravalli, Sanders, Silver Bow							
Falco peregrinus Peregrine Falcon	**Falconidae** Falcons	G4	S3	DM; MBTA; BCC10; BCC11; BCC17	Sensitive - Known on Forests (BD, BRT, CG, HLC, KOOT, LOLO)	SENSITIVE	SGCN3	2%	100%	Cliffs / canyons
		Species Occurrences verified in these Counties: Beaverhead, Big Horn, Blaine, Broadwater, Carbon, Cascade, Chouteau, Deer Lodge, Flathead, Gallatin, Glacier, Granite, Jefferson, Lake, Lewis and Clark, Lincoln, Madison, Meagher, Mineral, Missoula, Park, Pondera, Powell, Prairie, Ravalli, Sanders, Silver Bow, Stillwater, Sweet Grass, Teton, Toole, Treasure, Yellowstone							
Gymnorhinus cyanocephalus Pinyon Jay	**Corvidae** Jays / Crows / Magpies	G3	S3	MBTA; BCC17			SGCN3	5%	55%	Open conifer forest
		Species Occurrences verified in these Counties: Big Horn, Blaine, Broadwater, Carbon, Carter, Cascade, Chouteau, Custer, Fergus, Gallatin, Garfield, Golden Valley, Jefferson, Lewis and Clark, Musselshell, Park, Petroleum, Phillips, Powder River, Rosebud, Stillwater, Sweet Grass, Wheatland, Yellowstone							
Haemorhous cassinii Cassin's Finch	**Fringillidae** Finches	G5	S3	MBTA; BCC10			SGCN3	11%	62%	Drier conifer forest
		Species Occurrences verified in these Counties: Beaverhead, Big Horn, Broadwater, Carbon, Cascade, Chouteau, Custer, Deer Lodge, Fergus, Flathead, Gallatin, Glacier, Golden Valley, Granite, Jefferson, Judith Basin, Lake, Lewis and Clark, Lincoln, Madison, Meagher, Mineral, Missoula, Musselshell, Park, Petroleum, Phillips, Powder River, Powell, Ravalli, Rosebud, Sanders, Silver Bow, Stillwater, Sweet Grass, Teton, Wheatland, Yellowstone **State Rank Reason:** Data show recent short-term declines in population for this species							
Himantopus mexicanus Black-necked Stilt	**Recurvirostridae** Avocets	G5	S3B	MBTA			SGCN3	1%	8%	Wetlands
		Species Occurrences verified in these Counties: Cascade, Chouteau, Gallatin, Glacier, Golden Valley, Lake, Lewis and Clark, Missoula, Phillips, Ravalli, Stillwater, Teton, Yellowstone								
Ixoreus naevius Varied Thrush	**Turdidae** Thrushes	G5	S3B	MBTA			SGCN3	1%	37%	Moist conifer forests
		Species Occurrences verified in these Counties: Broadwater, Cascade, Flathead, Gallatin, Glacier, Golden Valley, Granite, Judith Basin, Lake, Lewis and Clark, Lincoln, Madison, Meagher, Mineral, Missoula, Park, Pondera, Powell, Ravalli, Sanders, Teton **State Rank Reason:** The Varied Thrush has undergone recent population declines in Montana and across the Northern Rockies and where timber harvest, insect outbreak, and fire result in a loss of suitable breeding habitat.							
Lanius ludovicianus Loggerhead Shrike	**Laniidae** Shrikes	G4	S3B	MBTA; BCC10; BCC17		SENSITIVE	SGCN3	4%	100%	Shrubland
