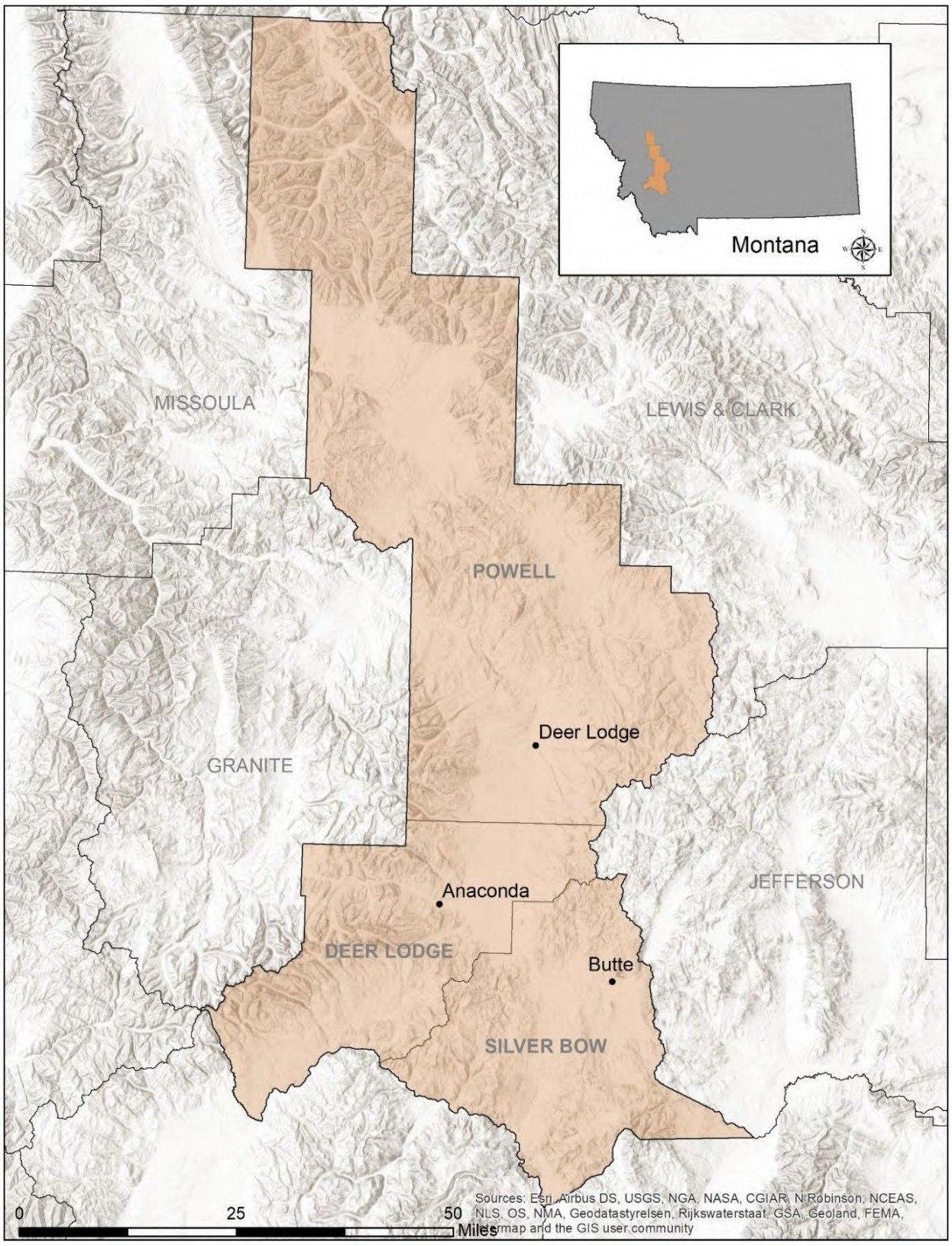
Long Range Plan

Powell, Deer Lodge and Silver Bow Counties, Montana



Section 1. Introduction

The Tri-County Long-Range Plan is a working document outlining the natural resource data, status, and trends from the three counties of Powell, Deer Lodge, and Silver Bow. This plan represents a commitment to local and regional partnerships and outlines strategic approaches to solving complex natural resource issues. It will be used to prioritize projects for Natural Resources Conservation Service (NRCS) financial incentive programs.

The goal of the Long-Range Plan is to review natural resource characteristics and issues found throughout the tri-county area. This document will be updated on a regular basis and will be used to highlight resource concerns of high priority. It will give guidance for the planning of Targeted Implementation Plans over the next one to five years.

The Tri-County Long Range Plan was developed by the NRCS Deer Lodge Field Office with help from the North Powell, Mile High, and Deer Lodge Valley Conservation Districts. Additional local partners were also consulted during the completion of this plan. 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 "Source" section.

Partners in Natural Resources

- North Powell Conservation District
- Deer Lodge Valley Conservation District
- Mile High Conservation District
- Blackfoot Challenge
- Watershed Restoration Coalition
- Clark Fork Coalition
- Natural Resources Conservation Service (NRCS) Deer Lodge Field Office
- US Fish and Wildlife Service (USFWS)
- US Bureau of Land Management
- US Forest Service
- Montana Fish, Wildlife & Parks (FWP)
- Montana Dept. of Natural Resources and Conservation (DNRC)
- Pheasants Forever (PF)
- Trout Unlimited (TU)
- Ducks Unlimited (DU)
- Intermountain West Joint Venture (IWJV)
- Soil and Water Conservation Districts of Montana (SWCDM)
- Montana Association of Conservation Districts (MACD)

Section II. Natural Resource Inventory

The tri-county area includes an incredible diversity of landforms and ecosystems. Numerous valleys contain an abundance of lakes, rivers, streams, and wetlands and are dominated by grass and shrub communities. The lowlands transition to the foothills of the Rocky Mountains where bunchgrass communities and low-altitude forests of Douglas-fir and ponderosa pine begin. The highest point in the three counties is West Goat Peak in the Anaconda Range at 10,793 feet, followed by Table Mountain in Silver Bow County (10,223 feet) and Mt Powell in Powell County (10,168 feet). The three counties contain portions of the Swan, Lewis and Clark, Garnet, Nevada, Boulder, Anaconda, Flint Creek, Pioneer, and Highland Ranges of the Rocky Mountains. From a resource management perspective, this diversity of landforms creates unique challenges and opportunities.

Humans

Powell County

According to the most recent statistics available from the US Bureau of Census, the population of Powell County was estimated at 6,852 in 2017. Population composition is estimated to be 91% white, 4.5% American Indian, and 2.5% identifying as two or more races (US Census Bureau, 2017). Powell County covers 2,333 square miles, 1,489,231 acres, and shares county borders with Deer Lodge County to the south, Granite County to the west, Lewis and Clark County to the northeast and Silver Bow County to the southeast. The largest city in the county is Deer Lodge which also serves as the county seat with a population of 3,111 in the 2010 census.

Powell County includes the Montana State Prison, which is a major employer in the county.

Deer Lodge County

According to the most recent estimates available from the US Bureau of Census, the population of Deer Lodge County was estimated at 9,131 in 2017. Composition is estimated to be 96% white, 1% American Indian, and 4% identifying as two or more races (US Census Bureau, 2017). Deer Lodge County covers 741 square miles, approximately 463,583 acres, and shares county borders with Silver Bow County to the east, Powell, Granite, and a small part of Jefferson Counties to the north, and Beaverhead County to the south. Deer Lodge County is a consolidated city-county (formally known as Anaconda-Deer Lodge County), with the largest city being Anaconda. Anaconda serves as the county seat, and the consolidated city-county area had a population of 9,298 in the 2010 census.

Table 1: Powell County land ownership (MT Cadastral GIS Data Layers)

Land Ownership	*Acreage*	*% Ownership of the County*
US Forest Service	648,651	44%
Bureau of Land Management	90,720	6%
State of Montana	74,911	5%
Montana Fish, Wildlife & Parks	40,189	2%
Montana State Prison	32,822	2%
Rock Creek Cattle Company (Private)	22,780	2%
Local Government	1,269	0%
Other Private Land	577,889	39%
Total Ownership Acres	**1,489,231**	**100%**

Table 2: Deer Lodge County land ownership (MT Cadastral GIS Data Layers)

Land Ownership	*Acreage*	*% Ownership of the County*
US Forest Service	171,602	37%
Montana Fish, Wildlife & Parks	50,505	11%
Unspecified federal land	38,862	8%
ARCO Environmental Remediation LLC (Private)	20,549	4%
Other State Land	9,290	2%
Local Government	5,805	1%
Other Private Land	166,970	36%
Total Ownership Acres	**463,583**	**100%**

Silver Bow County

Like Deer Lodge County, Silver Bow is a consolidated city-county area formally known as Butte-Silver Bow County. Butte is its largest city and the county seat. The consolidated area had a population of approximately 36,400 in the 2010 census. According to the most recent estimates available from the US Bureau of Census, the population of Silver Bow County was estimated at 34,514 in 2017. The county is estimated 94% white, 2% American Indian, and 1% identifying as two or more races (US Census Bureau, 2017). Silver Bow County covers 719 square miles, approximately 574,128 acres, and shares county borders with Jefferson County to the east, Madison, and Beaverhead Counties to the south, and Deer Lodge County on the west.

The largest city in the county is Butte, which also serves as the county seat. At the time of the 2010 census, it had a population of 33,503.

Table 3: Silver Bow County land ownership (MT Cadastral GIS Data Layers)

Land Ownership	*Acreage*	*% Ownership of the County*
US Forest service	226,746	40%
Bureau of Land Management	64,014	11%
Unspecified federal land	3,786	1%
State of Montana	23,012	4%
MT Fish, Wildlife & Parks	19,245	3%
Local Government	7,937	1%
Montana Resources LLP (Private)	15,323	3%
Other Private Land	214,065	37%
Total Ownership Acres	**574,128**	**100%**

Most of the land in the tri-county area (58%) is publicly owned, with much of the public land belonging to the US Forest Service (approximately 72%). The remainder of the public lands are owned by the Bureau of Land Management, the State of Montana, and other federal and state agencies (including Montana State Prison). ARCO Environmental Remediation LLC and Rock Creek Cattle Company are the largest private landowners in the tri-county area. (Table 1, 2, and 3).

Agriculture

According to the National Agricultural Statistics Survey 2017 Census data, the tri-county area is home to 455 farms covering an area of about 706,777 acres. The average farm size for the three counties combined is 1,213acres with an average median size of 195 acres. Over 67,250 acres of agricultural lands are irrigated with the majority being in Powell County (51,743 acres). The irrigated acres in the counties are forage which includes hay and pasture. Primary agricultural products include livestock (primarily cattle), some sheep, small grains (spring and winter wheat, oats, barley, and corn), and forage (grass and alfalfa). (See Table 4 and appendices 1-3.)

Table 4. Farm records from the USDA National Agricultural Statistics Survey from 2017.

Farm Statistics from 1997, 2002, 2007, 2012, and 2017	**2017**	**2012**	**2007**	**2002**	**1997**
Deer Lodge County					
Number of Farms	77	93	123	109	83
Average Size (Acres)	962	716	645	1,239	1,225
Land in Farms (Acres)	74,083	66,577	79,335	134,997	101,657
Irrigated Land (Acres)	13,117	10,760	19,692	17,386	17,639
Powell County					
Number of Farms	254	263	273	274	230
Average Size (Acres)	2253	2,240	2,456	2,258	2824
Land in Farms (Acres)	572,388	589,239	670,354	618,687	649,489

Irrigated Land (Acres)	51,743	53,316	74,103	62,807	62,952
Silver Bow County					
Number of Farms	142	140	175	155	116
Average Size (Acres)	425	498	578	476	864
Land in Farms (Acres)	60,306	69,740	101,081	73,792	100,181
Irrigated Land (Acres)	2,412	4,590	8,797	5,881	7,542

Over the past twenty years (Census years 1990-2010) the population of Powell County has increased 6%, Silver Bow County has increased 0.8%, and Deer Lodge County has decreased by 10% (US Bureau of Census). The average farm size in all three counties has decreased during this time. In recent years, the NRCS Deer Lodge Field Office has been working more frequently with ranches that have been subdivided— particularly in higher-elevation forested areas. Often these smaller-scale landowners have different viewpoints and goals than those within the traditional agricultural community. Additionally, many are from outside the area or the state, and are unfamiliar with many of the issues affecting forested properties (wildfires, disease, forest health, etc.).

