

LONG RANGE PLAN

**Missoula & Mineral
County, Montana**

Long Range Plan

For: Missoula & Mineral County, Montana

Updated: August 2024

Section I. Introduction

Purpose

The Long-Range Plan is a working document outlining the natural resource data, status and trends from both Missoula and Mineral County, Montana. This 5-year plan represents a commitment to local and regional partnerships and outlines strategic approaches to solving complex natural resource issues. The plan will be used to prioritize projects for NRCS financial incentive programs.

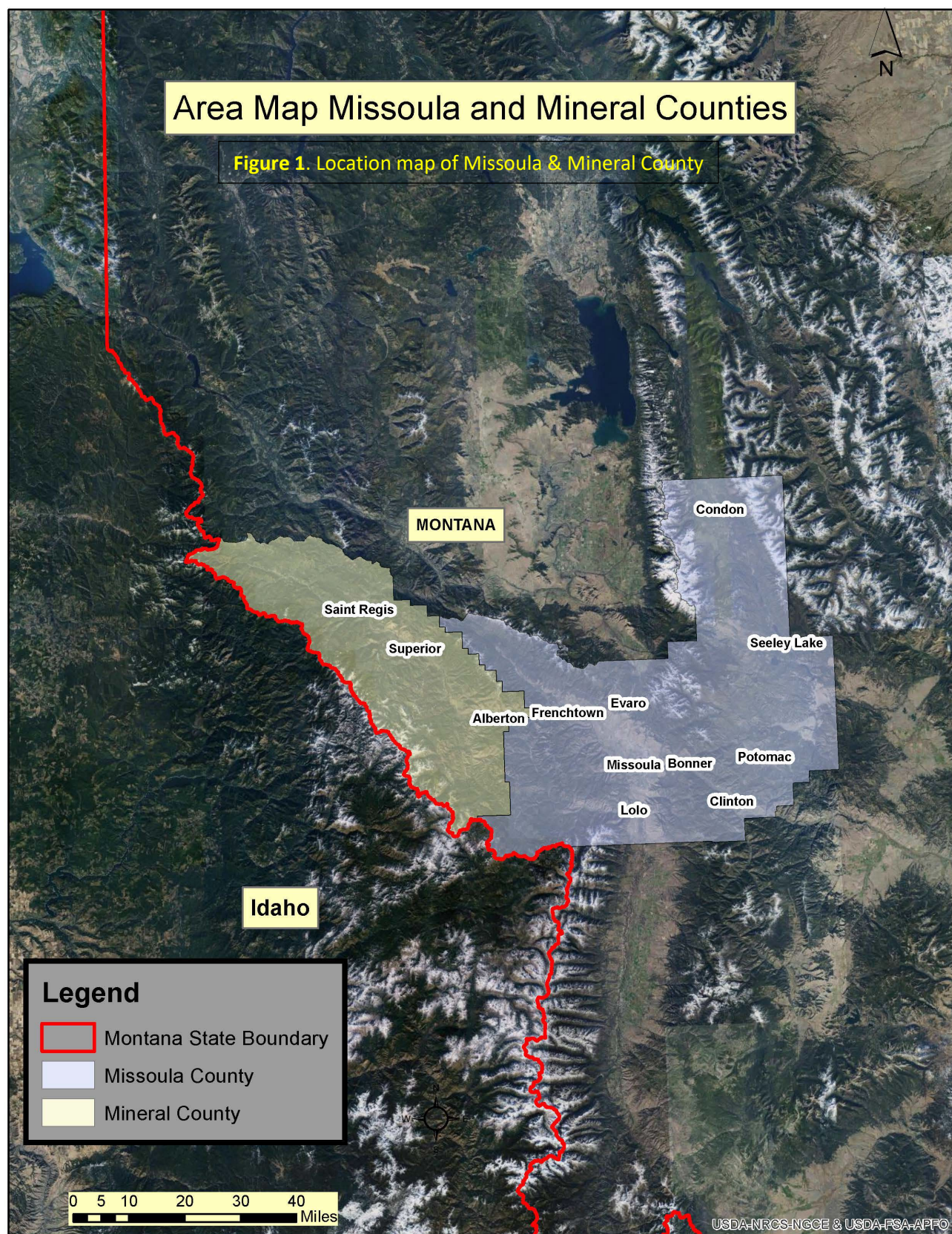
The goal of the Long-Range Plan is to review natural resource characteristics and issues found throughout both Missoula and Mineral Counties and surrounding areas. Updated on a semi-annual basis, this document will be used to highlight resource concerns of high priority and will provide guidance on future planning of Targeted Implementation Plans (TIP).

The Missoula and Mineral County Long Range Plan was developed by the NRCS Missoula Field office with help from multiple partners. In addition, existing resource plans and management plans from partners have been referenced in completing this document. A full listing of resources can be found in the Appendices Section.

Partners in Natural Resources

- Mineral County Conservation District
- Missoula Conservation District
- Clark Fork Watershed Group
- Natural Resources Conservation Service (NRCS)
 - Missoula Field Office
- Confederated Salish and Kootenai Tribes (CSKT)
- Montana State University Extension (MSU)
- U.S. Forest Service (USFS)
- U.S. Fish and Wildlife Service (USFWS)
- Montana Fish Wildlife & Parks (FWP)
- Flathead Indian Irrigation Project (FIIP)
- Five Valleys Land Trust & Montana Land Reliance
- Montana Dept. of Natural Resources and Conservation (DNRC)
- Trout Unlimited (TU)
- Rocky Mountain Elk Foundation (RMEF)
- Intermountain West Joint Venture (IMJV)
- The Blackfoot Challenge
- The Nature Conservancy (TNC)
- Missoula and Mineral County Weed Districts

- Soil and Water Conservation Districts of Montana (SWCDM)
- Montana Association of Conservation Districts (MACD)
- Missoula and Mineral County Government
- City of Missoula
- Clark Fork Coalition
- Community Food and Agriculture Coalition (CFAC)
- Center for Large Landscape Conservation
- Community and Planning Services (CAPS) Missoula County



Section II. County Profile and Natural Resource Inventory

Missoula County

Missoula County is located at the west-central edge of Montana sharing its borders with six counties in Montana along with two counties in the state of Idaho. Missoula County is characterized by having five large valleys with two major rivers winding through several mountain ranges, many of which help form the surrounding county boundaries. The Clark Fork River, which is a tributary of the Columbia River runs through the heart of Missoula County flowing from southeast at the Powell County line to the northwest towards Mineral County. The county has an immense amount of public land with the federal government managing over 52% of the total acres within the county. The vast majority of public land in Missoula County is included within the Lolo National Forest, Bitterroot National Forest, and Flathead National Forest. Missoula County has a semi-arid climate with cold and moderately snowy winters, hot and dry summers, and spring and autumn are characterized by having short seasons. Winter conditions are milder than the vast majority of other counties of Montana. The average annual precipitation in Missoula County can vary from 14 inches in lower elevations of the valley floors to over 40 inches at upper elevations of some of the mountain ranges.

Farming/ranching, mining, timber harvesting, along with tourism and recreation make up the core of the economic structure in rural portions of Missoula County. The leading industries for the city of Missoula are health care, and education with two major hospitals, the University of Montana and public schools being the largest employers. In 2019 the growth rate for Missoula County was 1.3%. The rapidly growing population base and the increase in development and loss of open space in conjunction with a diverse set of land-use activities creates a unique set of challenges for both county residents and land managers alike.

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Missoula County at a Glance

Missoula County has a total area of 2,614 square miles or 1,673,518 acres (1.78% of Montana), with 29 square miles being comprised of water. According to the most recent statistics available from the US Bureau of Census, the estimated population of Missoula County was 121,849 in 2023 making it the second most populous county in the state. The population density is 46.6 inhabitants per square mile. The racial makeup of the county was 87.4% white, 2.7% American Indian, 5.0% Hispanic or Latino, 1.8% Asian, 0.6% black or African American, and 3.5% from two or more races. The largest city in the county is Missoula which also serves as the county seat with a population of approximately 77,757 per the 2023 Census Bureau data.

According to the Montana Natural Heritage Program, 62% of land in Missoula County is publicly owned, of which the majority (52%) is owned by the US Forest Service. Only 18% of lands in Missoula County are held in private ownership (304,177 acres). The Flathead Indian Reservation boundaries encompass 7% of Missoula County, primarily along the northern edge of the county. The Reservation is home to three tribes, the Bitterroot Salish, Upper Pend d'Orielle and the Kootenai - together they are known as the Confederated Salish and Kootenai Tribes (CSKT). Historically the three Tribes maintained territories stretching from central Montana through eastern Washington and into Canada. The Flathead Reservation was established in 1855 by the Hellgate Treaty. The Reservation covers approximately 1.3

million acres. The majority of the Reservation is located within Lake County; however, the reservation also extends into Sanders and Missoula Counties. The 1904 Flathead Allotment Act eventually led to the opening of the Reservation to non-Indian homesteaders in 1910. According to CSKT's 2018 Annual Report the Reservation has approximately 8,087 enrolled tribal members, 5,000 of which live on or near the reservation (CSKT 2018 Annual Report). The city of Pablo serves as the seat of government for the CSKT. **Table's 1-3** detail the *Land Management Summary, Agricultural Statistics, and Land Use in Missoula County*. **Appendix A & B** includes county boundaries, map ownership, and land use of Missoula County in close detail.

Table 1: Missoula County Land Management Summary

Land Ownership	Public Agency	Total Acres	Land Percentage
Public Lands	All	1,038,682	62%
Federal	U. S. Forest Service	852,982	52%
	U.S. Bureau of Land Management	19,795	1%
	U. S. Department of Defense	6	< 1%
	U.S. Government	10	< 1%
State	Montana State Trust Lands	96,251	6%
	Montana University System	1,003	< 1%
	Montana Fish, Wildlife & Parks	39,757	2%
	Montana Department of Transportation	139	<1%
	State of Montana	20,633	1%
Local	Local Government	8,106	<1%
Reservation Boundaries (CSKT)	N/A	119,313	7%
Private Conservation Lands	N/A	155,679	9%
Conservation Easements	N/A	55,659	3%
Private Lands or Unknown Ownership	N/A	304,177	18%

Agriculture

The primary agricultural land use in Missoula County is woodland (74%), followed by pasture and rangeland (16%) and cropland (8%). The total number of farms has decreased over the past ten years by over 17% to 576 total farms reported in 2017. The acres in farmland jumped slightly between 2012 and 2017; this is likely the result of farmland consolidation over a 5-year period in Missoula County. Most of the agriculture land is spread throughout several valleys that exist within the county. The remaining balance of acres in the county are mountainous and are covered with timber. Primary agricultural

products include livestock (mainly cattle) and forage (grass and alfalfa). There is limited small grain production (spring and winter wheat, oats and barley) and a growing number of acres in diversified vegetable production (often on small 'truck farms' and high tunnels) as well as small orchard operations and turf farms. The elevation of the agricultural producing land ranges from 3,200 to 4,000 feet above sea level. The average growing season in Missoula County is approximately 120 days. Most of the agriculture takes place on the outskirts of the Missoula city boundary line, north towards the Jocko Valley, south along the Bitterroot River Corridor and west towards Huson, Montana. The Potomac Valley region located east of Missoula County towards the Powell County line is where the majority of the cattle producers reside but is more generally forested and of lower suitability for agriculture.

Table 2: Agricultural Statistics, NASS

MISSOULA COUNTY, MONTANA	2017	2012	2007
Number of Farms	576	637	699
Land in Farms (acres)	260,117	247,141	281,893
Average Size of Farm (acres)	452	388	403

Table 3: Missoula County Land Uses

Missoula County Land Use	2017 (acres)	% of Land use
Pasture & Rangeland	41,619	16%
Woodland	192,487	74%
Cropland	20,809	8%
Other	2,601	1%

Mineral County

Mineral County is located in the extreme western edge of Montana sharing its northwestern border with Shoshone County, Idaho. The southwestern border of Mineral County is shared with Clearwater County, Idaho. The eastern boundary is shared by both Sanders County and Missoula County, Montana. This western border is also home to the Coeur d'Alene Mountains which are part of the Bitterroot Range. The Clark Fork River, which is a tributary of the Columbia River runs the length of Mineral County flowing from southeast to the northwest. The county has a wealth of public land with the federal government managing over 80% of the total acres within the county. The vast majority of public land in Mineral County is included within the Lolo National Forest. The Lolo National Forest and private land holdings in Mineral County are located in a rain shadow formed by the Idaho-Montana state line divide. The average annual precipitation on the Lolo National Forest acreage can vary from 30 inches in lower elevations to 50 inches at upper elevations. The mean average precipitation in the county is 16 inches.

The economy, culture, and custom of Mineral County has been shaped by the beneficial use of natural resources for decades. From the beginning, farming/ranching, mining, and timber harvesting helped form the basic economic structure of the county. These activities are still prevalent today, along with an increased interest in recreational use of the land by county residents and out-of-state visitors. These

diverse land-use activities in conjunction with a moderately growing population base pose a unique set of challenges for both county residents and land managers alike.

Humans

Mineral County at a Glance

Mineral County has a total area of 1,222 square miles or 782,067 acres (0.83% of Montana), with 3.8 square miles being comprised of water. According to the most recent statistics available from the US Bureau of Census, the estimated population of Mineral County was 5,090 in 2023. The population density is 4.2 inhabitants per square mile. The racial makeup of the county was 89.4% white, 2.3% American Indian, 4.1% Hispanic or Latino, 0.9% Asian, 0.6% black or African American, and 3.4% from two or more races. The largest city in the county is Superior which also serves as the county seat with a population of approximately 834 in the 2020 census.

According to the Montana Natural Heritage Program, 91% of land in Mineral County is publicly owned, of which the majority (82%) is owned by the U.S. Forest Service. Only 9% of lands in Mineral County are held in private ownership (304,177 acres). **Table's 4-6** detail the *Land Management Summary, Agricultural Statistics, and Land Use in Mineral County*. **Appendix C & D** includes county boundaries, map ownership, and land use of Mineral County in close detail.

Table 4: Mineral County Land Management Summary

Land Ownership	Public Agency	Total Acres	Land Percentage
Public Lands	All	708,328	91%
Federal	U. S. Forest Service	639,061	82%
State	Montana State Trust Lands	26,863	3%
	Montana Fish, Wildlife & Parks	41,382	5%
	Montana Department of Transportation	286	<1%
	State of Montana	345	<1%
Local	Local Government	391	<1%
Private Conservation Lands	N/A	4	<1%
Conservation Easements	N/A	148	<1%
Private Lands or Unknown Ownership	N/A	73,587	9%

Agriculture

The primary agricultural land use in Mineral County is woodland (53%), followed by pasture and rangeland (13%) and cropland (30%). The total number of farms has decreased slightly over the past ten years by less than 6% to 93 total farms reported in 2017. The acres in farmland jumped significantly

between 2012 and 2017; this is likely the result of farmland consolidation over a 5-year period in Mineral County. Most of the agriculture land in the county consists of narrow intermittent bands of acreage along the Clark Fork River valley. The remaining balance of the acres in the county are mountainous and are covered with timber. Primary agricultural products include livestock (mainly cattle) and forage (grass and alfalfa). There is limited small grain production (spring and winter wheat, oats and barley) and a small number of acres in diversified vegetable production (often on small ‘truck farms’ and high tunnels) as well as small orchard operations. The elevation of the agricultural producing land ranges from 2,700 to 3,000 feet above sea level. The average growing season in Mineral County is approximately 115 days. Most of the agriculture takes place in the narrow valleys along the Clark Fork River Corridor between Alberton, Montana and St. Regis, Montana. Cattle producers reside in these river valley bottoms as well, but their operations can extend to higher elevations of forested ground. These higher elevation areas are of lower suitability for agriculture but are generally well suited for timber growth and production.

Table 5: Agricultural Statistics, NASS

MINERAL COUNTY, MONTANA	2017	2012	2007
Number of Farms	93	95	99
Land in Farms (acres)	18,408	17,049	22,654
Average Size of Farm (acres)	198	179	229

Table 6: Mineral County Land Uses

Mineral County Land Use	2017 (acres)	% of Land use
Pasture & Rangeland	2,393	13%
Woodland	9,756	53%
Cropland	5,524	30%
Other	736	4%

Geology and Soils

Missoula County

The field work for the Missoula County Soil survey (Soil Survey Area MT638) was completed in 1983 and published in 1985. Much of the information in this paper is taken from the Soil Survey Manuscript. The survey area contains portions of seven mountain ranges. The ranges include the Garnet Range in the eastern portion; the Mission and Swan Ranges to the north; the Sapphire Range to the southeast; the Bitterroot Range to the southwest and the Grave Creek and Ninemile Ranges to the northwest. The county lies within three Major Land Resource Areas (MLRA) including 44A – Northern Rocky Mountain Valleys, 43A – Northern Rocky Mountains, and 43B – Central Rocky Mountains.

The Precambrian rocks are among the oldest exposed sedimentary rocks in the world. They are represented by the Ravalli, Piegan, and Missoula Groups, which are commonly referred to as the “Belt rocks”. Most of the soils in the mountainous areas are underlain by sediment from the Belt rocks.

The major valleys in the survey area are filled with Tertiary lakebed sediment, Pleistocene silt from Glacial Lake Missoula, and recent alluvium. Pleistocene glacial deposits are in the Clearwater, Swan, and Blackfoot River drainageways. During the Pleistocene Epoch, a large body of water backed up behind an ice dam that was 2,000 feet high and was filled by the rising waters in the Clark Fork and Flathead Valleys. This body of water has been named Glacial Lake Missoula. The lake extended into Missoula County and reached a maximum elevation of about 4,200 feet above sea level, or about 1,000 feet above the present elevation of the city of Missoula. Deposits from the lakebed consist principally of silty material and fine sand.

There are relatively small acreages of Prime Farmland in Missoula County. The vast majority of which are found along the Clark Fork River between the town of Clinton and northwest of Frenchtown. Some of these soils are forested. Some soils are classified as ‘prime if irrigated’ meaning they do well under irrigation and should be prioritized for this purpose. Soils that are prime if irrigated lie mainly along river corridors, including a large area surrounding the city of Missoula and extending to Frenchtown. Farmlands of Statewide Importance occur mainly in the Blackfoot Valley on broad alluvial fans and terraces. Farmlands of Local Importance are widely scattered in areas where hay and forage are grown and occur mainly west of Missoula and some areas near Potomac. See **Appendix E** for detail map of *Missoula County Soils of Importance*.

Mineral County

The Lolo National Forest Land Systems Inventory was published by the US Forest Service Soil survey in 1989. Much of the information in this section was taken from that publication. Ongoing updates have been made to this inventory and the resulting soil survey is available on-line as Soil Survey Area MT603. Mineral county contains portions of two mountain ranges. The ranges include the Bitterroot Mountains in the southern portion and the Coeur d’Alaine Mountains to the north. The county lies within two Major Land Resource Areas (MLRA) including 44A – Northern Rocky Mountain Valleys and 43A – Northern Rocky Mountains.

The most predominant bedrock in the county are the partially metamorphosed, ancient sedimentary rocks of the Belt Basin Supergroup: known as the Belt metasedimentary rocks. Evidence of the depositional environment of these rocks can be observed today by the occurrence of mudcracks, ripple marks, crossbedding, and fossil algal mats. Most of the soils in the mountainous areas are underlain by sediment from the Belt rocks. About 40 million years ago, during the Tertiary period, there was massive filling of valleys with sediment.

The Tertiary Period ended about 3 million years ago with the beginning of the Pleistocene. Glacial Lake Missoula was created by a glacial ice dam on the Clark Fork River near Lake Pend Oreille. This large glacial lake flooded the Clark Fork River drainage below about 4,200 feet. Lacustrine deposits are located on high benches along the Clark Fork River and in the mouths of some tributary drainages.

Many of the soil surfaces have been influenced by volcanic activity originating in the Cascade Range. Volcanic ash has been transported by wind as loess and redistributed on the mountains of western Montana. The thickest deposits resulted from the Mount Mazama eruption about 6,700 years ago.

There are small acreages of Prime Farmland in Mineral County - nearly all of which are found along terraces above the Clark Fork River between the town of Alberton and west of Superior. Some soils are classified as 'prime if irrigated' meaning they do well under irrigation and should be prioritized for this purpose. Soils that are prime if irrigated in Mineral County are very minor in extent and occur on fans and benches above the Clark Fork River. Farmlands of Statewide Importance are very minor in extent and occur mainly in glacial lake sediments on dissected terraces. Farmlands of Local Importance are widely scattered in areas where hay and forage are grown on flatter slopes above the Clark Fork River. Forested areas are included in these designated areas. *See **Appendix F** for detail map of Mineral County Soils of Importance.*

Water

Precipitation

Due to the unique nature of both Missoula and Mineral Counties, there are three distinct regions: The semiarid valleys (Lower Bitterroot and Central Clark Fork), Mid-elevation mountainous areas (throughout both counties), and high elevation mountains (Swan Mountain Range and Bitterroot Mountain Range). A common problem throughout these areas is the lack of growing season precipitation; only 30% of the total precipitation falls during the growing season while the rest accumulates as winter precipitation. Because most of the precipitation comes during the winter, irrigation is a critically important agronomic purpose in both counties. The lack of growing season precipitation significantly reduces crop yield potentials on non-irrigated sites. The semiarid valleys receive annual precipitation of 14 to 16 inches, with some pockets of areas along the base of the Sapphire Front receiving less than 14 inches annually due to a rain shadow effect from the Bitterroot Range. The mid-elevation mountainous areas scattered throughout both counties receive 30 to 40 inches of annual precipitation. The high elevation mountains of the Swan and Bitterroot Mountain Ranges receive 40 to 50 inches of annual precipitation with a few of the higher peaks reaching in excess of 50 inches. (Missoula and Mineral County Soil Survey). *See **Figure 2** for mean annual precipitation which details the precipitation patterns for Montana including Missoula and Mineral Counties.*

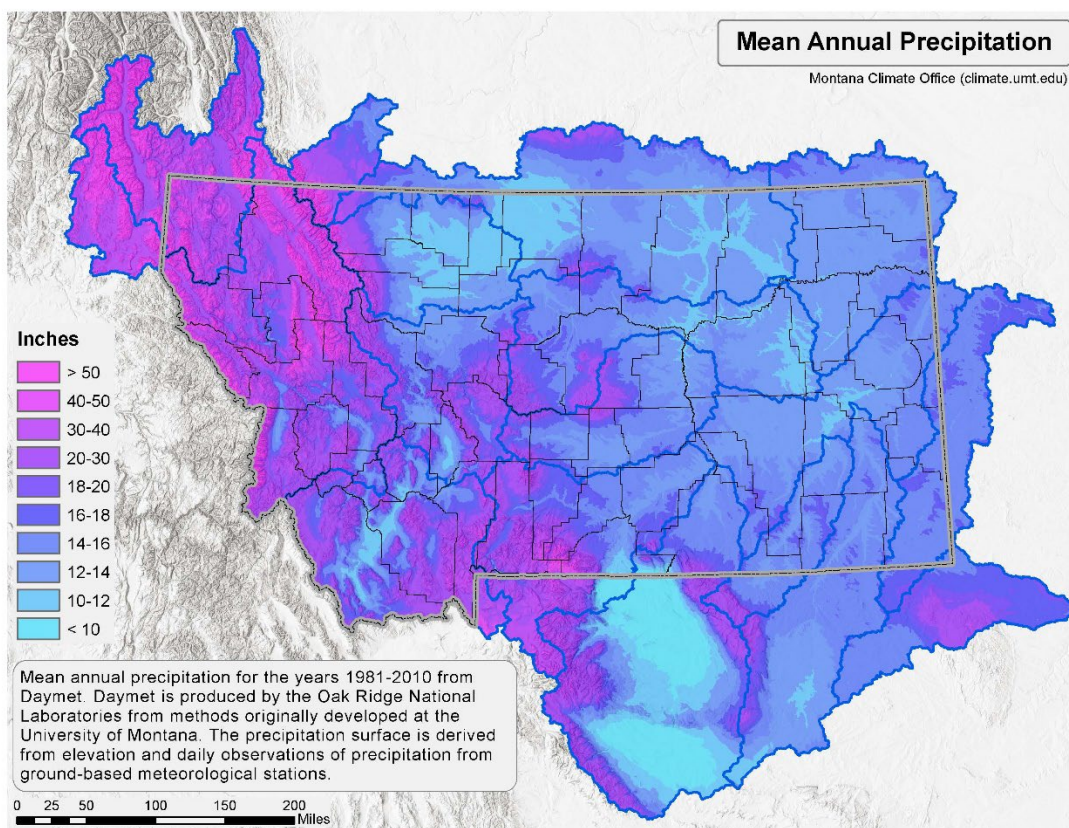


Figure 2. Mean annual precipitation in Montana

Watershed and Streams

Missoula and Mineral Counties lie along the Central Clark Fork Basin which drains over 22,000 square miles of Montana and Idaho into the Clark Fork River before it reaches Lake Pend Oreille in Idaho.

The Clark Fork River, which is a tributary of the Columbia River runs through the heart of both Missoula and Mineral Counties flowing from southeast at the Granite County line to the northwest into Sanders County, Montana. The Clark Fork enters Missoula County near Beavertail Hill State Park which is just west of the Granite County, Montana boundary. From there the Clark Fork River travels through the remainder of Missoula County and northwest into Mineral County. At the town of St. Regis, the river moves northeast into Sanders County near the Donlan Flats area. After flowing through Sanders County, the Clark Fork River enters the state of Idaho, emptying into Lake Pend Oreille. Past Lake Pend Oreille the Clark Fork then joins with the Columbia River with eventually reaching the Pacific Ocean. During its path through Missoula and Mineral Counties numerous tributaries contribute to the Clark Fork River.

The Clark Fork drainage has been severely affected by historic mining activities. High levels of arsenic, cadmium, zinc, aluminum and copper have been detected in the Clark Fork River. Missoula County, Montana has 6,670 records of mining claims on public land managed by the Bureau of Land Management with 221 active claims. The United States Geological Survey lists 304 mines on record in

Missoula County. The most commonly listed primary commodities mined in Missoula County are gold, silver, copper, and lead. Mineral County, Montana has 3,496 records of mining claims on public land managed by the Bureau of Land Management with 193 active claims. The United States Geological Survey lists 175 mines on record in Mineral County. The most commonly listed primary commodities mined in Mineral County are gold, silver, copper, and lead (The Diggings, 2019).

According to Montana Department of Environmental Quality (DEQ), both Missoula and Mineral Counties reside in the Pend Oreille Sub-Major Basin (a basin of the Columbia River). Five Hydrologic Unit Codes (HUC) comprise Missoula County: Bitterroot which begins at the Ravalli County boundary and flows north to the confluence of the Clark Fork River, Middle Clark Fork which begins at the confluence of the Blackfoot River and Clark Fork River and flows northwest to the Mineral County Boundary, Blackfoot that begins at the Powell County Boundary and flows west to the confluence of the Blackfoot River and the Clark Fork River, Flint-Rock which begins at the Granite County boundary and flows northwest to the confluence of the Blackfoot River and the Clark Fork River, and Swan River that begins at the confluence of Beaver Creek and flows northwest to the Lake County boundary. One Hydrologic Unit Code (HUC) comprises Mineral County: Middle Clark Fork which begins at the Missoula County boundary and flows northwest to the Sanders County boundary. **Appendix G** lists the waters associated with the Central Clark Fork River drainage that are designated as impaired by DEQ in both Missoula and Mineral Counties. **Appendix H** provides a map of the location of each of the impaired streams within the Central Clark Fork River drainage.

Common impairments for waters within Missoula and Mineral Counties include sedimentation/siltation, turbidity, nitrogen/nitrate, phosphorus, flow alterations, heavy metals, temperature and alterations to streamside vegetation. Causes of impairments are commonly a result of historical mining, silviculture activities, livestock grazing and other agricultural practices.

Many partners are actively working to improve water quality and riparian function within both Missoula and Mineral Counties including The Clark Fork Coalition, FWP, Northwestern Energy, USFWS, Trout Unlimited, CSKT, Montana Department of Environmental Quality (DEQ), Missoula and Mineral County Conservation Districts, NRCS and the Soil and Water Conservation Districts of Montana, among others. The NRCS is an active participant in many of these discussions and projects when they occur on private lands.

Flathead Reservation Water Resources

- ✓ 963 miles of perennial streams
- ✓ 3,118 miles of intermittent and ephemeral streams
- ✓ 71,849 lake surface acres
- ✓ 103,133 Wetland Acres

The Flathead Indian Reservation contains a vast and diverse array of water resources as shown in the table on the left. A report issued by the CSKT tribe titled “CSKT Water Quality Assessment Report” benchmarks the existing surface water quality conditions on tribal waters. According to the report,

Table 6. Water resources on the Flathead Indian Reservation.

72% of perennial streams and 87% of intermittent streams are impaired for one or more uses. On the Reservation the sources for impairment of water quality are generally related to land use practices

which generate nonpoint sources of pollution. **Tables 7 and 8** below, from the CSKT report, outline the causes and sources of impairment as well as their estimated extents.

