LONG RANGE PLAN

NRCS Field Office – Miles City

Custer County, Montana

November 2020

Contents

SECTION I

Vision

Our vision for natural resources conservation in Custer County is the implementation of increased levels of stewardship on all land uses throughout the county.

Mission

Our mission is to simultaneously promote environmental and economic sustainability.

Purpose

The purpose of the Custer County Long-Range Plan is to identify and prioritize resource concerns in the county then develop strategies to address them.

Local Conservation Partners

The following is a list of entities in which informal working relations have been established, or may be desired, in order to work towards the vision laid out by this Long-Range Plan.

- American Bird Conservancy
- Bird Conservancy of the Rockies
- Buffalo Rapids Irrigation District
- Bureau of Land Management (BLM)
- Custer County Commissioners
- Custer County Conservation District
- Custer County Farm Service Agency
- Custer County Local Working Group
- Custer County Weed District
- Ducks Unlimited
- Fort Keogh Livestock and Range Experiment Station
- Kinsey Irrigation Company
- Local Landowners, Farmers and Ranchers
- Montana Bureau of Mines & Geology
- Montana Department of Agriculture
- Montana Department of Environmental Quality
- Montana Department of Natural Resources & Conservation (DNRC)
- Montana Fish Wildlife & Parks
- Montana NRCS Miles City Area Office
- Montana State University Extension Service
- Northern Great Plains Joint Venture
- Northern Plains Resource Council
- Pheasants Forever
- Rocky Mountain Elk Foundation
- T&Y Irrigation District
- Trout Unlimited
- US Fish & Wildlife Service
- US Bureau of Reclamation
- US Forest Service
- US Geological Service
- USDA Agricultural Research Service
- Yellowstone River Conservation District Council

Term

The timeframe for the Long-Range Plan is five years. The plan will be reviewed annually and amended or updated as required.

SECTION II NATURAL RESOURCE INVENTORY

GENERAL INFORMATION

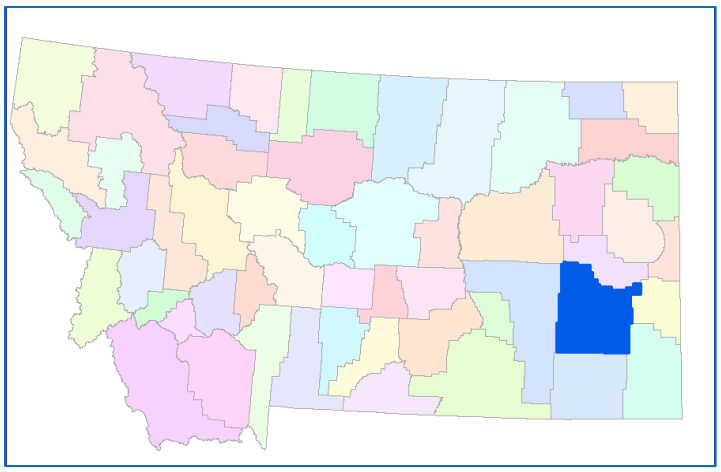


Figure 1. Custer County, Montana

Custer County ranks number eleven among Montana's 56 counties for land area. It covers 3,783.36 square miles or 2,427,520 acres. Located in central Eastern Montana, Custer County is adjacent to Rosebud County to the west and Prairie County to the north. Fallon and Carter County border Custer County on the east and the southern boundary is the Powder River County line. Figure 1.

Elevation ranges from 3,782 feet on an unnamed high point in the Hayes Point Quadrangle to a little over 2,200 feet where the Yellowstone River crosses into Prairie County in the far northeast corner of the county.

Custer County is home to 11,699 people. Miles City and Ismay are the only incorporated towns in the County. Other communities or populated places with federally recognized names include Bonfield, Shirley, Garland, Volborg, and Mizpah. The high point, major roads, towns and other general information are shown in Appendix A1.

Average annual precipitation ranges from 12 to 16 inches, as shown in Appendix A2. Relative effective annual precipitation (REAP) is the amount of rainfall that will be available for plants. REAP varies greatly across the landscape, as shown in Appendix A3. Most precipitation falls as rain between April and July, with convective storms common during the summer. Average daily high temperatures of around 88ºF occur in July; average daily lows around 9 to 10ºF occur in December and January.

PEOPLE

Over 72% of Custer County residents live in Miles City. Only 21 people live in Ismay, which has the distinction of being the smallest incorporated municipality in Montana. County-wide, 92% of adults are high school graduates; 22.4 % have earned a bachelor's degree or higher. Unemployment is low in Custer County, at 2.6 % in June of 2019, compared to the state average of 3.2% and the national rate of 3.7% for the same month. In Miles City over 12% of the population live below the poverty line. County-wide the level is 9.8% (US Census Bureau, 2019).