Geology and Soils

Deer Lodge County Soils

The field work for the Deer Lodge County Soil Survey (Soil Survey Area MT616) was completed in 1996 and published in 2001. Much of the information in this section is taken from the Soil Survey Manuscript. The soil survey lies within two Major Land Resource Areas (MLRA): 44B – Central Rocky Mountain Valleys, and 43B – Central Rocky Mountains. The county includes about 463,583 acres and about 51 percent is forest land, 47percent range, 1.5 percent irrigated cropland and pasture, and 0.5 percent non-irrigated hay land.

Over half of Deer Lodge County is included in the mapping area (MT616) which includes most of the private

lands within the county. Other areas within Deer Lodge County that were mapped include the portion of the Beaverhead-Deer Lodge National Forest in the Anaconda Range, southwest of the Continental Divide; the southernmost part of the Flint Creek Range near Olson Mountain; and the easternmost extension of the county that includes Saratoga, Orofino, and Cottonwood Mountains. Lost Creek State Park is included in the mapping area. Within mapped areas, elevations range from 4,680 feet at Racetrack, where the Clark Fork River flows out of Deer Lodge County, to a high of 10,607 feet at Mount Haggin in the Anaconda Range. The high peaks of the Continental Divide have elevations between 9,500 and 10,650 feet. The elevation at Anaconda is approximately 5,200 feet.

The Deer Lodge County soil survey area lies in the Northern Rocky Mountain physiographic province, within the structural province of the Rocky Mountain Fold-Thrust Belt. The Continental Divide forms the southwestern portion of the county border, then trends eastward through the center of the county. The county is characterized by rugged, mountainous terrain separated by the broad valleys of the Clark Fork and Big Hole Rivers. Portions of three mountain ranges extend into the county. The Flint Creek Range is high and rugged and extends into the northwestern part of the county. The high peaks of the Anaconda Range form the Continental Divide, and the range extends into the central and southwestern parts of the county. Warm Springs Creek separates these two ranges. The relatively low, rounded mountains on the eastern margin of the county are known locally as the Deer Lodge Mountains. The Deer Lodge Valley is characterized by large, gravel-capped terraces that slope gently away from the high mountains toward the Clark Fork River.

Near the river, there are low terraces that were formed more recently. In the southern part of the valley, the terraces grade into coalescing alluvial fans that radiate outward from the mouths of some of the tributary canyons. The Big Hole Valley is crescent-shaped, with broad bottomlands and extensive grass-covered terraces. A northeast-trending fault bounds the valley to the west and rugged mountains surround it.

Parent Material

The soils in Deer Lodge County formed from many kinds of parent materials. The major materials are recent alluvium, glacial alluvium, mixed alluvium and colluvium, soft bedrock, hard bedrock, and volcanic mudflows. Glacial alluvium is deposited by glacial melt water and is on terraces and outwash plains. Material weathered from soft Cretaceous aged bedrock is a major parent material and is usually calcareous. Material weathered from hard sandstone is another parent material for many upland soils. Soils near the site of the old Anaconda smelter have been impacted by smelter waste and include rangeland with acidic surfaces and floodplains with heavy metal contamination. The Clark Fork River is currently being reclaimed through extensive removal of contaminated sediments.

Agronomy

Agricultural income is derived primarily from cattle raised in cow-calf and cow-calf/yearling operations. Sheep and hog farming represent a small component. On most operations, the forage produced on rangeland is supplemented through grazing on woodlands, tame pastures and hay land, and crop stubble.

Prime Farmland and Other Important Farmland

Farmland of Local Importance - These are concentrated in the fans and terraces and include areas that are too limited by climate to be included with the other designations but still produce good yields of hay and pasture. These lands make up around five percent of total acreage in the county.

Prime if Irrigated – These are on river bottoms and low terraces along the Clark Fork River and make up about 1.9 percent of total acreage.

Farmland of Statewide Importance - These are mainly found on elevated landscapes above the major river valleys and make up around 0.9 percent of total.

Prime Farmland – These are on fans and terraces east of Warm Springs and make up around 0.4 percent of soils in the county.

Mineral Resources

Mining has had a significant impact on Deer Lodge County, although perhaps more ground has been disturbed for ore processing than for the actual mines. The first smelter was completed in Anaconda in 1884, processing copper for the Butte mines. A succession of smelters was built and operated near Anaconda until final closure in1980. Mineral deposits are relatively small by comparison to the surrounding counties. Mining activity has been sporadic since 1864, although exploration for gold and silver was reported for 1992 on Dry Cottonwood Creek northeast of Warm Springs (McCulloch, 1993). Many small placer deposits in both the Flint and Anaconda Ranges have been worked with varying degrees of success, particularly in the Georgetown Lake area. A placer deposit at Cable Creek, east of Georgetown Lake, is considered to have been the richest deposit; the Dry Gulch deposit near the headwaters of Modesty Creek is considered to have been the most persistent. Gold and silver have been produced from lode mines near Georgetown Lake and in the Mill Creek and Lost Creek drainages. Most of the mineral production in Deer Lodge County has been gold and silver. Tungsten was produced from the Bonanza Mine just east of Georgetown Lake, and sapphires have been mined from the Dry Cottonwood Creek drainage. Nonmetallic deposits mined in Deer Lodge County include limestone and marble for use as a flux in smelting, tuffaceous clays for use in ceramics and as fire clay, and sand and gravel. Five wildcat wells were drilled for oil and gas in the Deer Lodge Valley. In 1984, two wells were drilled in Deer

Lodge County near Warm Springs to depths of 6,701 and 11,774 feet (2,042 and 3,589 m). Although minor amounts of oil were found, both were abandoned as dry holes. Coal is included within sedimentary interbeds of the Lowland Creek Volcanics and the Tertiary sediments. The beds are thin and impure and are not considered to be of commercial value.

Powell County Soils

The fieldwork for this soil survey (Survey Area MT644) was completed in 1989 and is made up primarily of private lands. The county also contains portions of four other soil survey areas which are comprised mainly of public lands. Soil names and descriptions were approved in 1991. Much of the information in this section is taken from the Soil Survey Manuscript. The soil survey falls within three MLRAs: 43A-Northern Rocky Mountains, 43B-Central Rocky Mountains, and 44A-Northern Rocky Mountain Valleys. Powell County average elevation ranges from 3,500 to 8,600 feet. The county includes about 1,489,231 acres and about 65 percent is forest land, 31 percent range, 3 percent irrigated cropland and pasture, and 0.5 percent non- irrigated hay land.

Other areas within the survey area that were mapped include Beaverhead National Forestlands (MT605) in the southwestern portion, Helena National Forestlands (MT631) in the eastern portion, and Lolo National Forestlands (MT603) in the northern portion. The soil survey of the Bob Marshall and Scapegoat Wilderness Area (MT633) is ongoing but not yet completed.

The Powell County survey area is located near the center of the Northern Rocky Mountains. The rugged, mountainous terrain of the Flint Creek Range to the southwest and the relatively low, rounded mountains of the Garnet Range to the east characterize the survey area. The Deer Lodge Valley separates the ranges with its broad benches sloping toward the flood plain of the Clark Fork River. In the northeastern and eastern sections of the county, the Continental Divide forms 60 miles of the border.

The Garnet Range trends west-northwest across the northern half of the survey area. The upper surface of the Garnet Range is an ancient plateau; there are only a few hundred feet of relief in the range's upper elevations. The Garnet Range contains several isolated topographic highs, including Devil Mountain with an elevation of 7,438 feet above sea level.

The Flint Creek Range is a rugged north-south trending feature located on the southwestern margin of the survey area. The Flint Creek Range is much more dissected than the Garnet Range and has a maximum relief of 4,000 feet. In the Powell County Area, the range's highest peak is Mount Powell, with an elevation of 10,168 feet. The Lewis and Clark Range extends into the northern tip of Powell County but was not included in the survey area.

The Clark Fork River, which parallels Interstate Highway 90 north through the survey area and eventually

drains into the Columbia River, drains the survey area. Tributaries enter the Clark Fork drainage from the Flint Creek, Lewis and Clark, and Garnet Ranges. The Little Blackfoot River and its tributaries drain the east-central portion of the survey area, joining the Clark Fork River at Garrison.

Parent Material

Most of the soils in the private lands portion of the county formed in alluvium from mixed sources or from material weathered from bedrock. Types of this bedrock include andesite, argillite, basalt, granite, limestone, quartzite, rhyolite, and sandstone. Soils that formed in argillites and quartzites are generally loamy. Soils weathered from some igneous rocks are generally clayey. Granitic parent materials usually form sandy soils. Soils from mixed alluvium are either clayey or loamy. Many soils in the area have accumulated lime from the parent material which can affect the availability of plant nutrients, especially phosphorus.

Prime Farmland and Other Important Farmland

Farmland of Local Importance - These are concentrated in the fans and terraces and include areas that are too limited by climate to be included with the other designations but still produce good yields of hay and pasture. These lands make up around 10 percent of total acreage in the county.

Farmland of Statewide Importance - These are mainly found on elevated landscapes above the major river valleys and make up around 3.5 percent of total.

Prime Farmland – These are on fans and terraces west of Deer Lodge and make up around 2.5 percent of soils in the county.

Prime if Irrigated – These are on river bottoms and low terraces along the Clark Fork River and make up about 1.8 percent of total acreage.

Mineral Resources

In 1852, Powell County Area was the site of Montana's first placer gold discovery near the mouth of Gold Creek. The placer deposit at the mouth of Bear Creek produced more than $7,000,000 in gold and silver before 1917. The Powell County Area ranks fourth overall in the historical production of placer gold in Montana between 1904 and 1946. Lode deposits of gold, silver, copper, lead, and zinc were emplaced with the granodiorite intrusive rocks. These deposits include replacement lodes located along the contact between granodiorite and the Cambrian and Precambrian sedimentary rocks it intruded and in veins within both the intrusive bodies and the country rocks they intruded. Commercial phosphate was mined for several years outside Garrison, near the Clark Fork River. These deposits were mined for use in fertilizer but were stopped due to fluoride emissions. Phosphate is currently being mined near Warm Springs Creek. There are no

significant oil and gas prospects located in the survey area at this time. Seven exploration holes have previously been drilled in the Deer Lodge Valley. Minor lignite deposits are contained in the Tertiary Sediments around the Rock Creek area, southwest of Garrison, and in the area near Spotted Dog Creek, west of Elliston.

Silver Bow County Soils

The field work for the Silver Bow County Soil Survey (Soil Survey Area MT670, contains parts of Beaverhead and Jefferson Counties as well) was completed in 1996 and published in 2001. This covers most of the private lands in the county. There are also portions of two other soil survey areas (MT635 and MT605) that contain mostly public lands and some inholdings of private property. Much of the information in this section is taken from the Soil Survey Manuscript. The soil survey lies within three Major Land Resource Areas (MLRA): 43B – Central Rocky Mountains, and 44B—Central Rocky Mountain Valleys.

The county includes about 574,128 acres and about 54 percent is forest land, 44 percent range, 1.0 percent non-commercial forest, 0.7 percent irrigated cropland and pasture, and 0.3 percent non-irrigated hay land.

Silver Bow County is in the Northern Rocky Mountains. This area is characterized by narrow valleys and deeply dissected mountain ranges. Valleys have an external drainage provided by an irregular network of interconnected streams.

Elk Park Valley is located northeast of Butte and has the highest elevation and most humid climate. The Continental Divide crosses its south end at 6,400 feet elevation, and Bison Creek flows northward through the valley, exiting at about 6,250 feet elevation at the north end. This valley is predominantly native range and grass hay. Summit Valley extends southeast from Butte along the base of East Ridge. Blacktail Creek flows northwest through the valley, which is dominated by industrial and residential development. The extreme southeastern end of the Deer Lodge Valley is included in the area. This portion of the valley is drained by the upper reaches of the Clark Fork River; included areas are predominantly native range. The Rocker-Divide Valley extends south from Rocker to the area near Divide. The Continental Divide crosses about the middle of the valley at an elevation of about 5,810 feet. Sand Creek flows north to Silver Bow Creek at an elevation of 5,300 feet. Divide Creek flows south to the Big Hole River at an elevation of about 5,350 feet. This valley is dominated by native range with a minor amount of residential and industrial development concentrated at the north end of the valley. The north half of the Melrose Valley is included in the soil survey area and is drained by the Big Hole River.

This area is dominantly irrigated cropland with an increasing residential development component. Part of the Big Hole Valley extending west from Divide is also included in the soil survey area. This part is a narrow, youthful valley with limited irrigated croplands along a narrow floodplain. This stream valley likely has an origin as an overflow route from the Big Hole Basin as it filled during an earlier geologic time, possibly as early as the Pliocene.