		Species Occurrences verified in these Counties: Beaverhead, Big Horn, Blaine, Broadwater, Carbon, Carter, Cascade, Chouteau, Custer, Daniels, Dawson, Fallon, Fergus, Gallatin, Garfield, Glacier, Golden Valley, Hill, Jefferson, Liberty, Madison, Mccone, Meagher, Musselshell, Petroleum, Phillips, Pondera, Powder River, Prairie, Richland, Roosevelt, Rosebud, Sheridan, Stillwater, Sweet Grass, Teton, Toole, Valley, Wheatland, Wibaux, Yellowstone							
Nucifraga columbiana Clark's Nutcracker	**Corvidae** Jays / Crows / Magpies	G5	S3	MBTA	Species of Conservation Concern on Forests (FLAT)		SGCN3	9%	84%	Conifer forest
		Species Occurrences verified in these Counties: Beaverhead, Big Horn, Broadwater, Carbon, Carter, Cascade, Chouteau, Custer, Deer Lodge, Fergus, Flathead, Gallatin, Glacier, Golden Valley, Granite, Jefferson, Judith Basin, Lake, Lewis and Clark, Liberty, Lincoln, Madison, Meagher, Mineral, Missoula, Musselshell, Park, Petroleum, Phillips, Pondera, Powder River, Powell, Ravalli, Sanders, Silver Bow, Stillwater, Sweet Grass, Teton, Toole, Wheatland, Yellowstone							
Numenius americanus Long-billed Curlew	**Scolopacidae** Sandpipers	G5	S3B	MBTA; BCC10; BCC11; BCC17		SENSITIVE	SGCN3	19%	100%	Grasslands
		Species Occurrences verified in these Counties: Beaverhead, Big Horn, Blaine, Broadwater, Carbon, Carter, Cascade, Chouteau, Custer, Daniels, Dawson, Deer Lodge, Fallon, Fergus, Flathead, Gallatin, Garfield, Glacier, Golden Valley, Granite, Hill, Jefferson, Judith Basin, Lake, Lewis and Clark, Liberty, Madison, Mccone, Meagher, Missoula, Musselshell, Park, Petroleum, Phillips, Pondera, Powder River, Powell, Prairie, Ravalli, Richland, Roosevelt, Rosebud, Sanders, Sheridan, Stillwater, Sweet Grass, Teton, Toole, Treasure, Valley, Wheatland, Wibaux, Yellowstone							
Oreoscoptes montanus Sage Thrasher	**Mimidae** Thrashers / Mockingbirds / Catbirds	G4	S3B	MBTA; BCC10; BCC17		SENSITIVE	SGCN3	9%	84%	Sagebrush
		Species Occurrences verified in these Counties: Beaverhead, Big Horn, Broadwater, Carbon, Carter, Chouteau, Custer, Fallon, Gallatin, Garfield, Golden Valley, Jefferson, Lewis and Clark, Madison, Musselshell, Park, Petroleum, Phillips, Powder River, Prairie, Richland, Rosebud, Sanders, Silver Bow, Stillwater, Sweet Grass, Valley, Wheatland, Yellowstone							
Picoides arcticus Black-backed Woodpecker	**Picidae** Woodpeckers	G5	S3	MBTA	Sensitive - Known on Forests (BD, BRT, CG, HLC, KOOT, LOLO)	SENSITIVE	SGCN3	2%	49%	Conifer forest burns
		Species Occurrences verified in these Counties: Broadwater, Flathead, Gallatin, Lewis and Clark, Lincoln, Madison, Mineral, Missoula, Powder River, Powell, Ravalli, Rosebud, Sanders								