Agricultural Producers

The National Agricultural Statistic Service *Census of Agriculture* data discloses that there are 856 agriculture producers in Custer County; roughly seven percent of the population. Almost 42% of producers are female. Four hundred twelve producers list farming or ranching as their primary

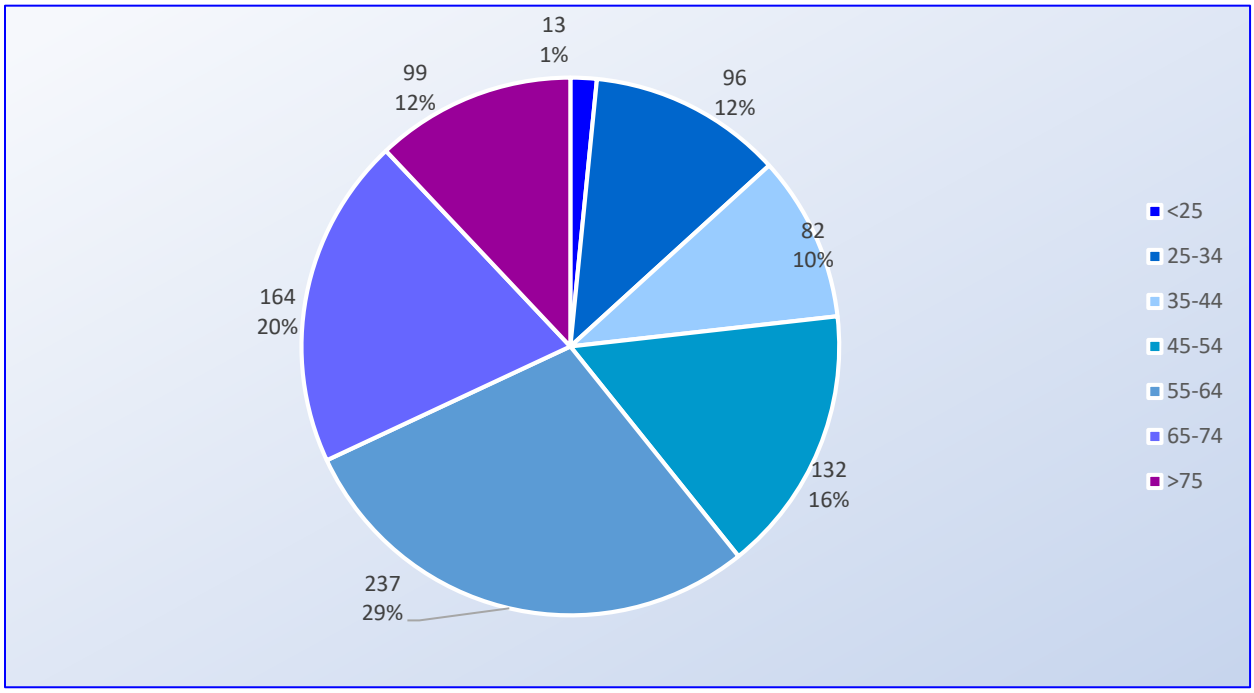


Figure 2. Age Ranges of Custer County Producers

occupation; 632 producers have lived on their present farm for over ten years. The average length of time living on the present farm in Custer County is 25.5 years. Young farmers are those who are 35 years old or younger. Ninety-five farms are operated by beginning farmers or ranchers, defined as those who have been in the business for 10 years or less.

Figure 2 depicts the age ranges of Custer County Producers. Nearly two-thirds are age 55 or older. (USDA NASS, 2019).

AGRICULTURE

The Census definition of a farm, including all crop and livestock operations, is any place from which $1,000 or more of agricultural products were produced and sold, or normally would have been sold, during the census year. There are 441 farms in Custer County on over 2.01 million acres. Average farm size is 4,737 acres; about 39% of the farms are 1,000 acres or more. According to Census information, around 94% of the agricultural land in the county is grazing land, and a little less than 6% is active cropland. Total cropland encompasses 118,537 acres; in 2017, 237 farms harvested crops on 63,556 acres.

According to the Census, 157 farms are at least partly irrigated, totaling 37,223 irrigated acres. Two hundred seventy-one farms produce cattle. The 2017 inventory was 90,952 head; 64,259 head were sold. Twenty-nine farms raise sheep with sales of 5,461 head in 2017.

The Figure 3 shows the eight major crops grown in Custer County. Forage for livestock includes hay, haylage, silage, and greenchop. In this case, nearly all forage crops are hay, and 78% of the hay is alfalfa (USDA NASS, 2019).

The Census reported that 97 farms practiced rotational or management intensive grazing. Thirty-four farms employed no till practices on 9,400 acres of cropland. Thirty-five farms reported using reduced till strategies (not including no-till) and 62 farms reported using intensive tillage practices. Twenty-five farms reported planting cover crops on 2,670 acres in Custer County.