Table 7. Causes of impairment of Reservation streams and rivers

Causes	Perennial - Stream miles	Perennial - Percent of total stream miles	Intermittent - Stream miles	Intermittent - Percent of total stream miles
Flow alteration	567	59 %	1,538	49%
Habitat alteration	729	76%	2,692	86%
Nutrients	393	41%	1,897	61%
Siltation	661	69%	2,655	85%
Suspended solids	623	65%	2,655	85%
Turbidity	455	47%	2,261	73%
Thermal modification	298	31%	1,223	39%
Pathogens	224	23%	1,196	38%
Ammonia	11	1%	0	0

Table 8. Sources of impairment of Reservation streams and rivers

Causes	Perennial - Stream miles	Perennial - Percent of total stream miles	Intermittent - Stream miles	Intermittent - Percent of total stream miles
Silviculture	175	18%	896	29%
Hydromodification	632	66%	1,718	55%
Habitat modification	667	69%	2,659	85%
Agriculture – grazing	660	69%	2,691	86%
Agriculture – crops	382	40%	1,255	40%
Other urban runoff	356	37%	1,523	49%
Ground water loading	11	1%	0	0
Minor municipal sources	7	1%	0	0
Resource extraction	3	0.3%	0	0

Irrigation

There are approximately 15,458 acres of irrigated land in the river bottoms and floodplains of Missoula County. The principle water courses in the county are the Clark Fork River, Swan River, Clearwater River, Blackfoot River, Bitterroot River systems and their tributaries. The principle valleys where irrigation is found in Missoula county include the Missoula Valley, the lower end of the Bitterroot Valley, the Swan River Valley, the Potomac Valley, and the lower part of the Flathead Valley. There are several irrigation districts on file with the county, some of these include the Big Flat Irrigation District, Clinton Irrigation District, Frenchtown Irrigation District, Carlton Creek Irrigation Company to name a few. The vast majority of irrigated lands in Missoula County grow perennial forages including pasture, grass hay and

alfalfa. Most of the irrigated soils are sandy loams along the river bottoms throughout the county. The lower portions of the Flathead Valley and west of Missoula near Frenchtown are comprised of sandy clay formations. The permeable sandy soils have a moderate to high infiltration rate and are in need of additional management during the irrigation season to ensure that enough water is being properly applied throughout the growing season. Areas of the county with clay soil components have low infiltration rates and are particularly susceptible to runoff if irrigation water is over-applied or applied at rates that are greater than the intake rates of the soils. Soils that are prime if irrigated lie mainly along river corridors, including a large area along the Clark Fork River surrounding the city of Missoula and extending to Frenchtown (Missoula County Soil Survey).

There are approximately 633 acres of irrigated land in Mineral County most of which consists of small intermittent bands along the Clark Fork River valley. The valley bottoms throughout the county are considered well-watered due to the proximity of both the Clark Fork River and St. Regis River and their tributaries to existing agricultural land. The vast majority of land under irrigation in the county consists of small acreage parcels in the river bottoms where irrigation water is delivered from individual or small privately-owned ditches. There are no known irrigation districts or large irrigation companies servicing Mineral County. The vast majority of irrigated lands in Mineral County grow perennial forages including pasture, grass hay and alfalfa. Most of the irrigated soils are sandy loam with considerable areas containing gravel and boulders. These permeable soils have a moderate to high infiltration rate and are in need of additional management during the irrigation season to ensure that enough water is being properly applied throughout the growing season. Soils that are prime if irrigated in Mineral County are very minor in extent and occur on fans and benches above the Clark Fork River (Lolo National Forest Land Systems Inventory).

Water delivery for irrigated land on the Flathead Indian Reservation is operated by the Flathead Indian Irrigation Project (FIIP). The irrigation infrastructure was authorized by Congress in 1908 and constructed to provide irrigation water to approximately 150,000 acres of land on the Flathead Indian Reservation. The project started construction in 1908 and was completed 56 years later in the early 1960s (Bureau of Reclamation – The Flathead Project). During this time there was construction of an extensive network of over 1,200 miles irrigation canals and seventeen reservoirs. The FIIP serves over 127,000 acres in the Mission, Jocko and Little Bitterroot Valleys. In 2015 after more than a decade of negotiation the State of Montana Legislature ratified the CSKT Montana Compact outlining water usage for irrigation and instream flows on the CKST reservation and beyond. The Compact currently awaits approval by the United States Congress. The Compact protects historical irrigation uses while at the same time providing for Tribal in-stream flow targets. One of the key goals of the Compact is to improve irrigation efficiencies within the target area. Due to the age of FIIP, much of the infrastructure suffers from deterioration. In fact, according to the Department of Interior, Bureau of Reclamations Dam Safety Program, in 1991, ten of the Flathead Reservation's dams were ranked within the top 150 nationwide for posing the greatest level of hazard (CSKT Comprehensive Plan Vol 1). Loss of water through seepage within canals from porous soils and deteriorated banks is another major concern.

Sources for irrigation water are most frequently surface-derived but a small number of irrigation systems use wells to pump from aquifers. Irrigation occurs primarily via impact sprinkler and flooding. Many irrigators have already converted from flood irrigation to sprinkler which includes hand lines, wheel lines, k-lines and pivots. However, a large number of fields are still irrigated by flooding. Most

flood irrigation in both Missoula and Mineral Counties can generally be characterized as ‘wild flood’ meaning the flooding is often completed via a series of contour ditches over uneven topography. This uneven irrigation causes numerous dry areas within each field while also causing over-irrigation and ponding in other areas. Flood irrigation on uneven topography often creates significant amounts of runoff. This runoff not only wastes water but also reduces water quality in streams and waterbodies as the runoff often carries elevated levels of nutrients, sediments and higher water temperatures directly into impaired waterways.

Groundwater

Currently, Missoula County has 14,973 wells on file with the Montana Bureau of Mines and Geology. The deepest well on record is 2907 feet and the shallowest well is 4 feet in depth. Most of the wells on record in the county are between 0 – 199 feet in depth. Only 6 total wells are reported at depths greater than 1000 feet. The vast majority of wells reported in Missoula County are for domestic water use. Other major water uses on file in Missoula County include wells for irrigation, monitoring, public water supply, and stockwater use. The top three geologic sources for wells in Missoula County are Alluvium (Pleistocene), Alluvium (Holocene), and Belt Supergroup.

Mineral County has 1,709 wells on file with the Montana Bureau of Mines and Geology. The deepest well on record is 2407 feet and the shallowest well is 4.3 feet in depth. Most of the wells on record in the county are between 0 – 199 feet in depth. Only 1 well is reported at depths greater than 1000 feet. The majority of wells reported in Mineral County are for domestic water use. Other major water uses on file in Mineral County include wells for irrigation, monitoring, public water supply, Geotech, or have unknown uses. The top three geologic sources for wells in Missoula County are Alluvium (Pleistocene), Alluvium (Holocene), and Belt Supergroup.

Wetlands/Riparian Areas

Wetlands are among the most important and beneficial ecosystems on the landscape. Montana’s State Wildlife Action Plan identifies all streams, rivers, floodplain and riparian, and wetland community types across the state as “Community Types of Greatest Conservation Need”. The plan defines this as meaning there is a clear obligation to use resources to implement conservation actions that provide direct benefit to these community types Area (Montana State Wildlife Action Plan, 2015). Wetlands provide critical biological, ecological, and economic benefits including flood attenuation, water filtration, carbon sequestration, drought resiliency, and wildlife habitat. Wetlands are home to 31% of all U.S. plant species, half of all North American bird species use wetlands as some point in their lifecycle, and nearly half of all threatened or endangered species in the U.S. are also associated with wetlands.

According to CSKT, the reservation alone contains approximately 22,000 acres of the above-mentioned wetlands and another 75,000 acres of lake open water. Together with the thousands of miles of tribal streams and riparian areas, these areas support most of the Reservation’s fish and wildlife. CSKT values the importance of these resources and has active wetland and riparian restoration programs. The Tribe’s goal is to “halt wetland and riparian losses on the Reservation and ultimately work to restore quantity and quality of these important aquatic resources” (CSKT Wetland Conservation Program).

Missoula and Mineral Counties contain a diverse array of wetland types. A total of 82,763 acres of wetlands can be found within the two county borders. Exact acreage amounts by county of palustrine

(lacking flowing water), lacustrine (lake associated), riverine (river associated), and riparian wetland types are found in the following table.

Table 9. Wetland acres by type in both Missoula and Mineral Counties. Montana Natural Heritage Program (Environmental Summary Report).

County	Palustrine	Lacustrine	Riverine	Riparian
Missoula	29,571	8,468	6,974	16,810
Mineral	6,708	326	3,594	10,312

Conservation Lands

Conservation easements are a valuable conservation tool. Depending on the parameters contained in the deed language, land can be protected for decades or even in perpetuity for the purposes of protecting plant or animal habitat, landscape features (e.g. wetlands) or land management activities like farming and ranching. Easement acre values and percent of county totals vary quite a bit over the two focus counties. Missoula County contains the most with 55,659 acres (3%) under some form of conservation easement. Of those acres, 44,516 are associated with private landowners and the remainder are held by the State of Montana (9,444) and the federal government (1,699 acres). Of the federal acres, the US Department of Agriculture holds the easement on 83 acres. By comparison, Mineral County only contains a total of 148 acres of conservation easements – less than one percent of the total county acreage. All those acres are associated with private easement holders (land trusts, animal conservation organizations, etc.).

Besides easement acres, other privately-owned designated conservation lands in the two counties include 155,679 acres in Missoula County; the vast majority of which are owned by The Nature Conservancy and four acres in Mineral County owned by Five Valleys Land Trust. Tribal owned conservation lands include 14,861 acres of Mission Mountain Tribal Wilderness in Missoula County. **See Appendix B & D** for land use summary of both Missoula and Mineral County's in close detail.

Plants and Animals

Federally Listed Species

The U.S. Fish and Wildlife Service's (USFWS) Ecological Services Division lists the following Threatened species as present within areas of Missoula and Mineral Counties: bull trout (*Salvelinus confluentus*), Canada lynx (*Lynx canadensis*), grizzly bear (*Ursus arctos horribilis*), yellow-billed cuckoo (*Coccyzus americanus*), water howellia (*Howellia aquatilis*), and red knot (*Calidris canutus rufa*). No federally Endangered species are known to reside within these counties. One Proposed (wolverine, *Gulo gulo luscus*) and one Candidate species (whitebark pine, *Pinus albicaulis*) are considered present. **See Appendix K** for USFWS document for Montana Counties.

Grizzly Bear

The USFWS, in cooperation with Montana FWP, the U.S. Forest Service (USFS), National Parks Service (NPS), Bureau of Land Management (BLM), Blackfoot Tribe and Confederated Salish and Kootenai Tribes currently manages grizzly bears in Montana as ‘threatened’ under authority of the Endangered Species Act. This cooperative management is under the Interagency Grizzly Bear Committee (IGBC) within which

Table 10. *Estimated grizzly bear densities in NCDE areas. (Courtesy Grizzly Bear Management Plan for Western Montana)*

Area	Size (mi ²)	Density (mi ² /bear)	Number of Bears
Red Meadow	215	10-15	14-22
Whitefish	831	18-25	33-46
Glacier National Park	1,583	6-8	198-264
St. Mary	211	10-20	11-21
Badger-Two Medicine	323	27-38	9-12
South Fork Flathead River	1,624	10-13	125-162
East Front	1,119	25-31	36-45
Swan Front	780	20-30	26-39
Mission Mountains	1,044	25-45	23-42
Scapegoat	1,903	56-112	17-34
Total	9,633	14-20	492-687
Total excluding GNP	8,050	19-27	294-423

all agencies and tribes are partners (FWP Grizzly Bear Management Plan for Western Montana). Missoula and Mineral Counties are 2 of 17 Montana counties that currently or could in the near future contain populations of grizzly bears. Limiting human-bear conflicts is a critical component of grizzly bear recovery plans.

Bull Trout

Bull trout are listed as a ‘threatened’ species in both Missoula and Mineral Counties. Bull trout require specific habitat needs and are more vulnerable to

environmental degradation than are other fish species. They require clean, cold, clear, complex and connected habitat (the five C’s). Bull trout populations have declined due to habitat loss and degradation from a variety of human-caused factors.

Collaborative efforts by many partners including USFWS, FWP, USFS, CSKT, DNRC and many others developed the Montana Bull Trout Restoration Plan. Silviculture, agriculture, and grazing has been identified as a source of impairment for water quality within the Central Clark Fork River, often resulting in increased turbidity and sediment

loads. Many decades of past mining and smelting operations, particularly from portions of the Upper Clark Fork River drainage area has contributed significantly to downstream heavy metal accumulation within bull trout spawning and rearing habitat in the Central Clark Fork River System.

A plethora of high mountain lakes, irrigation reservoirs, lakes and streams support abundant fish populations. However, quality of habitat has been degraded by development activities. Water diversion structures block access to spawning grounds over much of the original ranges of bull trout and westslope cutthroat trout (*Oncorhynchus clarkii lewisi*). Many streams are dewatered each year due to irrigation uses. Numerous opportunities exist to improve water quality and overall aquatic habitat within Missoula and Mineral Counties.



Figure 3. *Current range of bull trout in Montana (Montana Field Guide)*

Canada Lynx

Canada lynx are listed as a ‘threatened’ species in both Missoula and Mineral Counties. Canada lynx are limited to areas occupied by their main prey source, the snowshoe hare (*Lepus americanus*). Both the lynx and hare are typically found inhabiting moist, cool, boreal forests, typically above 4,000 feet in elevation. As hares make up approximately 90% of the lynx diet in winter, any degradation to snowshoe hare habitat that reduces hare populations has a direct commensurate negative impact on lynx populations as well. Critical habitat has been designated for Canada lynx in Missoula County (**Figure 4**).

Historic lynx population declines in Missoula and Mineral Counties mimic those found in other occupied Montana counties and are largely a result of anthropogenic causes including timber harvest, infrastructure establishment, overharvest, and wildfire suppression. Currently, although exact populations levels are uncertain for the area, according to the USFWS’s October 2017 Species Status Report for the Canada Lynx recent studies have indicated that both lynx reproduction and recruitment are occurring at healthy levels. To maintain these healthy numbers, conservation partners should seek to implement the Interagency Lynx Biology Team’s conservation strategy including: managing vegetation for a mosaic of successional stages, reducing habitat fragmentation, minimizing winter related recreational disturbances, avoiding backcountry road construction, and where possible maintaining fire as a key ecological process and disturbance mechanism.

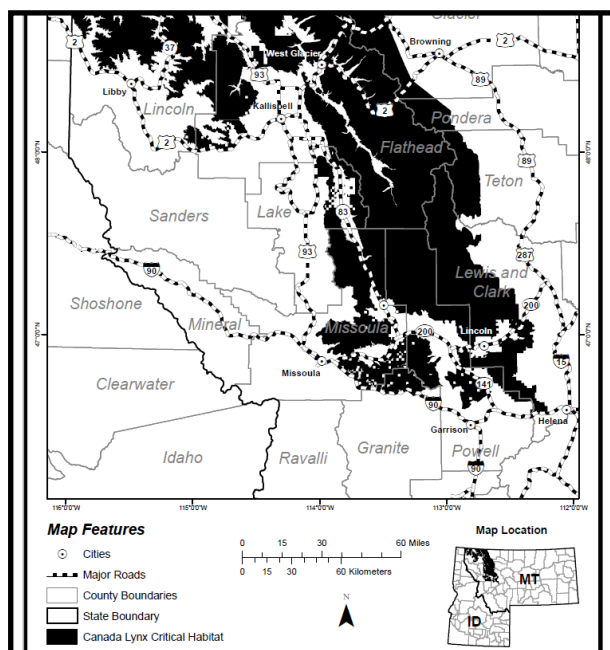


Figure 4: Canada lynx critical habitat in Western Montana.

Red Knot

The USFWS has listed the red knot as threatened due to loss of breeding and nonbreeding habitat, disruption of natural predator cycles on breeding grounds, reduced prey availability throughout the nonbreeding range, and increasing frequency and severity of mismatches in the timing of the birds' annual migratory cycle relative to favorable food and weather conditions. Migratory stopovers in Montana have been rare at wetlands scattered across the state. This medium-sized, bulky sandpiper about 23-25 cm in total length can be found on rare occasion in wetland habitat areas in Missoula County (Montana Field Guide).

Yellow-Billed Cuckoo

The western distinct population segment of the yellow-billed cuckoo was listed as threatened west of the Continental Divide in Montana under the Endangered Species Act by the USFWS. As noted by USFWS, the primary factors threatening the western distinct population segment as loss and

degradation of habitat for the species from altered watercourse hydrology and natural stream processes, livestock overgrazing, encroachment from agriculture, and conversion of native habitat. The yellow-billed cuckoo is a slender bird with a long, distinctly patterned tail and white throat and breast. The back and head of the yellow-billed cuckoo are a plain grayish-brown. The upper mandible of the curved bill is mostly black, with some yellow, while the lower mandible is yellow in its entirety. The bird is generally 26 to 30 cm in length and weighs an average 55 to 65 grams. This bird is sighted on rare occasion in wetland habitat areas in Missoula County (Montana Field Guide).

Wolverine

The wolverine is listed as a 'proposed' species for both Missoula and Mineral Counties. Wolverines are limited to alpine tundra and primarily coniferous forests in western Montana. They are generally solitary and wide-ranging and are opportunistic omnivores. In the early 1990s wolverines were nearly extinct in Montana, however their numbers and range have been increasing ever since (Montana Field Guide). On October 18, 2016, the USFWS published a Federal Register action reopening the comment period on their February 4, 2013 proposed rule to list the wolverine as threatened in the contiguous U.S. A final listing determination is expected in 2020.

Water Howellia

The USFWS lists water howellia as a threatened plant species in Missoula County. This aquatic herb is predominantly a winter annual with germination taking place in the fall and seedlings over-wintering and resuming growth in the spring. Water howellia has both submerged and floating stems that are up to 100 cm tall. White flowering occurs on the surface of the water. Germination of seeds occurs only when ponds dry out and seeds are exposed to air. The population size in a given year is affected by the extent to which the pond dries out at the end of the previous year. Due in part to this dependence, population size varies widely from year to year. Exceedingly wet years will detrimentally affect population size the next year since seeds will not germinate. Conversely, very dry years may also adversely impact populations if enough water is not present to support a good population and subsequent production of seed. Water howellia is restricted in Montana to depressional wetlands in the Swan Valley, typically occupying small basins where the water level recedes partially or completely by the Fall. Montana contains the largest number of occupied ponds and wetlands though the total occupied area is small, and it is clustered in a small portion of the state, making it vulnerable to localized events and management actions (Montana Field Guide).

Whitebark Pine

Whitebark pine is listed as a candidate species in both Missoula and Mineral Counties. Whitebark pine is a common component of subalpine forests occurring in all major mountain ranges of western and central Montana. Populations have been severely impacted by mountain pine beetle outbreaks and by the introduction of the white pine blister rust pathogen. Major declines in whitebark pine have been noted across its range.

State Species of Concern

According to the Montana Natural Heritage Program Species of Concern Report last updated April 16, 2020, Missoula County contains 74 state listed animal Species of Concern. These species consist of 11 mammal species, 29 bird species, 2 reptile species, 2 amphibian species, 3 fish species, 10 insect species,

12 mollusk species, and 5 other invertebrate species. Habitats generally associated with these species are diverse including both terrestrial and aquatic types and comprise mountain streams, rivers, lakes, grasslands, riparian forests, conifer forests, wetlands, and sagebrush. More specialized species on the list can be found only in association with Missoula County's waterfalls, rocky side slopes, alpine, and forested mountain springs. ***See Appendix L for State Animal Species of Concern for Missoula County.***

A total of 71 state listed plant Species of Concern also can be found within Missoula County. They are generally comprised of 9 fern species, 1 conifer, 31 dicot species, 15 monocot species, 9 bryophytes, and 6 lichens. Most of these species subsist in Missoula's general habitat types (grasslands, riparian, forests) but a few specialized species can only be found in more limited habitats including rock slopes, alpine, marshes, and fens. ***See Appendix M for State Plant Species of Concern for Missoula County.***

Mineral County generally contains fewer state listed species. For animals, Mineral is known to accommodate a total of 46 species of state concern. They are comprised of 7 mammal species, 14 bird species, 2 reptile species, 3 amphibian species, 2 fish species, 7 insect species, and 11 mollusks. ***See Appendix N for State Animal Species of Concern for Mineral County***

Plant species of state concern include one conifer, 16 dicot species, 5 monocot species, 1 bryophytes, and 2 lichens, for a total of 25 found within the county. ***See Appendix O for State Plant Species of Concern for Mineral County.***

Important Bird Areas

Missoula and Mineral Counties are located in the North American Bird Conservation Initiative's (NABCI) Bird Conservation Region 10. Two designated NABCI Important Bird Area are located within Missoula County: Clark Fork River – Grass Valley IBA (24,927 acres total; 79% under private ownership) and approximately northern 1/6th portion of the Bitterroot River IBA (~ 4,600 acres).

Noxious and Invasive Species

Both Missoula and Mineral Counties suffer from a litany of noxious and invasive species issues. Treatment and control of all invasive species in all areas is not feasible. However, identification and treatment of new and emerging threats should be prioritized. In addition, opportunities for integrated approaches to dealing with specific geographic areas and/or species should be sought. The Missoula and Mineral County Weed Districts maintain an updated noxious weed list and prioritization.

Noxious weeds in both Missoula and Mineral Counties are those designated noxious by the Montana Department of Agriculture. Priority weeds are listed in order, beginning with a 1A designation, where the weeds are not present or have limited presence in Montana. The management criteria for priority 1A weeds will require eradication and containment if possible, along with education. Priority 1B weeds have limited presence in Montana. Management of weeds under this designation will require eradication and containment if possible, along with education. Priority 2A weeds are common in isolated areas throughout Montana. Management will require eradication or containment where the weeds are less abundant. Prevention, education, and continued management are priorities for weeds with this designation in both counties. Priority 2B weeds are abundant in Montana and widespread in many counties. The management for weeds under this designation requires eradication or containment

where they are found to be less abundant. Prevention, education, and continued management are priorities for weeds with this designation in both counties. Priority 3 weeds are considered regulated plants that have potential to create negative impacts to the landscape. These plants may not be intentionally spread or sold other than as a containment in agricultural products. The state recommends research, education, and prevention to minimize the spread of these regulated plants in both counties. ***See Appendix I for detail list of Montana Noxious Weed's for 2019.***

Vegetative Weed Species

Both Missoula and Mineral Counties are home to a wide diversity of both annual and perennial weed species. To date Dyer's woad is the only priority 1A weed species present in Missoula County. Both Missoula and Mineral Counties have limited infestations of priority 1B weeds such as blueweed, rush skeletonweed, purple loosestrife and the knotweed complex. Missoula and Mineral Counties have populations of priority 2A weeds such as orange hawkweed, perennial pepperweed, yellowflag iris, and common buckthorn. Priority 2B weeds such as leafy spurge, spotted and diffuse knapweed, and dalmatian and yellow toadflax are widespread in both counties. There are biological control systems established for the Priority 2B weed species in both counties.

Mineral County has designated common mullein, mayweed, and scentless chamomile as Category 4 weeds. These have been determined by the Mineral County Weed Board to pose significant threat to the natural resources of the county. These weeds are capable of rapid spread rendering lands unfit for beneficial uses. The management criteria for Category 4 weed species in Mineral County includes awareness and education, monitoring and containment of known infestations of these weeds, and eradication where possible.

It is important to remain vigilant regarding new and invasive weeds. New weed species of concern include the annual grass ventenata (*Ventenata dubia*). Ventenata is known to take over native range, pastures, hay fields, and right of ways. It is also found in the neighboring State of Idaho where they have seen a 50% decrease in production of land that this species has invaded (MSU Extension – Ventenata, 2018). The weed management plan for both Missoula and Mineral Counties is continually updated with new species. The Missoula and Mineral County Weed Management Plan calls for integrated weed management strategies and methods including treatment, control, prevention, education, mapping, and chemical control (Missoula and Mineral County Weed Districts, 2020).

Aquatic Invasive Species

Aquatic Invasive Species (AIS) pose a threat to the biodiversity of lakes and streams in western Montana. AIS infestations in aquatic ecosystems can lead to a degradation of water quality and reduce species diversity by outcompeting native plants and decreasing desirable habitat. Missoula and Mineral Counties currently have no known infestations of AIS. Target aquatic invasive weed species in both Missoula and Mineral Counties are Eurasian watermilfoil (*Myriophyllum spicatum*), curly-leaf pondweed (*Potamogeton crispus*), flowering rush (*Butomus umbellatus*) and hydrilla (*Hydrilla verticillate*). Of concern is the potential introduction of zebra and quagga mussels (*Dreissena polymorpha* and *Dreissena rostriformis*). Montana has recently had a positive detection for invasive mussels. Since this detection the state of Montana has set up check stations around the state, including multiple check stations in both Missoula and Mineral Counties to check for AIS including the quagga and zebra mussels.

Rangeland

Range and pastureland are two minor components of the various land uses found within Missoula and Mineral Counties. Corridors of varying elevation along the Clearwater, Blackfoot, Bitterroot, Clark Fork drainages are areas where range and pasture are most prevalent in Missoula County. The vast majority of range and pastureland in Mineral County is found along the Clark Fork River corridor at varying elevations. Rangelands consist mostly of forested or open areas where elevations in both counties range from twenty-five hundred to six thousand feet. Cow/calf operations are the major type of livestock enterprise. Native rangeland is used primarily for grazing by domestic livestock; however, it also is used as wildlife habitat, recreational areas and has esthetic value. Rangeland soils are frequently gravelly, rocky and shallow. Some native range plants of particular importance in both Missoula and Mineral Counties include rough fescue (*Festuca campestris*), Idaho fescue (*Festuca idahoensis*), bluebunch wheatgrass (*Pseudoroegneria spicata*), arrowleaf balsamroot (*Balsamorhiza sagittata*), camas (*Camassia quamash*), Columbia needlegrass (*Achnatherum nelsonii*), needle-and-thread (*Hesperostipa comata*), prairie coneflower (*Ratibida columnaris*), prairie junegrass (*Koeleria macrantha*) and western wheatgrass (*Pascopyrum smithii*).

Range condition varies in both counties, but large areas of rangeland have been degraded. Much of this degradation took place decades ago with the arrival of large quantities of livestock. Continuous, season-long grazing and over stocking has led to significant reductions in rangeland quality over the past 120 years. As bunchgrasses declined, they were replaced with less desirable grasses, shrubs and weeds. Exotic species such as timothy, redtop, smooth brome, orchard grass, tall fescue, crested wheatgrass and many others were planted for hay and pasture and these plants displaced native rangeland vegetation in some areas, mostly in valley bottoms. Spotted knapweed, sulphur cinquefoil, whitetop, leafy spurge, goatweed, dalmatian toadflax, thistles and other noxious weeds are common within the rangelands of both counties. These plants often out-competed many native grasses. Annual grasses are also outcompeting native species and include, cheatgrass, Japanese brome and most recently ventenata. The short-lived perennial grass bulbous bluegrass is also a common invader. Poor grazing management, invasive species, and changes in fire regime are responsible for rangelands moving away from climax plant communities. According to the USDA publication *Climax Vegetation of Montana*, from 1976 Missoula and Mineral counties had 30% of rangelands in good to excellent condition and 70% in less than good. While there are still examples of excellent climax communities in both counties the percentage of excellent rangeland has dropped. Some rangelands within both counties are in an invaded state or have been lost to conifer encroachment and development, while other segments of native rangelands have decreased in productivity to overgrazing, invasive species, or any combination of these pressures.

Animal unit months or *AUMs typical for both Missoula and Mineral Counties can vary in production depending on range type and condition from 1.09 to 0.1 on native range, and 2.5 to 0.5 AUMs per acre on pasture. To protect existing range resources and riparian health, livestock grazing management is of key importance. Rotating livestock and altering grazing season usage are important tools managers can use to manage their livestock. For areas that are already heavily invaded by annual grasses and weeds, the best course of action is often to time grazing events to coincide with peak palatability of the non-desirable species while working to limit usage when desirable species are most susceptible to grazing pressures. **See Appendix J for Plant Hardiness Zone Map of Montana.**

Forestland

As described in Arno's "Forest Regions of Montana", both Missoula and Mineral Counties fall within the West-Central Montana Forest Region, characterized as dryer than either northwestern Montana or Idaho, with larch, ponderosa pine, and grand-fir locally dominant as well as warm, dry Douglas-fir forest habitat types. As elevations rise, forest types include lodgepole, on up to subalpine fir. Both County Community Wildfire Protection Plans (CWPP) include an in-depth discussion of the different major vegetation groups so it isn't repeated here.

Missoula County is 74% forested. Sixty-four percent of forest acres held in federal and state ownership, leaving about 135,063 acres in non-industrial private forest (NIPF). Approximately 29% of Missoula County falls within a wildland urban interface. Mineral County is 93% forested. Ninety-six percent of the forest acres are in federal and state ownership, leaving about 9,756 agricultural-woodland acres in private ownership along with 33,503 acres in NIPF.