Anaxyrus boreas Western Toad	Bufonidae True Toads	G4	S2		Sensitive - Known on Forests (BD, BRT, CG, HLC, KOOT, LOLO)	SENSITIVE	SGCN2	6%	38%	Wetlands, floodplain pools
		Species Occurrences verified in these Counties: Beaverhead, Chouteau, Deer Lodge, Flathead, Gallatin, Glacier, Granite, Jefferson, Judith Basin, Lake, Lewis and Clark, Lincoln, Madison, Meagher, Mineral, Missoula, Park, Pondera, Powell, Ravalli, Sanders, Silver Bow, Teton **State Rank Reason:** Over the last few decades this species has undergone serious declines in abundance due primarily to infection with Chytrid fungus. While declines in breeding site occupancy appear to have stabilized in the last decade, changes to abundance across the species range within Montana remain unknown. Significant threats to the persistence of this species remain from continued impacts of disease and mortality of adults and young during breeding and local migration.								

FISH (ACTINOPTERYGII)

2 SPECIES

COUNTY = GALLATIN (based on mapped species occurrences)

SCIENTIFIC NAME COMMON NAME TAXA SORT	FAMILY (SCIENTIFIC) FAMILY (COMMON)	GLOBAL RANK	STATE RANK	USFWS	USFS	BLM	FWP SWAP	% OF GLOBAL BREEDING RANGE IN MT	% OF MT THAT IS BREEDING RANGE	HABITAT
Oncorhynchus clarkii bouvieri Yellowstone Cutthroat Trout	Salmonidae Trout	G5T4	S2		Sensitive - Known on Forests (CG)	SENSITIVE	SGCN2		12%	Mountain streams, rivers, lakes
		Species Occurrences verified in these Counties: Big Horn, Carbon, Gallatin, Meagher, Park, Stillwater, Sweet Grass, Yellowstone **State Rank Reason:** The Yellowstone Cutthroat trout is currently ranked "S2" in Montana because it is at risk because of very limited and/or potentially declining population numbers, range and/or habitat, making it vulnerable to extirpation in the state.								
Oncorhynchus clarkii lewisi Westslope Cutthroat Trout	Salmonidae Trout	G5T4	S2		Sensitive - Known on Forests (BD, BRT, CG, HLC, KOOT, LOLO)	SENSITIVE	SGCN2		34%	Mountain streams, rivers, lakes
		Species Occurrences verified in these Counties: Beaverhead, Broadwater, Cascade, Chouteau, Deer Lodge, Fergus, Flathead, Gallatin, Glacier, Granite, Jefferson, Judith Basin, Lake, Lewis and Clark, Lincoln, Madison, Meagher, Mineral, Missoula, Park, Pondera, Powell, Ravalli, Sanders, Silver Bow, Teton, Wheatland **State Rank Reason:** The Westslope Cutthroat trout is currently ranked "S2" in Montana because it is at risk due to very limited and/or potentially declining population numbers, range and/or habitat, making it vulnerable to extirpation in the state.								

INVERTEBRATES - INSECTS

6 SPECIES

COUNTY = GALLATIN (based on mapped species occurrences)

SCIENTIFIC NAME COMMON NAME TAXA SORT	FAMILY (SCIENTIFIC) FAMILY (COMMON)	GLOBAL RANK	STATE RANK	USFWS	USFS	BLM	FWP SWAP	% OF GLOBAL BREEDING RANGE IN MT	% OF MT THAT IS BREEDING RANGE	HABITAT
BEETLES										
Microcylloepus browni Brown's Microcylloepus Riffle Beetle	Elmidae Riffle Beetles	G1	S1					100%	1%	Springs
		Species Occurrences verified in these Counties: Gallatin **State Rank Reason:** This riffle beetle is currently listed as "S1" in MT due to extremely limited and/or rapidly declining population numbers, range and/or habitat, making it highly vulnerable to global extinction or extirpation in the state. These warm-spring beetles are generally endemic to only a few locations; this species is endemic to 1 known location, a warm springs in the Bridger Creek Canyon outside of Bozeman.								
Zaitzevia thermae Warm Spring Zaitzevian Riffle Beetle	Elmidae Riffle Beetles	G1	S1					100%	1%	Springs
		Species Occurrences verified in these Counties: Gallatin **State Rank Reason:** This riffle beetle is currently listed as "S1" in MT due to extremely limited and/or rapidly declining population numbers, range and/or habitat, making it highly vulnerable to global extinction or extirpation in the state. These warm-spring beetles are generally endemic to only a few locations; this species is endemic to 1 known location, a warm springs in the Bridger Creek Canyon outside of Bozeman.								
BUTTERFLIES										
Boloria frigga Frigga Fritillary	Nymphalidae Brush-footed Butterflies	G5	S1S2						12%	Montane wetlands
		Species Occurrences verified in these Counties: Beaverhead, Gallatin, Madison								
STONEFLIES										