These valleys are surrounded by low rounded mountains covered with a mixed Douglas-fir (*Pseudotsuga menziesii*) and lodgepole pine (*Pinus contorta*) forest with a few parks or clearings. Fleecer Mountain lies west of the Rocker-Divide Valley and has a rounded summit that extends above timberline to 9,436 feet elevation. East of the Rocker–Divide Basin is an area of low, rounded mountains graduating to the higher relief Highland Mountains, at about 10,200 feet elevation. This range has a rugged, sharp profile due to past glaciation. East Ridge and its northern extension, Rampart Mountain, border Summit Valley to the east. The western, steeply dipping face of East Ridge reflects faulting along the western base, lifting the ridge in recent geological time. The well-defined western side of Elk Park also indicates the presence of a fault. Away from fault zones, the mountains near these valleys generally lack the rugged profile of many mountain ranges found in western Montana. The rounded profiles indicate lack of glaciation and deep weathering of uniform bedrock. The steep canyon walls and narrow valley of the Big Hole River above Divide indicate a relatively young valley or recent rejuvenation. At Maiden Rock, between Divide and Melrose, the Big Hole River cuts through resistant quartzite and soft Tertiary sediments in a meandering pattern that suggests that the river has been rejuvenated by some process relatively recently, and the present river has been imposed on the bedrock. The section of the Big Hole River from Divide to Wise River is actively downcutting as is indicated by the V-shaped section of the valley. Upstream of Wise River, the valley follows a rift valley of less resistant rocks, so the stream valley is slightly wider along this reach.

Parent Material

Most of the soils in the survey area formed in residuum derived rocks of the Boulder Batholith and associated volcanic and metamorphic rocks. Farmable soils are dominantly found on the Tertiary sediments of the valley floors with thinner soils found over bedrock in the surrounding mountains. Elk Park and Summit valleys are underlain by Quaternary alluvium composed dominantly of sand from weathering of the surrounding of granite bedrock.

Agronomy

Silver Bow County contains a very limited amount of cropland. The primary land use for tilled acreage is pasture or hay land. Acreage is usually cropped for the purpose of maintaining pasture or hay land. Cropland and pasture are predominantly flood irrigated. Wet soils are mainly used for hay production and pasture.

Sub irrigated meadows are used for wintering cattle and for early spring grazing. Prime Farmland and Other Important Farmland

Prime Farmland - There is no Prime Farmland in Silver Bow County. Prime if Irrigated – There are only 38

acres that qualify for this designation.

Farmland of Statewide Importance - These are mainly found on elevated landscapes above the major river valleys and make up around 1.1 percent of total.

Farmland of Local Importance - These are concentrated in the fans and terraces and include areas that are too limited by climate to be included with the other designations but still produce good yields of hay and pasture. These lands make up around 0.7 percent of total acreage in the county.

Mineral Resources

The Summit Valley District (Butte) is the location of a world-class copper, molybdenum, and base and precious metals deposit. The district ranks as one of the top 10 deposits in the United States for copper, silver, lead, zinc, and manganese. In 1864, placer gold was discovered in the district. By 1874, the importance of the silver deposits was recognized. By 1879, copper became the target for development with the completion of effective smelters. Copper output reached its peak in 1917 during exploitation of the large Main Stage Veins for which the district is famous. Copper and silver were later followed by zinc and manganese. Current open-pit production is from disseminated, porphyry style copper and molybdenum mineralization.

Limited areas of placer mining for gold are found in the northern part of the Rocker-Divide Valley. These areas were likely expensive to mine due to lack of nearby water supplies and not very productive. The old, unreclaimed excavations are still visible from local roads. In this area, near the intersection of Interstates 90 and 15, is an area of gossan (oxidized iron minerals), an alteration that has been heavily prospected but nonproductive. A minor amount of hard-rock silver and lead mining took place in the area east of Melrose, but there are no active mines in this area as of 2009. Small areas of placer mining and hard-rock prospecting took place along parts of Camp Creek east of Melrose and at Moose Town on Moose Creek. Glendale, located on Trapper Creek west of Melrose, was the site of an early silver-lead smelter. This smelter served area mines, mostly located farther west in the Pioneer Mountains at Hecla. For many years, phosphate was mined around Maiden Rock. Phosphate ore was shipped near Rocker, where elemental phosphorus and other products were made. These operations have been closed and mostly reclaimed. Quartzite from the Quadrant Formation was also mined at Maiden Rock for use as a flux for the phosphorus operations.

Water

Precipitation

Mean annual precipitation in Powell, Deer Lodge, and Silver Bow Counties ranges from ten inches to over 60 inches. Generally, precipitation is lowest in the valleys and increases with elevation. Approximately 67 percent of annual precipitation falls during the growing season.

Rivers, Streams, and Lakes

Powell County drains into the Clark Fork River Watershed. The southern portion of the county drains into the Clark Fork River, Little Blackfoot River, and associated tributaries. The central portion of the county drains into the Blackfoot River system including the major tributaries of Nevada Creek, Douglas-Cottonwood Creek, Monture Creek, and the North Fork of the Blackfoot River. The northern portion of the county drains into the South Fork of the Flathead River (See Appendix 1).

Browns Lake and Kleinschmidt Lake are two large intermountain basins located five miles southeast of Ovando, just south of Highway 200. Intermountain pothole wetlands are abundant throughout this portion of the Blackfoot River Valley.

Nevada Creek Lake is a reservoir constructed on Nevada Creek in 1938 to provide irrigation water. It is located approximately eight miles southeast of Helmville along Highway 141.

Deer Lodge County drains into the Missouri River and Columbia River Watersheds. The eastern slope of the Continental Divide flows into the Big Hole River, a tributary to the Jefferson River that combines with the Gallatin and Madison Rivers to form the Missouri. Notable tributaries to the Big Hole drainage include Pintlar Creek, Mudd Creek, Fishtrap Creek, LaMarche Creek, Seymour Creek, Deep Creek, and Bear Creek. The west slope of the Continental Divide flows into the Columbia Basin via the Clark Fork River and its tributaries.

Interestingly, various sections of the Clark Fork River have had different names over the years. For the purposes of this plan, we will consider the Clark Fork to begin at the confluence of Silver Bow and Warm Springs Creeks in Deer Lodge County. Other notable tributaries to the Clark Fork in Deer Lodge County include Willow Creek, Mill Creek, Lost Creek, and Racetrack Creek.

Georgetown Lake is a 2,818-acre impoundment on the North Fork of Flint Creek on the border of Granite and Deer Lodge Counties. It was originally created in 1885 to produce power for the town of Philipsburg and nearby mining operations. In the early 1900s the dam provided power to the Anaconda Copper Mining Company and the smelter in Anaconda.

Silver Bow County is split into the Missouri and Columbia Watersheds by the Continental Divide. Silver Bow Creek and its tributary, Blacktail Creek, form the upper reaches of the Clark Fork drainage. Other notable tributaries to the Clark Fork include Browns Gulch Creek, Sand Creek, and German Gulch Creek. Streams flowing from the east slopes of the divide are tributaries to the Big Hole River and Jefferson River. Camp Creek and Divide Creek flow into the Big Hole River. Fish Creek flows into the Jefferson River. Mining operations have greatly affected surface waters in Silver Bow County. A 1950s water resources survey indicated that many springs and streams had dried up due to mining operations apparently dropping the water table. Silver Bow Creek was also so polluted that it was unsuitable for agricultural uses.

The Berkeley Pit is in Butte. A former open pit mine, it is about 1 mile long, half a mile wide, and 1,780 feet deep. It is filled to a depth of 900 feet with water. Yankee Doodle Creek, previously a tributary to Silver Bow Creek was diverted due to the construction of the pit. The pit is heavily acidic and contaminated with arsenic, cadmium, copper, zinc, and lead.

Mountain lakes are common throughout the three counties and provide many benefits which include sustaining stream flows, wildlife habitat, and recreation. Most of these lakes are located on public land, primarily in national forest.

Impaired Waters

The Montana Department of Environmental Quality is required by the Clean Water Act to assess Montana's water quality and prepare a report every two years. The Montana Water Quality Report and List of Impaired Waters (known as the Integrated Report) combines reporting information for the Clean Water Act Section 305(b) assessment of water bodies and the Section 303(d) list of water bodies that do not meet water quality standards. Water bodies not meeting standards need pollution reduction studies, called Total Maximum Daily Loads (TMDLs). TMDLs also include plans to improve water quality to eventually meet standards. Although TMDLs have not been completed for all the impaired streams in Deer Lodge, Powell, and Silver Bow counties, there is sufficient information available to identify impairments. These can be found in the most recent Integrated Report on Montana DEQ's website http://deq.mt.gov/Water/Resources/Report.

Irrigation

Large-scale irrigation projects began in conjunction with mining development in the late 1800s and through the 1900s. The mining industry and its associated communities required agricultural development for a food supply, and therefore irrigation projects were developed in a semi-arid region. In North Powell County, the Nevada Creek dam and reservoir were built in 1938 through the New Deal, and much of Nevada Creek has since been mechanically altered to facilitate irrigation. The impacts of irrigation have drastically altered the hydrology of the counties and continue to affect watercourses today.

Agricultural irrigation is the largest water use in the Clark Fork River Basin. Irrigation occurs primarily via flooding through an outdated, under-maintained system of ditches and canals, but also through direct pumping from the Clark Fork and Blackfoot Rivers and associated tributaries. Many irrigators have already converted some of the flood irrigation to sprinkler which includes hand lines, wheel lines, and pivots. However, a large percentage of fields are still irrigated by flooding (See FLU maps in the Appendix). The most common type of irrigated cropland is pasture and hay.

Flood irrigation in the basin 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 of other areas. Flood irrigation on uneven topography 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 and eventually into the Clark Fork River.

In addition to inefficiency and runoff, the negative impacts of flood irrigation to aquatic ecosystems are significant. Flood irrigation infrastructure has created many barriers to fish survival (bull trout and west slope cutthroat trout in particular) and fish passage due to dewatering, elevated temperatures, disconnected tributaries, and lack of fish screening. Many streams have also been straightened and altered leaving little water for both fish and irrigation during late summer and early fall.

Water quantity is a serious issue in Powell, Deer Lodge and Silver Bow Counties for several reasons. The basin receives very little precipitation in the form of season rainfall and lacks significant reservoir storage. The main source of water is snowmelt, which in recent years, has decreased from historical levels. A combination of low precipitation levels and over-appropriation of water rights has created a situation of excessive dewatering as well as some conflict between water users, regulatory bodies, and non-governmental organizations. The State of Montana closed the basin to new water permits in 1995, but the effects of over- appropriation continue to be substantial.

Wildlife

Deer Lodge, Powell, and Silver Bow Counties are home to a wide array of wildlife species. Iconic species of the Rocky Mountains such as grizzly bears, elk, bighorn sheep, and cutthroat trout are common in the area. This assemblage of wildlife, complete with a full array of large ungulates and predators, adds recreational and aesthetic values to many properties. However, it also presents challenges due to conflicts with agricultural interests. Despite problems with competition for forage, livestock predation, and fence damage, healthy wildlife populations and habitat are a goal for most landowners.

Montana's State Wildlife Action Plan (SWAP) identifies community types, focal areas, and species in Montana with significant issues that warrant conservation attention. The SWAP is meant to guide conservation throughout Montana and is a great reference for managing wildlife within the tri-county area.

Federally Listed Species

The U.S. Fish and Wildlife's Service's (USFWS) Ecological Services Division lists the following threatened species as present within areas of Deer Lodge, Silver Bow, and Powell Counties: bull trout (*Salvelimus confluentus),* Canada Lynx *(Lynx canadensis)*, Grizzly Bear *(Ursus arctos hoibilis),* and red know (*Calidris*

canutus rufa). None of Montana's federally endangered species are known to reside within these counties but one candidate (wolverine, *Gulo gulo luscus)* and one proposed species (whitebark pine, *Pinus albicaulis*) are considered present.