The lowland ponderosa pine forest natural fire regime would be frequent, low intensity fires with fire free intervals of 5 to 25 years. In the Douglas-fir forests, the natural, uninhibited fire regime would be fire free intervals of about 45 years, with low to moderate intensity fires that maintained forests in a state where the tree species present, spacing between trees, and understory vegetation are well adapted to fire in healthy state. Lodgepole pine forests experience a longer duration fire interval from 100 to 500 years and are stand replacing. A century of fire suppression and manipulation of the natural disturbance mechanisms leave many forests, both public and private, in a state that fires quickly surpass the historic norm and become high severity, stand replacement fires. The wildfire threat and trend toward more catastrophic fire to the urban interface is common knowledge. The counties each have a CWPP that discusses this topic in detail, so it is not repeated here. Forest insect and disease issues are ever-present and in a constant state of flux. The current culprits in Missoula County include; bark beetles, spruce budworm, Douglas-fir tussock moth, mistletoe infestations, and root rot. The aforementioned manipulation of disturbance mechanisms has often increased the number of trees per acre far beyond the natural system sustainability and skewed the forest tree species composition toward those more susceptible to insects, disease, and wildfire. This situation complicates and limits forest management options.

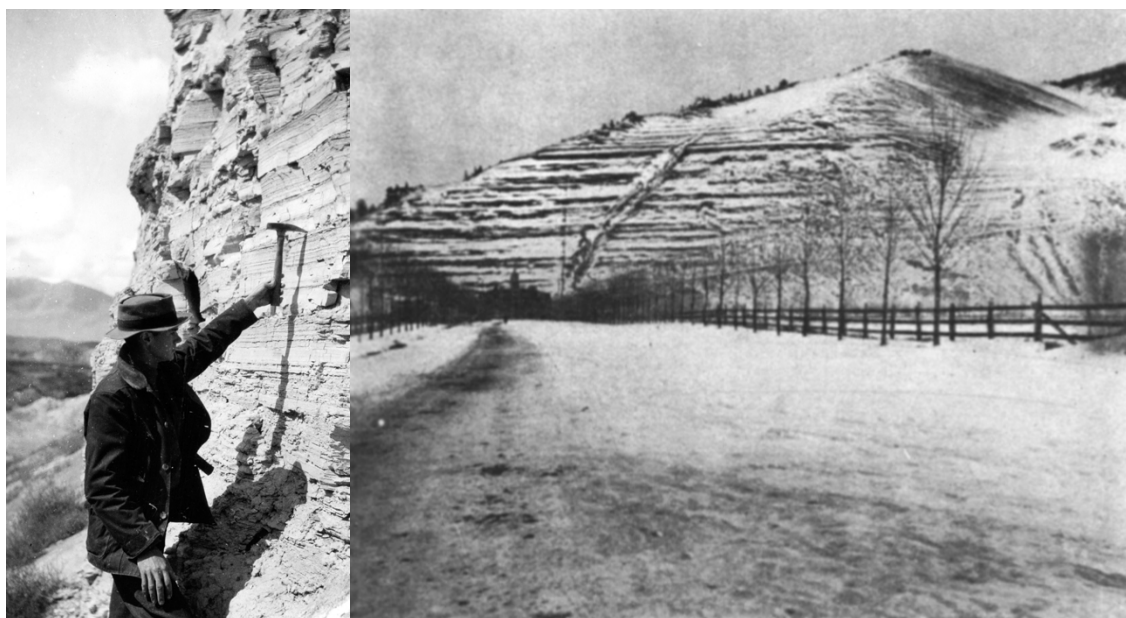
Logging has played a major role in both Missoula and Mineral counties over the past 130 years. Extensive logging has occurred in most areas. Historically logging provided timber for mines and smelting, a source of railroad ties for the railroads and shelter and income to homesteaders. Harvesting remained at a high-level during WWII and the postwar economy and provided the main economic driver for both counties into the early 1990s.

Missoula County government has offered fire hazard reduction grants for the last several years to encourage landowners to improve defensible space around structures, usually only several acres in size. MSU Forest Extension holds a Forest Stewardship class in both counties most years. There remains extensive opportunities to work with private landowners on forest-related issues including pre-commercial thinning, forest health and fuels reduction.

Unique Features

Glacial Lake Missoula Features (Missoula and Mineral Counties)

Unique to Missoula and Mineral Counties are the presence of landscape features from Glacial Lake Missoula. These features were first described in detail by J. T. Pardee in 1910. Pardee was a USGS geologist who was raised in Phillipsburg, Montana. He recognized the vast extent and existence of the lake in a 1910 paper on the topic and would later describe many of its unique features in detail in his 1942 paper. The ultimate linkage of the work by Pardee on Glacial Lake Missoula features with the work of J. Harlen Bretz on the Channeled Scablands would eventually validate the concept of the catastrophic floods as a landscape shaping process. The mystery of the source of the water would finally be tied with the vast erosional features documented by Bretz.



A young J.T. Pardee examining lakebed sediments and the iconic shorelines on Mount Sentinel (Missoula County) prior to construction of the "M".

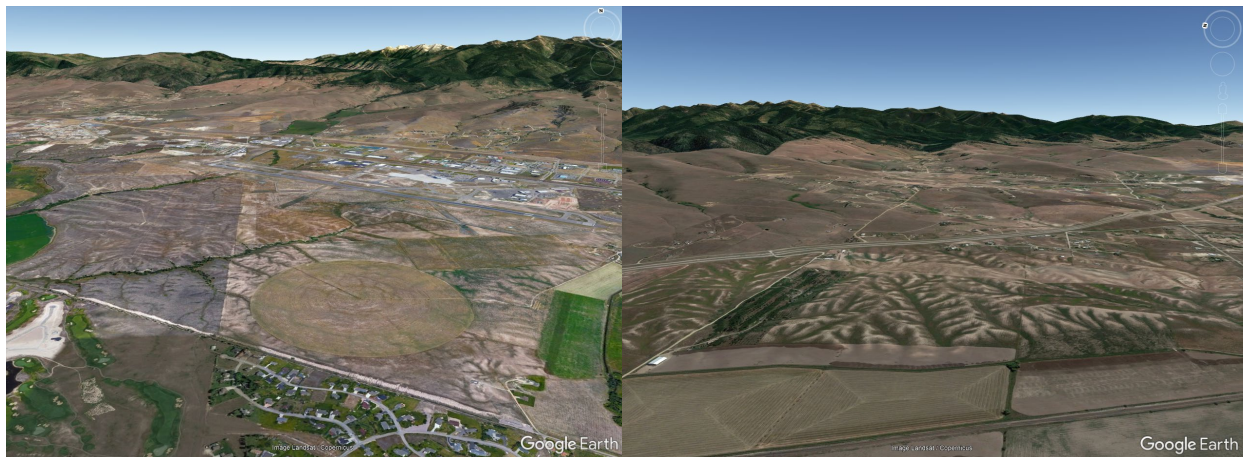
The concept of both catastrophic flooding and glacial ice dams were new to geology in the early part of the 1900's and the common thought was that landscapes evolved slowly over time and could not be shaped by massive forces of catastrophic flooding. A large part of the great controversy over the catastrophic flood features found in Eastern Washington and described by Bretz was linking the massive flood features of the channeled scablands to a mechanism and source of water which could create them. In this regard, the following two paragraphs stand out from the original paper published about Glacial Lake Missoula by Pardee in 1910.

"The evidence of icebergs, together with the apparent recency of the lake and the variable height of its surface, connect this lake with the glacial period, and readily lend themselves to the suggestion that its dam was of ice.

Bailey Willis has suggested that this was a Pleistocene lake dammed by a glacier. Many years ago, Professor Chamberlin conceived the idea of a glacial dam and furthermore tentatively suggested that its location was in the Pend d'Oreille region with outflow by way of Spokane." Pardee, 1910.

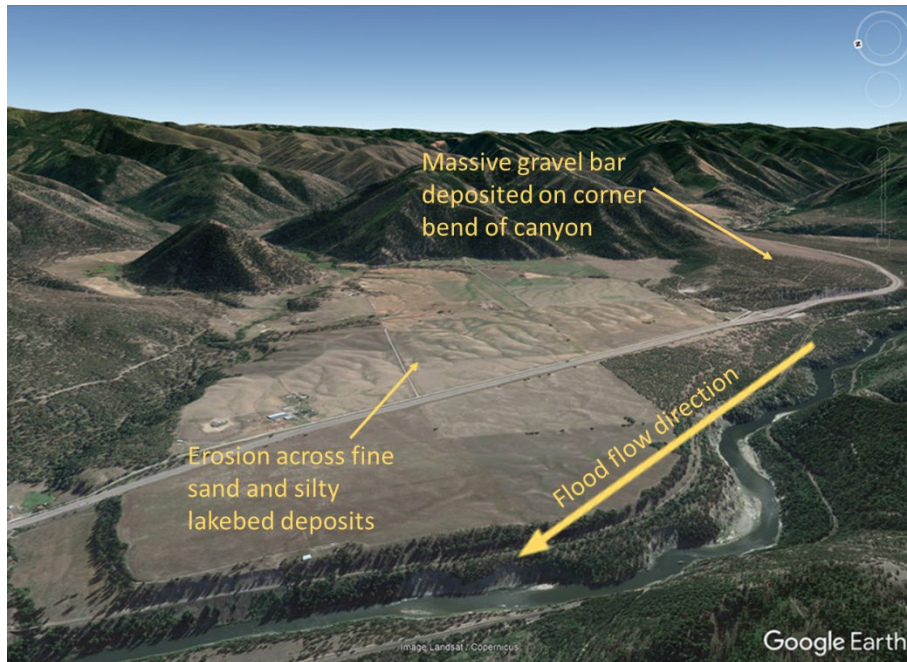
We will briefly review some of the evidence of catastrophic floods documented by Pardee and others in more recent contributions to gain a better understanding of the relationships between the events of Glacial Lake Missoula and the existing landform features found in Missoula and Mineral Counties.

Lakebed sediments occur in patchy areas within Missoula County, primarily along the northern margin of the valley. There are significant areas of these silty lakebed sediment soils near the Missoula Airport and along Interstate 90 in the Rollercoaster Road area between west of the junction of highway 89 heading towards Frenchtown. These areas are very hilly in relief and include an area with a dendritic erosional pattern as seen in aerial photos. A common soil series on these areas within Missoula County is the Grassvalley soil series.



Pivot on lake sediment soils near the Missoula Airport and dendritic drainage pattern on lakebed sediments along I-90.

An interesting area of Lakebed sediments occurs within Mineral County in the area of Tarkio Flats along Interstate 90. Flood waters flowing down the canyon along the Clark Fork River deposited cut and fill type gravel deposits on the inside bends of the canyon as it interacted with the local topography of the canyon. Just east of Tarkio Flats is a massive gravel bar deposit that was deposited by drainage of Glacial Lake Missoula. Areas to the west in Tarkio Flats show erosion patterns across fine sand and silty lakebed sediment deposits. Soils in this area are comprised of the following soil series: Tarkio (clayey textured lakebed sediments), Tally (fine sandy textured glaciofluvial sediments) and Halfmoon (silty textured lakebed sediments). Knowledge of the presence of an extensive glacial lake and related flood events that occurred in western Montana provides important context in which to learn and understand regional landforms and gain a better understanding of the related distribution of unique deposits and the soils that have formed from them.



Tarkio Flats (Mineral County) area showing massive gravel bar deposit and erosion of fine sand and silty lakebed sediments.

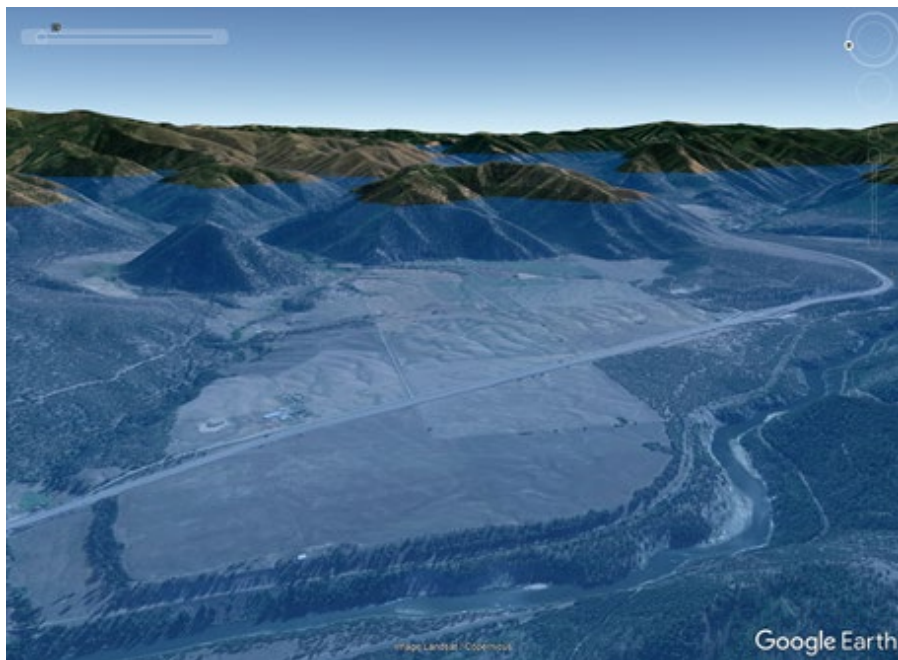


Image showing the 4,250 ft highest water level of Glacial Lake Missoula.

Great Fire of 1910 (Missoula and Mineral Counties)

The Great Fire of 1910 was a wildfire in the western United States that burned over three million acres (roughly the size of Connecticut) in North Idaho and Western Montana, with runs into Eastern Washington and Southeast British Columbia, during the summer of 1910. The fire blew up over the



weekend of August 20-21, after strong winds caused numerous smaller fires to merge into a firestorm of extraordinary size- killing 87 people, destroying several entire towns, and an estimated billion dollars' worth of timber in current value. It is believed to be the largest forest fire in U.S. history, and is considered to be a significant turning point in the development of wildfire prevention and suppression techniques. Local exhibits can be found at museums in Superior, MT and Wallace, ID- with other excellent interpretive sites located throughout the area as well.

Milltown Dam and Restoration (Missoula County)

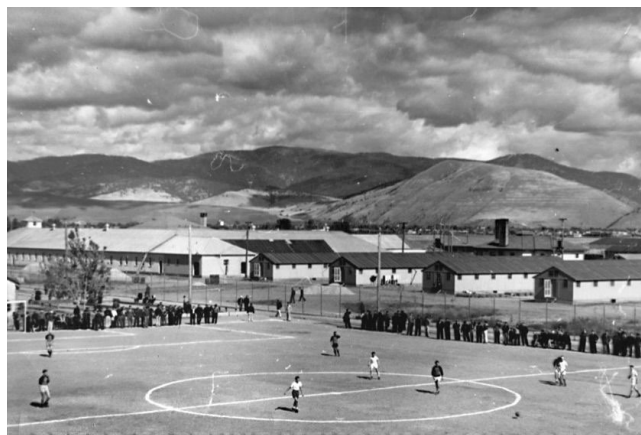
Milltown Dam was located near the confluence of the Clark Fork and Blackfoot Rivers, about 4 miles upstream of downtown Missoula, and was built in 1906-7 to provide hydroelectricity to the local sawmills which provided the timbers for the mine shafts in Butte.



Shortly after the dam was built, catastrophic flooding occurred during the spring of 1908, washing millions of tons of mining waste downstream from Butte, some of which settled behind the dam, remaining there for 100 years. The EPA listed the area along the Clark Fork on the Federal Superfund list in 1983 based on high levels of arsenic detected in area drinking water wells, and cleanup efforts were underway by 2006. Over the course of the cleanup, the dam and powerhouse were removed, and over 3 million cubic yards of contaminated sediments were also removed from the reservoir in preparation for restoration activities. The site now features a 500-acre state park that provides numerous recreation opportunities and habitat for wildlife. An overlook above the confluence of the Clark Fork and Blackfoot Rivers has an interpretive area which chronicles the Milltown cleanup and celebrates area history and heritage.

Historic Fort Missoula (Missoula County)

Fort Missoula was established as a permanent military post in 1877 and built in response to requests of local townspeople and settlers for protection in the event of conflict with local Indian tribes, and



throughout its history has served as a key part of Missoula's history. During the 1890s, black Soldiers from the 25th Infantry were stationed at the Fort and gained a nationwide following when a contingent of 23 men formed the Bicycle Corps and successfully traveled over 1,900 miles, from Missoula to St. Louis in 41 days. During WWII, the Fort served as a detention center, and held over 2,300 men- mostly Japanese and Italian, who had been identified as potential security risks. The Army left the Fort following WWII, but it's continued to remain active- with its buildings hosting USFS and other entities, along with

museums dedicated to Montana's rich history, and the people who have lived here.

Girard Larch Grove (Missoula County)

On the western shore of Seeley Lake, a magnificent 250 acre stand of old growth Western Larch can be found. Amongst this stand is the Seeley Lake Monarch, or Gus- the largest documented larch tree in the



world. Gus is approximately 1,000 years old and stands 163 feet tall- with a circumference of nearly 23 feet. The larch in the Girard Grove average 600 years of age and were preserved in 1953 through a cooperative partnership including USFS, the Anaconda Company, Intermountain Logging Conference, and other local stakeholders, and can be viewed along a scenic nature trail that loops through the stand. The Girard Grove is one of the finest remaining stands of Western Larch in the United States, and each year in October, Seeley Lake hosts its Tamarack Festival, celebrating the annual turning of the trees found in the memorial grove.

Ninemile Ranger Station & Remount Depot (Missoula County)

Remount Depot- The Ninemile Remount Depot was established in 1930 near Huson after a severe wildfire season in 1929 exhausted the supply of trained mules and skilled packers, and the USFS was forced to use unbroken pack animals, leading to serious delays and injuries to both animals and



humans. Completed by the Civilian Conservation Corps (CCC) in 1935, the Remount Depot was once home for more than 1500 pack mules, who were integral to firefighting, trail building, and many other kinds of backcountry work, and was, at one time, the center for the U.S. Forest Service packing activities in the Northern Rockies. Though its mission as a remount depot ended in 1953, Ninemile Ranger Station continues to support ranger districts in Montana, North Dakota and northern Idaho by growing hay and wintering stock for summer use in wilderness areas, and is now home to the Northern Region Pack Train and Ninemile Wildlands Training Center, providing training in horsemanship, and traditional packing and backcountry skills. In 1980, the depot was listed

on the National Register of Historic Places for its historical buildings and role in Forest Service, CCC, and local history, and features exhibits and interpretive trails, in addition to nearby recreational sites.

Savenac Historic Nursery (Mineral County)

Located near Haugan in the western part of the county, the Savenac Nursery was once one of the largest



USFS tree nurseries in the Western United States, operating from 1907 until 1969. The nursery produced over 12 million seedlings annually for use in reforestation of National Forests throughout the West- its operations have since been moved to the Coeur d'Alene Nursery in Idaho. Savenac Nursery was added to the National Register of Historic Places in 1999, and today ten buildings built during the 1930s by the Civilian Conservation Corps remain on the grounds, along with interpretive trails and a small arboretum.

Route of the Hiawatha (Mineral County)



The Route of the Hiawatha has been called the crown jewel of rail-to-trail biking adventures, built on 16 miles of Old Milwaukee Railroad grade. The trail begins near Taft, MT and passes through nine tunnels (including the 1.6 mile long St. Paul Tunnel) and over seven trestles on its way down to Pearson, ID. The Hiawatha is known for its scenic beauty and outstanding views from the trestles and overlooks, and also features a series of interpretive kiosks which provide excellent information on the 1910 Fire. It was named to

the hall of fame by the Rail-to-Trail Conservatory, one of only 15 trails across the United States to receive this designation.

Section III. Conservation Activity Analysis

Recent NRCS Activities

The NRCS office for both Missoula and Mineral Counties is located in the city of Missoula. The Pablo Field Office located in the CSKT Tribal Complex in Pablo, MT also serves the tribal land located in Missoula County. The Missoula Field Office works with both tribal and non-tribal producers.

NRCS work in both Missoula and Mineral Counties has focused on meeting the needs of the Local Working Group's priority. The priority in Missoula County has shifted between grazing and forestry over the past several years. During the last 10 years, 91 forestry improvement projects totaling 763.7 acres have been completed in Missoula County. There remains a strong need and desire in Missoula County to prioritize forestry and grazing-related projects. Additionally, 91 herbaceous weed control projects, totaling 988 acres have been implemented throughout the county. Grazing practices such as fence (57,818 feet installed), livestock pipeline (14,145 feet installed), and prescribed grazing (5,748.6 acres) have been commonly applied in Missoula County as well. Irrigation sprinkler systems have also been a common practice, where 23 have been installed over the same 10-year period. High tunnels have also been a commonly contracted practice with 10 installed over the past 10 years. Multiple other practices have been contracted to lesser extents.

Table 11. NRCS EQIP implementation of commonly applied practices in **Missoula County, Montana** from 2009 to 2019.

Practice Name	Unit Type	Applied Amount	Number of Practices
Conservation Cover	AC	0.3	1
Cover Crop	AC	158.3	10
Critical Area Planting	AC	18.2	3
Diversion	FT	596	1
Fence	FT	57817.9	27
Forage and Biomass Planting	AC	193	7
Forest Stand Improvement	AC	763.7	91
Fuel Break	AC	1.8	1
Heavy Use Area Protection	AC	1	1
Herbaceous Weed Treatment	AC	988.4	91
Invasive Plant Species Control	AC	987.2	56
Irrigation Pipeline	FT	30648	20
Irrigation System, Microirrigation	AC	2.2	10
Irrigation Water Conveyance, Pipeline	FT	5172	4
Irrigation Water Management	AC	1776.6	45
Livestock Pipeline	FT	14145	10
Mulching	AC	4	2
Nutrient Management	AC	629.6	26
Pest Management Conservation System	AC	618.5	28
Prescribed Grazing	AC	5748.6	28
Pumping Plant	NO	162	18
Range Planting	AC	24.3	6
Seasonal High Tunnel System	SQFT	15376.1	10
Spring Development	NO	2	2
Sprinkler System	AC	931.6	23
Structure for Water Control	NO	26	26
Tree/Shrub Establishment	AC	127.1	23
Tree/Shrub Site Preparation	AC	0.6	2
Water Well	NO	2	2
Watering Facility	NO	15	12
Windbreak/Shelterbelt Establishment	FT	1942	4
Woody Residue Treatment	AC	783.1	89

- *NRCS in Missoula County has two permanent Wetland Reserve Program easements in the county totaling 105 acres. These easements are wetland-dependent wildlife habitat focused. Inventory and management of the easements is an on-going process.*

For Mineral County the priority for the Local Working Group has been forestry work over the last several years. During the last 10 years, 23 forestry improvement projects totaling 308.7 acres have been completed in Mineral County. There remains a strong need and desire in Mineral County to prioritize forestry-related projects. Additionally, 25 herbaceous weed control projects, totaling 79.5 acres have been implemented throughout the county. High tunnels have also been a commonly contracted practice with 5 installed over the past 10 years. Multiple other practices have been contracted to lesser extents.

Table 12. NRCS EQIP implementation of commonly applied practices in Mineral County, Montana from 2009 to 2019.

Practice Name	Unit Type	Applied Amount	Number of Practices
Conservation Crop Rotation	AC	3.4	2
Cover Crop	AC	11	3
Forage and Biomass Planting	AC	5.4	3
Forest Stand Improvement	AC	308.7	23
Fuel Break	AC	4.5	4
Herbaceous Weed Treatment	AC	79.5	25
Irrigation System, Microirrigation	AC	0.4	3
Irrigation Water Management	AC	0.3	1
Nutrient Management	AC	12.7	7
Pest Management Conservation System	AC	1.5	3
Seasonal High Tunnel System	SQFT	5472.1	5
Woody Residue Treatment	AC	313.2	27

Confederated Salish Kootenai Tribe – Natural Resource Management

The Confederated Salish Kootenai Tribe (CSKT) has developed a comprehensive resource plan to guide natural resource management and development on the Flathead Indian Reservation. The Tribe has identified goals for each natural resource and outlined a series of alternatives for management. While the plan focuses on lands and resources it also incorporates social service and human concerns. The plan also serves to define policies and processes that will guide future resource management on the Reservation.

CSKT has a long history of effective resource management. They have enacted a great many Ordinances that serve to guide the preservation, restoration and protection of their cherished resources. CSKT is very mindful of ‘zones of influences’ that affect Reservation resources. Zones of influence are policies and practices of off-reservation entities and individuals that affect the Reservation and its resources. For example, management of off-Reservation resources such as water quality and fish and wildlife habitat can have profound effects on the Reservation’s own resources. The concept of an ecological zone of influence is important to the Tribe because a single major development activity off-Reservation can affect the Tribes’ resource base forever. CSKT places great value on communication and coordination of environmental and economic policies between itself and other entities.

For the purposes of facilitating resource planning efforts, CSKT has divided the Reservation into 6 smaller planning units called Study Areas. Each Study Area was developed to organize and prioritize resource information at a manageable scale. Study Areas include: Flathead Lake-River, Polson-Elmo, Camas-Hot Springs, Mission Valley, Perma-Dixon and Jocko Valley. Refer to the CSKT Comprehensive Resource Plan, Volume 1, Chapter 6 for information specific to each Study Area. The incorporation of the major resource and planning issues outlined within each Study Area is critical to NRCS planning efforts.

Conservation Districts

Montana’s conservation districts are political subdivisions of state government, created by the legislature in 1939. A non-paid elected and appointed board of supervisors governs the activities of a conservation district. The 58 conservation districts in Montana are part of a national network of over 3,000 conservation districts similarly organized in all 50 states. Their main function is to conduct local activities to promote conservation of natural resources. The activities vary from district to district, but generally include education, on-the-ground conservation projects, and 310 Stream Permitting. Funding for conservation district operations comes from their authority to levy a tax on real property within their district. For conservation projects and educational activities, conservation districts rely heavily on grants from state and federal governments (History of Montana Conservation Districts).

Both Missoula County and Mineral County each have their own conservation districts that are affiliated with the Montana Association of Conservation Districts (MACD). The Missoula Conservation District (MCD) was established on May 8, 1946. The Mineral County Conservation District (MCCD) was established on November 3, 1946. The Missoula Conservation District convenes on the second Monday of each month at the Gerald W. Marks Exploration Center in Missoula. The Mineral County Conservation District convenes on the third Tuesday of each Month at the Choices Conference Center in Superior.

Section IV. Natural Resource Issues to be Addressed

At the end of 2019 and through the beginning of 2020 the Missoula Field Office has met with partners and evaluated opportunities to expand partnerships for the betterment of conservation. Listed below are some of the most pressing resource issues identified by NRCS and our partners.

Forestry

The opportunity exists within Missoula and Mineral Counties to improve forest lands. NRCS, DNRC Service Foresters, the Blackfoot Challenge, and MSU-Extension are the only known resident personnel providing technical forestry advice to private landowners in both counties. Forest site potential is not being realized in most areas due to management practices over the last 100 years. The most pressing forestry concerns in both counties are as follows:

- Decline of Quaking Aspen trees. Aspen trees can grow in a wide range of environmental conditions and are tolerant to a multitude of climate variations. Aspen communities are essential for creating biodiversity richness within coniferous dominated forests by providing an abundance of forages for a wide variety of wildlife species. Over the last few decades, aspen populations have been declining in western Montana due to frequent drought conditions, recruitment failure resulting from grazing wildlife and livestock animals, as well as conifer encroachment.
- Decline of healthy riparian forests. Riparian areas were the first to be logged and have roads constructed during the homestead era. Due to the lack of large rock and bedrock in most area streams, large diameter wood and tree roots are a key component to stream and flood plain stability. Historically this created high quality fishery habitat for native fish species by maintaining complex stream structures with deep, cool pools. These areas also provided quality habitat for terrestrial wildlife species (see large diameter forest bullet in references section).
- Root disease. A fungal disease, root disease is a native forest pathogen that lives in the soil. Douglas-fir and the true firs are the most susceptible, and as the amount of these species has greatly increased in stands over the last 100 years so has the effect of root disease in Sanders County forests. Fire historically played a major role in subduing firs species and promoting root disease resistant species. As fire has been removed, firs have begun to dominate stands thereby increase susceptibility of the stand to root diseases.
- Mountain Pine Beetle. The impact of mountain pine beetle outbreaks throughout western Montana over the last few decades has created a cause for concern among landowners, forest managers, and the forest products industry. The majority of the trees killed by these infestations have been lodgepole pine, but the beetle has also affected and killed ponderosa pine trees as well. Both of these tree species are vitally important to the forest products sector in Montana. The mountain pine beetle has had a significant negative impact not only to the wood supply in Montana, but also the aesthetics and habitat quality of the landscape.
- Lack of large diameter, old forests. These forests have greatly declined in the last 100+ years and often occurred in riparian areas that burned less frequently and have higher moisture. These forests provide a habitat component lacking in younger, smaller diameter forests. Cavity dependent species utilize these forests heavily, and other wildlife use them sporadically such as ungulates utilizing them during deep snow periods. Heart rots increase as trees get older. This allows primary cavity excavators to hollow out trees that creates habitat for secondary cavity users (pine marten, fisher, bats, owls, etc.).