Pipilo chlorurus Green-tailed Towhee	Passerellidae New World Sparrows	G5	S3B	MBTA			SGCN3	3%	60%	Shrub woodland
		Species Occurrences verified in these Counties: Beaverhead, Big Horn, Blaine, Broadwater, Carbon, Chouteau, Custer, Deer Lodge, Fergus, Gallatin, Garfield, Granite, Jefferson, Judith Basin, Lewis and Clark, Madison, Meagher, Musselshell, Park, Petroleum, Phillips, Powder River, Silver Bow, Stillwater, Sweet Grass, Valley, Wheatland, Yellowstone **State Rank Reason:** Populations in Montana and across the Northern Rockies have undergone recent declines.								
Psiloscops flammeolus Flammulated Owl	Strigidae Owls	G4	S3B	MBTA; BCC10	Sensitive - Known on Forests (BD, BRT, HLC, KOOT, LOLO) Sensitive - Suspected on Forests (CG) Species of Conservation Concern on Forests (FLAT)	SENSITIVE	SGCN3	2%	36%	Dry conifer forest
		Species Occurrences verified in these Counties: Beaverhead, Broadwater, Flathead, Gallatin, Granite, Jefferson, Lake, Lewis and Clark, Lincoln, Madison, Mineral, Missoula, Powell, Ravalli, Sanders								
Spizella breweri Brewer's Sparrow	Passerellidae New World Sparrows	G5	S3B	MBTA; BCC10; BCC17		SENSITIVE	SGCN3	12%	100%	Sagebrush
		Species Occurrences verified in these Counties: Beaverhead, Big Horn, Blaine, Broadwater, Carbon, Carter, Chouteau, Custer, Dawson, Deer Lodge, Fallon, Fergus, Flathead, Gallatin, Garfield, Glacier, Golden Valley, Granite, Hill, Jefferson, Lake, Lewis and Clark, Liberty, Lincoln, Madison, Mccone, Meagher, Missoula, Musselshell, Park, Petroleum, Phillips, Pondera, Powder River, Powell, Prairie, Ravalli, Richland, Roosevelt, Rosebud, Sanders, Sheridan, Silver Bow, Stillwater, Sweet Grass, Teton, Toole, Treasure, Valley, Wheatland, Wibaux, Yellowstone **State Rank Reason:** Species faces threats from loss of sagebrush habitats it is dependent on as a result of habitat conversion for agriculture and increased frequency of fire as a result of weed encroachment and drought.								
Strix nebulosa Great Gray Owl	Strigidae Owls	G5	S3	MBTA		SENSITIVE	SGCN3, SGIN	2%	46%	Conifer forest near open meadows
		Species Occurrences verified in these Counties: Beaverhead, Carbon, Deer Lodge, Flathead, Gallatin, Granite, Jefferson, Judith Basin, Lake, Lewis and Clark, Lincoln, Meagher, Missoula, Park, Powell, Ravalli, Silver Bow, Sweet Grass, Teton, Wheatland								
Troglodytes pacificus Pacific Wren	Troglodytidae Wrens	G5	S3	MBTA			SGCN3	1%	39%	Moist conifer forests
		Species Occurrences verified in these Counties: Beaverhead, Broadwater, Cascade, Fergus, Flathead, Gallatin, Glacier, Granite, Jefferson, Judith Basin, Lake, Lewis and Clark, Lincoln, Madison, Meagher, Mineral, Missoula, Park, Powell, Ravalli, Sanders, Stillwater, Sweet Grass, Teton								

REPTILES (REPTILIA)

1 SPECIES

COUNTY = GALLATIN (based on mapped species occurrences)

SCIENTIFIC NAME COMMON NAME TAXA SORT	FAMILY (SCIENTIFIC) FAMILY (COMMON)	GLOBAL RANK	STATE RANK	USFWS	USFS	BLM	FWP SWAP	% OF GLOBAL BREEDING RANGE IN MT	% OF MT THAT IS BREEDING RANGE	HABITAT
Phrynosoma hernandesi Greater Short-horned Lizard	Phrynosomatidae Sagebush / Spiny Lizards	G5	S3		Sensitive - Known on Forests (CG) Sensitive - Suspected on Forests (HLC)	SENSITIVE	SGCN3, SGIN	19%	66%	Sandy / gravelly soils
		Species Occurrences verified in these Counties: Big Horn, Blaine, Broadwater, Carbon, Carter, Cascade, Chouteau, Custer, Dawson, Fergus, Gallatin, Garfield, Glacier, Golden Valley, Hill, Lewis and Clark, Liberty, Mccone, Musselshell, Petroleum, Phillips, Pondera, Powder River, Prairie, Richland, Roosevelt, Rosebud, Silver Bow, Stillwater, Sweet Grass, Teton, Toole, Treasure, Valley, Wheatland, Wibaux, Yellowstone								

AMPHIBIANS (AMPHIBIA)

1 SPECIES

COUNTY = GALLATIN (based on mapped species occurrences)

SCIENTIFIC NAME COMMON NAME TAXA SORT	FAMILY (SCIENTIFIC) FAMILY (COMMON)	GLOBAL RANK	STATE RANK	USFWS	USFS	BLM	FWP SWAP	% OF GLOBAL BREEDING RANGE IN MT	% OF MT THAT IS BREEDING RANGE	HABITAT

Isocapnia crinita Hooked Snowfly	Capniidae Small Winter Stoneflies	G5	S2					20%	9%	Mountain Streams to Rivers
		Species Occurrences verified in these Counties: Flathead, Gallatin, Lincoln, Missoula, Ravalli **State Rank Reason:** The Hooked Snowfly is currently ranked "S2" in Montana because it was thought to be at risk due to very limited and/or potentially declining population numbers, range and/or habitat, making it vulnerable to extirpation in the state. But, recent range extensions due to newly reported collections may warrant re-evaluating this SOC rank.								
Isocapnia integra Alberta Snowfly	Capniidae Small Winter Stoneflies	G4G5	S2					20%	5%	Mountain Streams to Rivers
		Species Occurrences verified in these Counties: Broadwater, Carbon, Cascade, Flathead, Gallatin, Lincoln, Mineral, Park, Stillwater, Sweet Grass, Yellowstone **State Rank Reason:** The Alberta snowfly is currently ranked "S2" in Montana because it was thought to be at risk due to very limited and/or potentially declining population numbers, range and/or habitat, making it vulnerable to extirpation in the state. But, recent range extensions due to taxonomic changes may warrant re-evaluating this SOC rank.								
Isoperla petersoni Springs Stripetail	Perlodidae Perlodid Stoneflies	G5	S2					10%	9%	Alpine / Mountain streams
		Species Occurrences verified in these Counties: Gallatin, Glacier **State Rank Reason:** The Springs Stripetail is currently ranked a "S2" Species of Concern in MT at risk because of very limited and/or potentially declining population numbers, range and/or habitat, making it vulnerable to extirpation in the state. Limited sites with small populations, but also difficult to identify without adult specimens.								