As of October 2019, the grizzly bear is listed as a threatened species under the Endangered Species Act in all three counties. Although grizzly bears remain under the jurisdiction of the USFWS, much of the day-to-day management is done by FWP within the bounds of what listing allows. Grizzly bear recovery in the Northern Rocky Mountains is facilitated by the Interagency Grizzly Bear Committee (IGBC). The IGBC covers five different recovery ecosystems, one of which is the Northern Continental Divide Ecosystem (NCDE). Northern Powell County occurs within the NCDE. The NCDE Subcommittee is comprised of the USFWS in cooperation with FWP, the U.S. Forest Service (USFS), National Park Service (NPS), Bureau of Land Management (BLM), Blackfeet Tribe, and Confederated Salish and Kootenai Tribes. The NCDE has a target goal of 500 or more grizzly bears for the 17 counties that make up the NCDE. Grizzly bears are mainly located in the northern part of Powell County. The Garnet Mountains and the Bob Marshall Wilderness make up the main grizzly bear population center in Powell County, with occasional sightings in the lower surrounding areas. Grizzly bears have been frequenting the valley floor, especially around Helmville, in search of food. An important part of any grizzly bear recovery plan is to limit human-bear conflicts.

Bull trout is listed as a threatened species in Powell, Deer Lodge, and Silver Bow Counties. Bull Trout require the "5 C's" which are clean, cold, clear, complex, and connected habitat. Because of their specific habitat needs, they are more vulnerable to environmental degradation than other fish species. Their numbers have severely declined due to habitat loss and human caused habitat degradation. FWP, Montana Department of Natural Resources and Conservation, National Wildlife Federation, USFWS, U.S. Forest Service, and many other organizations have developed the "Restoration Plan for Bull Trout in the Clark Fork River Basin and Kootenai River Basin Montana". This comprehensive plan is intended for the management, conservation, and restoration of bull trout and their habitat. Bull trout exist in low numbers in the upper end of the Clark Fork River drainage because of severe habitat degradation by contamination of heavy metals from past mining efforts in the area. This human caused habitat degradation starts in Silver Bow County, continues into Deer Lodge County, and then into the Clark Fork River in Powell County.

Figure 1. Montana Bull Trout Distribution

The Clark Fork River, an important foraging, migrating, and overwintering bull trout habitat, is currently undergoing a 43-mile long "clean-up" process administered by the Montana Department of Environmental Quality. The heavy metals (cadmium, copper, zinc, and lead) and arsenic in the Clark Fork River are from historic mining, milling, and smelting processes linked to the Anaconda Company operations

in Butte and Anaconda. The clean-up area in Powell County ranges from the headwaters near Warm Springs Creek to the Powell County/Granite County border.

Fish

According to the FWP Statewide Fisheries Management Plan, west slope cutthroat trout are present in many of the tributary streams in the Upper Clark Fork. Angling restrictions and habitat improvements in the Little Blackfoot and Silver Bow drainages have sought to improve west slope cutthroat numbers in these areas. Many of the cutthroat populations in the Upper Clark Fork show little to no hybridization with introduced rainbow trout. Additionally, fluvial forms remain in several locations. While west slope cutthroat trout are relatively uncommon in the mainstem of the Upper Clark Fork River, the species does provide a unique fishing opportunity in a river largely dominated by brown trout. Information is lacking on the abundance and life histories of mountain whitefish and non-game native fishes. Efforts are needed to describe these and monitor trends.

Arctic Grayling have been identified by FWP as a high priority species of concern in Montana. The Big Hole River, that drains portions of southern Silver Bow and Deer Lodge counties, is a stronghold for this species in the upper Missouri River watershed. In 2010 the USFWS determined that the upper Missouri River basin Distinct Population Segment of Arctic Grayling warranted protection under the ESA, but listing was precluded by higher priority species. Due to efforts of numerous conservation partners and NRCS, the USFWS determined in 2014 that listing was not warranted for the Big Hole population of Arctic Grayling. Despite this victory for conservation there is still work to be done to improve habitat conditions for grayling and other aquatic species in the Big Hole watershed.

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 cutthroat trout. Irrigation return flows adversely affect every major stream including the Clark Fork River. Many streams are dewatered each year due to irrigation uses. Numerous opportunities exist to improve water quality and overall aquatic habitat within the tri-counties and specifically within the Clark Fork River Superfund Site.

State Species of Concern (SOC)

Powell County has an extensive variety of wildlife and plants. According to the Montana Natural Heritage Program (MNHP), there are 550 species of animals, of which five are Species of Concern. These include 253 species of birds, 32 of which are species of concern (SOC); 204 species of invertebrates with eight SOC; 66 species of mammals with 13 SOC; 15 species of fish with two SOC; six species of reptiles; and six species of amphibians with one species of concern (see Appendix 6).

There are also 765 species of plants in Powell County, of which 38 are SOC. Most of these are vascular plants (35 SOC) but do include bryophytes (three SOC), lichens, and algae (see Appendix 7).

Deer Lodge County also has an abundance of animals present with a total of 487 species, of which 41 are SOC. These include 245 species of birds with 22 SOC; 155 species of invertebrates with four SOC; 63 species of mammals with eleven SOC; 17 species of fish with three SOC; four species of amphibians with one SOC; and three species of reptiles (see Appendix 8).

There are also 432 species of plants in Deer Lodge County, of which 39 are SOC. Vascular plants make up 429 species, with 32 SOC (see Appendix 9). The remaining species of plants are algae and bryophyte with four SOC.

Of the three counties, Silver Bow County has the lowest number of animal species present with 418, of which 36 are SOC. These include 198 species of birds with 19 SOC; 135 species of invertebrates with two SOC; 60 species of mammals with eleven SOC; 15 species of fish with two SOC; six species of reptiles with one SOC; and four species of amphibians with one SOC (see Appendix 10).

Silver Bow County also contains 397 species of plants, of which 14 are SOC. Most of these are vascular plants (394 species), with 15 SOC (see Appendix 11). There are also two species of algae and one species of bryophyte.

Important Bird Areas

A global initiative of BirdLife International and implemented by Audubon in the U.S., the Important Bird Areas Program (IBA) is an effort to identify and conserve areas that are vital to birds and other biodiversity. Within the tri-county area, there is one IBA, the Blackfoot Valley (13,370 acres total; ten percent under private

ownership). The Blackfoot Valley is an area of intermountain grasslands and glaciated potholes set in the heart of the Rocky Mountains. This area is important for waterfowl and grassland birds and is the site of trumpeter swan reintroductions. Over 200 species of birds have been recorded in this area.

Conservation Easements and Similar 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 three focus counties. Powell County contains the most with 158,173 acres (11%) under some form of conservation easement. Of those acres, 60,480 are associated with private landowners and the remainder held by the State of Montana (35,569) and the federal government (U.S Fish and Wildlife Service holds 62,124 acres).

Deer Lodge County contains the second highest amount of conservation easements with 7,628 acres -- two percent of the total county acreage. Most of those acres, 5,357 to be exact, are associated with private easement holders (land trusts, animal conservation organizations, etc.). The NRCS holds all federally-owned conservation easement rights in the county with 620 acres.

Silver Bow County holds 3,520 acres (1%) acres of conservation easements with 3,417 of those being under private ownership. The remaining acres (103) are associated with federal oversight and consist of one Wetlands Reserve Program easement managed by NRCS.

Besides easement acres, other privately-owned designated conservation lands in the three counties include 5,202 acres owned by The Nature Conservancy and 5,575 acres owned by The Blackfoot Challenge, both in Powell County.

Riparian Areas/Wetlands

Wetlands are amongst the most important and beneficial ecosystems on the landscape. Wetlands provide critical biological, ecological, and economic benefits including flood attenuation, water filtration, carbon sequestration, and drought resiliency. Further, wetlands are home to 31 percent 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 US are also associated with wetlands. Deer Lodge, Powell, and Silver Bow Counties contain a diverse array of wetland types. A total of 105,600 acres of wetlands can be found within the three 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 5: Wetland acres in the three counties

	Wetland Acres by Type			
	Palustrine	Lacustrine	Riverine	Riparian
Deer Lodge	15,555	3,398	834	5,691
Powell	45,178	2,803	5,057	15,653
Silver Bow	5,637	1,738	455	3,601

Riparian Areas are some of the most productive and resilient ecological systems in Montana, but they are also subject to degradation. Wildlife, livestock, and humans have concentrated their activities on riparian areas for millenniums due to the availability of water. Riparian areas also provide valuable travel corridors, wildlife habitat, floral and faunal diversity and thermal refugia. Riparian areas throughout the tri-counties have been degraded due to mining, livestock concentration, manipulation for irrigation, and development.

Noxious and Invasive Species

All three counties host a large variety of noxious and invasive species issues, and total treatment and control of all invasive species in all areas is likely infeasible. 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.

Vegetative Weed Species

Powell, Deer Lodge and Silver Bow Counties are home to a wide diversity of both annual and perennial weed species. Notable weed species include black henbane, sulfur cinquefoil, tall buttercup, whitetop, yellow toadflax, dalmatian toadflax, houndstongue, field bindweed, leafy spurge, Canada thistle, spotted knapweed, St. Johnswort, and common caraway.

One weed that is spreading rapidly in Powell and Deer Lodge Counties is common caraway (*carum carvi*). Common caraway is an introduced seed crop that has become an invasive weed throughout the West. Caraway likes wet areas, which is why it is a problem in irrigated hay fields and pastures in Powell and Deer Lodge Counties. The basal rosette of caraway impedes grass and alfalfa growth by spreading across the soil surface. The plant is not well-utilized by livestock. Few control methods are known and mainly rely on herbicides, irrigation reduction or cessation and grazing deferment. Small infestations can be controlled by hand-pulling

before seed-set.

It is important to remain vigilant regarding new and invasive weeds. New weed species of particular concern include the annual grass ventenata (*Ventenata dubia*). Ventenata has been recently observed in Powell County and is known to take over native range, pastures, hay fields, and right of ways. In Idaho, where ventenata has become established, the state has seen a 50 percent decrease in production of land that this species has invaded (MSU Extension, 2018).

Aquatic Invasive Species

Aquatic invasive species (AIS) are not yet prevalent within the tri-county area. FWP lists curlyleaf pond weed as the only aquatic invasive plant in the Clark Fork River drainage. http://fwp.mt.gov/fishAndWildlife/species/ais/speciesId/default.html

In addition to vegetative AIS, 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. There have not been any detections of zebra or quagga mussels in the three counties yet. However, vehicles with boats passing through the area, and inspected at the local check station, have been found to contain invasive mussels.

Rangeland

In all three counties, rangeland makes up a large and critical portion of both the ecosystem and economic base. Range condition varies, but large areas of rangeland have been seriously degraded through continuous, season-long grazing, overstocking and lack of winter grazing opportunities. Lack of proper land management has led to significant reductions in rangeland quality and production over the past 160 years. Poor grazing management, invasive species, and changes in the fire regime resulting in conifer encroachment, are responsible for rangelands moving away from climax plant communities. Bunchgrass populations have decreased and have been frequently replaced with less desirable grasses, shrubs, and weeds. Exotic species such as timothy, redtop, smooth brome, orchardgrass and crested wheatgrass were planted for hay and pasture. These plants have displaced native rangeland vegetation in some areas, mostly in valley bottoms. Spotted knapweed, sulphur cinquefoil, leafy spurge, houndstongue, Canada thistle and other noxious weeds are common within the rangelands of the three counties, as well as annual grasses such as cheatgrass and Japanese brome. Ventenata, a new invading annual grass, poses a significant threat to native bunchgrass communities.

Achieving healthy, sustainable rangelands through proper grazing management is an important management concern in the area. Implementation of rotational grazing systems is necessary to improve and/or maintain the kinds and amounts of native plants that make up the historic native plant communities. Similarity index is often

less than 50 percent on greater than 50 percent of the rangeland acres. Production on many of the ecological sites in the survey areas is below the potential of what those sites can produce when in their historic climax condition. Much of the acreage was once dominated by tall-growing and high-producing bunchgrasses.

Presently it is dominated by low producing native grasses, introduced grasses, weeds, and brush. The amount of forage produced on these low similarity index sites can be as low as one-third of the potential annual production.

Livestock grazing management is of key importance in protecting existing range resources. Livestock herd rotation and varied grazing season usage are important tools that landowners can utilize 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.

Rangeland Characteristics by County

Silver Bow County

Approximately 30 percent of Silver Bow County supports rangeland vegetation and contains an additional ten percent of grazeable forest understory. Cow/calf operations are the major type of livestock enterprise, constituting about 92 percent of farm income. Native rangeland is used primarily for grazing by domestic livestock; however, it also is used as wildlife habitat, recreational areas and has esthetic value.

Powell County

Range, which includes rangeland, grazeable forestland, and native or naturalized pasture, is the dominant land use in the Powell County Area. Most farm income is derived from cattle. Cow-calf and cow/calf-yearling operations are the major types of livestock enterprises. Several ranches include farm flocks of sheep in their operations.