- Douglas-fir Insect and disease issues. The inland variety of Douglas-fir is likely one of the more common tree species found across the landscape in western Montana. Douglas-fir have the ability to grow and proliferate in a wide variety of environments and can naturally regenerate with ease across the landscape. This tree species is also known to regenerate with such density and aggressiveness that it can stagnate and suppress pine or larch regeneration when these species are the preferred trees for a particular growing site. Over-time, forest tree communities can become dominated by Douglas-fir, thus creating a medium for a wide array of insects and disease issues that are known to affect this species when water, sunlight, and nutrients become a limiting factor in a competitive growing environment. Common insect and disease issues affecting Douglas-fir in both Missoula and Mineral Counties are Douglas-fir tussock moth, Douglas-fir beetle, Armillaria root disease (as mentioned above), Dwarf mistletoe, and western spruce budworm (Inland Douglas-fir Management Challenges).
- Poor or lack of forest management. Lack of forest management has resulted in overstocked forests, increasing the densities of shade-tolerant species. As forests become over-stocked root disease, fire and other challenges become more common. Additionally, poor management often causes the ‘high-grading’ of stands whereby the best trees are removed during harvest thereby removing their genetics from the stand and reducing the quality of genetics within future stands.
- Fire-wise home and property practices. Like most of the west, both Missoula and Mineral Counties have seen an increase in home construction and subdivision in recent years. Many landowners have not taken necessary precautions to protect their property and/or structures from wildfire. Working with landowners to manage vegetation near structures and add resiliency to their properties is an important resource issue.

Irrigation

As stated in the “Irrigation” section, the CSKT Montana Compact was ratified by the state of Montana in 2015 and currently awaits approval by United States Congress. The Compact outlines water usage for irrigation and instream flows on the CKST reservation and beyond while also protecting historical irrigation uses. One of the key goals of the Compact is to improve irrigation efficiencies within the target area.

Irrigation is fundamental to agriculture in Missoula County. Irrigation is not as vital to agriculture in Mineral County with only 633 total irrigated acres countywide. The principal valleys where irrigation is found in Missoula County include the Missoula Valley, the lower end of the Bitterroot Valley, the Swan River Valley, the Potomac Valley, and the lower part of the Flathead Valley. There are several irrigation districts on file with the county, some of these include the Big Flat Irrigation District, Clinton Irrigation District, Frenchtown Irrigation District, Carlton Creek Irrigation Company to name a few. The vast majority of irrigated lands in Missoula County grow perennial forages including pasture, grass hay and alfalfa. The Flathead Indian Irrigation Project (FIIP) operates the irrigation delivery system in the Jocko Valley. Vast infrastructure improvements have been made in this area over the years, but portions of this irrigation system are antiquated and are in need of repair and replacement. Irrigation improvements needed throughout Missoula County include updating water delivery conveyances to gravity pressure, converting from open ditch to pipeline to reduce system losses, improving water measurement abilities, and reducing waste and runoff within the system. Improving on-farm irrigation efficiencies by improving infrastructure is also needed. In addition, reducing off-season delivery demands within the irrigation system for stockwater could leave more water in streams for fish and

wildlife if alternative stockwater options are provided to landowners. Working with partners to address multiple resource benefits is a key goal of the Missoula NRCS field office.

Weeds

Weeds are a constant natural resource challenge in both Missoula and Mineral Counties. The type of weeds and density of each within the county is more information than will be discussed in this document, however, focusing on emerging threats should be a priority. Aggressively targeting new threats should be a cornerstone of any active weed management plan and should be a high priority for focusing resources whenever possible.

Habitat

Wildlife and wetland habitat are a priority for many natural resource partners in both Missoula and Mineral Counties. Native fisheries of bull trout and westslope cutthroat trout have been a primary focus for Northwest Energy mitigation, FWP, Trout Unlimited, The Clark Fork Coalition, and the U.S. Forest Service. Addressing issues such as forestry and rangeland health and improving riparian areas will result in overall improvement to wildlife habitat.

Pasture and Range Improvements

Many of the tame pastures (dry and irrigated) in both Missoula and Mineral Counties are in fair to poor condition. The conditions are a result of both grazing management and species selection and diversity. Targeting improvements to both grazing and/or species selection could provide significant resource benefits. The Ronan NRCS and Lake County Conservation District have completed numerous pasture-related field trials in Lake County including legume inter-seeding studies and a 40-acre dryland forage study in 2017. The results of these studies are promising and are currently being monitored and analyzed and results could prove beneficial in planning future treatments for pastures within Missoula and Mineral Counties as well.

Rangeland conditions in both Missoula and Mineral Counties vary but significant amounts of rangeland are in fair to poor condition. Grazing management, noxious weeds, and climactic issues all affect rangelands. Improving grazing rotations should be strongly encouraged and when necessary providing infrastructure to facilitate rotational grazing such as fences and stockwater systems should be analyzed.

Soil Health

Soil health remains an area of interest in both Missoula and Mineral Counties. Many producers are interested in improving their soil health and increasing the sustainability of their agricultural operations. Farmers have started utilizing cover crops, but adoption is still low. Encouraging more landowners to adopt soil building practices should be prioritized. Producers using cover crops have reduced input costs and created additional forage opportunities. Expanding the use and adoption of cover crops, and other soil health practices could prove beneficial within both counties.

Conservation Easements

Conservation easements will continue to be encouraged as a tool for landowners within both counties that seek to conserve certain attributes and values associated with their land. The Missoula NRCS Field Office will continue to work with partners and landowners to assist with the easement process.

Riparian Zones:

Riparian zones play a critical role in our watersheds. From flood control to habitat to aesthetics and recreation these areas are some of the most important within the landscape. Many of our partners have taken a leading role in preserving and restoring riparian zones. There exists significant interest and opportunity to focus efforts on protecting and restoring riparian habitat and doing so provides NRCS the opportunity to strengthen and expand partnerships.

Section V. Prioritization of Natural Resource Problems and Desired Outcomes**Missoula County:**

The most recent Missoula County Local Working Group (LWG) meeting took place on April 16th, 2024 at the Gerald W. Marks Exploration Center and Rocky Mountain Gardens here in Missoula. The meeting was facilitated by Travis Lemke of the Missoula Field Office and Radley Watkins of the Missoula Conservation District (MCD). Additional participants included representatives from NRCS, MCD, Missoula County Department of Ecology and Extension (MCDEE), US Fish and Wildlife Service (USFWS) Partners Program, Montana Department of Natural Resources (DNRC), Five Valleys Land Trust (FVLT), Missoula County Lands and Communities Department, and local landowners. The meeting began with a review of the Priority Resource Concerns (PRCs) that were identified at the last LWG meeting. The PRCs include:

- Wildlife habitat/fragmentation
- Increased development/land use pressure
- Water quality/quantity
- Invasive species
- Forest health
- Soil health

Participants discussed adding climate resiliency into the mix of PRCs and concluded that a lot of the MCD or NRCS practices have factors of climate resiliency already built into them. Examples include maintaining and promoting carbon sequestration in the soil through practices such as no-till or reduced till, cover cropping, rotational grazing, and forest thinning to reduce wildfire risk and insect and disease susceptibility. Next, the LWG discussed possible new projects to address in partnership with NRCS and MCD. These projects include:

- Fish screens on large irrigation outtakes
- Large public lands acquisition
- Stream riparian restoration and whole-watershed rehabilitation work (such as road removal).
- Securing summer instream flows on Grant Creek
- Water Quality - surface water quality monitoring on the Clearwater Chain of Lakes
- Development of biological weed control and financial support for research efforts
- Pollinator conservation efforts that focus on habitat conservation, especially in wildland-urban interface (WUI) areas
- Habitat connectivity to improve passage through the landscape, particularly of I-90 and HWY 93
- Stream restoration along Sixmile Creek under I-90 to provide connective habitat

- Grizzly mitigation TIPs expanded as grizzly bears expand their range to keep bears from becoming acclimated to humans and out of highly populated areas or human inhabited corridors
- Wetland and stream restoration to cool down the water to improve conditions for native fish and invertebrates, particularly to help mitigate late summer, low flow stream temperatures
- Restoring for riparian health to address significant erosion due to major flooding events
- Incentive reserve areas in mapped Channel Migration Zones (CMZs) focusing projects on how future high flows will affect properties within the CMZ
- Irrigation improvements for water quality/quantity and soil health on agricultural land within Missoula County's west Mullan Road area to try to preserve our ag land from being sold into development
- NRCS easements with an emphasis on forested ground which could help avoid the cost of fighting wildfire in the WUI and areas with truly remote homes
- Wildlife-friendly fencing conversion
- Forest thinning to help reduce the risk of wildfires in the Mt. Dean, Miller Creek, Bear Gulch, Pattee Canyon, and Seeley Lake area.
- Community Agriculture

The 2024 LWG concluded with an acknowledgement of the importance of partnership in addressing conservation needs and challenges throughout the county.

Prioritized Resource Concerns (no order of priorities provided):

- **Forest Health:** Missoula County is 74% forested and supporting healthy forests and fire resiliency is a priority to the LWG. Extensive efforts and collaboration have been put forward by partners and the Missoula NRCS Field Office to develop a forest health TIP that would address forest health concerns in both the upper Ninemile drainage and the Potomac valley.
- **Water Quality with a special emphasis on riparian health and restoration of impaired streams:** There is strong support within the county and from the LWG to address water quality issues particularly along the mainstem of the Clark Fork River and its major tributaries. Largely this support relates to riparian health issues caused by impacts from building sites, grazing, farming, mining, and channelization to support infrastructure improvements. The goal would be to address non-point water pollution and restore stream/riparian habitat while complementing partner efforts by collaborating within high priority focus areas in the county. This TIP proposal is still in development.
- **Weed Control:** Like most counties in Montana, Missoula County is plagued by numerous noxious weeds. There is strong support for weed control-related projects, particularly as a supporting practice that would complement forest health and stream restoration work. In addition, there are several acres of range and pastureland throughout the county that are in dire need of weed management. This resource concern is being addressed in conjunction with the upper Ninemile and Potomac valley forest health TIP proposals.
- **Urban Development with an emphasis on preserving farmland and surrounding wildlife and riparian areas:** The rapid population growth in Missoula County over the last several years has resulted in the loss of agricultural lands to development. Nearly 20% of the land suited for agriculture in Missoula County lie within two miles of the Missoula City limits. These areas are at risk for development and further fragmentation. The LWG has a strong interest in creating wildlife

corridors, and open green space in at risk areas along with protecting and preserving riparian areas and farmland with the use of various easement funding mechanisms. More research, collaboration, and planning will need to be done on potential projects and partnerships.

Mineral County:

The most recent Mineral County Local Working Group (LWG) meeting took place on April 5th, 2023 at the Mineral County Conservation District building in Superior. The meeting was facilitated by John Bowe of the Missoula Field Office. Participants included local landowners and the Mineral County Conservation District Administrator and Board Members. The meeting began with an introduction about the purpose of LWG's and the guidance they provide for establishing Priority Resource Concerns (PRCs) and Targeted Implementation Plans (TIPs). Participants reviewed the PRCs that were established at the 2022 LWG meeting. A motion was held to retain the existing PRCs with a 6-0 vote by the Conservation District Board Members.

Prioritized Resource Concerns (no order of priorities provided):

- ***Water Quality with a special emphasis on streambank remediation:*** There exists support within the county and within the LWG to address water quality issues particularly along the mainstem of the Clark Fork River and its major tributaries. Largely this support relates to riparian health issues caused by impacts from building sites, grazing, farming, and mining. There is a small demand for irrigation improvement from producers who reside along the Clark Fork River Valley Bottoms, however, many of the more basic on-farm flood to sprinkler improvements have already been addressed after years of work in the area by NRCS. There may still be opportunities for on-farm improvements. An area in need of more work is to improve the delivery system to producers and help improve efficiency of both water movement and management.
- ***Forest Health:*** Mineral County is primarily tree-covered. Supporting healthy forests and fire resiliency. Fire mitigation is a popular topic locally and many partners are actively seeking opportunities to collaborate on projects. The County has an active forestry program to treat fuels within 200' of homes. DNRC and Bitterroot RC&D are active in the county and often provide expertise and funding for forest management practices. The NRCS is looking for opportunities to collaborate with partners to develop forest-related projects.
- ***Weed Control:*** Like most counties in Montana, Mineral County is plagued by numerous noxious weeds. There is strong support for weed control-related projects. A fair amount of discussion at the LWG revolved around weed control. More research and planning needs to be done on potential projects and partnerships.

Section VI. Targeted Implementation Plans

Upper Ninemile Forest Health Project:

The Missoula NRCS Field Office along with partners including the Missoula County Local Working Group (MCLWG), Montana Department of Natural Resources and Conservation (DNRC), the Missoula County Office of Emergency Management, and the Missoula Weed District, have identified the Ninemile

drainage area as a priority for forest health. The prioritized area lies within Missoula County and extends from the confluence of Butler Creek within the Ninemile Creek drainage to an area just beyond Pats Creek to the north. This area has been identified as a high priority because it encompasses one of the better site-indexes for trees on private land in the county, and it has good potential with motivated landowners actively engaged in promoting the benefits of improved forest health throughout the drainage.

This TIP proposal encompasses over 16,000 acres, close to half of which is publicly owned and is primarily Forest Service. Private ownership is limited primarily to the valley floors with moderate elevation gains on forested lands totaling 8,359 acres. Landowners in this area of the county have been actively participating in conservation efforts with not only NRCS, but with Missoula CD, RMEF, USFS, TU, DNRC, FWP for many years. The Focus Area ties in to and overlaps with the Wildland Urban Interface (WUI). Conservation practices proposed through NRCS would also help address the goals and objectives in the National Cohesive Wildland Fire Management Strategy, the Community Wildfire Protection Plan, Joint Chief's Landscape Restoration Partnership, and the NRCS Long Range Plan for Missoula County.

The goals of the project are to improve forest health, resiliency, and increase the productivity of privately held forest lands in the upper Ninemile drainage. An ancillary goal is to improve wildlife habitat and collaborate with partner groups to increase landowner education and awareness of forest health and associated ecological components.

The specific objectives of the Upper Ninemile TIP are to:

- Increase the knowledge of forest landowners within Missoula County regarding forest health and how implementation of conservation practices can improve the health and resiliency of their forested land;
- Promote participation in the forest stewardship workshop hosted by MSU Extension on an annual basis;
- Improve wildlife habitat (cover/shelter/nesting/food).
- Improvement of forest health, resiliency to insects, disease and fire, and over-all productivity:
 - Develop management plans for each program participant with consideration for stand diversity, multiple age class retention, optimal stand densities, and overall health;
 - Through implementation of conservation practices, stem density would be decreased within over-stocked stand and insect and disease issues would be addressed;
 - Through implementation of appropriate supporting practices, resource concerns would be addressed resulting in a reduction in noxious weeds and soil erosion.

Potomac Valley Forest Health Project:

The Missoula NRCS Field Office along with partners including the Missoula County Local Working Group (MCLWG), Montana Department of Natural Resources and Conservation (DNRC), the Blackfoot Challenge, the Missoula County Office of Emergency Management, and the Missoula Weed District, have identified the Potomac Valley area as a priority for forest health. The prioritized area surrounds the community of Potomac which lies within Missoula County. The western boundary of the TIP is adjacent to and compliments the boundary for Wildfire Adapted Missoula (WAM), which is a Joints Chiefs Special Initiative Project. Additional partners of WAM include the BLM, USFS, and TNC. The northern boundary

of the project area border portions of MT HW200, while the east boundary and southern boundary are Garnet Range Road and Cramer Creek Road respectfully.

This TIP proposal encompasses just over 29,000 acres, close to half of which is publicly owned ground comprised of Forest Service, Bureau of Land Management, State of Montana, and University of Montana land. Private ownership is limited primarily to the valley floors with moderate elevation gains on forested lands totaling 15,692 acres. Landowners in this area of the county have been actively participating in conservation efforts with not only NRCS, but with Missoula CD, the Blackfoot Challenge, USFS, DNRC, and FWP for many years. The Focus Area ties in to and overlaps with the Wildland Urban Interface (WUI). Conservation practices proposed through NRCS would also help address the goals and objectives in the National Cohesive Wildland Fire Management Strategy, the Community Wildfire Protection Plan, Joint Chief's Landscape Restoration Partnership, and the NRCS Long Range Plan for Missoula County.

The goals of the project are to improve forest health, resiliency, and increase the productivity of privately held forest lands in the Potomac Valley. An ancillary goal is to improve wildlife habitat and collaborate with partner groups to increase landowner education and awareness of forest health and associated ecological components.

The specific objectives of the Potomac Valley TIP are to:

- Increase the knowledge of forest landowners within Missoula County regarding forest health and how implementation of conservation practices can improve the health and resiliency of their forested land;
- Promote participation in the forest stewardship workshop hosted by MSU Extension on an annual basis;
- Improve wildlife habitat (cover/shelter/nesting/food).
- Improvement of forest health, resiliency to insects, disease and fire, and over-all productivity:
 - Develop management plans for each program participant with consideration for stand diversity, multiple age class retention, optimal stand densities, and overall health;
 - Through implementation of conservation practices, stem density would be decreased within over-stocked stand and insect and disease issues would be addressed;
 - Through implementation of appropriate supporting practices, resource concerns would be addressed resulting in a reduction in noxious weeds and soil erosion.

Packer Creek Forest Health Project:

The Packer Creek Forest Health TIP will enhance the health and productivity of forested acreage, with collateral benefits in reducing wildfire hazard and noxious weeds - achieved through the implementation of a robust set of practices during the period of 2022-2026. This dynamic project will directly complement the US Forest Service's Cruzane Mountain Project and will effectively engage a diverse group of landowners and partners through grassroots outreach activities and collaborative efforts in western Mineral County, Montana. Conservation partners for this TIP include: Mineral County Conservation District, Montana Department of Natural Resources and Conservation (DNRC), Mineral County Weed District, Bitter Root RC&D, Mineral County Resource Council, and the US Forest Service.

The conservation practices offered within this TIP include: Forest Stand Improvement, Woody Residue Treatment, Fuel Break, Tree and Shrub Pruning, and Herbaceous Weed Treatment.

Grizzly Conflict Mitigation Project:

EQIP funds will provide participants with financial assistance for installation of electric fences and electrified drive-over mats to deter grizzlies from entering areas of anthropogenic attractants with potential bear/human conflict. Reducing bear/human conflict is a key strategy to the recovery of the Northern Continental Divide Ecosystem population of grizzly bears. The geographic boundary of the TIP and the efficacy of the chosen conservation practices are supported by empirical data and real-world proven application by partners in the Blackfoot region of Montana. Conservation partners for this TIP include: Montana Fish Wildlife and Parks, Blackfoot Challenge, and the US Fish and Wildlife Service. The conservation practices offered within this TIP include: Structures for Wildlife, 5-wire fence, Structures for Wildlife, 12-foot electric drive-over mat, and Obstruction Removal, fence removal.

North Ovando Fuels Reduction Project:

Prescribed grazing and supporting infrastructure will be implemented to treat the resource concern of plant productivity and health. Conservation partners for this TIP include: Montana Department of Natural Resources & Conservation (DNRC), Powell County Weed District (PCWD), US Forest Service (USFS), Lolo National Forest, Seeley Ranger District, and the North Powell County Local Working Group (NPCLWG). The conservation practices offered within this TIP include: Forest Stand Improvement, Fuel Break, and Woody Residue Treatment.

Lower Miller Creek Riparian Health Project:

The riparian health of Miller Creek has experienced anthropogenic degradation for decades. The creek is listed under the Clean Water Act section 303(d) for temperature and sediment impairments. This project will compliment ongoing efforts upstream and focus on streambank stabilization, fish habitat enhancement, improvements to in-stream flow and fish passageway improvements on the lower reaches of Miller Creek. Conservation partners for this TIP include: Clark Fork Coalition (CFC), Montana Fish, Wildlife and Parks (FWP), Missoula Conservation District (MCD), Missoula County Weed District (MCWD), and Western Sustainability Exchange (WSE). The conservation practices offered within this TIP include: Fence, Riparian Forest Buffer, Herbaceous Weed Treatment, Pumping Plant, Well (stockwater), Irrigation Sprinkler, Irrigation Pipeline, Livestock Pipeline, Tree/Shrub Establishment, and Watering Facility.

Lower Ninemile Forest Health Project:

The Lower Ninemile Forest Health TIP aims at addressing plant productivity and health, plant composition and structure, and wildfire hazards from biomass accumulation. Through financial and technical assistance and partnerships the goal of this TIP is to improve forest health and resilience to wildfire. Conservation partners for this TIP include: Montana Department of Natural Resources and Conservation (DNRC), Missoula County Office of Emergency Management and Lands and Communities, Missoula County Department of Ecology and Extension, Missoula County Conservation District, U.S.

Forest Service, Frenchtown Rural Fire District, and Bitterroot RC&D. The conservation practices offered within this TIP include: Herbaceous Weed Management, Woody Residue Treatment, and Forest Stand Improvement.

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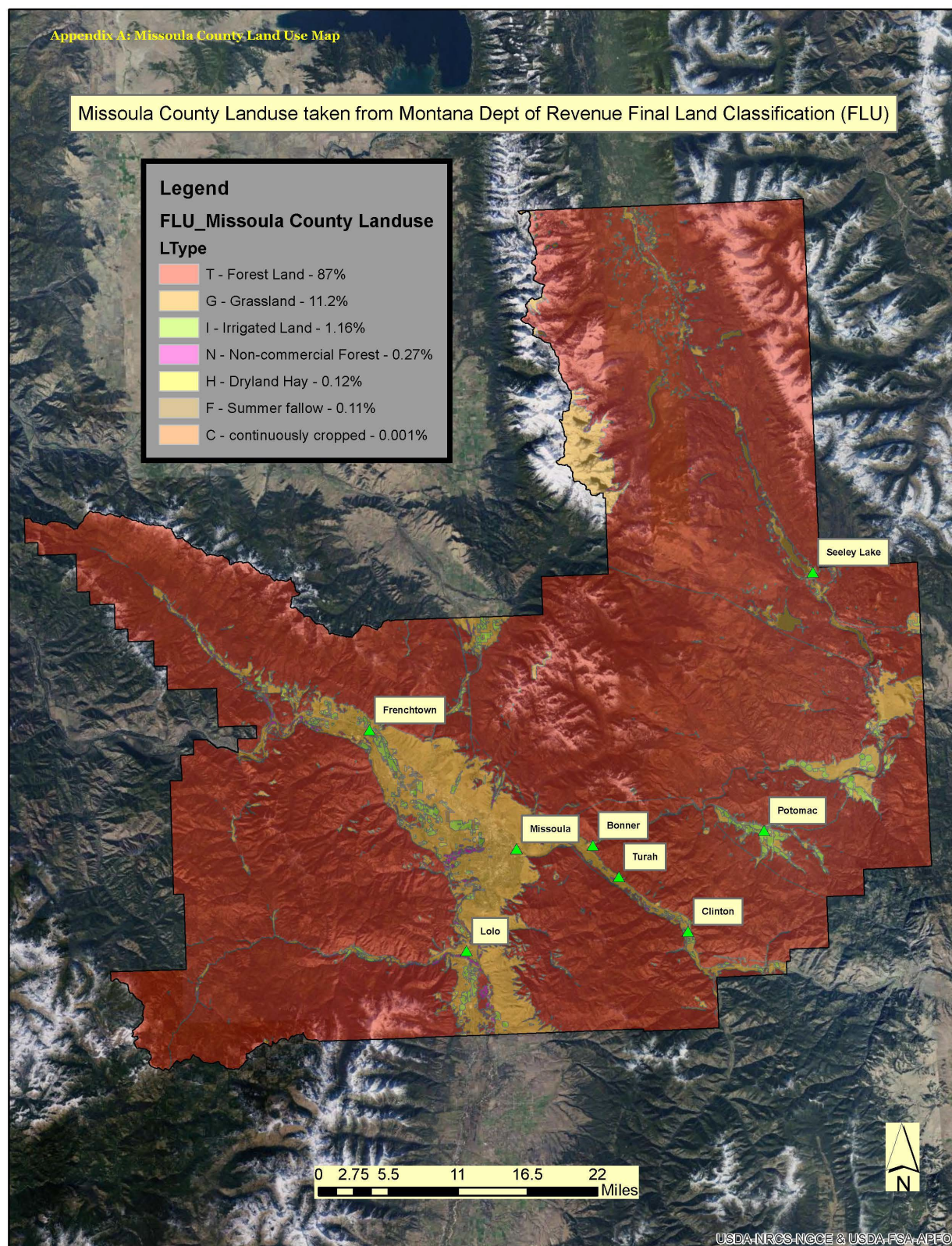
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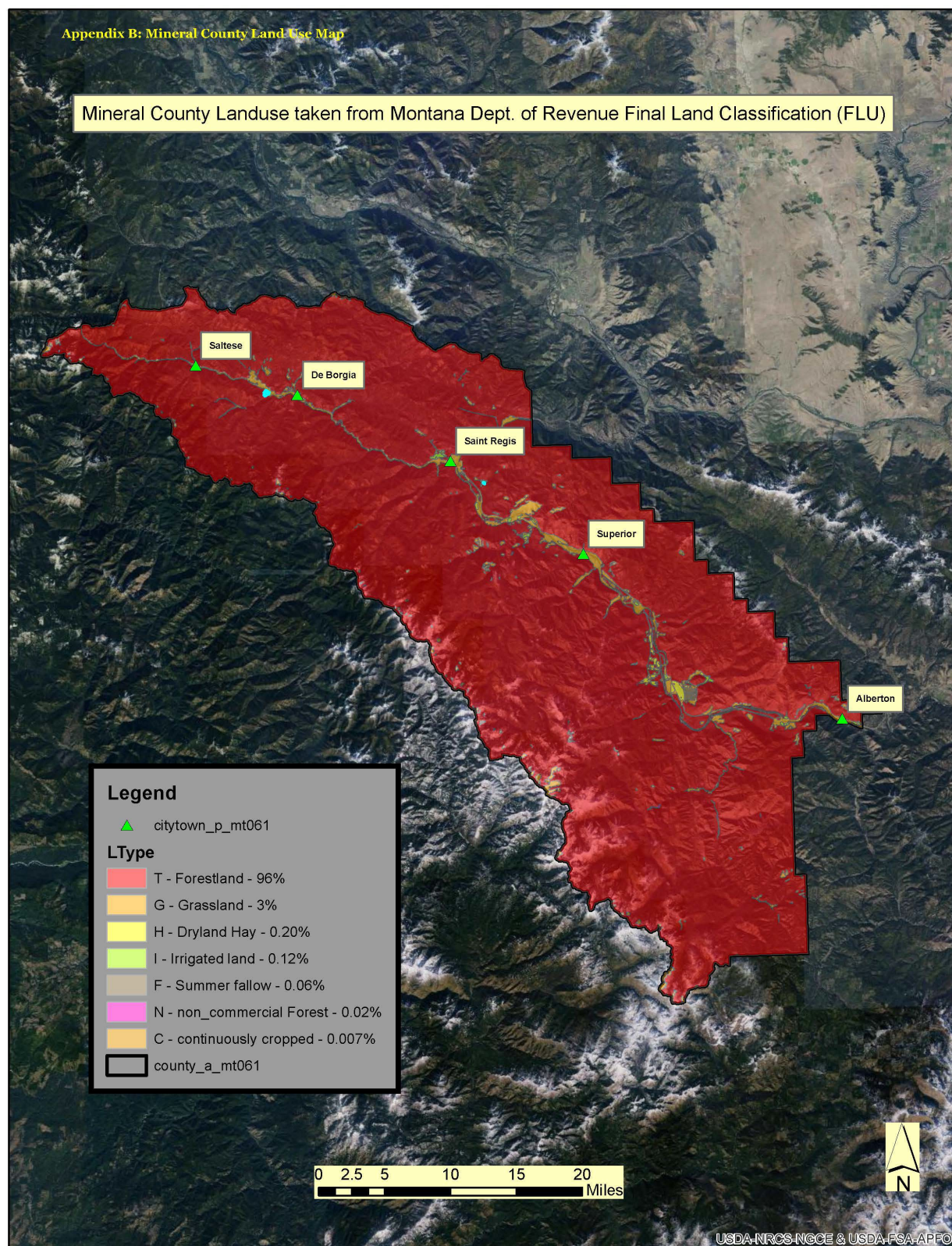
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Section VII. Long Range Plan Appendices