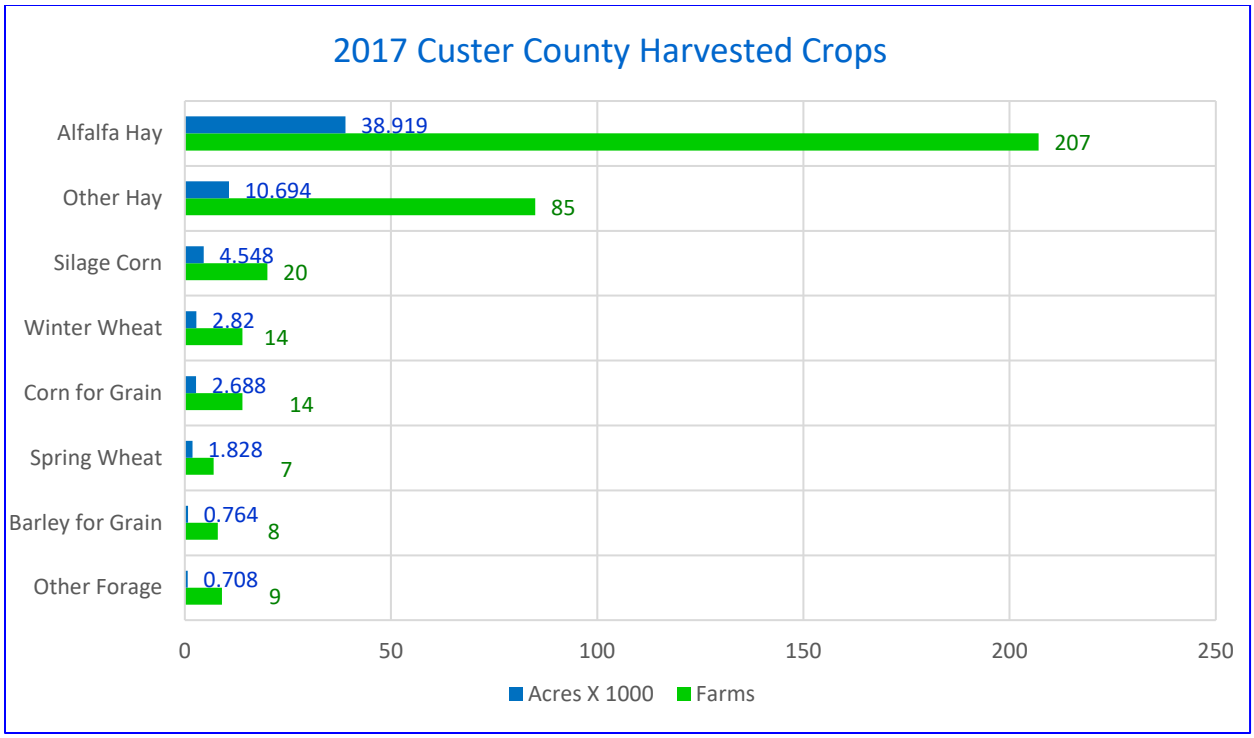


Figure 3. Crops Harvested in 2017, Custer County, Montana

LANDCOVER/LAND USE

Landcover Types

The Montana Natural Heritage Program (MTNHP) Land Cover Report for Custer County describes seven landcover types in the county. These are shown with number of acres of each and their relative proportions in Figure 4.

Appendix A4 shows the county landcover with data provided by the Montana Natural Heritage Program (MTNHP). Several other landcover types appear in this more sophisticated depiction. The scale of the map makes it difficult to discern small areas of certain types such as Great Plains Wooded Draws and Ravines and Introduced Upland Vegetation. However, the map provides a clear visual of the extent of cultivated land throughout the county, and the location of the grasslands and badlands.

Great Plains Mixedgrass Prairie ecosystem covers much of the eastern two-thirds of Montana. Soils are primarily fine and medium-textured. Canopy cover is mostly grasses; western wheatgrass (*Pascopyrum smithii*) is usually dominant. Other species include thickspike wheatgrass (*Elymus lanceolatus*), green needlegrass (*Nassella viridula*), blue grama (*Bouteloua gracilis*), and needle and thread (*Hesperostipa comata*). Forb diversity is typically high. In areas where sagebrush steppe borders the mixed grass prairie, common plant associations include Wyoming big sagebrush (*Artemisia tridentata ssp. Wyomingensis*)—western wheatgrass. Fire and grazing are the primary drivers of this system. Drought can also impact the ecosystem, in general favoring the shortgrass component at the expense of the mid-height grasses. With intensive grazing, cool season exotics such as Kentucky bluegrass (*Poa pratensis*), smooth brome (*Bromus inermis*), and Japanese brome (*Bromus japonicus*) increase in dominance (MNHP, 2019).