Deer Lodge County

Rangeland makes up about 47 percent of the land area in the Deer Lodge County Area. Agricultural income is derived primarily from cattle raised in cow-calf and cow-calf/yearling operations. On most operations, the forage produced on rangeland is supplemented through grazing on other land uses. These include woodlands, irrigated and dry tame pastures, hay land aftermath, and some crop stubble. In winter, livestock are fed hay that is produced on the unit or purchased locally. A five- to six-month winter feed period is common throughout the area.

Major Land Resource Area Vegetation Descriptions

Portions of MLRAs 43AA, 43AB, 43B, 44AA, and 44AB overlap with the three counties (please also refer to the MLRA map in Appendix 2). Common grassland communities are as follows:

43AA – Bluebunch Wheatgrass Community

Bluebunch wheatgrass, rough fescue, needle-and-thread, needlegrass, prairie Junegrass, Sandberg bluegrass, sedge species

43AB – Rough Fescue Community

Rough fescue, bluebunch wheatgrass, Idaho fescue, green needlegrass, needle-and-thread, needlegrass species, prairie Junegrass, Sandberg bluegrass, western wheatgrass, thickspike wheatgrass, sedge species

43B-Rough Fescue Community

Rough fescue, bluebunch wheatgrass, Idaho fescue, Sandberg bluegrass, needlegrass species, oatgrass, prairie Junegrass, sedge species

44AA-Bluebunch Wheatgrass Community

Rough fescue, needle-and-thread, green needlegrass, Sandberg bluegrass, prairie Junegrass, western wheatgrass, thickspike wheatgrass

44AB-Taller Bunchgrass Community

Rough fescue, bluebunch wheatgrass, Idaho fescue, green needlegrass, needle-and-thread, needlegrass species, prairie Junegrass, Sandberg bluegrass, western wheatgrass, thickspike wheatgrass, sedge species

Common Forbs for all MLRAs:

Western yarrow, cudweed sagewort, lupine, rosy pussytoes, Missouri goldenrod, aster, arnica, prairie smoke, nineleaf biscuitroot, bitterroot, larkspur, penstemon species, buckwheat, western stoneseed, arrowleaf balsamroot, milkvetch species, mariposa lily, field chickweed, meadow deathcamas, phlox species, potentilla, Indian paintbrush

Common Shrubs for all MLRAs:

Fringed sagewort, Wyoming big sagebrush, rubber rabbitbrush, green rabbit brush, Woods' rose, antelope

bitterbrush, common snowberry, Saskatoon serviceberry, chokecherry, currant,

Forestland

The forests of the three counties occur at the intersection of several regional forest boundaries (as described in Stephen Arno's *Forest Regions of Montana*). Douglas-fir dominate the dry forests and lodgepole pine increasingly prevails as the elevation rises. Limber pine, subalpine fir, grand fir, spruce, and alpine larch add a splash of diversity, cottonwoods line the riparian zone and aspen groves can be quite prolific.

Common understory vegetation in the Douglas-fir forest includes arnica, false Solomon's seal, western meadowrue, bluebunch wheatgrass, elk sedge and Idaho fescue. In the lodgepole pine forest, pinegrass, elk sedge, grouse whortleberry, huckleberry, kinnikinnic, snowberry, and Oregon grape are common components.

Forest ownership by county:

Deer Lodge County is approximately 51 percent forested. Ninety-one percent of the forested acres are a combination of federal and state land. Approximately 22,000 acres are privately owned.

Powell County is 65 percent forested. Eighty percent of the forested acres are a combination of federal and state land. Approximately 165,000 acres is privately owned.

Silver Bow County is 54 percent forested. Seventy percent of the forested acres are a combination of federal and state land. Approximately 27,000 acres is privately owned.

The natural, uninhibited fire regime for the Douglas-fir forests consisted of fire-free intervals of about 45 years, with low to moderate intensity fires that maintained forests in a state where the tree species, spacing between trees, and understory vegetation adapted well to fire. Lodgepole pine forests traditionally experienced a longer duration fire interval ranging from 100 to 500 years. These fires were generally stand-replacing events.

A century of fire suppression and manipulation of the natural disturbance mechanisms left many forests (both public and private) in a state where fires quickly surpass the historic norm and become high severity stand-replacement fires. The trend toward more catastrophic wildfires in the urban interface is common knowledge. Each county has a Community Wildfire Protection Plan that discusses this topic in detail.

Forest insect and disease issues are ever-present and in a constant state of flux. The current primary culprits in these counties include bark beetles and spruce budworm. The manipulation of disturbance mechanisms has increased the number of trees per acre far beyond those found in the natural system. The increase in tree stocking creates an environment that is more susceptible to insects, disease, and wildfire. This situation complicates and limits forest management options.

Superfund Site

The headwaters of the Clark Fork River are located in and around the towns of Butte and Anaconda. From the mid-1800s through most of the 1900s this area was home to a vast array of mining and smelting operations.

Although these mines supplied much of the country with necessary metals to fuel the industrial revolution, they also caused extensive pollution in the form of heavy metals in mine tailings, sediments, and ground and surface water. In 1908, a massive flood washed tons of contaminated sediments down the Clark Fork River to be deposited throughout the floodplain and captured at the Milltown Dam near the confluence of the Clark Fork and Blackfoot Rivers. After much litigation, the areas around Butte, Anaconda, and 120 miles of the Clark Fork River floodplain now make up the largest Superfund complex in the United States. Current extensive restoration work is being done by Montana DNRC on the upper Clark Fork River.

In 1983, the State of Montana filed a lawsuit against the Atlantic Richfield Company (ARCO) for injuries against the state's natural resources in the Upper Clark Fork River Basin (UCFRB). In 1989, the EPA filed another lawsuit to establish ARCO's liability for remedial cleanup in the UCFRB. The Natural Resources Damage Program (NRDP) pursued the natural resource damage litigation against ARCO on behalf of the state. Settlements were completed in 1999, 2005, and 2008. The 1999 settlement provided resource damages that established the UCFRB Restoration Fund. This fund is administered by the Governor of Montana and is established to restore, rehabilitate, replace, or acquire the equivalent of the injured natural resources of the UCFRB. Expenditure of these funds is guided by the Upper Clark Fork River Basin Aquatic and Terrestrial Resources Restoration Plans, updated February of 2019.

Section III. Conservation Activity Analysis

Recent NRCS Work

NRCS work in the tri-county area has historically focused on meeting the needs of the Local Working Group's priorities. These priorities have shifted between grazing, irrigation, forestry and weed control over the past twenty years. The projects covering the most acreage during the last two decades are prescribed grazing (251,467 acres) and herbaceous weed control (48,549 acres). Other common practices include grazing-related practices such as fencing (100 miles), livestock pipeline (58 miles) and watering facilities (201 total) (Table 6). Multiple other practices have been contracted to lesser extents. While high tunnels have been rare in the past, they are increasing due to improved funding and national initiatives.

Table 6. NRCS EQIP implementation of commonly applied practices from 2000 to 2020.

Practice Name	Unit Type	Applied Amount	Number of Projects
Prescribed Grazing	Ac	251,467	77
Herbaceous Weed Treatment/Pest Management	Ac	48,549	175
Fence	Mi	100	5
Livestock Pipeline	Mi	58	71
Irrigation Pipeline	Ft	17,630	5
Irrigation Water Management	Ac	6,717	35
Forest Stand Improvement	Ac	4,426	44
Forage Harvest Management	Ac	4,272	11

Woody Residue Treatment	Ac	3,389	86
Sprinkler System	Ac	1,832	17
Animal Trails and Walkways	Ac	1,727	6
Forest Stand Improvement	Ac	687	113
Fuel Break	Ac	627	27
Nutrient Management	Ac	487	7
Watering Facility	No	201	168
Brush Management	Ac	177	5
Pumping Plant	No	64	26
Spring Development	No	51	50
Structure for Water Control	No	49	14
Critical Area Planting	Ac	15	7
Water Well	No	8	8
Seasonal High Tunnel System for Crops	No	2	2
Irrigation System, Microirrigation	Ac	.2	1

Partners

The Clark Fork Coalition

(This is a summary from the Clark Fork Coalition website. For more information visit https://clarkfork.org/) The Clark Fork Coalition achieves its mission by protecting clean water, restoring degraded waterways, and engaging people in the critical work of caring for their rivers. Those strategies are grounded in a deep commitment to collaboration and a strong dedication to win-win solutions. We ensure our work is science-based, community-focused, stakeholder-informed, and fueled and sustained by diverse partnerships. That's been a winning solution for the river since 1985, and we're proud of what we've accomplished together. Here are some highlights:

-Launching a world-class restoration of the Upper Clark Fork River by winning a $200 million settlement to clean up toxic mining wastes along 56 miles of river, while securing $77 million to restore the area to health.

-Removing Milltown Dam near Missoula and restoring the historic confluence of the Clark Fork and Blackfoot rivers.

-Leading community-based opposition to dangerous large-scale mines proposed for the headwaters of the Blackfoot River and beneath the Cabinet Mountains Wilderness.

-Pioneering cleanup and restoration on a working cattle ranch at our Dry Cottonwood Creek Ranch in the Deer Lodge Valley.

-Directly engaging thousands of people caring for their river through education programs and a vibrant and active Volunteer River Corps.

-Re-watering and reconnecting tributaries to main-stem rivers by brokering voluntary water transactions that have returned billion gallons of water to thirsty streams since 2003.

-Improving water quality, removing fish barriers, improving irrigation efficiency, and enhancing fish and wildlife habitat by working with private and public landowners to restore streams in the Bitterroot, Blackfoot, Nine Mile and Upper Clark Fork.

The Blackfoot Challenge

(This is a summary from the Blackfoot Challenge website. For more information visit http://blackfootchallenge.org/)

Based in Ovando, the Blackfoot Challenge is a private conservation organization that has been focusing on the

Blackfoot River valley for approximately 20 years. There projects have included Trumpeter Swan restoration, predator depredation mitigation, wetland and riparian restoration, forest management, drought resiliency and conservation easements.

Watershed Restoration Coalition

(This is a summary from the Watershed Restoration Coalition website. For more information visit http://www.mt-wrc.org/)

The WRC was formed in 1999 to work with private landowners on projects that conserve and restore the resources in the Upper Clark Fork Watershed in western Montana. The watershed stretches from Butte to Garrison, encompassing the uppermost 120 miles of the Clark Fork River, as well as the valley's many creeks, forests, ranchlands, and people.

We focus on preserving the large, intact landscapes that support this region's agricultural way of life, and that provide critical habitat for western Montana's world-class fish and wildlife.

We help landowners put in place practices and projects that improve their agricultural operations as well as the valuable water and land near their home. Our projects leverage multiple funding resource because we partner with state and federal agencies, local conservation districts, and nonprofits. Some examples of our projects include:

East Valley Watershed Project (2003-2006): 16 off-stream stock water pipelines installed, several corrals moved, and monitoring setup for 7 large ranches.

Upper Clark Fork River Tributaries TMDL (2007-2010): determined the health of all tributaries in our watershed, as well as cataloged sources of impairment.

East Deer Lodge Forest Stewardship Project (2008-2011): developed a collaborative plan to sustainably harvest timber and restore streams on 40,000 acres of U.S. Forest Service lands.

Integrated Watershed Restoration Projects (2011 to present): installed new stock water pipelines and tanks, fish- friendly irrigation diversions, water conservation/irrigation upgrades, riparian enhancements, and much more.

*Upper Clark Fork Drought Resiliency Regional Conservation Partnership Program (RCPP) (*2017 to present*):* Created by the 2014 Farm Bill, the Regional Conservation Partnership Program (RCPP) is a partner-driven, locally led approach to conservation. It offers new opportunities for USDA's Natural Resources Conservation Service (NRCS) to harness innovation, welcome new partners to the conservation mission, and demonstrate the value and efficacy of voluntary, private lands conservation. Funded projects will be completed by the end of 2025.

Conservation Districts

Three conservation districts cooperate with the Deer Lodge NRCS field office. The Deer Lodge Valley Conservation District serves the Upper Clark Fork Watershed in Powell and Deer Lodge. The North Powell Conservation District serves the northern portions of Powell County. Mile High Conservation District serves Silver Bow County. All three conservation districts work closely with NRCS in an advisory capacity to steer conservation priorities.