Appendix C: Missoula County Land Use Summary



**MONTANA
Natural Heritage
Program**

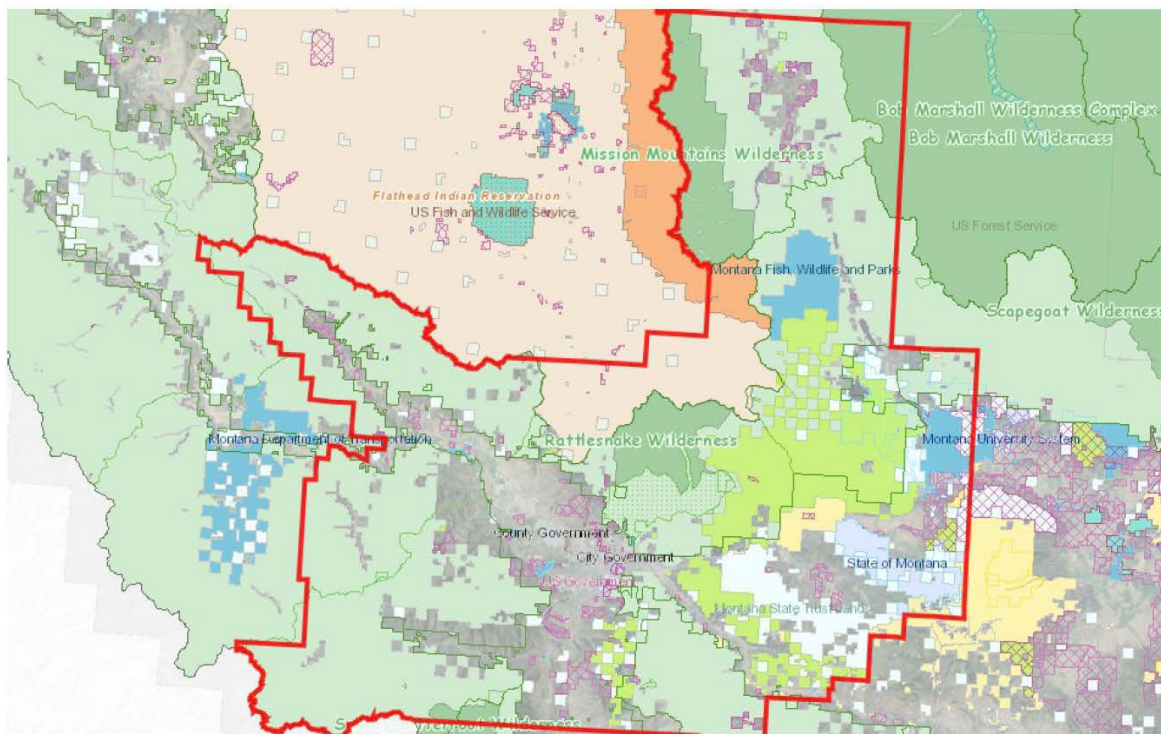
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Land Management

Summarized by: **Missoula (County)**



Land Management Summary

[Explain](#)

	Ownership	Tribal	Easements	Other Boundaries (possible overlap)
Public Lands	1,038,682 Acres (62%)			
Federal	872,793 Acres (52%)			
US Forest Service	852,982 Acres (51%)			
USFS Owned	852,982 Acres (51%)			
USFS Ranger Districts				1,089,156 Acres
Bitterroot National Forest, Stevensville Ranger District				12,252 Acres
Flathead National Forest, Spotted Bear Ranger District				44,938 Acres
Flathead National Forest, Swan Lake Ranger District				193,400 Acres
Lolo National Forest, Missoula Ranger District				395,664 Acres
Lolo National Forest, Ninemile Ranger District				232,778 Acres
Lolo National Forest, Plains/Thompson Falls Ranger District				1 Acres
Lolo National Forest, Seeley Lake Ranger District				205,901 Acres
Lolo National Forest, Superior Ranger District				4,222 Acres

Land Management Summary				Explain
	Ownership	Tribal	Easements	Other Boundaries (possible overlap)
USFS National Forest Boundaries				1,089,161 Acres
Bitterroot National Forest				12,252 Acres
Flathead National Forest				238,338 Acres
Lolo National Forest				838,571 Acres
USFS Wilderness Areas				192,757 Acres
Bob Marshall Wildemess				44,938 Acres
Bob Marshall Wildemess Complex				44,938 Acres
Mission Mountains Wilderness				62,714 Acres
Rattlesnake Wilderness				34,253 Acres
Selway-Bitterroot Wilderness				5,914 Acres
USFS Research Natural Areas				2,805 Acres
Carlton Ridge Research Natural Area				955 Acres
Council Grove Research Natural Area				149 Acres
Petty Creek Research Natural Area				314 Acres
Plant Creek Research Natural Area				311 Acres
Sheep Mountain Bog Research Natural Area				126 Acres
Shoofly Meadows Research Natural Area				950 Acres
USFS National Recreation Areas				25,106 Acres
Rattlesnake National Recreation Area				25,106 Acres
USFS Special Interest Areas				369 Acres
Condon Creek Botanical Area				228 Acres
Elk Meadows Botanical Area				102 Acres
Marys Frog Pond Botanical Area				39 Acres
US Bureau of Land Management	19,795 Acres (1%)			
BLM Owned	19,795 Acres (1%)			
BLM Areas of Critical Environmental Concern				576 Acres
Bear Creek Flats Area of Critical Environmental Concern				576 Acres
US Department of Defense	6 Acres (<1%)			
USDOD Owned	6 Acres (<1%)			
US Government	10 Acres (<1%)			
US Government Owned	10 Acres (<1%)			
State	157,783 Acres (9%)			
Montana State Trust Lands	96,251 Acres (6%)			
MT State Trust Owned	96,251 Acres (6%)			
State Forests				25,692 Acres
Clearwater State Forest				25,692 Acres
Montana Fish, Wildlife and Parks	39,757 Acres (2%)			
MTFWP Owned	39,757 Acres (2%)			
MTFWP State Parks				429 Acres
Beavertail Hill State Park				68 Acres
Council Grove State Park				182 Acres
Frenchtown Pond State Park				54 Acres
Placid Lake State Park				31 Acres
Salmon Lake State Park				42 Acres
Travelers' Rest State Park				52 Acres
MTFWP Fishing Access Sites				1,687 Acres
Angevine Fishing Access Site				13 Acres
Beavertail Pond Fishing Access Site				54 Acres
Chief Looking Glass Fishing Access Site				13 Acres
Clearwater Crossing Fishing Access Site				15 Acres

Land Management Summary				Explain
	Ownership	Tribal	Easements	Other Boundaries (possible overlap)
☐ Corrick's River Bend Fishing Access Site				32 Acres
☐ Deep Creek Fishing Access Site				36 Acres
☐ Erskine Fishing Access Site				431 Acres
☐ Harpers Lake Fishing Access Site				205 Acres
☐ Johnsrud Park Fishing Access Site				18 Acres
☐ K. Ross Toole Fishing Access Site				29 Acres
☐ Kelly Island Fishing Access Site				705 Acres
☐ Kona Bridge Fishing Access Site				3 Acres
☐ Marco Flats Fishing Access Site				2 Acres
☐ Ninemile Prairie Fishing Access Site				14 Acres
☐ Petty Creek Fishing Access Site				27 Acres
☐ Russell Gates Memorial Fishing Access Site				40 Acres
☐ Schwartz Creek Fishing Access Site				14 Acres
☐ Sha-Ron Fishing Access Site				1 Acres
☐ Tamarack Creek Fishing Access Site				6 Acres
☐ Turah Fishing Access Site				13 Acres
☐ Weigh Station Fishing Access Site				16 Acres
MTFWP Wildlife Management Areas				44,470 Acres
Blackfoot-Clearwater Wildlife Management Area				44,351 Acres
Mount Jumbo Wildlife Management Area				119 Acres
Montana University System	1,003 Acres (<1%)			
MUS Owned	1,003 Acres (<1%)			
MUS Experimental Areas				20,358 Acres
☐ Lubrecht State Experimental Forest				20,358 Acres
Montana Department of Transportation	139 Acres (<1%)			
MTDOT Owned	139 Acres (<1%)			
State of Montana	20,633 Acres (1%)			
State of Montana Owned	20,633 Acres (1%)			
Local	8,106 Acres (<1%)			
Local Government	8,106 Acres (<1%)			
Local Government Owned	8,106 Acres (<1%)			
Reservation Boundaries				119,313 Acres (7%)
Flathead Indian Reservation				104,452 Acres (6%)
Mission Mountains Tribal Wilderness				14,861 Acres (1%)
Private Conservation Lands	155,679 Acres (9%)			
TNC Owned	155,052 Acres (9%)			
Five Valleys Land Trust	424 Acres (<1%)			
Rocky Mountain Elk Foundation	163 Acres (<1%)			
The Vital Ground Foundation	40 Acres (<1%)			
Conservation Easements				55,659 Acres (3%)
Private				44,516 Acres (3%)
Montana Land Reliance				12,093 Acres (1%)
The Nature Conservancy				6,393 Acres (<1%)
Rocky Mountain Elk Foundation				4,973 Acres (<1%)
Five Valleys Land Trust				19,680 Acres (1%)
Flathead Land Trust				10 Acres (<1%)
The Vital Ground Foundation				1,273 Acres (<1%)
National Wildlife Federation				20 Acres (<1%)
Institute of the Rockies				74 Acres (<1%)

Land Management Summary				Explain
	Ownership	Tribal	Easements	Other Boundaries (possible overlap)
State & Local Montana Fish, Wildlife and Parks City Government County Government Federal US Forest Service US Fish and Wildlife Service US Department of Agriculture US Government			9,444 Acres (1%) 8,293 Acres (<1%) 629 Acres (<1%) 522 Acres (<1%) 1,699 Acres (<1%) 872 Acres (<1%) 80 Acres (<1%) 83 Acres (<1%) 664 Acres (<1%)	
Private Lands or Unknown Ownership	304,177 Acres (18%)			

Appendix D: Mineral County Land Use Summary



MONTANA
Natural Heritage
Program

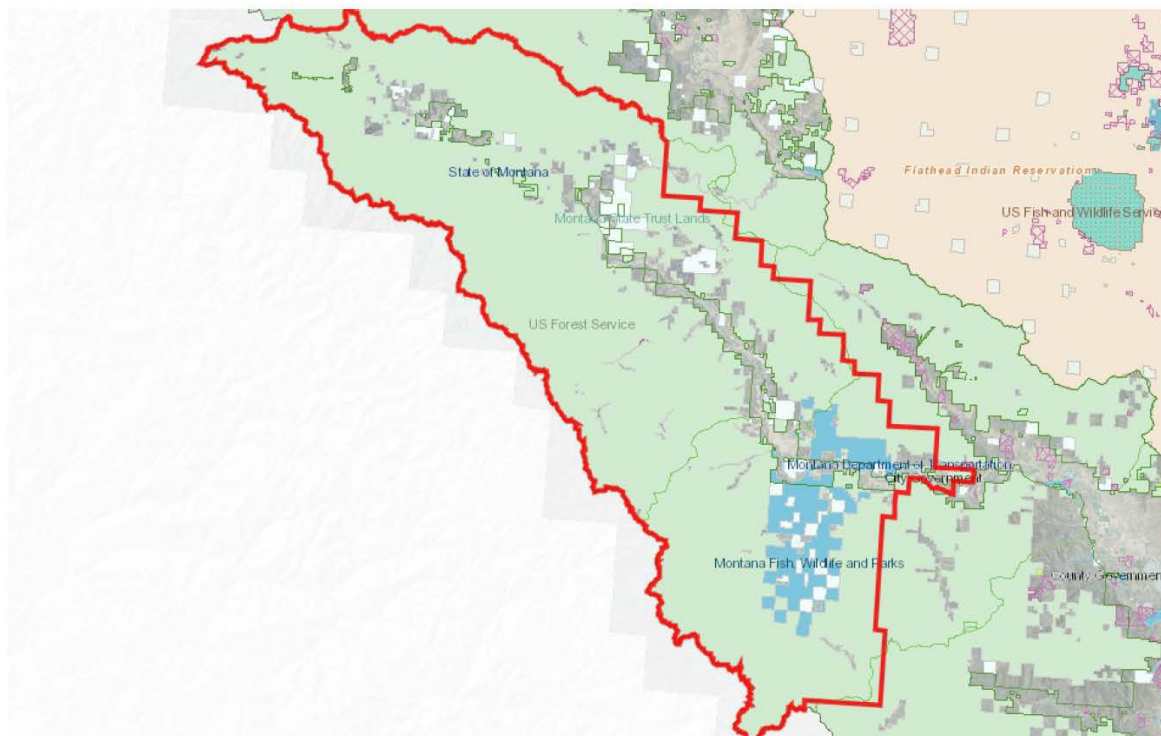
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Land Management

Summarized by: **Mineral (County)**

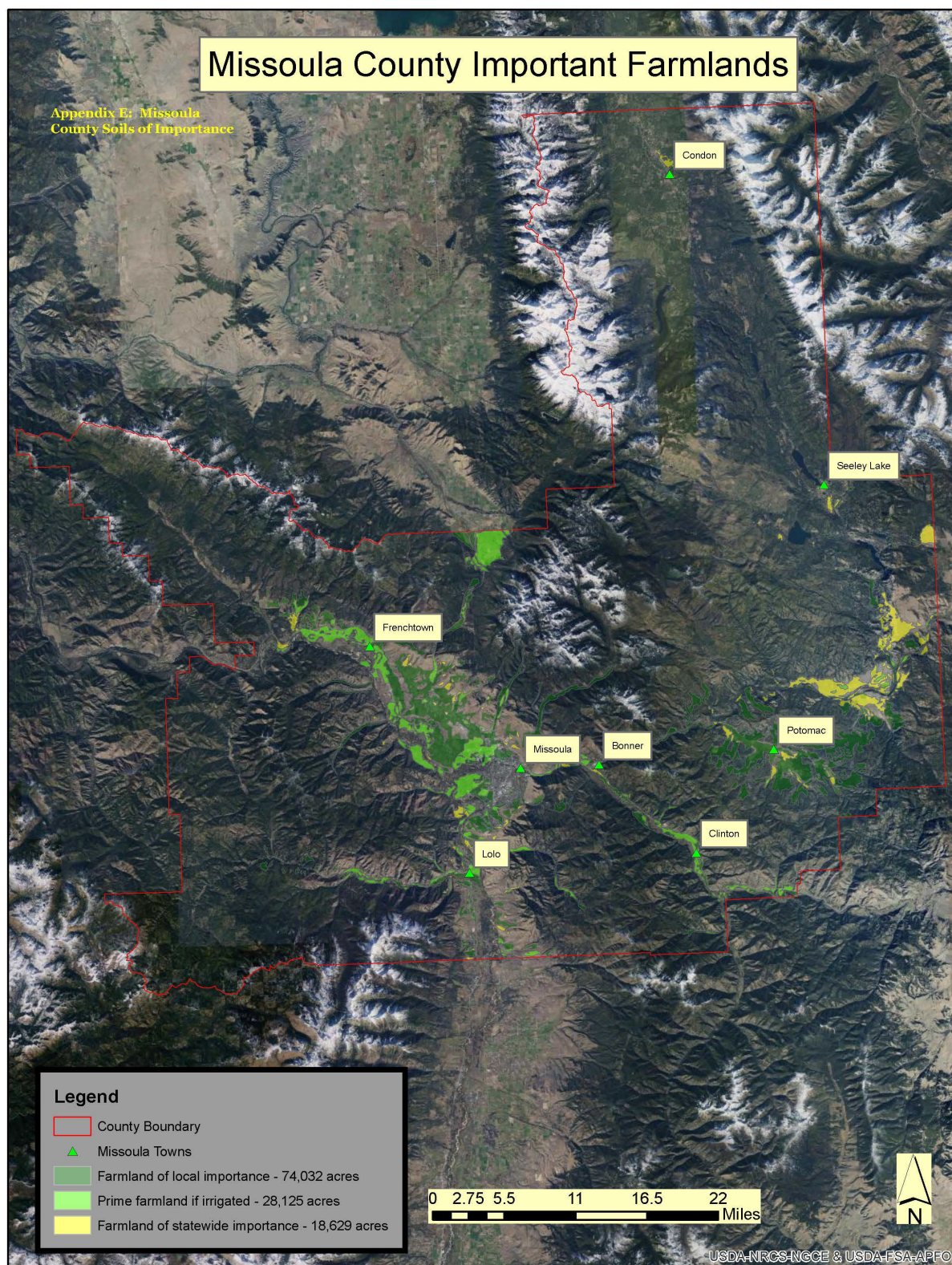


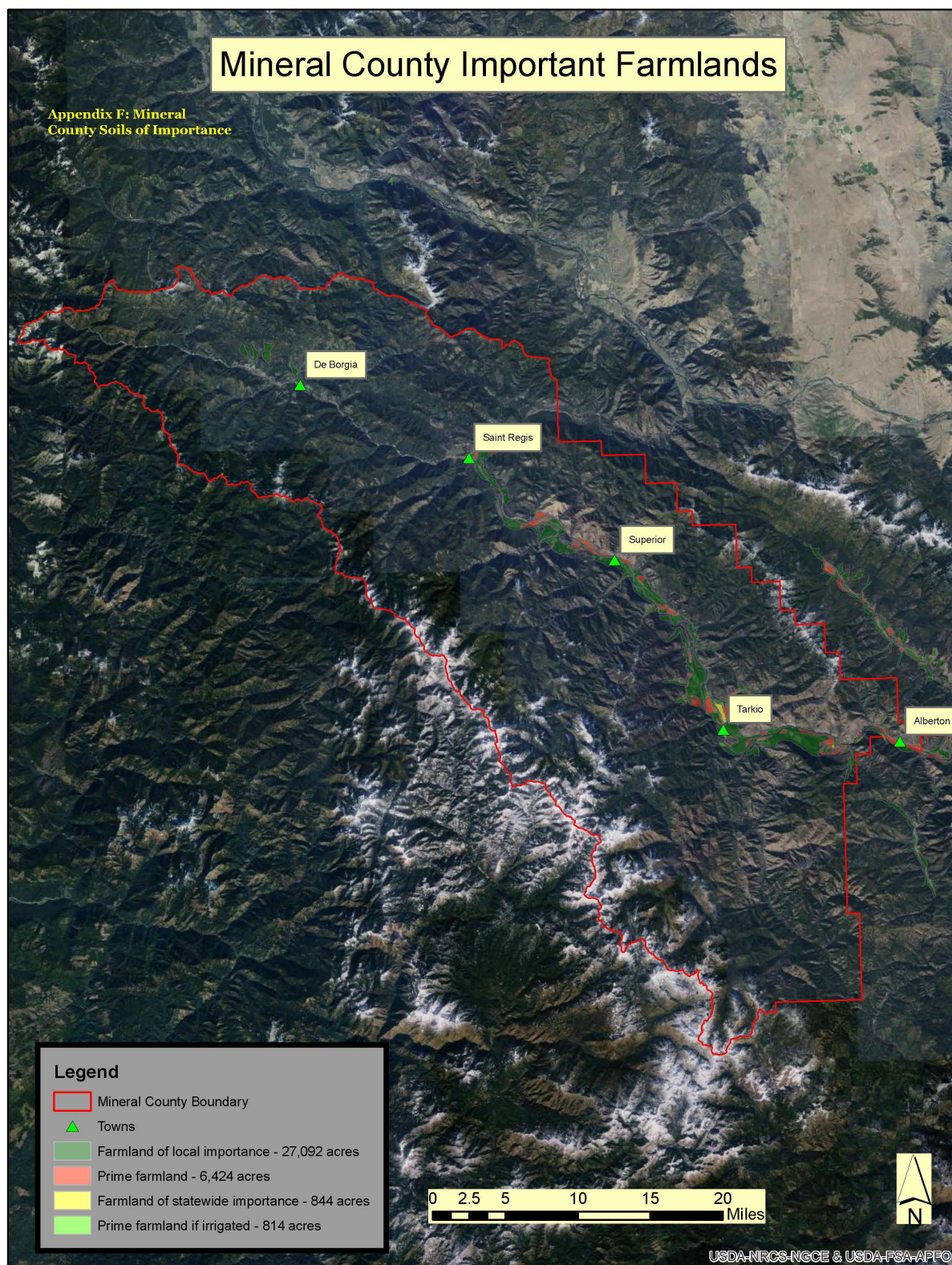
Land Management Summary

[Explain](#)

	Ownership	Tribal	Easements	Other Boundaries (possible overlap)
Public Lands	708,328 Acres (91%)			
Federal	639,061 Acres (82%)			
US Forest Service	639,061 Acres (82%)			
USFS Owned	639,061 Acres (82%)			
USFS Ranger Districts				738,071 Acres
Lolo National Forest, Missoula Ranger District				2,788 Acres
Lolo National Forest, Ninemile Ranger District				236,969 Acres
Lolo National Forest, Plains/Thompson Falls Ranger District				641 Acres
Lolo National Forest, Superior Ranger District				497,673 Acres
USFS National Forest Boundaries				738,070 Acres
Lolo National Forest				738,070 Acres
State	68,876 Acres (9%)			
Montana State Trust Lands	26,863 Acres (3%)			
MT State Trust Owned	26,863 Acres (3%)			
Montana Fish, Wildlife and Parks	41,382 Acres (5%)			
MTFWP Owned	41,382 Acres (5%)			
MTFWP Fishing Access Sites				591 Acres
Alberton Gorge Fishing Access Site				214 Acres
Big Eddy Fishing Access Site				20 Acres

Land Management Summary				18 Acres Explain
☐ Big Pine Fishing Access Site				18 Acres
☐ Dry Creek Fishing Access Site				2 Acres
☐ Forest Grove Fishing Access Site	Ownership	Tribal	Easements	Other Boundaries (possible overlap)
☐ Forks Fishing Access Site				15 Acres
☐ Lower Osprey Fishing Access Site				8 Acres
☐ Middle Osprey Fishing Access Site				46 Acres
☐ Natural Pier Fishing Access Site				78 Acres
☐ Ralph's Takeout Fishing Access Site				108 Acres
☐ St. John's Fishing Access Site				1 Acres
☐ St. Regis Fishing Access Site				7 Acres
☐ Tarkio East Fishing Access Site				9 Acres
☐ Tarkio Fishing Access Site				41 Acres
☐ Upper Osprey Fishing Access Site				
☒ Montana Department of Transportation	286 Acres (<1%)			
☐ MTDOT Owned	286 Acres (<1%)			
☒ State of Montana	345 Acres (<1%)			
☐ State of Montana Owned	345 Acres (<1%)			
☒ Local	391 Acres (<1%)			
☒ Local Government	391 Acres (<1%)			
☐ Local Government Owned	391 Acres (<1%)			
☒ Private Conservation Lands	4 Acres (<1%)			
☐ Five Valleys Land Trust	4 Acres (<1%)			
☒ Conservation Easements			148 Acres (<1%)	
☒ Private			148 Acres (<1%)	
☒ Five Valleys Land Trust			145 Acres (<1%)	
☒ The Vital Ground Foundation			3 Acres (<1%)	
☐ Private Lands or Unknown Ownership	73,587 Acres (9%)			

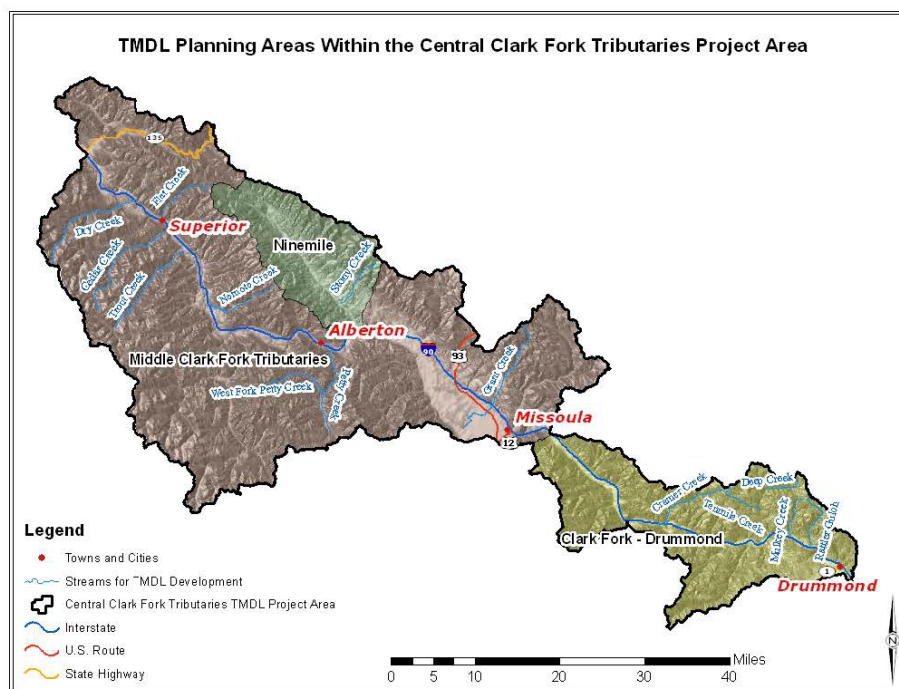




Appendix G: DEQ list of impaired streams along the Central Clark Fork River drainage in both Missoula and Mineral Counties.

Waterbody & Location Description	TMDL Prepared	TMDL Pollutant Category	Impaired Use(s)
Dry Creek, headwaters to mouth (Clark Fork River)	Nitrogen (Total)	Nutrients	Aquatic Life, Primary Contact Recreation
Flat Creek, headwaters to mouth (Clark Fork River)	Sedimentation/Siltation	Sediment	Aquatic Life, Primary Contact Recreation
Trout Creek, headwaters to mouth (Clark Fork River)	Turbidity	Sediment	Aquatic Life
Nemote Creek, headwaters to mouth (Clark Fork River)	Nitrogen (Total)	Nutrients	Aquatic Life, Primary Contact Recreation
	Phosphorus (Total)	Nutrients	Aquatic Life, Primary Contact Recreation
	Temperature, water	Temperature	Aquatic Life
West Fork Petty Creek, headwaters to mouth (Petty Creek)	Phosphorus (Total)	Nutrients	Aquatic Life, Primary Contact Recreation
	Sedimentation/Siltation	Sediment	Aquatic Life
Petty Creek, headwaters to mouth (Clark Fork River)	Sedimentation/Siltation	Sediment	Aquatic Life
	Temperature, water	Temperature	Aquatic Life
Stony Creek, headwaters to mouth (Ninemile Creek)	Phosphorus (Total)	Nutrients	Aquatic Life, Primary Contact Recreation
Grant Creek, headwaters to mouth (Clark Fork River)	Nitrate/Nitrite (Nitrite + Nitrate as N)	Nutrients	Aquatic Life, Primary Contact Recreation
	Nitrogen (Total)	Nutrients	Aquatic Life, Primary Contact Recreation
	Sedimentation/Siltation	Sediment	Aquatic Life
	Temperature, water	Temperature	Aquatic Life
Cramer Creek, headwaters to mouth (Clark Fork River)	Sedimentation/Siltation	Sediment	Aquatic Life
Tenmile Creek, headwaters to mouth (Bear Creek)	Phosphorus (Total)	Nutrients	Aquatic Life, Primary Contact Recreation
	Sedimentation/Siltation	Sediment	Aquatic Life
Deep Creek, headwaters to mouth (Bear Creek)	Nitrate/Nitrite (Nitrite + Nitrate as N)	Nutrients	Aquatic Life
	Sedimentation/Siltation	Sediment	Aquatic Life
Mulkey Creek, headwaters to mouth (Clark Fork River)	Sedimentation/Siltation	Sediment	Aquatic Life, Primary Contact Recreation
Rattler Gulch, headwaters to mouth (Clark Fork River)	Phosphorus (Total)	Nutrients	Aquatic Life
	Sedimentation/Siltation	Sediment	Aquatic Life

Appendix H: Map of impaired streams along the Central Clark Fork River drainage in both Missoula and Mineral Counties.



**Appendix I: Montana Noxious
Weed List for 2019**

Montana Noxious Weed List

Effective: June 21, 2019

PRIORITY 1A These weeds are not present or have a very limited presence in Montana. Management criteria will require eradication if detected, education, and prevention:

- (a) Yellow starthistle (*Centaurea solstitialis*)
- (b) Dyer's woad (*Isatis tinctoria*)
- (c) Common reed (*Phragmites australis* ssp. *australis*)
- (d) Medusahead (*Taeniatherum caput-medusae*)

PRIORITY 1B These weeds have limited presence in Montana.