INVERTEBRATES - MOLLUSKS

3 SPECIES

COUNTY = GALLATIN (based on mapped species occurrences)

SCIENTIFIC NAME COMMON NAME TAXA SORT	FAMILY (SCIENTIFIC) FAMILY (COMMON)	GLOBAL RANK	STATE RANK	USFWS	USFS	BLM	FWP SWAP	% OF GLOBAL BREEDING RANGE IN MT	% OF MT THAT IS BREEDING RANGE	HABITAT
Discus shimekii Striate Disc	Discidae Discs	G5	S1					5%	36%	Aspen, mesic/moist conifer woodlands
		Species Occurrences verified in these Counties: Carbon, Gallatin, Granite, Hill, Lake, Lincoln, Madison, Meagher, Park, Powell, Sweet Grass								
Margaritifera falcata Western Pearlshell	Margaritiferidae Margaritiferid Mussels	G5	S2		Sensitive - Known on Forests (BD, BRT, CG, HLC, KOOT, LOLO)	SENSITIVE	SGCN2	10%	26%	Mountain streams, rivers
		Species Occurrences verified in these Counties: Beaverhead, Broadwater, Cascade, Deer Lodge, Gallatin, Granite, Jefferson, Lake, Lewis and Clark, Lincoln, Madison, Meagher, Missoula, Powell, Ravalli, Sanders, Silver Bow **State Rank Reason:** The Western Pearlshell is currently ranked a "S2" Species of Concern in MT and is at risk because of very limited and/or potentially declining population numbers, range and/or habitat, making it vulnerable to extirpation in the state. This species is widespread in geographic area, but is declining in terms of area occupied and the number of sites with viable individuals; populations showing repeated reproduction (at least several age classes) are now the exception rather than the rule. Montana currently has only 14 "excellent" viable populations out of ~200 known locations (Stagliano 2010). Short term trends show populations declining by ~20% over the last decade (Stagliano 2015).								
Oreohelix yavapai mariae Gallatin Mountainsnail	Oreohelicidae Mountain Snails	G5T1	S1					100%	1%	Limestone talus, dry conifer woodland
		Species Occurrences verified in these Counties: Gallatin								

INVERTEBRATES - OTHER

1 SPECIES

COUNTY = GALLATIN (based on mapped species occurrences)

SCIENTIFIC NAME COMMON NAME TAXA SORT	FAMILY (SCIENTIFIC) FAMILY (COMMON)	GLOBAL RANK	STATE RANK	USFWS	USFS	BLM	FWP SWAP	% OF GLOBAL BREEDING RANGE IN MT	% OF MT THAT IS BREEDING RANGE	HABITAT
CRUSTACEANS										
Stygobromus puteanus A Subterranean Amphipod	Crangonyctidae Gammarid Amphipods	G1G2	S1S2					100%	1%	Subterranean Aquatic Ecosystems
		Species Occurrences verified in these Counties: Broadwater, Gallatin **State Rank Reason:** This Subterranean Amphipod is currently listed as "S1S2" in MT due to extremely limited and/or rapidly declining population numbers, range and/or habitat, making it highly vulnerable to global extinction or extirpation in the state. These subterranean amphipods are generally endemic to a few locations.								

Potential Species of Concern

Potential Species of Concern
0 Species
Filtered by the following criteria:
County = Gallatin (based on mapped **Species Occurrences**)

⊞ **Special Status Species**

⊞ **Additions To Statewide List**

⊞ **Species Removed From Statewide List**

⊞ **Species of Greatest Inventory Need**

Citation for data on this website:
Montana Animal Species of Concern Report. Montana Natural Heritage Program and Montana Fish, Wildlife and Parks. Retrieved on 1/8/2020, from http://mtnhp.org/SpeciesOfConcern/?AorP=a

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