Section IV. Priority Resource Concerns

Recent Local Work Group (LWG)Meetings

The following natural resource concerns were identified by the local work groups convened by the Deer Lodge Valley, North Powell, and Mile High Conservation Districts in 2021.

North Powell Conservation District:

The North Powell conservation District convened the local work group on June 7, 2021 and has listed the following resource concerns for the county: Fuels reduction, forest stand improvement, aspen regeneration, riparian health, conifer encroachment, irrigation improvements, pest pressure: weeds, wildlife habitat improvements, soil health, and grazing management.

Mile High Conservation District:

The Mile High Conservation District convened the local work group on September 27, 2021 and has listed the following resource concerns for Silver-Bow County: Fuels Reduction, Forest Stand improvement, aspen regeneration, riparian health, conifer encroachment, irrigation improvements, weeds, wildlife habitat improvements, soil health, and grazing management.

Deer Lodge Valley Conservation District:

In 2021 the Deer Lodge Valley Conservation District opted to mail out a survey rather than convene the local work group in person due to COVID19 concerns. Nineteen responses were received from the survey. The results were collected on July 16, 2021. The number one resource concern among ranchers, farmers, private landowners, and forest owners is the degraded plant condition that is occurring on forest land. Plant pest pressure on forest land was also specifically listed as a concern. The resource concern that came in second was degraded plant condition on pastureland and rangeland. The category that received the 3rd most votes was the Livestock: Inadequate Feed and Forage.

The results of the 2021 local work group meetings are used to augment the priority resource concern list for the Deer Lodge NRCS Field Office. The Priority Resource Concerns are as follows:

Project Type: Forestry- Fuels Reduction

Resource Concern: Wildfire Hazard from Biomass Accumulation

Concern Description: Decades of fire suppression, forest management and human development have created forest conditions ill-adapted to a healthy fire regime. Fuels reduction to decrease wildfire risk is a concern anywhere that human dwellings and structures interface with forestland. As more people move into the suburban and exurban forest, there is an increased risk to human safety associated with wildfire. Moreover, fire management resources must be used to address areas of human habitation as a top priority in the event of wildfires.

Trend: Human populations continue to expand into the forest/exurban interface which increases risk and need for fuels reduction. Fuels continue to accumulate through fire suppression. Forests shift to less fire adapted species compositions and stand densities.

Potential Conservation Practices: Fuel Break (383), Forest Stand Improvement (666), Woody Residue Treatment (384)

Desired Future Conditions: Reduced wildfire risk, fire adapted forest ecosystems, societal acceptance of prescribed and natural fire on the landscape.

Objective: Reduce the wildfire risk to life and property.

Project Type: Forestry - Forest Stand Improvement

Resource Concern: Plant Productivity and Health, Plant Structure and Composition

Concern Description: Forest stand improvement projects that reduce disease and insect risk and/or increase vigor and quality are a priority with forest landowners. However, intermediate treatment of timber stands is labor intensive and generally low profit for contractors, making the jobs undesirable.

Trend: Forests, like most ecosystems, are in a constant state of change. Often, management actions are driven by economics rather than conservation. Consequently, there is a perpetual need for practices such as intermediate treatments thinning of young stands that improve conditions but cost money rather than make money.

Potential Conservation Practices: Forest Stand Improvement (666), Woody Residue Treatment (384)
Desired Future Conditions: Healthy forests with diverse species composition, diverse age classes, and improved health and vigor.

Objective: Develop a TIP that strategically focuses FA and TA on at least one high priority area for improving forest health.

Project Type: Forestry- Aspen Regeneration

Resource Concern: Plant Structure and Composition

Concern Description: Quaking aspen stands are in decline throughout the Rocky Mountains. As an early successional species, aspen stands require some disturbance regime to regenerate. Many stands have become decadent or have been replaced by conifers due to alteration of disturbance, particularly fire regime.

Grazing/browsing can also limit recruitment of young aspen clones. Aspen regeneration is important to wildlife habitat and ecosystem health.

Trend: Reduced incidence of disturbance through fire suppression results in the continued decline of aspen stands. Grazing pressure from domestic and wild animals suppresses younger age class clones.

Potential Conservation Practices: Forest Stand Improvement (666), Restoration of Rare and Declining Habitats (643), Fence (382), Upland Wildlife Habitat Management (645)

Desired Future Conditions: NRCS and partners can strategically identify watersheds where aspen regeneration practices are feasible and needed to maintain forest and habitat diversity.

Objective: Identify at least one area with ready, willing, and able landowners to treat decadent aspen stands with regeneration techniques.

Project Type: Rangeland - Conifer Encroachment

Resource Concern: Plant Pest Pressure

Concern Description: Intermountain grasslands are a valuable resource for wildlife and agriculture. Several factors including effective precipitation, elevation, soils, and disturbance regimes affect the occurrence of these grasslands. Since humans have altered the natural fire regime that historically limited conifer recruitment in these grasslands, many areas are subject to increased conifer encroachment. The encroachment reduces forage availability for wild and domestic ungulates, reduces stream flow, and makes some areas unsuitable for grassland obligate wildlife. Reintroducing fire to these ecosystems would be the best way to reduce conifer encroachment. However, in many areas fire is not a socially acceptable solution. The best available alternative is to remove conifers through mechanical or chemical methods to maintain the grasslands.

Trend: Conifer encroachment is spreading across more acres each year in the counties. Producers are aware of the problem but are generally not addressing it on their own.

Potential Conservation Practices: Brush Management (314), Prescribed Grazing (528), Fuel Break (383), Woody Residue Treatment (384), and Forest Stand Improvement (666).

Desired Future Conditions: Conifer encroachment will be removed through mechanical or other means to restore intermountain grassland areas.

Objective: Identify areas with conifer encroachment where a TIP may be implemented to restore native

rangeland.

Project Type: Forestry - Strategic Timber Harvest and Targeted Timber Harvest
Resource Concern: Plant Productivity and Health, Plant Structure and Composition
Concern Description: Past selection of the highest quality trees during timber harvest minimal management post-harvest has resulted in low quality middle-aged and mature forest stands.

Trend: Stable

Potential Conservation Practices: Woody residue treatment (384), Fuel Break (383), and Forest Stand Improvement (666).

Objective: Work with forest landowners to improve forest habitat. This can be done by altering the quality and species of the trees by strategic harvest and thinning. These practices could potentially alter species composition and increase timber productivity. This could also increase the property's value by enhancing aesthetic parts of the chosen property.

Project Type: Pasture and Range – Grazing Management and Infrastructure
Resource Concern: Plant Productivity and Health, Plant Structure and Composition
Concern Description: Many of the pastures (dry and irrigated) in the counties are not producing forage to their highest potential. The conditions are a result of less-than-ideal grazing management, inadequate infrastructure to facilitate management, and/or poor species composition. Targeting improvements to grazing and/or species composition could provide significant resource benefits.

Trend: More producers have become more interested in improving their pasture through improved grazing management techniques.

Potential Conservation Practices: Prescribed grazing (528), Range planting (550), and Forage Biomass and planting (512), (382) Fence, various stock water practices.

Desired Future Conditions: Manage stocking rates and grazing periods to adjust the intensity, frequency, timing, duration, and distribution of grazing and/or browsing to meet the planned objectives for the plant communities, and the associated resources, including the grazing and/or browsing animals.

Project Type: All Land Uses - Herbaceous Invasive Species
Resource Concern: Plant Pest Pressure
Concern Description: Weeds are a constant natural resource issue in Powell, Deer Lodge and Silver Bow Counties. The type of weeds and density of each within the counties is more information than will be discussed in this document. However, a few notable species are black henbane, sulfur cinquefoil, tall buttercup, whitetop,

yellow toadflax, dalmatian toadflax, houndstongue, field bindweed, leafy spurge, Canada thistle, spotted knapweed, St. Johnswort, and common caraway.

Emerging threats is another weed-related issue that could be addressed. 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. Common caraway and ventenata grass are currently emerging threats in the counties.

Trend: Weed pressure throughout the counties varies from year to year based on climate and precipitation, as well as new invasions. Some areas that were previously infested with leafy spurge and knapweed have seen reductions due to the introduction of biological controls. In other areas, weeds are increasing.

Potential Conservation Practices: Herbaceous Weed Treatment (315), Range Planting (550), and Integrated Pest Management (595)

Desired Future Conditions: The desired future condition would be a weed-free work unit, but that is not feasible. The realistic goal would be a strategic course of action that allows NRCS, partners, and producers to deal with new invasions quickly and efficiently and to implement mitigation measures on established weeds that allow for management and minimize negative impacts.

Objective: Elimination of invasive weeds is often not feasible. Our proposed alternative is to strategically manage established noxious weeds for the least impact on natural resources. We also suggest a targeted intensive effort to aggressively remove newly invading weeds before they become well established.

Project Type: Riparian Health

Resource Concern: Plant Structure and Composition; Plant Productivity and Health, Terrestrial Habitat for Wildlife and Invertebrates; Aquatic Habitat for Fish and other Organisms

Concern Description: Restoration and management of riparian areas is a high priority for many partners and landowners. Partners have already completed work in a few areas to limit riparian grazing, promote beaver dam mimicry, and restore hydrology. Despite these strides, significant riparian area degradation remains throughout the counties on tributaries and rivers.

Trend: The current trend is static except for areas where partners have initiated projects, which show improvement.

Potential Conservation Practices: Fence (382), Restoration of Rare and Declining Habitats (643), Prescribed Grazing (528), and Channel Bed Stabilization (584), Brush Management (314).

Desired Future Conditions: Strategically install structural practices and initiate management on high priority streams and tributaries.

Objective: Implement a TIP on at least one high priority watershed in the Clark Fork drainage where management and beaver mimicry can be used to restore riparian areas. The overall goal will be to establish beaver colonies in areas where landowners can tolerate their presence.

Project Type: Instream Habitat Improvements

Resource Concern: Aquatic Habitat for Fish and other Organisms

Trend: Shifting climatic conditions and decreased in stream flows coupled with decline in riparian health have created conditions where aquatic habitat is threatened or degraded. The trend is downward.

Potential Conservation Practices: Stream Habitat Improvement and Management (395), Structure for Water Control (587), Restoration of Rare and Declining Habitat, etc

Objective: Continue to identify areas that BDA's, Fish Screens, or other practices can be installed to improve in stream habitat.

Project Type: Irrigation and Water Storage

Resource Concern: Insufficient Water Quantity

Concern Description: Irrigation is fundamental to agriculture in Powell, Deer Lodge and Silver Bow Counties. Most of the irrigated ground in the area is used for hay production. Numerous diversions are present on rivers and streams throughout the area. There are also a few irrigation reservoirs. Many of these delivery systems are antiquated and in need of vast infrastructure improvements. Main areas for improvement include retrofitting diversion structures to reduce fish entrainment, updating water delivery conveyances to gravity pressure where possible, converting from open ditch to pipeline to reduce system losses, improving water measurement abilities, reducing system waste including stemming the significant tailwater return flows and providing alternative stock water options to reduce off-season delivery through canals for livestock water. On-farm improvements are also needed throughout the system. Currently significant wild-flood irrigation exists on steep slopes. Many areas could be converted to gravity irrigation, and alternative stock water options and overall improvements of efficiency and reductions in off-site movements of water, sediments and nutrients should be developed. Improving the efficiency of all these irrigation systems to improve instream flows is also a high priority. Working with partners to address multiple resource benefits is a key goal of the Deer Lodge Field Office.

Trend: Stable but conflict is common and improvement is needed.

Potential Conservation Practices: Irrigation Pipeline (430), Pumping Plant (533), Diversion (362), Fish Screen and other structures for water control (587), Sprinkler System (442), etc.

Objective: Continue systematically identifying high priority clusters of projects with the end goal of updating efficiencies throughout the major irrigation areas.

Project Type: Soil Health

Resource Concern: Variable but often includes Plant Productivity and Health, Organic Matter Depletion, and Soil Organism Habitat Loss or Degradation

Concern Description: Soil health remains an area of interest in the three counties. Many producers are interested in improving their soil health and increasing the sustainability of their agricultural operations. Producers have started to adopt cover crops, but adoption is still low. Encouraging more landowners to adopt soil building practices should be prioritized. Livestock producers are interested in improving soil health through innovative management techniques including bale grazing, high stock density, use of electric fence, and increased plant recovery periods.

Trend: Producers have become interested in regenerative agriculture techniques.

Potential Conservation Practices: Cover crop (340), Conservation cover (327), and Prescribed grazing (528).

Desired Future Conditions: Develop a potential TIP that incentivizes more producers to adopt regenerative agriculture techniques.