Management criteria will require eradication or containment and education:

- (a) Knotweed complex (*Polygonum cuspidatum*, *P. sachalinense*, *P. × bohemicum*, *Fallopia japonica*, *F. sachalinensis*, *F. × bohémica*, *Reynoutria japonica*, *R. sachalinensis*, and *R. × bohémica*)
- (b) Purple loosestrife (*Lythrum salicaria*)
- (c) Rush skeletonweed (*Chondrilla juncea*)
- (d) Scotch broom (*Cytisus scoparius*)
- (e) Blueweed (*Echium vulgare*)

PRIORITY 2A These weeds are common in isolated areas of Montana. Management criteria will require eradication or containment where less abundant. Management shall be prioritized by local weed districts:

- (a) Tansy ragwort (*Senecio jacobaea*, *Jacobaea vulgaris*)
- (b) Meadow hawkweed complex (*Hieracium caespitosum*, *H. praealtum*, *H. floridundum*, and *Pilosella caespitosa*)
- (c) Orange hawkweed (*Hieracium aurantiacum*, *Pilosella aurantiaca*)
- (d) Tall buttercup (*Ranunculus acris*)
- (e) Perennial pepperweed (*Lepidium latifolium*)
- (f) Yellowflag iris (*Iris pseudacorus*)
- (g) Eurasian watermilfoil (*Myriophyllum spicatum*, *Myriophyllum spicatum* x *Myriophyllum sibiricum*)
- (h) Flowering rush (*Butomus umbellatus*)
- (i) Common buckthorn (*Rhamnus cathartica* L.)
- (j) Ventenata (*Ventenata dubia*)

PRIORITY 2B These weeds are abundant in Montana and widespread in many counties. Management criteria will require eradication or containment where less abundant. Management shall be prioritized by local weed districts:

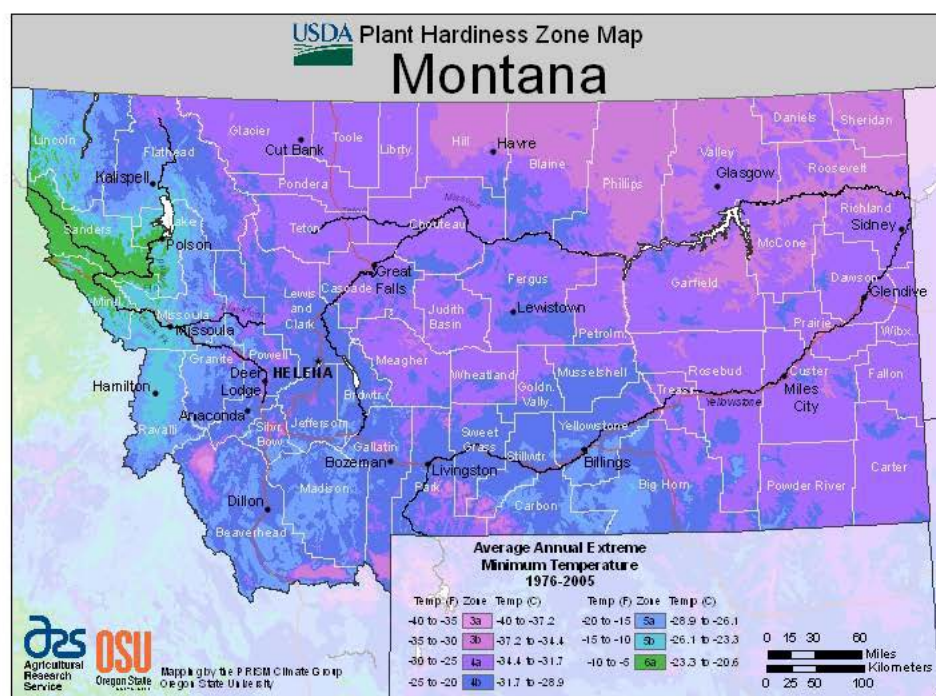
- (a) Canada thistle (*Cirsium arvense*)
- (b) Field bindweed (*Convolvulus arvensis*)
- (c) Leafy spurge (*Euphorbia esula*)
- (d) Whitetop (*Cardaria draba*, *Lepidium draba*)
- (e) Russian knapweed (*Acroptilon repens*, *Rhaponticum repens*)
- (f) Spotted knapweed (*Centaurea stoebe*, *C. maculosa*)
- (g) Diffuse knapweed (*Centaurea diffusa*)
- (h) Dalmatian toadflax (*Linaria dalmatica*)
- (i) St. Johnswort (*Hypericum perforatum*)
- (j) Sulfur cinquefoil (*Potentilla recta*)
- (k) Common tansy (*Tanacetum vulgare*)
- (l) Oxeye daisy (*Leucanthemum vulgare*)
- (m) Houndstongue (*Cynoglossum officinale*)
- (n) Yellow toadflax (*Linaria vulgaris*)
- (o) Saltcedar (*Tamarix* spp.)
- (p) Curlyleaf pondweed (*Potamogeton crispus*)
- (q) Hoary alyssum (*Berteroa incana*)

PRIORITY 3 Regulated Plants: (NOT MONTANA LISTED NOXIOUS WEEDS)

These regulated plants have the potential to have significant negative impacts. The plant may not be intentionally spread or sold other than as a contaminant in agricultural products. The state recommends research, education and prevention to minimize the spread of the regulated plant.

- (a) Cheatgrass (*Bromus tectorum*)
- (b) Hydrilla (*Hydrilla verticillata*)
- (c) Russian olive (*Elaeagnus angustifolia*)
- (d) Brazilian waterweed (*Egeria densa*)
- (e) Parrot feather watermilfoil (*Myriophyllum aquaticum* or *M. brasiliense*)

Appendix J: Plant Hardiness
Zone Map of Montana





United States Department of the Interior Fish and Wildlife Service

Ecological Services
Montana Field Office
585 Shepard Way, Suite 1
Helena, Montana 59601-6287
Phone: (406) 449-5225, Fax: (406) 449-5339



ENDANGERED, THREATENED, PROPOSED AND CANDIDATE SPECIES MONTANA COUNTIES* Endangered Species Act

December 12, 2019

C = Candidate
LT = Listed Threatened
LE = Listed Endangered
P = Proposed
PCH = Proposed Critical Habitat
CH = Designated Critical Habitat
XN = Experimental non-essential population

*Note: Generally, this list identifies the counties where one would reasonably expect the species to occur, not necessarily every county where the species is listed

County/Scientific Name	Common Name	Status
BEAVERHEAD		
<i>Spiranthes diluvialis</i>	Ute Ladies' Tresses	LT
<i>Ursus arctos horribilis</i>	Grizzly Bear	LT
<i>Lynx canadensis</i>	Canada Lynx	LT
<i>Gulo gulo luscus</i>	Wolverine	P
<i>Pinus albicaulis</i>	Whitebark Pine	C
BIG HORN		
<i>Mustela nigripes</i>	Black-footed Ferret	LE
BLAINE		
<i>Scaphirhynchus albus</i>	Pallid Sturgeon	LE
<i>Mustela nigripes</i>	Black-footed Ferret	LE
<i>Charadrius melodus</i>	Piping Plover	LT
BROADWATER		
<i>Spiranthes diluvialis</i>	Ute Ladies' Tresses	LT
<i>Lynx canadensis</i>	Canada Lynx	LT
<i>Ursus arctos horribilis</i>	Grizzly Bear	LT
<i>Gulo gulo luscus</i>	Wolverine	P
<i>Pinus albicaulis</i>	Whitebark Pine	C
CARBON		
<i>Lynx canadensis</i>	Canada Lynx	LT, CH
<i>Ursus arctos horribilis</i>	Grizzly Bear	LT
<i>Gulo gulo luscus</i>	Wolverine	P
<i>Zapada glacier</i>	Western Glacier Stonefly	LT
<i>Pinus albicaulis</i>	Whitebark Pine	C

County/Scientific Name	Common Name	Status
CARTER		
<i>Grus americana</i>	Whooping Crane	LE
<i>Myotis septentrionalis</i>	Northern Long-eared Bat	LT
CASCADE		
<i>Scaphirhynchus albus</i>	Pallid Sturgeon	LE
<i>Lynx canadensis</i>	Canada Lynx	LT
<i>Calidris canutus rufa</i>	Red Knot	LT
<i>Charadrius melodus</i>	Piping Plover	LT
<i>Ursus arctos horribilis</i>	Grizzly Bear	LT
<i>Gulo gulo luscus</i>	Wolverine	P
<i>Pinus albicaulis</i>	Whitebark Pine	C
CHOUTEAU		
<i>Scaphirhynchus albus</i>	Pallid Sturgeon	LE
<i>Lynx canadensis</i>	Canada Lynx	LT
<i>Charadrius melodus</i>	Piping Plover	LT
<i>Calidris canutus rufa</i>	Red Knot	LT
<i>Ursus arctos horribilis</i>	Grizzly Bear	LT
CUSTER		
<i>Scaphirhynchus albus</i>	Pallid Sturgeon	LE
<i>Sterna antillarum athalassos</i>	Interior Least Tern	LE
<i>Grus americana</i>	Whooping Crane	LE
<i>Myotis septentrionalis</i>	Northern Long-eared Bat	LT
DANIELS		
<i>Grus americana</i>	Whooping Crane	LE
<i>Charadrius melodus</i>	Piping Plover	LT
DAWSON		
<i>Scaphirhynchus albus</i>	Pallid Sturgeon	LE
<i>Sterna antillarum athalassos</i>	Interior Least Tern	LE
<i>Grus americana</i>	Whooping Crane	LE
<i>Charadrius melodus</i>	Piping Plover	LT
<i>Myotis septentrionalis</i>	Northern Long-eared Bat	LT
DEER LODGE		
<i>Salvelinus confluentus</i>	Bull Trout	LT, CH
<i>Ursus arctos horribilis</i>	Grizzly Bear	LT
<i>Lynx canadensis</i>	Canada Lynx	LT
<i>Calidris canutus rufa</i>	Red Knot	LT
<i>Gulo gulo luscus</i>	Wolverine	P
<i>Pinus albicaulis</i>	Whitebark Pine	C
FALLON		
<i>Grus americana</i>	Whooping Crane	LE
<i>Myotis septentrionalis</i>	Northern Long-eared Bat	LT
<i>Charadrius melodus</i>	Piping Plover	LT
FERGUS		
<i>Scaphirhynchus albus</i>	Pallid Sturgeon	LE
<i>Lynx canadensis</i>	Canada Lynx	LT
<i>Pinus albicaulis</i>	Whitebark Pine	C

County/Scientific Name	Common Name	Status
FLATHEAD		
<i>Salvelinus confluentus</i>	Bull Trout	LT, CH
<i>Ursus arctos horribilis</i>	Grizzly Bear	LT
<i>Silene spaldingii</i>	Spalding's Campion	LT
<i>Lynx canadensis</i>	Canada Lynx	LT, CH
<i>Coccyzus americanus</i>	Yellow-billed cuckoo (western pop.)	LT
<i>Gulo gulo luscus</i>	Wolverine	P
<i>Lednia tumana</i>	Meltwater Lednian Stonefly	LT
<i>Pinus albicaulis</i>	Whitebark Pine	C
GALLATIN		
<i>Spiranthes diluvialis</i>	Ute Ladies' Tresses	LT
<i>Lynx canadensis</i>	Canada Lynx	LT, CH
<i>Ursus arctos horribilis</i>	Grizzly Bear	LT
<i>Gulo gulo luscus</i>	Wolverine	P
<i>Pinus albicaulis</i>	Whitebark Pine	C
GARFIELD		
<i>Scaphirhynchus albus</i>	Pallid Sturgeon	LE
<i>Grus americana</i>	Whooping Crane	LE
<i>Charadrius melodus</i>	Piping Plover	LT, CH
<i>Sterna antillarum athalassos</i>	Interior Least Tern	LE
GLACIER		
<i>Ursus arctos horribilis</i>	Grizzly Bear	LT
<i>Lynx canadensis</i>	Canada Lynx	LT, CH
<i>Salvelinus confluentus</i>	Bull Trout	LT, CH
<i>Gulo gulo luscus</i>	Wolverine	P
<i>Lednia tumana</i>	Meltwater Lednian Stonefly	LT
<i>Zapada glacier</i>	Western Glacier Stonefly	LT
<i>Pinus albicaulis</i>	Whitebark Pine	C
GOLDEN VALLEY		
<i>Lynx canadensis</i>	Canada Lynx	LT
<i>Calidris canutus rufa</i>	Red Knot	LT
<i>Pinus albicaulis</i>	Whitebark Pine	C
GRANITE		
<i>Lynx canadensis</i>	Canada Lynx	LT, CH
<i>Ursus arctos horribilis</i>	Grizzly Bear	LT
<i>Salvelinus confluentus</i>	Bull Trout	LT, CH
<i>Gulo gulo luscus</i>	Wolverine	P
<i>Pinus albicaulis</i>	Whitebark Pine	C
HILL		
JEFFERSON		
<i>Spiranthes diluvialis</i>	Ute Ladies' Tresses	LT
<i>Lynx canadensis</i>	Canada Lynx	LT
<i>Ursus arctos horribilis</i>	Grizzly Bear	LT
<i>Gulo gulo luscus</i>	Wolverine	P
<i>Pinus albicaulis</i>	Whitebark Pine	C
JUDITH BASIN		
<i>Lynx canadensis</i>	Canada Lynx	LT
<i>Ursus arctos horribilis</i>	Grizzly Bear	LT
<i>Gulo gulo luscus</i>	Wolverine	P
<i>Pinus albicaulis</i>	Whitebark Pine	C

County/Scientific Name	Common Name	Status
LAKE		
<i>Ursus arctos horribilis</i>	Grizzly Bear	LT
<i>Howellia aquatilis</i>	Water Howellia	LT
<i>Silene spaldingii</i>	Spalding's Campion	LT
<i>Lynx canadensis</i>	Canada Lynx	LT, CH
<i>Salvelinus confluentus</i>	Bull Trout	LT, CH
<i>Coccyzus americanus</i>	Yellow-billed cuckoo (western pop.)	LT
<i>Gulo gulo luscus</i>	Wolverine	P
<i>Lednia tumana</i>	Meltwater Lednian Stonefly	LT
<i>Pinus albicaulis</i>	Whitebark Pine	C
LEWIS AND CLARK		
<i>Ursus arctos horribilis</i>	Grizzly Bear	LT
<i>Lynx canadensis</i>	Canada Lynx	LT, CH
<i>Salvelinus confluentus</i>	Bull Trout	LT, CH
<i>Calidris canutus rufa</i>	Red Knot	LT
<i>Gulo gulo luscus</i>	Wolverine	P
<i>Pinus albicaulis</i>	Whitebark Pine	C
LIBERTY		
<i>Calidris canutus rufa</i>	Red Knot	LT
<i>Ursus arctos horribilis</i>	Grizzly Bear	LT
<i>Pinus albicaulis</i>	Whitebark Pine	C
LINCOLN		
<i>Acipenser transmontanus</i>	White Sturgeon (Kootenai River Pop.)	LE
<i>Ursus arctos horribilis</i>	Grizzly Bear	LT
<i>Silene spaldingii</i>	Spalding's Campion	LT
<i>Lynx canadensis</i>	Canada Lynx	LT, CH
<i>Salvelinus confluentus</i>	Bull Trout	LT, CH
<i>Gulo gulo luscus</i>	Wolverine	P
<i>Pinus albicaulis</i>	Whitebark Pine	C
MADISON		
<i>Spiranthes diluvialis</i>	Ute Ladies' Tresses	LT
<i>Lynx canadensis</i>	Canada Lynx	LT
<i>Calidris canutus rufa</i>	Red Knot	LT
<i>Ursus arctos horribilis</i>	Grizzly Bear	LT
<i>Gulo gulo luscus</i>	Wolverine	P
<i>Pinus albicaulis</i>	Whitebark Pine	C
McCONE		
<i>Scaphirhynchus albus</i>	Pallid Sturgeon	LE
<i>Charadrius melodus</i>	Piping Plover	LT, CH
<i>Sterna antillarum athalassos</i>	Interior Least Tern	LE
<i>Grus americana</i>	Whooping Crane	LE
<i>Myotis septentrionalis</i>	Northern Long-eared Bat	LT
MEAGHER		
<i>Lynx canadensis</i>	Canada Lynx	LT
<i>Ursus arctos horribilis</i>	Grizzly Bear	LT
<i>Gulo gulo luscus</i>	Wolverine	P
<i>Pinus albicaulis</i>	Whitebark Pine	C
MINERAL		
<i>Ursus arctos horribilis</i>	Grizzly Bear	LT
<i>Lynx canadensis</i>	Canada Lynx	LT
<i>Salvelinus confluentus</i>	Bull Trout	LT, CH
<i>Gulo gulo luscus</i>	Wolverine	P
<i>Pinus albicaulis</i>	Whitebark Pine	C

County/Scientific Name	Common Name	Status
MISSOULA		
<i>Ursus arctos horribilis</i>	Grizzly Bear	LT
<i>Howellia aquatilis</i>	Water Howellia	LT
<i>Lynx canadensis</i>	Canada Lynx	LT, CH
<i>Salvelinus confluentus</i>	Bull Trout	LT, CH
<i>Coccyzus americanus</i>	Yellow-billed cuckoo (western pop.)	LT
<i>Calidris canutus rufa</i>	Red Knot	LT
<i>Gulo gulo luscus</i>	Wolverine	P
<i>Pinus albicaulis</i>	Whitebark Pine	C
MUSSELSHELL		
PARK		
<i>Lynx canadensis</i>	Canada Lynx	LT, CH
<i>Ursus arctos horribilis</i>	Grizzly Bear	LT
<i>Gulo gulo luscus</i>	Wolverine	P
<i>Pinus albicaulis</i>	Whitebark Pine	C
PETROLEUM		
<i>Scaphirhynchus albus</i>	Pallid Sturgeon	LE
<i>Calidris canutus rufa</i>	Red Knot	LT
PHILLIPS		
<i>Scaphirhynchus albus</i>	Pallid Sturgeon	LE
<i>Charadrius melodus</i>	Piping Plover	LT, CH
<i>Mustela nigripes</i>	Black-footed Ferret	LE, XN
<i>Grus americana</i>	Whooping Crane	LE
<i>Sterna antillarum athalassos</i>	Interior Least Tern	LE
<i>Calidris canutus rufa</i>	Red Knot	LT
PONDERA		
<i>Charadrius melodus</i>	Piping Plover	LT
<i>Ursus arctos horribilis</i>	Grizzly Bear	LT
<i>Lynx canadensis</i>	Canada Lynx	LT, CH
<i>Gulo gulo luscus</i>	Wolverine	P
<i>Pinus albicaulis</i>	Whitebark Pine	C
POWDER RIVER		
<i>Grus americana</i>	Whooping Crane	LE
<i>Scaphirhynchus albus</i>	Pallid Sturgeon	LE
<i>Myotis septentrionalis</i>	Northern Long-eared Bat	LT
POWELL		
<i>Ursus arctos horribilis</i>	Grizzly Bear	LT
<i>Lynx canadensis</i>	Canada Lynx	LT, CH
<i>Salvelinus confluentus</i>	Bull Trout	LT, CH
<i>Gulo gulo luscus</i>	Wolverine	P
<i>Pinus albicaulis</i>	Whitebark Pine	C
PRAIRIE		
<i>Scaphirhynchus albus</i>	Pallid Sturgeon	LE
<i>Sterna antillarum athalassos</i>	Interior Least Tern	LE
<i>Grus americana</i>	Whooping Crane	LE
<i>Myotis septentrionalis</i>	Northern Long-eared Bat	LT
<i>Charadrius melodus</i>	Piping Plover	LT

County/Scientific Name	Common Name	Status
RAVALLI		
<i>Salvelinus confluentus</i>	Bull Trout	LT, CH
<i>Lynx canadensis</i>	Canada Lynx	LT
<i>Coccyzus americanus</i>	Yellow-billed cuckoo (western pop.)	LT
<i>Ursus arctos horribilis</i>	Grizzly Bear	LT
<i>Gulo gulo luscus</i>	Wolverine	P
<i>Pinus albicaulis</i>	Whitebark Pine	C
RICHLAND		
<i>Scaphirhynchus albus</i>	Pallid Sturgeon	LE
<i>Charadrius melodus</i>	Piping Plover	LT, CH
<i>Sterna antillarum athalassos</i>	Interior Least Tern	LE
<i>Grus americana</i>	Whooping Crane	LE
<i>Myotis septentrionalis</i>	Northern Long-eared Bat	LT
ROOSEVELT		
<i>Scaphirhynchus albus</i>	Pallid Sturgeon	LE
<i>Charadrius melodus</i>	Piping Plover	LT, CH
<i>Sterna antillarum athalassos</i>	Interior Least Tern	LE
<i>Grus americana</i>	Whooping Crane	LE
<i>Calidris canutus rufa</i>	Red Knot	LT
<i>Myotis septentrionalis</i>	Northern Long-eared Bat	LT
ROSEBUD		
<i>Sterna antillarum athalassos</i>	Interior Least Tern	LE
<i>Scaphirhynchus albus</i>	Pallid Sturgeon	LE
<i>Grus americana</i>	Whooping Crane	LE
SANDERS		
<i>Ursus arctos horribilis</i>	Grizzly Bear	LT
<i>Lynx canadensis</i>	Canada Lynx	LT
<i>Salvelinus confluentus</i>	Bull Trout	LT, CH
<i>Silene spaldingii</i>	Spalding's Campion	LT
<i>Gulo gulo luscus</i>	Wolverine	P
<i>Pinus albicaulis</i>	Whitebark Pine	C
SHERIDAN		
<i>Charadrius melodus</i>	Piping Plover	LT, CH
<i>Grus americana</i>	Whooping Crane	LE
<i>Sterna antillarum athalassos</i>	Interior Least Tern	LE
<i>Calidris canutus rufa</i>	Red Knot	LT
SILVER BOW		
<i>Salvelinus confluentus</i>	Bull Trout	LT
<i>Ursus arctos horribilis</i>	Grizzly Bear	LT
<i>Lynx canadensis</i>	Canada Lynx	LT
<i>Gulo gulo luscus</i>	Wolverine	P
<i>Pinus albicaulis</i>	Whitebark Pine	C
STILLWATER		
<i>Lynx canadensis</i>	Canada Lynx	LT, CH
<i>Charadrius melodus</i>	Piping Plover	LT
<i>Calidris canutus rufa</i>	Red Knot	LT
<i>Ursus arctos horribilis</i>	Grizzly Bear	LT
<i>Gulo gulo luscus</i>	Wolverine	P
<i>Pinus albicaulis</i>	Whitebark Pine	C

County/Scientific Name	Common Name	Status
SWEET GRASS		
<i>Lynx canadensis</i>	Canada Lynx	LT, CH
<i>Ursus arctos horribilis</i>	Grizzly Bear	LT
<i>Gulo gulo luscus</i>	Wolverine	P
<i>Pinus albicaulis</i>	Whitebark Pine	C
TETON		
<i>Ursus arctos horribilis</i>	Grizzly Bear	LT
<i>Lynx canadensis</i>	Canada Lynx	LT, CH
<i>Calidris canutus rufa</i>	Red Knot	LT
<i>Charadrius melodus</i>	Piping Plover	LT
<i>Gulo gulo luscus</i>	Wolverine	P
<i>Pinus albicaulis</i>	Whitebark Pine	C
TOOLE		
<i>Calidris canutus rufa</i>	Red Knot	LT
<i>Ursus arctos horribilis</i>	Grizzly Bear	LT
<i>Pinus albicaulis</i>	Whitebark Pine	C
TREASURE		
No listings at this time		
VALLEY		
<i>Scaphirhynchus albus</i>	Pallid Sturgeon	LE
<i>Sterna antillarum athalassos</i>	Interior Least Tern	LE
<i>Grus americana</i>	Whooping Crane	LE
<i>Charadrius melodus</i>	Piping Plover	LT, CH
<i>Calidris canutus rufa</i>	Red Knot	LT
<i>Myotis septentrionalis</i>	Northern Long-eared Bat	LT
WHEATLAND		
<i>Lynx canadensis</i>	Canada Lynx	LT
<i>Ursus arctos horribilis</i>	Grizzly Bear	LT
<i>Gulo gulo luscus</i>	Wolverine	P
<i>Pinus albicaulis</i>	Whitebark Pine	C
WIBAUX		
<i>Scaphirhynchus albus</i>	Pallid Sturgeon	LE
<i>Sterna antillarum athalassos</i>	Interior Least Tern	LE
<i>Grus americana</i>	Whooping Crane	LE
<i>Myotis septentrionalis</i>	Northern Long-eared Bat	LT
<i>Charadrius melodus</i>	Piping Plover	LT
YELLOWSTONE		
<i>Grus americana</i>	Whooping Crane	LE
<i>Calidris canutus rufa</i>	Red Knot	LT

[illegible]

<u>Lynx canadensis</u> Canada Lynx	<u>Felidae</u> 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										
<u>Myotis lucifugus</u> Little Brown Myotis	<u>Vespertilionidae</u> 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, Hilli, 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.										
<u>Myotis thysanodes</u> Fringed Myotis	<u>Vespertilionidae</u> 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.										
<u>Pekania pennanti</u> Fisher	<u>Mustelidae</u> Weasels	G5	S3		Sensitive - Known on Forests (BD, BRT, HLC, KOOT, LOLO)	SENSITIVE	SGCN3	1%	31%	Mixed conifer forests
Species Occurrences verified in these Counties: Beaverhead, Deer Lodge, Flathead, Glacier, Granite, Lake, Lewis and Clark, Lincoln, Mineral, Missoula, Pondera, Powell, Ravalli, Sanders, Teton										

<i>Sorex hoyi</i> Pygmy Shrew	<i>Soricidae</i> Shrews	G5	S3				SGCN3	1%	15%	Open conifer forest, grasslands, and shrublands, often near water
Species Occurrences verified in these Counties: Beaverhead, Flathead, Granite, Hill, Lake, Lewis and Clark, Lincoln, Missoula, Powell, Sanders, Sheridan, Teton, Valley 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.										
<i>Sorex preblei</i> Preble's Shrew	<i>Soricidae</i> 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.										
<i>Synaptomys borealis</i> Northern Bog Lemming	<i>Cricetidae</i> New World Mice / Rats / Voles	G5	S2		Sensitive - Known on Forests (BD, BRT, HLC, KOOT, LOLO)		SGCN2, SGIN	1%	14%	Conifer forest wetland
Species Occurrences verified in these Counties: Beaverhead, Flathead, Granite, Lewis and Clark, Lincoln, Missoula, Ravalli State Rank Reason: Although populations of this species exist across much of western Montana, most appear isolated due to the species-specific habitat requirements and total area occupied is relatively small. Species faces significant threats to persistence from degradation of wetland habitats and isolation of populations that increase risk of local extirpation.										
<i>Ursus arctos</i> Grizzly Bear	<i>Ursidae</i> 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 = MISSOULA (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
<i>Accipiter gentilis</i> Northern Goshawk	<i>Accipitridae</i> 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										
<i>Aquila chrysaetos</i> Golden Eagle	<i>Accipitridae</i> 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										
<i>Ardea herodias</i> Great Blue Heron	<i>Ardeidae</i> 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.										
<i>Botaurus lentiginosus</i> American Bittern	<i>Ardeidae</i> Bitterns / Egrets / Herons / Night-Herons	G5	S3B	MBTA; BCC11; BCC17		SENSITIVE	SGCN3	4%	100%	Wetlands
Species Occurrences verified in these Counties: Blaine, Carter, Cascade, Chouteau, Fallon, Fergus, Flathead, Glacier, Golden Valley, Lake, Missoula, Phillips, Powell, Ravalli, Roosevelt, Sanders, Sheridan, Teton, Valley, Yellowstone State Rank Reason: The American Bittern is dependent on large wetland complexes, which have declined across the species range. Declines in Montana and the species specialized habitat requirements warrant general concern about the persistence of the species.										
		G5	S3B	MBTA		SENSITIVE	SGCN3	6%	100%	Riparian forest

<u><i>Catharus</i></u> <u><i>fuscescens</i></u> Veery	<u><i>Turdidae</i></u> Thrushes	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, McConne, Meagher, Mineral, Missoula, Musselshell, Park, Petroleum, Phillips, Pondera, Powder River, Powell, Ravalli, Richland, Roosevelt, Rosebud, Sanders, Silver Bow, Stillwater, Sweet Grass, Teton, Wheatland, Yellowstone								
<u><i>Certhia</i></u> <u><i>americana</i></u> Brown Creeper	<u><i>Certhiidae</i></u> Creepers	G5	S3	MBTA			SGCN3	4%	53%	Moist conifer forest
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										
<u><i>Chlidonias</i></u> <u><i>niger</i></u> Black Tern	<u><i>Laridae</i></u> Gulls / Terns	G4G5	S3B	MBTA; BCC11		SENSITIVE	SGCN3	7%	100%	Wetlands
Species Occurrences verified in these Counties: Blaine, Carter, Cascade, Chouteau, Daniels, Flathead, Glacier, Golden Valley, Lake, Madison, Missoula, Phillips, Pondera, Powell, Roosevelt, Sanders, Sheridan, Teton, Yellowstone										
State Rank Reason: Species has a small breeding population size and negative short-term population trends.										
<u><i>Coccothraustes</i></u> <u><i>vespertinus</i></u> Evening Grosbeak	<u><i>Fringillidae</i></u> 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 (Bontjer and Harvey 2008).										
<u><i>Coccyzus</i></u> <u><i>americanus</i></u> Yellow-billed Cuckoo	<u><i>Cuculidae</i></u> 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										
<u><i>Cygnus</i></u> <u><i>buccinator</i></u> Trumpeter Swan	<u><i>Anatidae</i></u> Swans / Geese / Ducks	G4	S3	MBTA	Sensitive - Known on Forests (BD, CG)	SENSITIVE	SGCN3	2%	9%	Lakes, ponds, reservoirs
Species Occurrences verified in these Counties: Beaverhead, Flathead, Lake, Lewis and Clark, Madison, Missoula, Park, Powell										
<u><i>Cypseloides</i></u> <u><i>niger</i></u> Black Swift	<u><i>Apodidae</i></u> Swifts	G4	S1B	MBTA; BCC10	Species of Conservation Concern on Forests (FLAT)		SGCN1, SGIN	5%	19%	Waterfalls