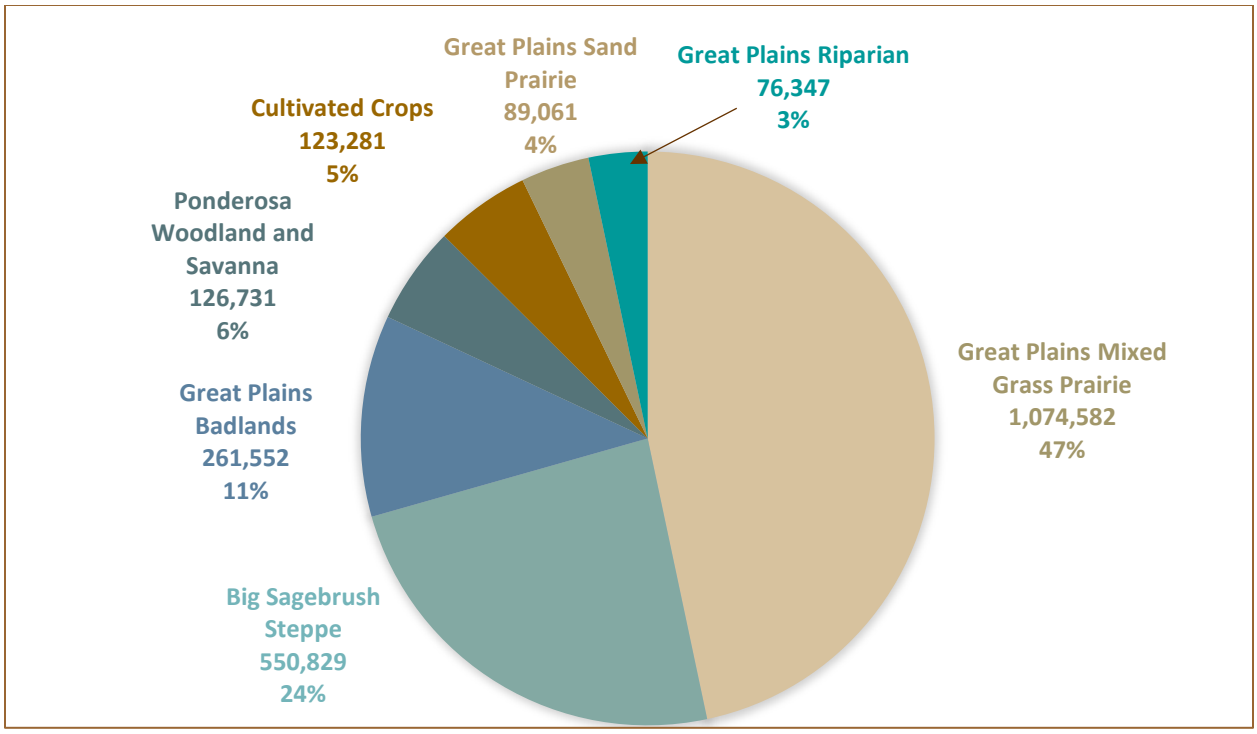


Figure 4. Custer County Landcover Systems

Big Sagebrush Steppe occurs throughout much of central and eastern Montana. The system is characterized by soils that are typically deep and non-saline and dominated by perennial grasses and forbs with a shrub cover of less than ten percent. Wyoming big sagebrush is the most common shrub component. Sagebrush typically increases in the system following heavy grazing and fire suppression.

Great Plains Badlands are areas containing highly eroded, rugged and often colorful landforms with sparse vegetation. Soils formed from highly erosive parent material often contain marine and other fossils. Badlands areas provide habitat for mule deer and other wildlife but support only intermittent grazing.

Ponderosa Pine (*Pinus ponderosa*) is the distinguishing plant species of the **Great Plains Ponderosa Pine Woodland and Savannah** system. Ponderosa pine prefer sites with higher soil moisture and coarse, rocky soil. Stands appear in a mosaic pattern on the landscape with grassland plant communities in the open spaces and downslope.

Cultivated cropland is areas used to produce crops, such as corn, wheat, pulse crops and forage crops, typically on an annual cycle. Agricultural plant cover is variable depending on season and type of farming.

Great Plains Sand Prairie is considered a unique ecological system due to coarse textured soils with exposed caprock sandstone formations occurring across the landscape. Native plant communities are dominated by needle and thread with little bluestem (*Schizachyrium scoparium*) and threadleaf sedge (*Carex filifolia*) on the finer textured soils. Rhizomatous warm season grasses prairie sandreed (*Calimovilfa longifolia*), sand bluestem (*Andropogon hallii*) and big bluestem (*Andropogon gerardii*) occur intermittently on coarser soils.

Areas of the **Great Plains Riparian** system occur along the Yellowstone, Tongue and Powder Rivers and intermittently along all major drainages. Plains cottonwood (*Populus deltoides*) and narrowleaf cottonwood (*Populus angustifolia*) dominate areas of higher soil water content or higher water tables; an understory of willow (*Salix spp*) is common. While riparian areas cover only around three percent of the land in the county, they are considered important for hay production as well as wildlife cover and habitat.

Great Plains Floodplains occur along the Yellowstone River and its larger tributaries. Narrowleaf cottonwood and Plains cottonwood are the dominant component. In relatively undisturbed stands, willow, redosier dogwood (*Cornus sericea*) and common chokecherry (*Prunus virginiana*) form a thick, multi-layered shrub understory, with a mixture of cool and warm season grasses below. Box elder (*Acer negundo*) and green ash (*Fraxinus pennsylvanica*) form a tree understory in mid-seral and late-seral stands. Many areas are now degraded to the point where relict cottonwood stands with little regeneration are the only remaining natural component. The understory vegetation is dominated by non-native pasture grasses, legumes and other introduced forbs, or by western snowberry (*Symphoricarpos occidentalis*) and rose (*Rosa* spp.) shrub community (MNHP, 2019)

Land Ownership

A map of the location and extent of Public Lands in Custer County is shown in Appendix A5. Just a fraction less than one third of the land in Custer County is publicly owned. Table 1 lists private and public landowners and the acres under their control.

Table 1. Custer County Land Ownership

Landowner	Acres	Percent of Land in Custer County
US Bureau of Land Management	568,768.5	23.4
Montana State Trust	168,615.5	6.95
USDA Fort Keogh	55,144.0	2.3
State of Montana	2,292.99	< 1
Montana Fish Wildlife & Parks	563.83	< 1
State of Montana Corrections	519.31	< 1
Local Government	423.93	< 1
City Government	22.46	< 1
Montana DOT	17.32	< 1
US Government	14.47	< 1
Private Landowners	1,631,138.42	67.2

SOILS

LLRs and MLRAs

Land Resource Regions (LRR) are large geographic areas that are characterized by a pattern of soils, climate, water resources and land uses. Major Land Resource Areas (MLRAs) are subregions of the Land Resource Regions and comprise smaller, homogeneous areas. MLRA's represent landscape-level areas with distinct physiography, geology, climate, water, soils, biological resources and land uses. These features are incorporated into the distinctions between ecological sites.