Project Type: Wildlife and Habitat

Resource Concern: Terrestrial Wildlife Habitat

Concern Description: Wildlife and habitat are key priorities for many natural resource partners in Powell, Deer Lodge, and Silver Bow Counties. Forest health, grassland conservation, wetland conservation, riparian management, and stream restoration have long been points of interest with landowners and partners throughout the counties, and all contribute the quality of habitat. There are also concerns with wildlife conflicts such as wild ungulate competition with livestock, fence damage, and losses to large carnivores. Sharp-tailed grouse have been reintroduced in Powell County and there is potential to improve habitat for this gamebird on grass/shrublands as well as other grassland obligates. Aspen regeneration projects also provide important wildlife habitat. Fisheries improvements, particularly for westslope cutthroat trout, arctic grayling, and bull trout will continue to be a priority in the counties. There is great potential to address fisheries concerns where these issues are intertwined with irrigation and riparian health.

Trend: Stable

Potential Conservation Practices: Upland Wildlife Habitat Management (645), Prescribed Grazing (528); Stream Habitat Improvement and Management (395), Wetland Wildlife Habitat Management (644), Structures for Wildlife (649), etc.

Desired Future Conditions/Objective: Reduced human/wildlife conflicts, improved habitat conditions across landuses, healthy stable wildlife populations

Project Type: Carbon Storage

Resource Concern: Plant Productivity and Health, Organic Matter Depletion

Concern Description: Organic matter is an important part of soil function and storing carbon in the ground will increase soil organic matter. There is potential to increased organic matter and stored carbon on many landuses.

Trend: Stable

Potential Conservation Practices: Cover crop (340), Forage and Biomass planting (512), Prescribed Grazing (528), etc

Desired Future Conditions/ Objective: Align practical management that benefits the land with national objectives.

Section V. Prioritization of Natural Resource Problems and Desired Future Outcomes

The following projects are in progress or proposed for EQIP funding through the Deer Lodge NRCS office:

Helmville Valley Conifer Encroachment TIP Summary:

The Helmville Valley Conifer Encroachment TIP will treat the priority resource concern of Plant Pest Pressure by removing encroaching conifers from intermountain grasslands. This will be accomplished by implementing the conservation practices Brush Management, Forest Stand Improvement, Woody Residue Treatment, and Herbaceous Weed Treatment. The TIP is needed because conifer encroachment has increased in this high priority conservation area over time due to fire suppression. NRCS will provide assistance to private landowners to treat 6,300 acres of conifer encroachment. This will treat encroachment on approximately 50% of the private rangeland in the TIP area with encroachment resource concerns. We are requesting $300,000 in year one, followed by $300,000 in each of years 2 through 5. Six different public and private partners have assigned $133,000 in funding to treating conifer encroachment in the area. This TIP will not only physically restore intermountain grassland but will strengthen the concept and emerging local culture of actively managing conifer encroachment. Implementation in progress, signup through 2024.

Gough Creek TIP Summary:

The Gough Creek Riparian Health TIP will treat the priority resource concern of Terrestrial Wildlife Habitat, Wildlife, and Invertebrates. There will be additional benefits to Aquatic Habitat for fish and other organisms; Soil Erosion: streambank; Degraded Plant Condition: structure and composition; and Degraded Plant Condition: plant productivity and health. This will be accomplished by implementing the conservation practices Restoration of Rare and Declining Natural Communities, Spring Development, Watering Facility, Livestock Pipeline, Fence, Brush Management, and Woody Residue Treatment. Requested $140,000 for FY2021; Implementation in progress, signup is completed.

Grizzly Conflict Mitigation TIP

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. This TIP is a financial and technical partnership between NRCS, The Blackfoot Challenge, Montana Fish Wildlife and Parks, and the US Fish and Wildlife Service. This TIP will align with the wildlife and habitat resource concerns outlined in the NRCS long-range plan for Powell and Missoula Counties. Funding is requested at $412,000 for FY2022-2026. Implementation in progress.

North Ovando Fuels Reduction TIP

Healthy forests are a critical component of the Powell County landscape, providing multiple public and private benefits. Recent changes in weather/climate patterns are creating longer fire seasons and drier fuel conditions, causing fires to increase in number, size, and intensity. Larger fires are more difficult to stop, creating a threat to human property, interests, lives, and livelihoods. This threat is expected to continue due to overly dense forests, increases in tree mortality, and the resulting buildup of hazardous fuels within Powell County. The Rice Ridge Fire of 2017 is a good example of these conditions, burning over 160,000 acres from Seeley Lake to Ovando before weather eventually stopped its spread. Nearly 80 percent of the Blackfoot Watershed is comprised of forested land, and 20% in private, noncommercial ownership. The North Ovando Fuel Reduction (NOFR) TIP is an opportunity to treat the primary resource concern of *Wildfire Hazard from Biomass Accumulation* and to make long-term conservation investments on private, non-industrial forested lands to reduce the risk of catastrophic wildfire events, while enhancing forest health. Wildlife habitat, and public safety. The NOFR TIP will directly address resource concerns on approximately 1000 acres with a total cost of $1,000,000. It is important to note the TIP area is relatively large compared to the planned treatment acres, however cumulative efforts among partners are intended to increase coverage and fill strategic gaps. Signup begins summer 2022.

Helmville Valley Grazing Management TIP

This project goal is to improve Plant Productivity and Health on grazing land by increasing stock density and shortening the duration of grazing periods. This allows for longer periods of plant recovery and more trampling to increase soil organic matter and decrease bare ground. Grazing infrastructure will be used to facilitate increased grazing intensity. The primary resource concern is Plant Productivity and Health. Secondary resource concerns include Inadequate livestock water quantity, quality, and distribution, and Soil organism habitat loss or degradation. EQIP funds are requested for $880,000. The project will begin in 2023 and run through 2025. Signup begins summer 2022.

Sources

US Census Bureau, https://www.census.gov/quickfacts/fact/table/

National Ag Statistics Service: https://www.nass.usda.gov

Montana Department of Environmental Quality, http://deq.mt.gov/Water/Resources/report

EPA-Air quality https://www3.epa.gov/airquality/urbanair/sipstatus/reports/mt_elembypoll.html#pm-10
1987 333

https://bcinvasives.ca/invasive-species/identify/invasive-plants/wild-caraway

MT DEQ Air Quality http://deq.mt.gov/Air/2017Air/Standards/airnonattainment

Deer Lodge County Soil Survey, NRCS, USDA.
https://www.nrcs.usda.gov/wps/portal/nrcs/surveylist/soils/survey/state/?stateId=MT

Powell County Soil Survey, NRCS, USDA.
https://www.nrcs.usda.gov/wps/portal/nrcs/surveylist/soils/survey/state/?stateId=MT

Silver Bow County Soil Survey, NRCS, USDA.
https://www.nrcs.usda.gov/wps/portal/nrcs/surveylist/soils/survey/state/?stateId=MT

Montana Climate Office. University of Montana. http://climate.umt.edu/atlas/precipitation/default.php

MontanaNatural Heritage Program. Montana Official State Website. October, 2019. http://mtnhp.org

Grizzly Bear Management Plan for Western Montana, Draft Programmatic Environmental Impact Statement. Montana Fish Wildlife and Parks. June, 2006.

U. S. Fish and Wildlife Service. 1993. Grizzly bear Recovery Plan. Missoula, Montana. 181pp.

Montana Bull Trout Restoration Team. Restoration Plan for Bull Trout in the Clark Fork River Basin and Kootenai River Basin Montana. June, 2000.

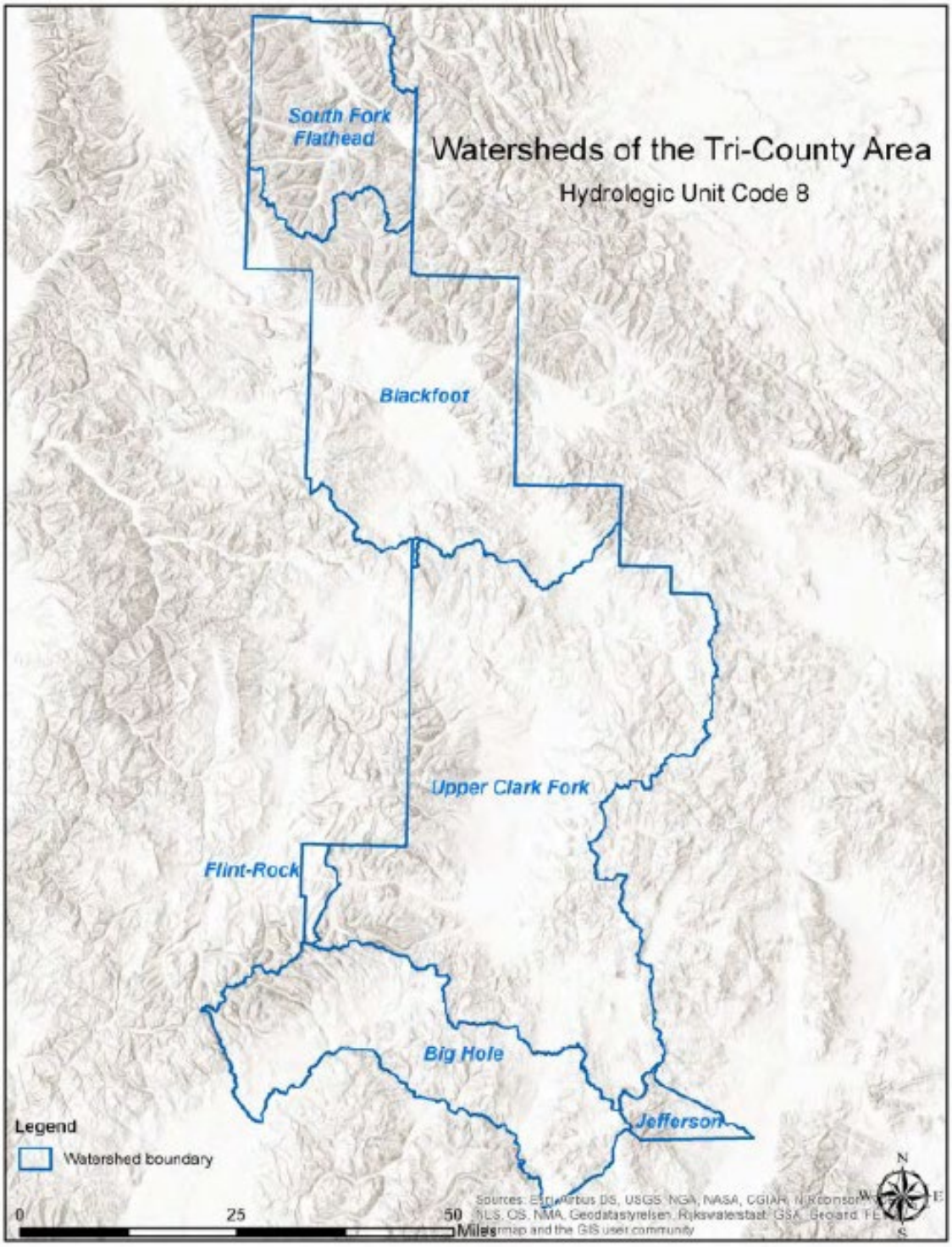
USDA National Agricultural Statistics Service. 2019.
https://www.nass.usda.gov/Quick_Stats/CDQT/chapter/2/table/1/state/MT/county/077/year/2017

https://www.nass.usda.gov/Quick_Stats/CDQT/chapter/2/table/1/state/MT/county/023/year/2017