		Species Occurrences verified in these Counties: Carbon, Flathead, Glacier, Lake, Lincoln, Missoula, Ravalli State Rank Reason: Species is limited in distribution and requires very specific features for nesting that are rare on the landscape making it vulnerable to extirpation in all or part of its range.								
<u><i>Dolichonyx oryzivorus</i></u> Bobolink	<u><i>Icteridae</i></u> 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.								
<u><i>Dryocopus pileatus</i></u> Pileated Woodpecker	<u><i>Picidae</i></u> 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								
<u><i>Falco peregrinus</i></u> Peregrine Falcon	<u><i>Falconidae</i></u> Falcons	G4	S3	DW: 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								
<u><i>Gavia immer</i></u> Common Loon	<u><i>Gaviidae</i></u> Loons	G5	S3B	MBTA	Sensitive - Known on Forests (KOOT, LOLO)		SGCN3	1%	14%	Mountain lakes w/ emergent veg
		Species Occurrences verified in these Counties: Flathead, Glacier, Lake, Lewis and Clark, Lincoln, Missoula, Powell, Sanders, Teton								
<u><i>Haemorhous cassinii</i></u> Cassin's Finch	<u><i>Fringillidae</i></u> 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								

<u><i>Strix nebulosa</i></u> Great Gray Owl	<u>Strigidae</u> 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										
<u><i>Troglodytes pacificus</i></u> Pacific Wren	<u>Troglodytidae</u> 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) 2 SPECIES COUNTY = MISSOULA (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
<u><i>Elgaria coerulea</i></u> Northern Alligator Lizard	<u>Anguidae</u> Alligator Lizards	G5	S3				SGCN3, SGIN	8%	12%	Talus slopes / rock outcrops
Species Occurrences verified in these Counties: Flathead, Granite, Lake, Lincoln, Mineral, Missoula, Ravalli, Sanders										
<u><i>Plestiodon skiltonianus</i></u> Western Skink	<u>Scincidae</u> Skinks	G5	S3				SGCN3, SGIN	2%	10%	Open conifer forest and adjacent grassland
Species Occurrences verified in these Counties: Flathead, Granite, Lincoln, Mineral, Missoula, Ravalli, Sanders										
AMPHIBIANS (AMPHIBIA) 2 SPECIES COUNTY = MISSOULA (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
<u><i>Anaxyrus boreas</i></u> Western Toad	<u>Bufo</u> 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.										
<u><i>Plethodon idahoensis</i></u> Coeur d'Alene Salamander	<u>Plethodontidae</u> Lungless Salamanders	G4	S2		Sensitive - Known on Forests (BRT, KOOT, LOLO)		SGCN2, SGIN	31%	5%	Spring / seep, waterfall, fractured rock
Species Occurrences verified in these Counties: Lincoln, Mineral, Missoula, Ravalli, Sanders										
FISH (ACTINOPTERYGII) 3 SPECIES COUNTY = MISSOULA (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
<u><i>Oncorhynchus clarkii lewisi</i></u> Westslope Cutthroat Trout	<u>Salmonidae</u> 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.										
<u><i>Prosopium coulteri</i></u> Pygmy Whitefish	<u>Salmonidae</u> Trout	G5	S3				SGCN3, SGIN	1%	1%	Deep mountain lakes and tributaries

		Species Occurrences verified in these Counties: Flathead, Lake, Lincoln, Missoula State Rank Reason: The Pygmy Whitefish is currently listed as an "S3" species of concern in Montana because they are potentially at risk because of limited and/or declining numbers, range and/or habitat, even though it may be abundant in some areas.									
<u><i>Salvelinus confluentus</i></u> Bull Trout	<u><i>Salmonidae</i></u> Trout	G5	S2	LT; CH	Threatened, Critical Habitat on Forests (BD, BRT, HLC, KOOT, LOLO)	THREATENED	SGCN2	5%	18%	Mountain streams, rivers, lakes	
		Species Occurrences verified in these Counties: Deer Lodge, Flathead, Glacier, Granite, Lake, Lewis and Clark, Lincoln, Mineral, Missoula, Powell, Ravalli, Sanders									
<u>INVERTEBRATES - INSECTS 10 SPECIES COUNTY - MISSOULA (based on mapped Species Occurrences)</u>											
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	
BUTTERFLIES											
<u><i>Euphydryas gillettei</i></u> Gillette's Checkerspot	<u><i>Nymphalidae</i></u> Butterflies	G3	S2						42%	Wet meadows	
		Species Occurrences verified in these Counties: Beaverhead, Cascade, Deer Lodge, Fergus, Flathead, Glacier, Madison, Mineral, Missoula, Pondera, Powell									
CADDISFLIES											
<u><i>Goereilla baumanni</i></u> Northern Rocky Mountains Refugium Caddisfly	<u><i>Rossianidae</i></u> Rossland Caddisflies	G1	S2					50%	5%	Forested mountain springs	
		Species Occurrences verified in these Counties: Lake, Missoula State Rank Reason: This NRM Caddisfly is currently ranked a "S2" Species of Concern in MT and 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 and specialized habitats. This species is a rare, endemic caddisfly only found in specific streams in the Pacific Influenced areas of Montana and Idaho (referred to as the Northern Rocky Mountain Refugium).									
<u><i>Rhyacophila newelli</i></u> A Rhyacophilan Caddisfly	<u><i>Rhyacophilidae</i></u> Primitive Caddisflies	G2	S2					50%	1%	Alpine / Mountain streams	
		Species Occurrences verified in these Counties: Missoula State Rank Reason: This Rhyacophilan Caddisfly 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.									

<i>Rossiana montana</i> Northern Rocky Mountains Refugium Caddisfly	<i>Rossianidae</i> Rossland Caddisflies	G2G3	S2					50%	1%	Forested mountain springs
Species Occurrences verified in these Counties: Lake, Mineral, Missoula, Sanders State Rank Reason: This NRM Caddisfly is currently ranked a "S2" Species of Concern in MT and 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 and specialized habitats. This species is a rare, endemic caddisfly only found in specific streams in the Pacific Influenced areas of Montana and Idaho (referred to as the Northern Rocky Mountain Refugium).										
DRAGONFLIES										
<i>Aeshna subarctica</i> Subarctic Darner	<i>Aeshnidae</i> Darner Dragonflies	G5	S1S2					5%	21%	Forested Wetlands
Species Occurrences verified in these Counties: Beaverhead, Flathead, Granite, Lake, Lewis and Clark, Lincoln, Missoula, Powell, Sanders State Rank Reason: This dragonfly is currently listed as an "S1S2" Species of Concern in MT due to extremely limited and/or rapidly declining population numbers, range and/or habitat, making it vulnerable to extirpation in the state.										
<i>Somatochlora walshii</i> Brush-tipped Emerald	<i>Corduliidae</i> Emerald Dragonflies	G5	S1S2					5%	9%	Forested Wetlands
Species Occurrences verified in these Counties: Flathead, Lake, Lewis and Clark, Lincoln, Missoula, Powell State Rank Reason: This dragonfly is currently listed as an "S1S2" Species of Concern in MT due to extremely limited and/or rapidly declining population numbers, range and/or habitat, making it highly vulnerable to extirpation in the state.										
MAYFLIES										
<i>Caurinella idahoensis</i> Lolo Mayfly	<i>Ephemereleididae</i> Ephemereleid Mayflies	G3	S2					50%	5%	Small forested mountain streams
Species Occurrences verified in these Counties: Mineral, Missoula, Sanders State Rank Reason: This Lolo mayfly is currently ranked "S2" in Montana, because it is at risk of extirpation in the state due to very limited and/or potentially declining population numbers, range and/or habitat. This species is a rare, endemic mayfly only found in specific streams in the Pacific Influenced areas of Montana and Idaho (referred to as the Northern Rocky Mountain Refugium).										
STONEFLIES										
<i>Isocapnia crinita</i> Hooked Snowfly	<i>Capniidae</i> 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.										
		G2	S2					33%	5%	Small forested mountain stream

<u>Soyedina potteri</u> Northern Rocky Mountains Refugium Stonefly	<u>Nemouridae</u> Spring Stoneflies	Species Occurrences verified in these Counties: Flathead, Glacier, Mineral, Missoula, Sanders State Rank Reason: The NRM stonefly is currently ranked "S2" in Montana because it is 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. This species is globally restricted to Montana and Idaho.									
<u>Zapada cordillera</u> Cordilleran Forestfly	<u>Nemouridae</u> Spring Stoneflies	G3	S2						33%	17%	Alpine / Mountain streams
Species Occurrences verified in these Counties: Flathead, Lake, Missoula State Rank Reason: The Cordilleran stonefly is currently ranked "S2" in Montana because it is 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. Occurrences in the Northern Rocky Mountain region (Montana and Idaho) appear to be disjunct glacial refugium populations (Gustafson 2001).											
INVERTEBRATES - MOLLUSKS 12 SPECIES COUNTY = MISSOULA (based on mapped Species Occurrences)											
SCIENTIFIC NAME COMMON NAME TAXA SORT	FAMILY (SCIENTIFIC) FAMILY (COMMON)	GLOBAL RANK	STATE RANK	USFS	USFS	BLM	FWP SWAP	% OF GLOBAL BREEDING RANGE IN MT	% OF MT THAT IS BREEDING RANGE	HABITAT	
<u>Cryptomastix sanburni</u> Kingston Oregonian	<u>Polyspridae</u> Oregonians / Forest Snails	G3	S1							Mesic/moist conifer forests	
Species Occurrences verified in these Counties: Missoula											
<u>Hemphillia camelus</u> Pale Jumping-slug	<u>Arionidae</u> Arionid Slugs	G4	S1S2						2%	Mesic/moist conifer forests	
Species Occurrences verified in these Counties: Lincoln, Mineral, Missoula, Sanders											
<u>Hemphillia danielsi</u> Marbled Jumping-slug	<u>Arionidae</u> Arionid Slugs	G3	S1S2					80%	2%	Mesic/moist conifer forests	
Species Occurrences verified in these Counties: Mineral, Missoula, Ravalli											
<u>Magipelta mycophaga</u> Magnum Mantleslug	<u>Arionidae</u> Arionid Slugs	G3	S2S3					33%	7%	Mesic/moist conifer forests	
Species Occurrences verified in these Counties: Flathead, Granite, Lincoln, Mineral, Missoula, Ravalli, Sanders											

<u>Margaritifera falcata</u> Western Pearlshell	<u>Margaritiferidae</u> 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).										
<u>Oreohelix alpina</u> Alpine Mountainsnail	<u>Oreohelidae</u> Mountain Snails	G2	S1					100%	1%	Limestone talus, alpine
Species Occurrences verified in these Counties: Lake, Lewis and Clark, Missoula, Powell										
<u>Oreohelix amariradix</u> Bitterroot Mountainsnail	<u>Oreohelidae</u> Mountain Snails	G1G2	S1S2					100%	1%	Talus, dry conifer forests
Species Occurrences verified in these Counties: Missoula										
<u>Oreohelix carinifera</u> Keelad Mountainsnail	<u>Oreohelidae</u> Mountain Snails	G1	S1					100%	1%	Limestone, dry conifer forests
Species Occurrences verified in these Counties: Granite, Missoula, Powell										
<u>Oreohelix haydeni</u> Lyrate Mountainsnail	<u>Oreohelidae</u> Mountain Snails	G2	S1S3							Limestone, dry conifer forests
Species Occurrences verified in these Counties: Granite, Mineral, Missoula										
<u>Prophysaon humile</u> Smoky Taildropper	<u>Arionidae</u> Arionid Slugs	G3	S2S3					50%	12%	Mesic/moist conifer forests
Species Occurrences verified in these Counties: Flathead, Lake, Lincoln, Mineral, Missoula, Ravalli, Sanders										
<u>Udosarx lyrata</u> Lyre Mantleslug	<u>Arionidae</u> Arionid Slugs	G3	S1					50%	2%	Mesic/moist conifer forests
Species Occurrences verified in these Counties: Mineral, Missoula, Ravalli										
	<u>Arionidae</u> Arionid Slugs	G3G4	S2S3					50%	11%	Mesic/moist conifer forests

<u>Zacoleus idahoensis</u> Sheathed Slug	Species Occurrences verified in these Counties: Flathead, Lake, Lincoln, Mineral, Missoula, Ravalli, Sanders										
INVERTEBRATES - OTHER 5 SPECIES COUNTY = MISSOULA (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											
<u>Stygobromus tritus</u> A Subterranean Amphipod	<u>Crangonyctidae</u> Gammarid Amphipods	G1G2	S1S2					100%	1%	Subterranean Aquatic Ecosystems	
Species Occurrences verified in these Counties: Missoula, Ravalli 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.											
FRESHWATER SPONGES											
<u>Ephydatia cooperensis</u> A Freshwater Sponge	<u>Spongillidae</u> Freshwater Sponges	G1G3	S1S3					100%	1%	Lakes	
Species Occurrences verified in these Counties: Missoula, Powell State Rank Reason: This Freshwater Sponge is currently ranked a "S1S3" 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. Known from a few locations in lakes of northwest Montana.											
MILLIPEDES											
<u>Adrityla cucullata</u> A Millipede	<u>Adritylidae</u> Adritylid Millipedes	G1G3	S1S3							Dry mixed conifer forest clearings	
Species Occurrences verified in these Counties: Missoula											
<u>Austrotyla montani</u> A Millipede	<u>Conotylidae</u> Conotylid Millipedes	G1G3	S1S3							Mixed conifer forests	
Species Occurrences verified in these Counties: Missoula											
<u>Corypus cochlearis</u> A Millipede	<u>Conotylidae</u> Conotylid Millipedes	G1G3	S1S3							Mixed conifer forests	
Species Occurrences verified in these Counties: Missoula, Sanders											

Appendix M: State Plant Species of Concern for Missoula County

• Species of Concern											
71 Species											
Filtered by the following criteria:											
County = Missoula (based on mapped Species Occurrences)											
FERNS AND FERN ALLIES (PTERIDOPHYTA) 9 SPECIES COUNTY = MISSOULA (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		
Botrychium sp. (SOC) Moonworts (SOC)		Ophioglossaceae Adder's-Tongue / Moonworts	G1G3	S1S3					Species Occurrences verified in these Counties: Deer Lodge, Flathead, Glacier, Granite, Jefferson, Lake, Lewis and Clark, Lincoln, Missoula, Park, Pondera, Powell, Ravalli, Sanders, Sweet Grass, Teton State Rank Reason: This is a general record for Botrychium species tracked by MTNHP. MTNHP tracks and maintains observation data for all Botrychium species in the state excluding <i>B. multifidum</i> and <i>B. virginianum</i> which are fairly common and readily identifiable from all other Botrychiums. Global and State Ranks for this record are placeholders only to allow Botrychium SOC to appear in searches using global and state ranks. For information pertinent to specific Botrychium species, please see the individual species' accounts.		
Cryptogramma cascadiensis Cascade Rockbrake		Pteridaceae Maidenhair Fern Family	G5	S3					Species Occurrences verified in these Counties: Lincoln, Missoula, Ravalli, Sanders State Rank Reason: <i>Cryptogramma cascadiensis</i> is known from 11 locations in western Montana, of which 2 locations are poorly defined and considered historical, 3 locations occur in Wilderness areas, and the remaining 4 locations occur on U.S. Forest Service lands. Although the fern is thought to be undercollected and could be more common, current population and location data is needed to remove this plant from the Species of Concern list.		
Dryopteris cristata Crested Shieldfern		Dryopteridaceae Wood Fern Family	G5	S3		Sensitive - Known on Forests (BRT, KDOT, LOLO) Species of Conservation Concern on Forests (FLAT)		3	Wetland/Riparian		
Species Occurrences verified in these Counties: Flathead, Glacier, Lake, Lincoln, Missoula, Ravalli State Rank Reason: Rare to uncommon in Montana where it is known from scattered occurrences across the western portion of the state. Most documented occurrences are on National Forest lands, though State Trust Lands and private lands also host significant populations.											
			G5	S3							

<u><i>Equisetum palustre</i></u> Marsh Horsetail		<u><i>Equisetaceae</i></u> Horsetails	Species Occurrences verified in these Counties: Beaverhead, Flathead, Glacier, Lake, Lincoln, Madison, Missoula, Ravalli, Sanders State Rank Reason: <i>Equisetum palustre</i> is known from a small number of sites in seven counties of western Montana.						
			G5	S3					freshwater lakes
<u><i>Isoetes echinospora</i></u> Spiny-spore Quillwort	<u><i>Isoetes ternella</i></u>	<u><i>Isoetaceae</i></u> Quillworts	Species Occurrences verified in these Counties: Flathead, Lake, Madison, Missoula, Ravalli, Sanders State Rank Reason: <i>Isoetes echinospora</i> is known from 8 occurrences scattered in western Montana. At one occurrence, the species has been observed in 1940, 1967, and 1998 indicating persistence. However, current survey work is needed to document locations, population sizes, and threats.						
			G4G5	S3					freshwater lakes
<u><i>Isoetes howellii</i></u> Howell's Quillwort		<u><i>Isoetaceae</i></u> Quillworts	Species Occurrences verified in these Counties: Flathead, Glacier, Lake, Missoula State Rank Reason: <i>Isoetes howellii</i> is known from about 5 locations in Northwestern Montana. Based on limited information threats appear to be minimal, but survey work to document locations, population sizes, and threats is greatly needed.						
			G4G5	S1					freshwater lakes
<u><i>Isoetes occidentalis</i></u> Western Quillwort	<u><i>Isoetes lacustris</i> var. <i>paupercula</i></u>	<u><i>Isoetaceae</i></u> Quillworts	Species Occurrences verified in these Counties: Flathead, Missoula State Rank Reason: <i>Isoetes occidentalis</i> is known from two locations in northwest Montana. Survey work to identify other locations, document population sizes, and determine threats is greatly needed.						
<u><i>Lycopodium inundatum</i></u> Northern Bog Clubmoss	<u><i>Lycopodiella inundata</i></u>	<u><i>Lycopodiaceae</i></u> Club-moss (Lycopod) Family	G5	S2		Sensitive - Suspected on Forests (KOOT) Species of Conservation Concern on Forests (FLAT)		3	Fens
Species Occurrences verified in these Counties: Flathead, Missoula State Rank Reason: Rare in Montana where it is known from only a few occurrences in the western portion of the state. Trend data are unavailable. One population may be negatively impacted or extirpated in the future by proposed activities and all populations are susceptible to changes in hydrology.									
<u><i>Ophioglossum pustillum</i></u> Adder's Tongue	<u><i>Ophioglossum vulgatum</i></u> [misapplied]	<u><i>Ophioglossaceae</i></u> Adder's-Tongue / Moonworts	G5	S3		Sensitive - Known on Forests (KOOT)		3	Fens, Wet meadows
Species Occurrences verified in these Counties: Flathead, Lake, Lincoln, Missoula State Rank Reason: Rare in Montana, where it is known from a couple dozen fens and wet meadows in the northwest corner of the state. Its viability in the state generally does not appear to be at risk from any human-caused impacts at this time.									
GYMNOSPERM (CONIFERS) 1 SPECIES COUNTY = MISSOULA (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
<u><i>Pinus albicaulis</i></u> Whitebark Pine		<u><i>Pinaceae</i></u> Fir / Hemlock / Larch / Pine / Spruce	G3?	S3	C	Candidate on Forests (BD, BRT, CG, HLC, KOOT, LOLO)	SENSITIVE		Subalpine forest, timberline
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 krummholz 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) 31 SPECIES COUNTY = MISSOULA (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
<u><i>Astragalus racemosus</i></u> Raceme Milkvetch		<u><i>Fabaceae</i></u> Pea Family	G5	S2S3				3	Grasslands (Clay soils)
Species Occurrences verified in these Counties: Carter, Fallon, Missoula									
State Rank Reason: Raceme milkvetch occurs near the margin of its range in Montana, where several, mostly small populations have been found in Carter and Fallon counties. Its response to grazing is unknown, however it accumulates selenium and may be toxic to livestock. Accurate population and trend data are lacking.									
<u><i>Bidens beckii</i></u> Beck Water-marigold	<u><i>Mexigadonta beckii</i></u>	<u><i>Asteraceae</i></u> Aster/Sunflowers	G5	S2		Sensitive - Known on Forests (KOOT, LOLO)		3	Aquatic

			Species Occurrences verified in these Counties: Broadwater, Flathead, Lake, Lincoln, Missoula State Rank Reason: Known from ten occurrences in the western valleys of the state, including 6 moderate to large populations and one historical occurrence from Salmon Lake dating to 1937. However, the species may be more abundant in the state than what current data suggests. Threats and Impacts to populations in Montana include boating activity, lake shore development, aquatic weeds and use of aquatic herbicides.					
<i>Brasenia schreberi</i> Watershield		<i>Cabombaceae</i> Watershields	G5	S1S2		Sensitive - Known on Forests (KOOT, LOLO)	4	Aquatic
			Species Occurrences verified in these Counties: Flathead, Lake, Lincoln, Missoula, Powell State Rank Reason: Restricted in Montana to shallow waters in the valleys of the northwest corner of the state where it is known from eight occurrences, including six relatively high quality populations. Potential threats to the species include boating activity, aquatic weeds, and several populations are subject to runoff from adjacent agricultural fields, though it is uncertain if this has negatively impacted any populations.					
<i>Camissonia andina</i> Obscure Evening-primrose	<i>Oenothera andina</i> , <i>Holmskirenia andina</i>	<i>Onagraceae</i> Evening-primrose Family	G4	S2			3	Sandy sites
			Species Occurrences verified in these Counties: Carbon, Missoula State Rank Reason: This species is at the edge of its range in Montana, where it has been documented from just a few locations. All known extant locations are from Carbon County. These populations collectively cover less than 20 acres, but they can vary greatly in size from year to year. It tolerates grazing well, and moderate grazing may be important in maintaining a suitable seedbed of exposed soil. Invasive weeds may pose the greatest risk.					
<i>Cardamine rupicola</i> Cliff Toothwort		<i>Brassicaceae</i> Mustards	G3	S3			3	Alpine
			Species Occurrences verified in these Counties: Flathead, Lake, Lewis and Clark, Missoula, Powell State Rank Reason: State endemic known from 3 population clusters. These are in the Mission Mtns, Swan Range and the Rocky Mtn Front Range. Many occurrences have not been surveyed for 30 or more years and many are based on a single herbarium specimen. However, the species grows at high elevations in rock and scree fields that generally are not subject to disturbance or other threats. Many populations also occur in designated wilderness areas which offer further protection. Additional occurrences likely exist across the known range of the species.					
<i>Castilleja cervina</i> Deer Indian Paintbrush		<i>Orobanchaceae</i> Broomrape Family	G4	SH				Wetland/Riparian
			Species Occurrences verified in these Counties: Flathead, Madison, Missoula, Powell State Rank Reason: Known from 3 widely separated collections in western Montana, including a 1901 collection in Missoula County near "Sunset Hill", a 1960 collection near Deer Lodge and an 1894 collection near Columbia Falls.					

<i>Castilleja covilleana</i> Coville Indian Paintbrush		<i>Orobanchaceae</i> Broomrape Family	G3G4	S3		Sensitive - Known on Forests (BRT) Sensitive - Suspected on Forests (BD)	2	Subalpine slopes
			Species Occurrences verified in these Counties: Flathead, Lake, Missoula, Ravalli State Rank Reason: This species is known in Montana, primarily from the West Fork of the Bitterroot River on the Bitterroot National Forest. 5 occurrences are known from historical collections or have unknown status. A few occurrences contain minor amounts of spotted knapweed and others occur in habitats that are susceptible to invasion by knapweed and other invasive species. Timber harvest activities may also pose a threat to some populations.					
<i>Centunculus minimus</i> Chaffweed	<i>Anemone minima</i>	<i>Myrsinaceae</i> Myrsine Family	G5	S2				Wetland/Riparian
			Species Occurrences verified in these Counties: Cascade, Lake, Missoula, Phillips, Powell, Ravalli, Sheridan, Valley State Rank Reason: Known from scattered locations across the state, though it is rare to uncommon in Montana. May be susceptible to some adverse impacts from human-caused disturbance due to its preference for vernal moist habitats in valley locations.					
<i>Collomia debilis var. camporum</i> Alpine Collomia		<i>Polemoniaceae</i> Phlox Family	G5T2	S1S2				Rock/Talus (Valleys to Montane)
			Species Occurrences verified in these Counties: Granite, Missoula, Ravalli State Rank Reason: Only known from a few sites in western Montana and Lemhi County, Idaho, from low elevation scree, talus or rocky slopes. Negative impacts from human disturbance and weed invasion are possible. Current status of most of the documented locations is not known. Survey and monitoring data are needed.					
<i>Drosera anglica</i> English Sundew		<i>Droseraceae</i> Sundew Family	G5	S3		Sensitive - Known on Forests (BD, BRT, CG, HLC, KOOT, LOLO)	2	Fens
			Species Occurrences verified in these Counties: Beaverhead, Flathead, Granite, Lake, Lewis and Clark, Lincoln, Madison, Missoula, Park, Powell, Ravalli, Sanders State Rank Reason: Known from over two dozen populations in the state, most of these are moderate to large-sized, healthy populations. Most occurrences are on federally managed lands with several of these in designated wilderness areas, research natural areas or Glacier National Park which help to protect the occurrences from many potential threats. However, one population is vulnerable to ski area expansion and activity, and the species may be negatively impacted by fire as observations at one location appear to indicate. Plants are also sensitive to and negatively impacted by trampling of peat mats on which the species grow.					