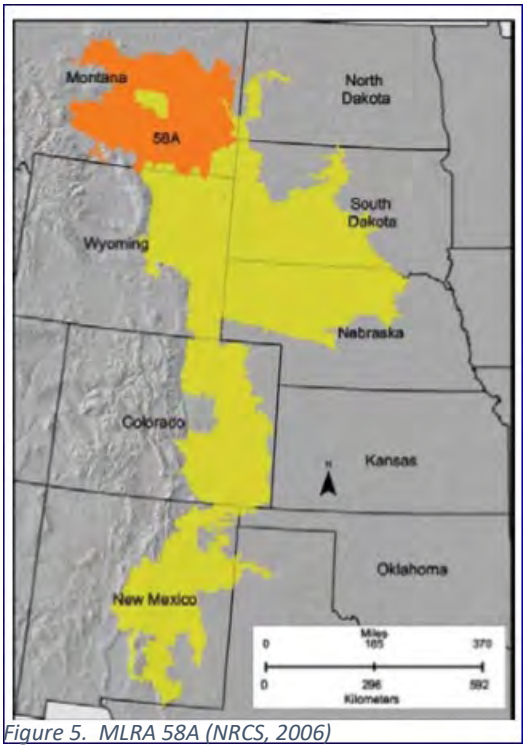


Figure 5. MLRA 58A (NRCS, 2006)

Custer County is entirely within MLRA 58A, Northern Rolling High Plains, Northern Part shown in orange in Figure 5. It lies within the Western Great Plains Range and Irrigated LRR, shown in yellow.

MLRA 58A—Northern Rolling High Plains Northern Part. This area is in the Missouri Plateau, Unglaciated section of the Great Plains Province of the Interior Plains. It is an area of old eroded plateaus and terraces. Slopes generally are gently rolling to steep, and wide belts of steeply sloping badlands border a few of the larger river valleys. Local relief is mainly 10 to 100 feet. In some areas flat-topped, steep-sided buttes rise sharply above the general level of the plains.

The dominant soil orders in the MLRA are Entisols[1] and Inceptisols[2] Soils typically have a frigid temperature regime, an ustic moisture regime and mixed or smectitic (two parts clay to one part other) mineralogy. They are generally shallow to very deep, well drained, and clayey or loamy.

Saline seeps are a problem in areas of cropland in this MLRA. Management practices promote infiltration of precipitation into shallow aquifers. As the shallow water table rises to the ground surface, evaporation leaves concentrations of salts behind. The level of total dissolved solids in the water from seeps commonly is more than four thousand parts per million (NRCS, 2006).

Geology

Geologic formations underlying Custer County are shown in Appendix A6. A formation in this context is a rock unit that has a distinctive appearance compared to surrounding layers and is of enough thickness

[1] Entisols are soils of recent origin. The central concept is soils developed in unconsolidated parent material with usually no genetic horizons except an A horizon. All soils that do not fit into one of the other 11 orders are Entisols. Thus, they are characterized by great diversity, both in environmental setting and land use. Many Entisols are found in steep, rocky settings. However, Entisols of large river valleys and associated shore deposits provide cropland and habitat for millions of people worldwide.

[2] Inceptisols (from Latin *inceptum*, "beginning") are soils that exhibit minimal horizon development. They are more developed than Entisols, but still lack the features that are characteristic of other soil orders. Although not found under aridic climate regimes, Inceptisols nevertheless are widely distributed and occur across a wide range of ecological settings. Inceptisols occupy an estimated 15 percent of the global ice-free land area.

and extension to be plotted on a map. Formations often contain a variety of related or interlayered rock types and are sometimes divided into smaller units called members.

Figure 6 shows the relative proportion of the seven geologic formations or members that each cover more than one percent of the land in Custer County. Together these add up to over 99% of land surface of the county. Several formations are not included due to their very small presence on the landscape.