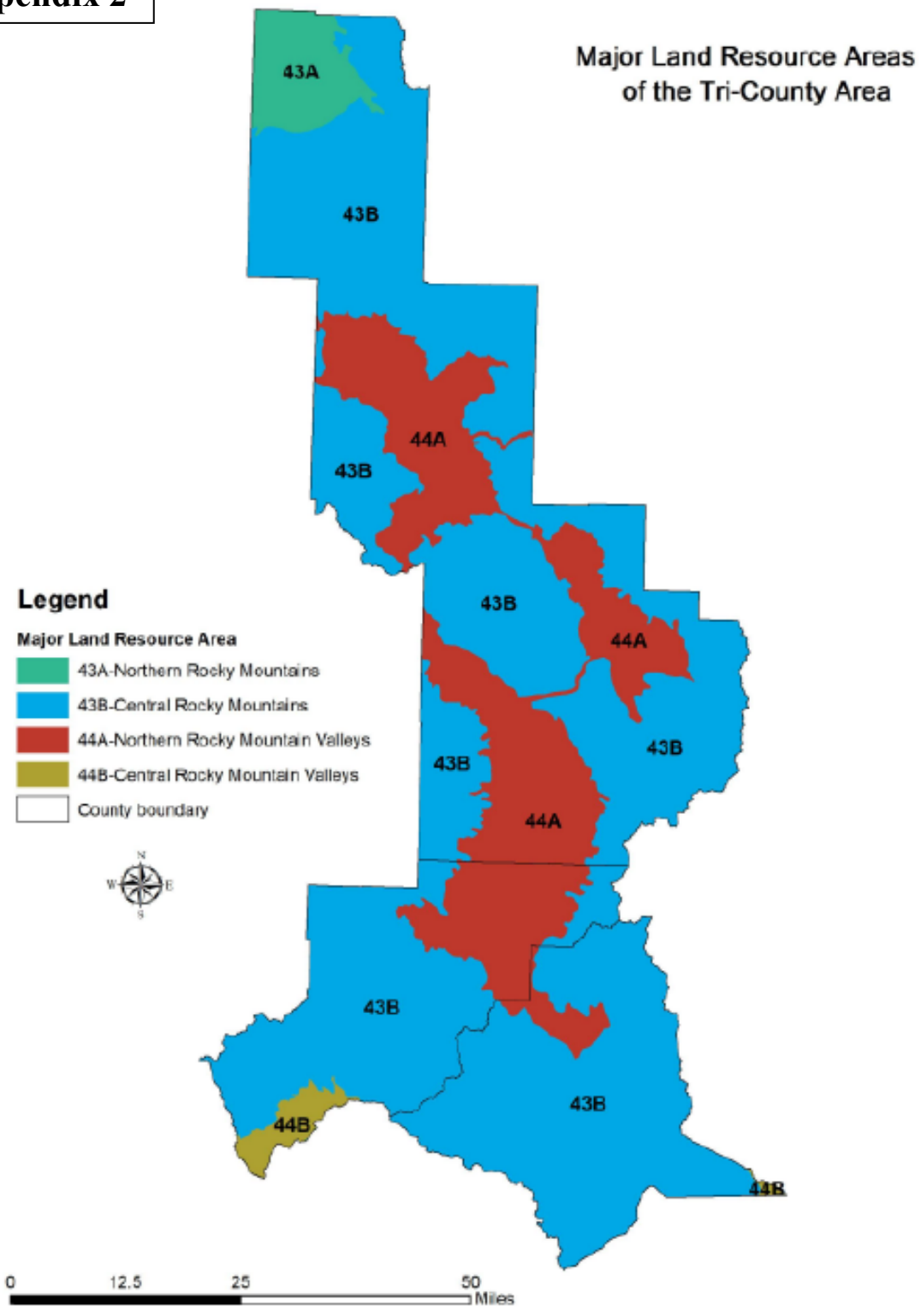
https://www.nass.usda.gov/Quick_Stats/CDQT/chapter/2/table/1/state/MT/county/093/year/2017

Upper Clark Fork River Basin Aquatic and Terrestrial Resources Restoration Plans. State of Montana, Natural Resource Damage Program. January, 2019.

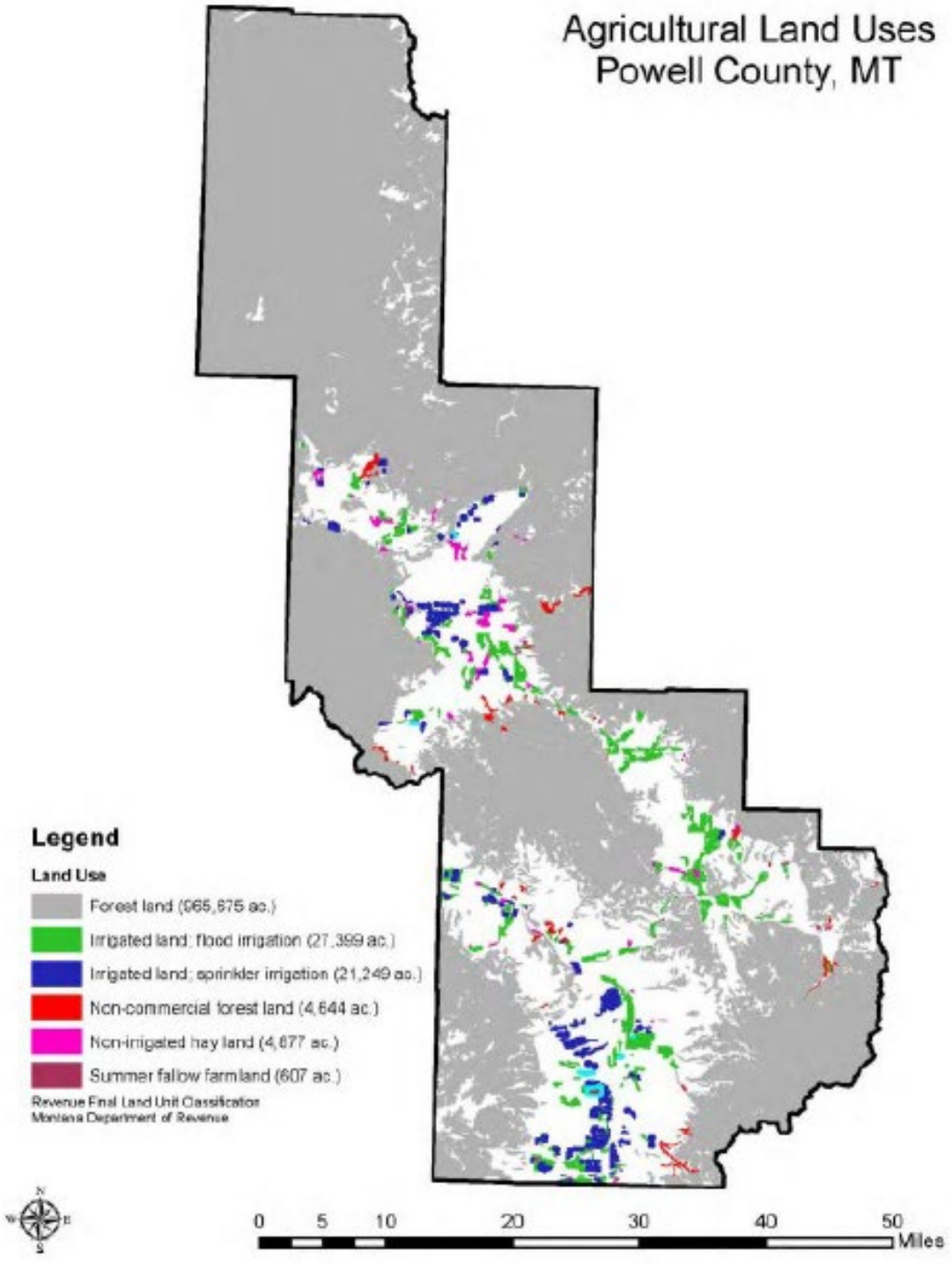
Appendix 1


Watersheds of the Tri-County Area
Hydrologic Unit Code 8
South Fork Flathead
Blackfoot
Upper Clark Fork
Flint-Rock
Big Hole
Jefferson
Legend
Watershed boundary
0
25
50
Miles
N
S

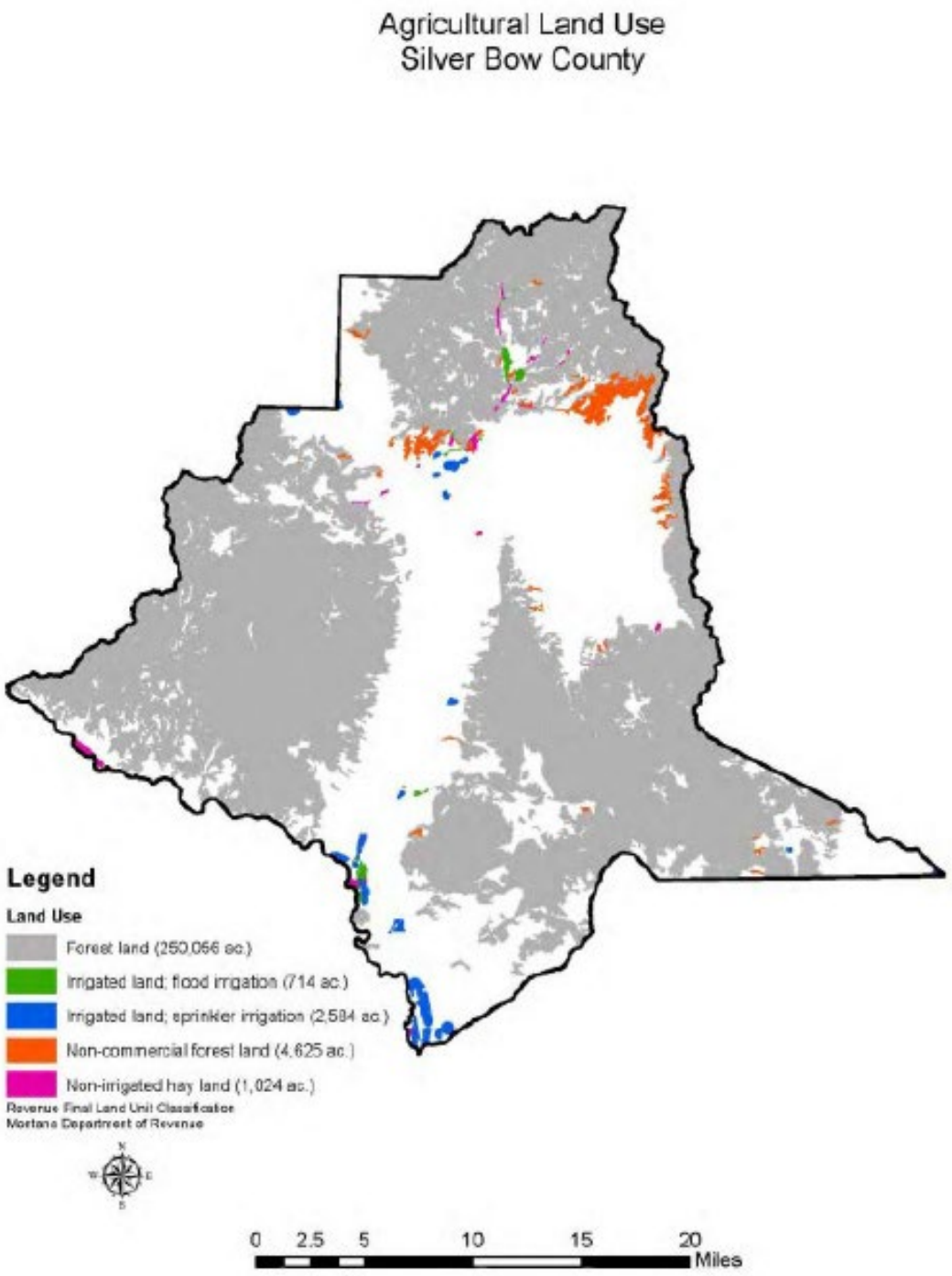
Appendix 2


Major Land Resource Areas
of the Tri-County Area
43A
43B
44A
43B
43B
44A
43B
43B
44A
43B
43B
44B
44B
Legend
Major Land Resource Area
43A-Northern Rocky Mountains
43B-Central Rocky Mountains
44A-Northern Rocky Mountain Valleys
44B-Central Rocky Mountain Valleys
County boundary
N
W
E
S
0
12.5
25
50
Miles

Appendix 3


Agricultural Land Uses
Powell County, MT
Legend
Land Use
Forest land (965,675 ac.)
Irrigated land: flood irrigation (27,399 ac.)
Irrigated land: sprinkler irrigation (21,249 ac.)
Non-commercial forest land (4,644 ac.)
Non-irrigated hay land (4,677 ac.)
Summer fallow farmland (607 ac.)
Revenue Final Land Unit Classification
Montana Department of Revenue
N
W
E
S
0 5 10 20 30 40 50
Miles

Appendix 4


Agricultural Land Use
Silver Bow County
Legend
Land Use
Forest land (250,066 ac.)
Irrigated land; flood irrigation (714 ac.)
Irrigated land; sprinkler irrigation (2,584 ac.)
Non-commercial forest land (4,625 ac.)
Non-irrigated hay land (1,024 ac.)
Revenue Final Land Unit Classification
Montana Department of Revenue
N
W
E
S
0 2.5 5 10 15 20
Miles