<u><i>Erigeron linearis</i></u> Linear-leaf Fleabane		<u><i>Asteraceae</i></u> Aster/Sunflowers	G5	S2				2	Sagebrush/Grasslands (Foothills to Montane)
Species Occurrences verified in these Counties: Beaverhead, Deer Lodge, Lewis and Clark, Mineral, Missoula, Park, Ravalli, Sanders, Silver Bow State Rank Reason: <i>Erigeron linearis</i> is a peripheral species known from a few small and moderate-sized, localized occurrences. Almost all populations are on federally-managed lands or lands under conservation easement. However, development on adjacent lands may fragment some areas of suitable habitat. Two historical locations are also known. The occupied habitats and population are susceptible to negative impacts from invasive weeds.									
<u><i>Gentianopsis simplex</i></u> Hiker's Gentian	<u><i>Gentiana simplex</i></u> , <u><i>Gentianella simplex</i></u>	<u><i>Gentianaceae</i></u> Gentians	G5	S2			Sensitive - Known on Forests (BD, CG) Sensitive - Suspected on Forests (KOOT, LOLO)	3	Fens, wet meadows, seeps
Species Occurrences verified in these Counties: Beaverhead, Carbon, Madison, Mineral, Missoula, Park, Stillwater, Sweet Grass State Rank Reason: Rare in Montana, where it is known from several widely scattered locations. Current population levels and trends are unknown, though potential threats to known populations appear to be minimal or non-existent at this time. Additional sites are likely to be documented if surveys were to be conducted.									
<u><i>Grindelia howellii</i></u> Howell's Gumweed	<u><i>Grindelia paysonorum</i></u>	<u><i>Asteraceae</i></u> Aster/Sunflowers	G3	S2S3			Sensitive - Known on Forests (LOLO) Sensitive - Suspected on Forests (HLC, KOOT) Species of Conservation Concern on Forests (FLAT)	1	Vernally moist sites (Open, Low-elevation)

			Species Occurrences verified in these Counties: Granite, Missoula, Powell State Rank Reason: In Montana, <i>Grindelia howellii</i> is known from over 100 mapped occurrences. However, most populations are small and many occur on roadsides or other similarly disturbed habitat. This habitat preference in conjunction with the short-lived nature of the species means occurrences may drift from place to place or from year to year and as a result many occurrences may be ephemeral. These attributes make determination of population numbers as well as the number of extant populations at any given time difficult to assess. Invasive weeds are a threat to many occurrences, as the habitat occupied by <i>G. howellii</i> is also favorable for many weedy species. Application of herbicides to control these weeds, especially along roadsides may also have a direct, negative impact.						
<u><i>Heterocodon rariflorum</i></u> Western Pearl-flower		<u><i>Campanulaceae</i></u> Bellflower Family	G5	S2			Sensitive - Known on Forests (BRT, KOOT, LOLO)	2	Vernally moist habitats
Species Occurrences verified in these Counties: Beaverhead, Lake, Lincoln, Mineral, Missoula, Powell, Ravalli, Sanders State Rank Reason: Over a dozen known occurrences, including a half-dozen moderate to large-sized populations, a few small populations and several occurrences that need further survey work to document population sizes. Most populations are on National Forest lands. Invasive weeds infest several populations and are likely to infest others. Hiking and ORV trails occur through or adjacent to a few populations and associated use may impact <i>H. rariflorum</i> plants.									
<u><i>Howellia aquatilis</i></u> Water Howellia		<u><i>Campanulaceae</i></u> Bellflower Family	G3	S3	LT		Threatened on Forests (LOLO)	2	Aquatic
Species Occurrences verified in these Counties: Lake, Missoula State Rank Reason: Water howellia is restricted in Montana to depressional wetlands in the Swan Valley, typically occupying small basins where the water level recedes partially or completely by the Fall. Montana contains the largest number of occupied ponds and wetlands though the total occupied area is small and it is clustered in a small portion of the state, making it vulnerable to localized events and management actions. Reed canary grass (<i>Phalaris arundinacea</i>) has invaded into some wetlands in the Swan Valley and it has the potential to form dense monocultures, thereby decreasing the amount of available habitat, though it has only been found in a small percentage of occupied water howellia sites so far. Additionally, water howellia is an annual species, which is solely dependent on recruitment from seed; and it has very narrow habitat and moisture requirements which leaves it vulnerable to extirpation as a result of consecutive years of unfavorable growing conditions.									
			G4	S3					riparian

<u><i>Impatiens aurella</i></u> Pale-yellow Jewel-weed		<u><i>Balsaminaceae</i></u> Impatiens	Species Occurrences verified in these Counties: Cascade, Flathead, Gallatin, Jefferson, Lake, Lewis and Clark, Mineral, Missoula, Sanders State Rank Reason: <i>Impatiens aurella</i> 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.						
<u><i>Ligusticum verticillatum</i></u> Idaho Lovage		<u><i>Apiaceae</i></u> Parsley/Carrot Family	G4G5	S3					
			Species Occurrences verified in these Counties: Granite, Lincoln, Missoula, Ravalli State Rank Reason: <i>Ligusticum verticillatum</i> occurs in northern Idaho, western Montana, and British Columbia. It has been found in Lincoln and Ravalli Counties, growing in moist forests and meadows of spruce-fir habitats, becoming common in Idaho. Herbarium specimens from Missoula and Granite Counties may be mis-identified. Current data on locations, population sizes, and threats is greatly needed.						
<u><i>Mertensia bella</i></u> Oregon Bluebells		<u><i>Boraginaceae</i></u> Borage Family	G4	S2S3		Sensitive - Known on Forests (LOLO)		2	Vernally moist soil (Montane)
			Species Occurrences verified in these Counties: Missoula State Rank Reason: Rare in Montana, where it is known only from the Lolo National Forest. Some disturbance may be beneficial or at least tolerated. Mining activity occurs near one site though it is unknown if this has had any impact on <i>M. bella</i> . Additional monitoring of the populations is needed to determine trends.						
<u><i>Mimulus ampliatus</i></u> Stalk-leaved Monkeyflower	<u><i>Mimulus patulus</i></u> , <u><i>Mimulus washingtonensis</i></u>	<u><i>Phrymaceae</i></u> Lopseed Family	G3	S3		Sensitive - Known on Forests (KOOT)			Vernally moist soil (Valleys to subalpine)
			Species Occurrences verified in these Counties: Flathead, Glacier, Lincoln, Missoula, Park, Ravalli, Sanders State Rank Reason: See rank details.						
<u><i>Nymphaea leibergeri</i></u> Pygmy Water-illy	<u><i>Nymphaea tetragona ssp. leibergeri</i></u>	<u><i>Nymphaeaceae</i></u> Water-illy Family	G5	S1				3	Aquatic
			Species Occurrences verified in these Counties: Flathead, Lake, Missoula State Rank Reason: Known from 4 extant occurrences in western valleys and one historical collection from Salmon Lake in the Seeley Lake area. Populations are susceptible to impacts from development, recreation, siltation and aquatic weeds.						
			G3	S3				3	Rocky slopes (Open, montane)

<u><i>Penstemon flavescens</i></u> Yellow Beardtongue		<u><i>Plantaginaceae</i></u> Plantain Family	Species Occurrences verified in these Counties: Mineral, Missoula, Ravalli State Rank Reason: Restricted in Montana to the Bitterroot Range primarily in Ravalli County but also documented from Mineral County. The species can be relatively common or widely scattered in areas of suitable habitat, though detailed information on the abundance of the species is lacking. More detailed information documenting the abundance, distribution and any potential threats is needed.						
<u><i>Penstemon humilis</i></u> Low Beardtongue		<u><i>Plantaginaceae</i></u> 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						
<u><i>Phlox kelseyi</i> var. <i>missoulensis</i></u> Missoula Phlox	<u><i>Phlox missoulensis</i></u>	<u><i>Polemoniaceae</i></u> Phlox Family	G3	S3		Sensitive - Known on Forests (BD, HLC) Sensitive - Suspected on Forests (LOLO)		2	Slopes/ridges (Open, foothills to subalpine)
			Species Occurrences verified in these Counties: Cascade, Granite, Jefferson, Judith Basin, Lewis and Clark, Madison, Meagher, Missoula, Powell, Teton State Rank Reason: Missoula phlox is a state endemic known from over 2 dozen occurrences in west-central Montana, most of which are moderate to large-sized. Populations occur on a mix of ownerships, including private lands which host several occurrences. The Waterworks Hill population is infested with several noxious weeds and heavy recreational trail use also occurs within the occupied habitat. Other populations appear to be at much less risk though some impacts from invasive weeds, recreational use and development are possible.						
<u><i>Ranunculus orthorhynchus</i></u> Straightbeak Buttercup		<u><i>Ranunculaceae</i></u> Buttercup Family	G5	S1S2				1	Wetland/Riparian (Montane)
			Species Occurrences verified in these Counties: Deer Lodge, Flathead, Glacier, Granite, Lake, Mineral, Missoula, Sanders State Rank Reason: Rare in Montana, where it is known from the western portion of the state based upon several specimen collections. However, only one collection has been made in the past two decades. Additional data are needed to determine this species' status.						
<u><i>Rotala ramosior</i></u> Toothcup		<u><i>Lythraceae</i></u> Loosestrife Family	G5	S1S2				4	Wetland/Riparian
			Species Occurrences verified in these Counties: Lake, Missoula, Ravalli State Rank Reason: Rare in Montana, where it is known from approximately a half-dozen wetland sites in the valley bottoms in the western portion of the state. Potential threats and impacts to the known occurrences, as well as population trends, need to be evaluated.						
			G5	S3					Forest (Moist, montane)

<u><i>Cypripedium fasciculatum</i></u> Clustered Lady's-slipper		<u>Orchidaceae</u> Orchids	G4	S3		Sensitive - Known on Forests (KOOT, LOLO) Species of Conservation Concern on Forests (FLAT)	1	Forests (Montane)
Species Occurrences verified in these Counties: Lake, Mineral, Missoula, Sanders State Rank Reason: Clustered lady's-slipper is known for Montana from the northwest portion of the state, where it is documented from 10 moderate to large populations, 3 historical occurrences and many additional small occurrences. Most populations occur on National Forest lands. Potential negative impacts to the species have mainly been related to timber harvesting.								
<u><i>Eriophorum gracile</i></u> Slender Cottongrass		<u>Cyperaceae</u> 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.								
<u><i>Juncus covillei</i></u> Coville's Rush		<u>Juncaceae</u> Rushes	G5	S2S3				Wetland/Riparian
Species Occurrences verified in these Counties: Flathead, Mineral, Missoula, Ravalli, Sweet Grass State Rank Reason: Rare and peripheral in Montana. Currently known from approximately a half-dozen widely scattered wetland/riparian sites in the mountainous portion of the state.								
			G5	S3				

<u><i>Muhlenbergia minutissima</i></u> Annual Muhly		<u>Poaceae</u> Grasses	Species Occurrences verified in these Counties: Beaverhead, Gallatin, Madison, Missoula, Ravalli, Silver Bow State Rank Reason: <i>Muhlenbergia minutissima</i> 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.					
<u><i>Potamogeton obtusifolius</i></u> Blunt-leaved Pondweed		<u>Potamogetonaceae</u> Pondweeds	G5	S3		Sensitive - Known on Forests (HLC) Sensitive - Suspected on Forests (LOLO)	2	Aquatic
Species Occurrences verified in these Counties: Flathead, Glacier, Lake, Missoula, Powell State Rank Reason: Known from over a dozen occurrences in northwest Montana. Several contain moderate to large-size populations and occur in valley and foothill locations in a variety of federal, state, and private ownerships. A few populations are on lands managed specifically for their conservation value. Some populations are vulnerable to impacts associated with development, recreation and increased sediment and nutrient loads.								
<u><i>Scheuchzeria palustris</i></u> Pod Grass		<u>Scheuchzeriaceae</u> Pod-grasses	G5	S3		Sensitive - Known on Forests (BD, KOOT, LOLO) Sensitive - Suspected on Forests (BRT)	2	Wetland/Riparian
Species Occurrences verified in these Counties: Flathead, Granite, Lake, Lincoln, Missoula State Rank Reason: Known in Montana from several dozen fens west of the Continental Divide. Several locations are known only from historical surveys or collections, or from sites that need additional surveys to document the populations. The majority of populations are on National Forest lands with MT State Trust lands, private and National Park lands supporting the remaining occurrences. Populations are primarily vulnerable to activities that change the hydrology of the occupied fen and wetland habitats.								
<u><i>Schoenoplectus subterminalis</i></u> Water Bulrush	<u><i>Scirpus subterminalis</i></u>	<u>Cyperaceae</u> Sedges	G5	S3		Sensitive - Known on Forests (HLC, KOOT, LOLO)	2	Wetland/Riparian

			Species Occurrences verified in these Counties: Flathead, Lake, Lewis and Clark, Lincoln, Missoula State Rank Reason: Over a dozen known occurrences in western Montana, most of which are moderate to large-sized populations primarily on National Forest lands. Populations are potentially vulnerable to changes in water levels or increases in nutrient and sediment loads associated with development, agriculture or adjacent timber harvesting.						
<u>Wolffia columbiana</u> Columbia Water-meal		<u>Lemnaceae</u> Duckweeds	G5	S2S3					Aquatic
			Species Occurrences verified in these Counties: Flathead, Lake, Missoula, Ravalli State Rank Reason: Rare. Known from several water bodies in the valleys of western Montana. Additional information on the species is needed within Montana to more precisely determine the species' conservation status.						
BRYOPHYTES (BRYOPHYTA) 9 SPECIES COUNTY = MISSOULA (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
<u>Dichodontium olympicum</u> Olympic Dichodontium Moss	Olympic Fork Moss	<u>Dicranaceae</u>	G3G5	S1					
			Species Occurrences verified in these Counties: Missoula						
<u>Scorpidium revolvens</u> Limprichtia Moss	<u>Drepanocladus revolvens</u> , <u>Limprichtia revolvens</u>	<u>Amblystegiaceae</u>	G5	S1					
			Species Occurrences verified in these Counties: Flathead, Gallatin, Glacier, Lake, Missoula, Sanders, Stillwater, Teton						
<u>Scorpidium scorpioides</u> A Scorpidium Moss		<u>Amblystegiaceae</u>	G5	S2		Sensitive - Known on Forests (HLC, KOOT) Species of Conservation Concern on Forests (FLAT)			
			Species Occurrences verified in these Counties: Flathead, Glacier, Lake, Lewis and Clark, Lincoln, Missoula, Powell, Teton						
<u>Sphagnum angustifolium</u> Narrowleaf Peatmoss		<u>Sphagnaceae</u> Peat Mosses	G5	S2					
			Species Occurrences verified in these Counties: Beaverhead, Flathead, Lincoln, Missoula, Sanders						
<u>Sphagnum centrale</u> A Peatmoss		<u>Sphagnaceae</u> Peat Mosses	G5	S1					
			Species Occurrences verified in these Counties: Flathead, Missoula, Ravalli, Sanders						
	Brown Peatmoss		G5	S2					

<u><i>Sphagnum fuscum</i></u> Brown Hair Peatmoss		<u><i>Sphagnaceae</i></u> Peat Mosses	Species Occurrences verified in these Counties: Flathead, Lake, Lincoln, Missoula, Ravalli							
<u><i>Sphagnum magellanicum</i></u> Red Spoon Peatmoss	Magellan's Peatmoss	<u><i>Sphagnaceae</i></u> Peat Mosses	G5	S1				Species of Conservation Concern on Forests (FLAT)		
			Species Occurrences verified in these Counties: Flathead, Lincoln, Madison, Missoula, Ravalli							
<u><i>Sphagnum mendocinum</i></u> Mendocino Peatmoss		<u><i>Sphagnaceae</i></u> Peat Mosses	G4G5	S1						
			Species Occurrences verified in these Counties: Flathead, Missoula							
<u><i>Sphagnum riparium</i></u> Streamside Peatmoss	Streamside Sphagnum Moss	<u><i>Sphagnaceae</i></u> Peat Mosses	G5	S1						
			Species Occurrences verified in these Counties: Lewis and Clark, Lincoln, Missoula							
LICHENS (FUNGI) 6 SPECIES COUNTY = MISSOULA (based on mapped <u>Species Occurrences</u>)										
SCIENTIFIC NAME COMMON NAME TAXA SORT	OTHER NAMES	FAMILY (SCIENTIFIC) FAMILY (COMMON)	GLOBAL RANK	STATE RANK	USFWS	USFS	BLM	MNPS THREAT CATEGORY	HABITAT	
<u><i>Arctoparmelia subcentrifuga</i></u> Subcentric Ring Lichen		<u><i>Parmeliaceae</i></u>	G4G5	S1						
			Species Occurrences verified in these Counties: Missoula							
			State Rank Reason: In Montana known from a few sites in the western and central regions of the state.							
<u><i>Lobaria haltii</i></u> Gray Lungwort Lichen		<u><i>Lobariaceae</i></u>	G4?	S2						
			Species Occurrences verified in these Counties: Flathead, Lake, Lincoln, Missoula, Sanders							
			State Rank Reason: Known from several locations in western Montana.							
<u><i>Normandina pulchella</i></u> Elf-Ear Lichen		<u><i>Verrucariaceae</i></u>	G4G5	S1						
			Species Occurrences verified in these Counties: Missoula, Ravalli							
			State Rank Reason: In the Rocky Mountains, this lichen has a spotty distribution. Known in Montana from one location.							
<u><i>Parmeliella triptophylla</i></u> Fingered Shingle Lichen	<u><i>Parmelia triptophylla</i></u> Black-bordered Shingle Lichen	<u><i>Pannariaceae</i></u>	G5	S1						
			Species Occurrences verified in these Counties: Glacier, Lake, Missoula, Ravalli							
			State Rank Reason: Locally rare when found.							
			G3G4	S1						

- Species of Concern
46 Species
Filtered by the following criteria:
County = Mineral (based on mapped [Species Occurrences](#))

Mammals (Mammalia) 7 Species County = Mineral (based on mapped Species Occurrences)										
Scientific Name	Family (Scientific)	GLOBAL Rank	STATE Rank	USFWS	USFS	BLM	FWP SWAP	% of Global Breeding Range in MT	% of MT that is Breeding Range	Habitat
<u><i>Corynorhinus townsendii</i></u>	<u>Vespertilionidae</u>	G4	S3		Sensitive - Known on Forests (BD, BRT, CG, HLC, KOOT, LOLO)	SENSITIVE	SGCN3	5%	87%	Caves in forested habitats
Townsend's Big-eared Bat	Bats									
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.										

<u>Myotis</u> <u>thysanodes</u> Fringed Myotis	<u>Vespertilionidae</u> 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.										
<u>Pekania</u> <u>pennanti</u> Fisher	<u>Mustelidae</u> Weasels	G5	S3		Sensitive - Known on Forests (BD, BRT, HLC, KOOT, LOLO)	SENSITIVE	SGCN3	1%	31%	Mixed conifer forests
Species Occurrences verified in these Counties: Beaverhead, Deer Lodge, Flathead, Glacier, Granite, Lake, Lewis and Clark, Lincoln, Mineral, Missoula, Pondera, Powell, Ravalli, Sanders, Teton										
<u>Ursus arctos</u> Grizzly Bear	<u>Ursidae</u> 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) 14 Species County = Mineral (based on mapped Species Occurrences)										

<i>Catharus fuscescens</i> Veery		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, McConne, Meagher, Mineral, Missoula, Musselshell, Park, Petroleum, Phillips, Pondera, Powder River, Powell, Ravalli, Richland, Roosevelt, Rosebud, Sanders, Silver Bow, Stillwater, Sweet Grass, Teton, Wheatland, Yellowstone							
<i>Certhia americana</i> Brown Creeper	<i>Certhiidae</i> Creeppers	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							
<i>Coccothraustes vespertinus</i> Evening Grosbeak	<i>Fringillidae</i> 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).							
<i>Dryocopus pileatus</i> Pileated Woodpecker	<i>Picidae</i> 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							

<u><i>Psiloscops flammeolus</i></u> Flammulated Owl	<u>Strigidae</u> 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										
<u><i>Troglodytes pacificus</i></u> Pacific Wren	<u>Troglodytidae</u> 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) 2 Species County = Mineral (based on mapped Species Occurrences)										
Scientific Name	Family (Scientific)	GLOBAL Rank	STATE Rank	USFWS	USFS	BLM	FWP SWAP	% of Global Breeding Range in MT	% of MT that is Breeding Range	Habitat
Common Name	Family (Common)									
TAXA Sort										

<u><i>Elgaria coerulea</i></u> Northern Alligator Lizard	<u>Aniguidae</u> Alligator Lizards	G5	S3				SGCN3, SGIN	8%	12%	Talus slopes / rock outcrops
Species Occurrences verified in these Counties: Flathead, Granite, Lake, Lincoln, Mineral, Missoula, Ravalli, Sanders										
<u><i>Plestiodon skiltonianus</i></u> Western Skink	<u>Scincidae</u> Skinks	G5	S3				SGCN3, SGIN	2%	10%	Open conifer forest and adjacent grasslands
Species Occurrences verified in these Counties: Flathead, Granite, Lincoln, Mineral, Missoula, Ravalli, Sanders										
Amphibians (Amphibia) 3 Species County = Mineral (based on mapped <u>Species Occurrences</u>)										
Scientific Name								% of Global Breeding Range in MT	% of MT that is Breeding Range	Habitat
Common Name	Family (Scientific)									
Name	Family	GLOBAL Rank	STATE Rank	USFWS	USFS	BLM	FWP SWAP			
TAXA Sort	(Common)									
<u><i>Anaxyrus boreas</i></u> Western Toad	<u>Bufonidae</u> True Toads	G4	S2		Sensitive - Known on Forests (BD, BRT, CG, HLC, KOOT, LOLO)	SENSITIVE	SGCN2	6%	38%	Wetlands, floodplain pools

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
<i>Oncorhynchus clarkii lewisi</i> Westslope Cutthroat Trout	<i>Salmonidae</i> 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.										
<i>Salvelinus confluentus</i> Bull Trout	<i>Salmonidae</i> Trout	G5	S2	LT; CH	Threatened, Critical Habitat on Forests (BD, BRT, HLC, KOOT, LOLO)	THREATENED	SGCN2	5%	18%	Mountain streams, rivers, lakes
Species Occurrences verified in these Counties: Deer Lodge, Flathead, Glacier, Granite, Lake, Lewis and Clark, Lincoln, Mineral, Missoula, Powell, Ravalli, Sanders										
Invertebrates - Insects 7 Species County = Mineral (based on mapped <i>Species Occurrences</i>)										

Scientific Name	Family (Scientific)	GLOBAL Rank	STATE Rank	USFWS	USFS	BLM	FWP SWAP	% of Global Breeding Range in MT	% of MT that is Breeding Range	Habitat
TAXA Sort	Family (Common)									
Butterflies										
<i>Euphydryas gillettii</i> Gillette's Checkerspot	<i>Nymphalidae</i> Brush-footed Butterflies	G3	S2						42%	Wet meadows
Species Occurrences verified in these Counties: Beaverhead, Cascade, Deer Lodge, Fergus, Flathead, Glacier, Madison, Mineral, Missoula, Pondera, Powell										
Caddisflies										
<i>Rhyacophila potteri</i> A Rhyacophilan Caddisfly	<i>Rhyacophilidae</i> Primitive Caddisflies	G3	S2					50%	5%	Forested mountain springs
Species Occurrences verified in these Counties: Beaverhead, Flathead, Mineral, Ravalli State Rank Reason: This Rhyacophilan Caddisfly is currently ranked a "S2" Species of Concern in MT and 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, and the species is difficult to identify without adult specimens.										
<i>Rossiana montana</i> Northern Rocky	<i>Rossianidae</i> Rossianid Caddisflies	G2G3	S2					50%	1%	Forested mountain springs

Mountains Refugium Caddisfly		Species Occurrences verified in these Counties: Lake, Mineral, Missoula, Sanders State Rank Reason: This NRM Caddisfly is currently ranked a "S2" Species of Concern in MT and 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 and specialized habitats. This species is a rare, endemic caddisfly only found in specific streams in the Pacific Influenced areas of Montana and Idaho (referred to as the Northern Rocky Mountain Refugium).								
Mayflies										
<i>Caurinella idahoensis</i> Lolo Mayfly	<i>Ephemerellidae</i> Ephemerellid Mayflies	G3	S2					50%	5%	Small forested mountain streams
Species Occurrences verified in these Counties: Mineral, Missoula, Sanders State Rank Reason: This Lolo mayfly is currently ranked "S2" in Montana, because it is at risk of extirpation in the state due to very limited and/or potentially declining population numbers, range and/or habitat. This species is a rare, endemic mayfly only found in specific streams in the Pacific influenced areas of Montana and Idaho (referred to as the Northern Rocky Mountain Refugium).										
Stoneflies										
<i>Isocapnia integra</i> Alberta Snowfly	<i>Capniidae</i> Small Winter Stoneflies	G4G5	S2					20%	5%	Mountain Streams to Rivers

[illegible]

<u><i>Gentianopsis simplex</i></u> Hiker's Gentian	<u><i>Gentiana simplex</i></u> <u><i>Gentianella simplex</i></u>	<u><i>Gentianaceae</i></u> Gentians	G5	S2		Sensitive - Known on Forests (BD, CG) Sensitive - Suspected on Forests (KOOT, LOLO)	3	Fens, wet meadows, seeps
Species Occurrences verified in these Counties: Beaverhead, Carbon, Madison, Mineral, Missoula, Park, Stillwater, Sweet Grass State Rank Reason: Rare in Montana, where it is known from several widely scattered locations. Current population levels and trends are unknown, though potential threats to known populations appear to be minimal or non-existent at this time. Additional sites are likely to be documented if surveys were to be conducted.								
<u><i>Heterocodon rariflorum</i></u> Western Pearl-flower		<u><i>Campanulaceae</i></u> Bellflower Family	G5	S2		Sensitive - Known on Forests (BRT, KOOT, LOLO)	2	Vernally moist habitats
Species Occurrences verified in these Counties: Beaverhead, Lake, Lincoln, Mineral, Missoula, Powell, Ravalli, Sanders State Rank Reason: Over a dozen known occurrences, including a half-dozen moderate to large-sized populations, a few small populations and several occurrences that need further survey work to document population sizes. Most populations are on National Forest lands. Invasive weeds infest several populations and are likely to infest others. Hiking and ORV trails occur though or adjacent to a few populations and associated use may impact <i>H. rariflorum</i> plants.								
<u><i>Impatiens aurella</i></u> Pale-yellow Jewel-weed		<u><i>Balsaminaceae</i></u> Impatiens	G4	S3				riparian
Species Occurrences verified in these Counties: Cascade, Flathead, Gallatin, Jefferson, Lake, Lewis and Clark, Mineral, Missoula, Sanders State Rank Reason: <i>Impatiens aurella</i> 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.								
<u><i>Kelloggia galioides</i></u> Kelloggia		<u><i>Rubiaceae</i></u> Bedstraws / Madder Family	G5	SH				Forest (Open/low-elevation)
Species Occurrences verified in these Counties: Mineral State Rank Reason: Known in Montana from one 1971 collection in the South Fork Fish Creek valley approximately 12 miles west-northwest of Alberton and a 0.5 mile north of the junction with Deer Creek.								
			G3	S3			3	Slopes and Scree (Dry)

<u><i>Lomatium attenuatum</i></u> Taper-tip Desert-parsley		<u><i>Apiaceae</i></u> Parsley/Carrot Family	Species Occurrences verified in these Counties: Beaverhead, Madison, Mineral State Rank Reason: <i>Lomatium attenuatum</i> is restricted to northwest Wyoming and southwest Montana, with most of its range in Montana. It is known from several locations in Beaverhead and Madison counties. Some populations may be vulnerable to impacts from mining activities and noxious weed invasion.					
<u><i>Mimulus clivicola</i></u> North Idaho Monkeyflower		<u><i>Phrymaceae</i></u> Lopseed Family	G4	S2†		Sensitive - Known on Forests (LOLO) Sensitive - Suspected on Forests (KOOT)		
Species Occurrences verified in these Counties: Mineral, Sanders State Rank Reason: See rank details.								
<u><i>Nocca parviflora</i></u> Small-flowered Pennycress	<u><i>Thlaspi parviflorum</i></u>	<u><i>Brassicaceae</i></u> Mustards	G3	S3			3	Meadows (Moist, Montane to alpine)
Species Occurrences verified in these Counties: Beaverhead, Carbon, Cascade, Madison, Meagher, Mineral, Park, Silver Bow State Rank Reason: <i>Nocca parviflora</i> is a regional endemic, known in Montana from several southwestern counties. It is a small, short-lived plant that likely requires some disturbance to maintain its habitat.								
<u><i>Penstemon flavescens</i></u> Yellow Beardtongue		<u><i>Plantaginaceae</i></u> Plantain Family	G3	S3			3	Rocky slopes (Open, montane)
Species Occurrences verified in these Counties: Mineral, Missoula, Ravalli State Rank Reason: Restricted in Montana to the Bitterroot Range primarily in Ravalli County but also documented from Mineral County. The species can be relatively common or widely scattered in areas of suitable habitat, though detailed information on the abundance of the species is lacking. More detailed information documenting the abundance, distribution and any potential threats is needed.								
<u><i>Ranunculus orthorhynchus</i></u> Straightbeak Buttercup		<u><i>Ranunculaceae</i></u> Buttercup Family	G5	S†S2			1	Wetland/Riparian (Montane)
Species Occurrences verified in these Counties: Deer Lodge, Flathead, Glacier, Granite, Lake, Mineral, Missoula, Sanders State Rank Reason: Rare in Montana, where it is known from the western portion of the state based upon several specimen collections. However, only one collection has been made in the past two decades. Additional data are needed to determine this species' status.								
			G5	S2†				Forest openings (Mesic, montane/subalpine)

<u>Ribes triste</u> Swamp Red Currant		<u>Grossulariaceae</u> Currants / Gooseberries	Species Occurrences verified in these Counties: Beaverhead, Deer Lodge, Granite, Mineral, Ravalli State Rank Reason: Rare in Montana, where it is known from a few collections from the western portion of the state. Additional data are needed.						
<u>Satureia douglasii</u> Yerba Buena	<u>Clinopodium douglasii</u>	<u>Lamiaceae</u> Mints	G5	S3					Forest (Moist, montane)
<u>Waldsteinia idahoensis</u> Idaho Barren Strawberry		<u>Rosaceae</u> Rose Family	G3	S2S3		Sensitive - Known on Forests (LOLO)			Forests (Ponderosa Pine)
Species Occurrences verified in these Counties: Mineral, Missoula, Ravalli, Sanders State Rank Reason: Rare in Montana, where it is known from several sites near the Idaho border. It is primarily a coastal species, disjunct in western Montana. Population levels appear healthy and may be increasing in some areas. State Rank Reason: Only one known site in Montana on National Forest land. Population is in an area susceptible to impacts from timber harvesting and road maintenance, though population appears to be stable or perhaps increasing in size.									
FLOWERING PLANTS - MONOCOTS (LILIOPSIDA) 5 SPECIES COUNTY = MINERAL (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
<u>Calamagrostis tweedyi</u> Cascade reedgrass		<u>Poaceae</u> Grasses	G3	S3					Montane Forest
Species Occurrences verified in these Counties: Mineral, Missoula, Ravalli, Sanders State Rank Reason: A species of limited distribution and currently considered to be globally rare. Restricted in Montana to the extreme western portion of the state.									
<u>Carex stenoptila</u> Small-winged Sedge		<u>Cyperaceae</u> 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.									

<u>Cypripedium fasciculatum</u> Clustered Lady's-slipper		<u>Orchidaceae</u> Orchids	G4	S3		Sensitive - Known on Forests (KOOT, LOLO) Species of Conservation Concern on Forests (FLAT)		1	Forests (Montane)
Species Occurrences verified in these Counties: Lake, Mineral, Missoula, Sanders State Rank Reason: Clustered lady's-slipper is known for Montana from the northwest portion of the state, where it is documented from 10 moderate to large populations, 3 historical occurrences and many additional small occurrences. Most populations occur on National Forest lands. Potential negative impacts to the species have mainly been related to timber harvesting.									
<u>Juncus covillei</u> Coville's Rush		<u>Juncaceae</u> Rushes	G5	S2S3					Wetland/Riparian
Species Occurrences verified in these Counties: Flathead, Mineral, Missoula, Ravalli, Sweet Grass State Rank Reason: Rare and peripheral in Montana. Currently known from approximately a half-dozen widely scattered wetland/riparian sites in the mountainous portion of the state.									
<u>Stipa lettermanii</u> Letterman's Needlegrass	<u>Achnatherum lettermanii</u>	<u>Poaceae</u> 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.									
BRYOPHYTES (BRYOPHYTA) 1 SPECIES COUNTY = MINERAL (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
<u>Homalothecium megacitium</u> Giant Golden Moss	<u>Trachythecium megacitium</u>	<u>Brachytheciaceae</u>	G4	S1					
Species Occurrences verified in these Counties: Lake, Lincoln, Mineral, Sanders State Rank Reason: Endemic to western North America. In Montana it occurs on the eastern edge of its distribution.									
LICHENS (FUNGI) 2 SPECIES COUNTY = MINERAL (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