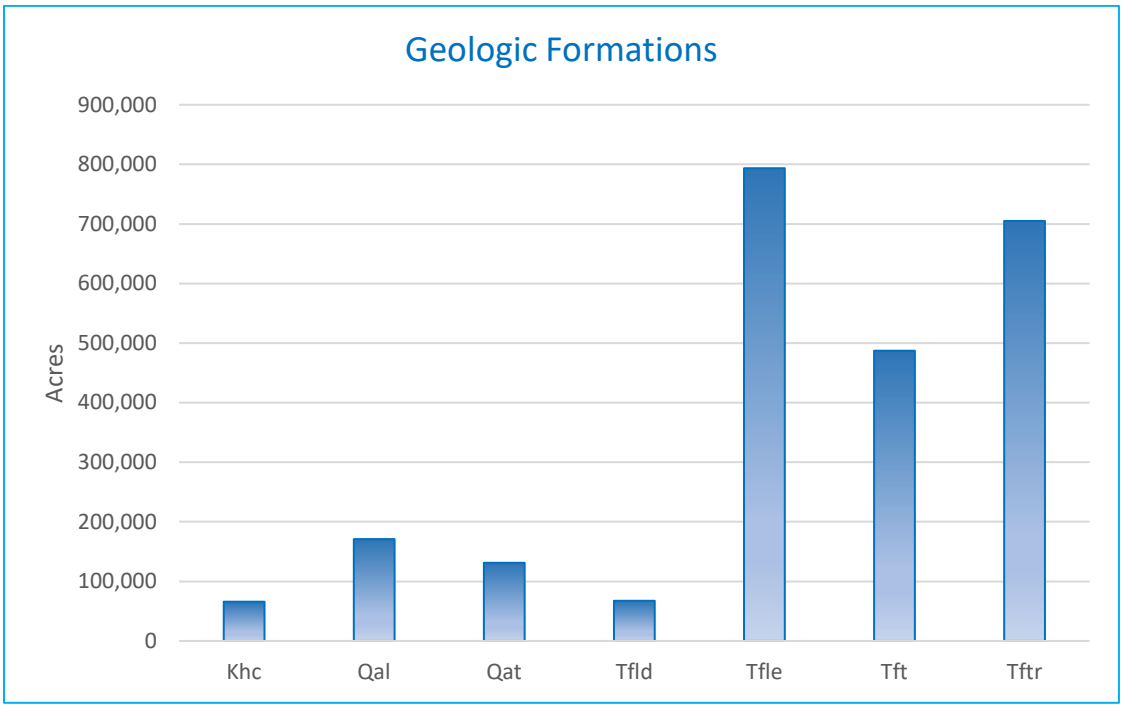


Figure 6. Geologic Formations in Custer County, Montana

Khc: **Hell Creek Formation**. The Hell Creek Formation was the last formation deposited during the Cretaceous Period. This is an enormous deposit which extends up from New Mexico through Colorado and Wyoming, across Montana, and into North Dakota, South Dakota, Saskatchewan, and Manitoba. The formation was named for exposures in Hell Creek in northern Garfield County, where its type section (the sequence of strata that constitute a stratigraphic unit in the location where it was originally recognized and described) is exposed in its full thickness. The Hell Creek Formation characteristically erodes into spectacular badlands where relatively hard concretions and sandstone lenses have protected softer, underlying shales and mudstones from erosion.

The Hell Creek Formation varies in thickness in the area from 200-300 feet. It is composed primarily of soft shale, siltstone, and silty sandstone, and characteristically has a banded appearance in shades of purple, green, and gray. Thin, discontinuous coal seams, carbonaceous shales, and bentonite are also common. Large-scale crossbedding is common in the sandstone lenses, all of which are lenticular (shaped like lentils, having a double-convex lens). The sandstones contain abundant lens-shaped and log-shaped concretions which can be several yards across. The formation contains a basal sandstone that is medium grained and cross-bedded. In some areas it contains specks of dark colored minerals, leading to a distinctive salt and pepper appearance. There are thin lenses of pebble and cobble conglomerate near

the base of the formation. This basal sandstone is often combined with the underlying Fox Hills into the Fox Hills-lower Hell Creek aquifer, which is used as a regional source of relatively soft water. Fossil plants and dinosaur bones are common in the Hell Creek Formation.

Qal. Alluvium. Sedimentary. Gravel, sand, silt, and clay deposits of stream and river channels, and floodplains.

Qat. Light gray to light brown, stratified, moderately well-sorted sand and gravel at elevations above the present floodplain. Thickness is as much as 100 feet in alluvial fill terrace deposit south of the Yellowstone River in the Terry and Fallon area, but generally less than 30 feet.

Tfu: The **Fort Union Formation** is a yellowish-brown sequence of interbedded continental deposits of sand, sandstone, siltstone, silt, clay, clayey shale and lignite. The sediments of the Fort Union Formation were deposited by eastward-flowing streams meandering on a broad swampy flood plain. It contains beds of lignite as much as nine feet thick.

Tftr. Tongue River Member of Fort Union Formation. This member is composed of yellowish orange sandstone, sandy and silty carbonaceous shale, and coal from ancient alluvial plains. Thickness can be as much as 984 feet.

Tfle. Lebo Member of Fort Union Formation. The Lebo member is dark gray carbonaceous shale, bentonitic claystone, sandstone, and coal deposited on alluvial plains. Thickness is as much as 607 feet.

Tft. The **Tullock Member of the Fort Union Formation** is yellowish-gray, fine- to medium-grained, trough-cross-bedded to planar-bedded or massive sandstone interbedded with brownish-gray or purplish-gray claystones, dark-gray carbonaceous shale, and thin lenticular coal beds. Its origin is the Paleocene era. The Tullock member was formed in broad alluvial systems consisting of dominant flood plains with swamps and few stream channels. Numerous vertebrate fossils are found throughout. The member is about 200 feet thick (Vuke, 2007).

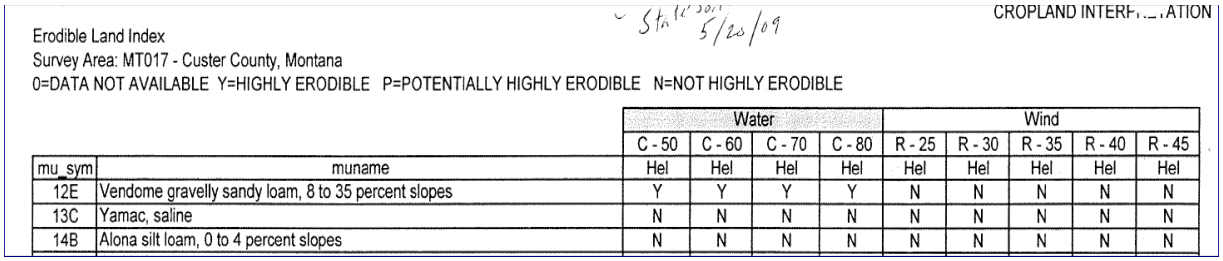
Petroleum Resources

The DNRC's Montana Board of Oil & Gas Conservation shows no record of oil production in Custer County from 1986 to 2019 (MT DNRC BOGC, 2019). The interactive map on the BOGC website shows only water and gas wells. Shale XP data shows 229 oil wells have been drilled in Custer County, but none of them are active (ShaleXP, 2019).

HEL Soils

Cropland soils are designated as highly erodible (HEL) or non-highly erodible (NHEL) based on their susceptibility to movement caused by the actions wind or water.

The NRCS Frozen Soils List for Custer County assigns erodibility values to each of 267 soils found in the county. Erodibility is divided into two categories, Water and Wind. The categories are further divided by sub-categories of climate factor (water) and the erosion intensity factor (wind). On the Frozen Soils List Y indicates Yes, the soil is highly erodible, and N indicates No, the soil is not highly erodible. Figure 7 is a snip of the first page of the Custer County Frozen Soils List to illustrate how soils are categorized.



CROPLAND INTERPRETATION

Erodible Land Index
Survey Area: MT017 - Custer County, Montana
0=DATA NOT AVAILABLE Y=HIGHLY ERODIBLE P=POTENTIALLY HIGHLY ERODIBLE N=NOT HIGHLY ERODIBLE

		Water				Wind				
		C - 50	C - 60	C - 70	C - 80	R - 25	R - 30	R - 35	R - 40	R - 45
mu_sym	muname	Hel	Hel	Hel	Hel	Hel	Hel	Hel	Hel	Hel
12E	Vendome gravelly sandy loam, 8 to 35 percent slopes	Y	Y	Y	Y	N	N	N	N	N
13C	Yamac, saline	N	N	N	N	N	N	N	N	N
14B	Alona silt loam, 0 to 4 percent slopes	N	N	N	N	N	N	N	N	N

Figure 7. Excerpt from Custer County Frozen Soils List

Many of the soils on the Frozen Soils List do not occur in cropland areas, but most of the soils are listed as highly erodible for water in all four climate scenarios. Almost 74% of the soils on the List are Y (highly erodible) in all four water erodibility sub-categores. There is more variability in the soils' susceptibility to wind erosion, but overall about a third of the soils in the county are also vulnerable to wind erosion if included in an annual crop system (USDA NRCS).

Soil Series

Soil series are made up of soils with profiles that are almost alike. Except for differences in the texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement. The Custer County Soil Surveys do not group soils into soils series or soil associations as many county Soil Surveys do. The soils are listed and classified by Family or Higher Taxonomic Class. Custer County Soil Surveys can be accessed at https://www.nrcs.usda.gov/wps/portal/nrcs/surveylist/soils/survey/state/?stateId=MT

Prime Farmland, Farmland of Statewide Importance and Prime if Irrigated Farmland

Prime Farmland

The U.S. Department of Agriculture defines land that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops and is also available for these land uses as Prime Farmland. Custer County has no soils designated as Prime Farmland.

Farmland of Statewide Importance

These are soils that have been determined to be of significance for production of food, feed, fiber, forage, and oilseed crops. These soils have an adequate and dependable water supply from precipitation or irrigation, favorable temperature and growing season, acceptable acidity or alkalinity, acceptable salt and sodium content, and few or no rocks. They are permeable to water and air, are not excessively erodible or saturated with water for a long period of time, and either do not flood frequently or are protected from flooding. They are available for farming, but could currently be cropland, pastureland, rangeland, forestland, or other land.

Forty soils in the county are designated as Soils of Statewide Importance, occurring on 361,525 acres. Four of these soils add up to over half of all Soils of Statewide Importance in Custer County.

- Map Unit 901 Sonnet-Sonnet, thin surface complex, 2- 8% slopes. 105,581 acres
- Map Unit 30C Yamacall Havre occasionally flooded loams. 0-8% slopes. 53,674 acres
- Map Unit 53C Kobase Silty Clay loams, 2-8% slopes. 21,690 acres
- Map Unit 79C Yamacall loam, 2-8% slopes. 19,229 acres

Prime if Irrigated Farmland

Prime if irrigated soils are those with the best combination of physical and chemical characteristics for agriculture such as the soil quality and adequate growing season necessary to produce high yields of crops suited to the region but occur in areas of limited rainfall.

Twenty-one Custer County soils are Prime Farmland if Irrigated, covering 117,919 acres. Four of these make up 54.9% of all the Prime if Irrigated soils in the county.

- Map Unit 41C Eapa loam 0-2% slopes. 21,343 acres
- Map Unit 79A Yamacall loam, 0-2% slopes. 17,627 acres
- Map Unit 481A Havre loam, 0-2% slopes, occasionally flooded. 13,957 acres
- Map Unit 489A Spinekop silty clay loam, 0-2% slopes. 11,825 acres

Prime if Irrigated and the Product of the Erodibility Index X Climate Factor Does Not Exceed 60

These soils would have all the characteristics of the previous designation if the features of their environment do not lend to excessive erosion. There are six of these in Custer County occurring on 23,523 acres. The two soils which occur most commonly are:

- Map Unit 453A Glendive-Havre complex, 0-2% slopes, occasionally flooded. 4,625 acres
- Map Unit 45A Glendive fine sandy loam 0-2% slopes, rarely flooded. 3,213 acres

Figure 8 shows the location of the soils in each of the Prime Soils designation. Figure 9 shows that many of these soils are currently in crop production or have been converted to pasture.

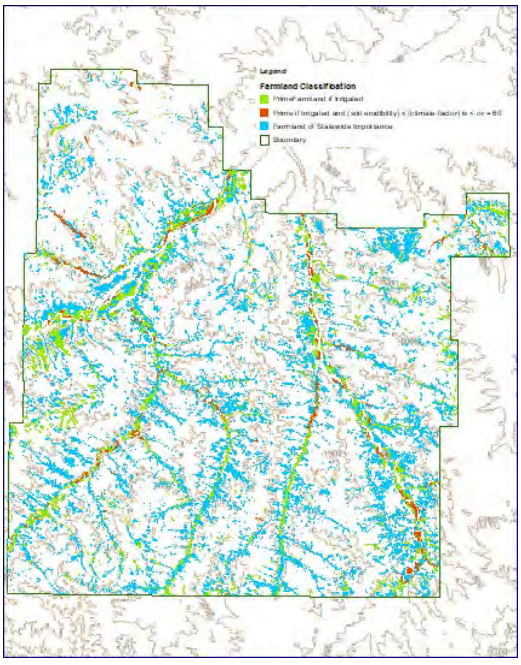


Figure 8. Important Soils

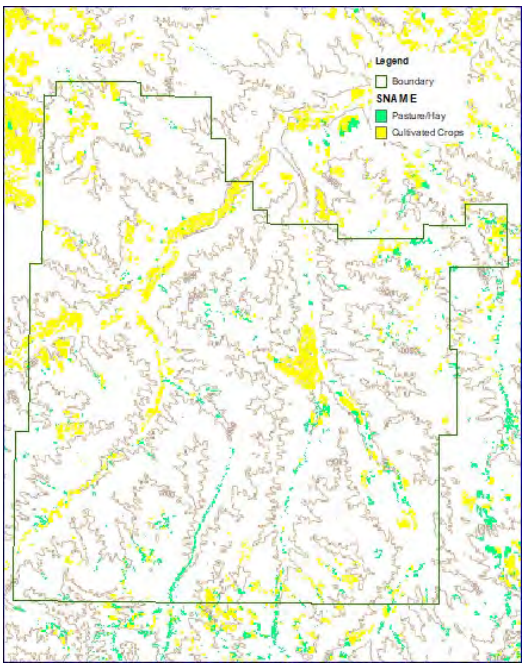


Figure 9. Crop and Pasture Lands

Hydric Soils

Hydric soils are characterized by frequent, prolonged saturation and low oxygen content, which lead to anaerobic chemical environments where reduced iron is present. This definition includes soils that

developed under anaerobic conditions in the upper part but no longer experience these conditions due to hydrologic alteration such as those hydric soils that have been artificially drained or are protected by ditches or levees.

There are relatively few areas of hydric soil in Custer County. In total they encompass 7,731 acres or about 0.3% of all the land in the county. They occur in drainageways and oxbows, on flood plains and to a much lesser extent, in depressions.

Thirty-one soils are shown on the NRCS Field Office Technical Guide table of hydric soils; four soils make up nearly 60 percent of all hydric soils in the county, Table 2.

Table 2. Custer County Hydric Soils

Soil Map Unit	Soil Name	Acres of Hydric Soils in the County	Percent of all Hydric Soils in the County
30c	Yamacall-Havre Occasionally flooded loam. 0-8% slopes.	1547.7	20
77A	Havre-Big Sandy loam. Frequently flooded. 0-2% slopes.	1245.2	16.1
473A	Lallie silty clay 0-2% slopes.	964.8	14.7
481A	Havre loams. Occasionally flooded. 0-2% slopes.	698	9

WATER

Hydrography

A hydrologic unit is the area of land surrounding a hydrologic feature such as a stream, river, or lake and includes all of the land areas that drains into that feature. The Hydrologic Unit Code (HUC) numbering system for watersheds developed by the U.S. Geological Survey (USGS) to provide a common coding system for State and Federal agencies. Each unique code is attached to a specific watershed, enabling different agencies to have common terms of reference and to agree on the boundaries of the watershed. The entire country has been mapped with six levels of HUCs: 2-digit Regions, 4-digit sub-regions, 6-digit basins, 8-digit HUCs for large watersheds known as sub-basins, 10-digit HUCs for watersheds, and 12-digit HUCs for smaller or sub-watersheds.

Portions of the Little Dry, Lower Yellowstone-Sunday, O'Fallon, Lower Powder, Mizpah and Lower Tongue sub-regions occur in Custer County. These are shown in Figure 10 as polygons with thick black boundaries. Within the subregions are 10-digit watersheds labeled and bordered in brown. These are divided into 12-digit sub-watersheds, shown on the map with blue borders.

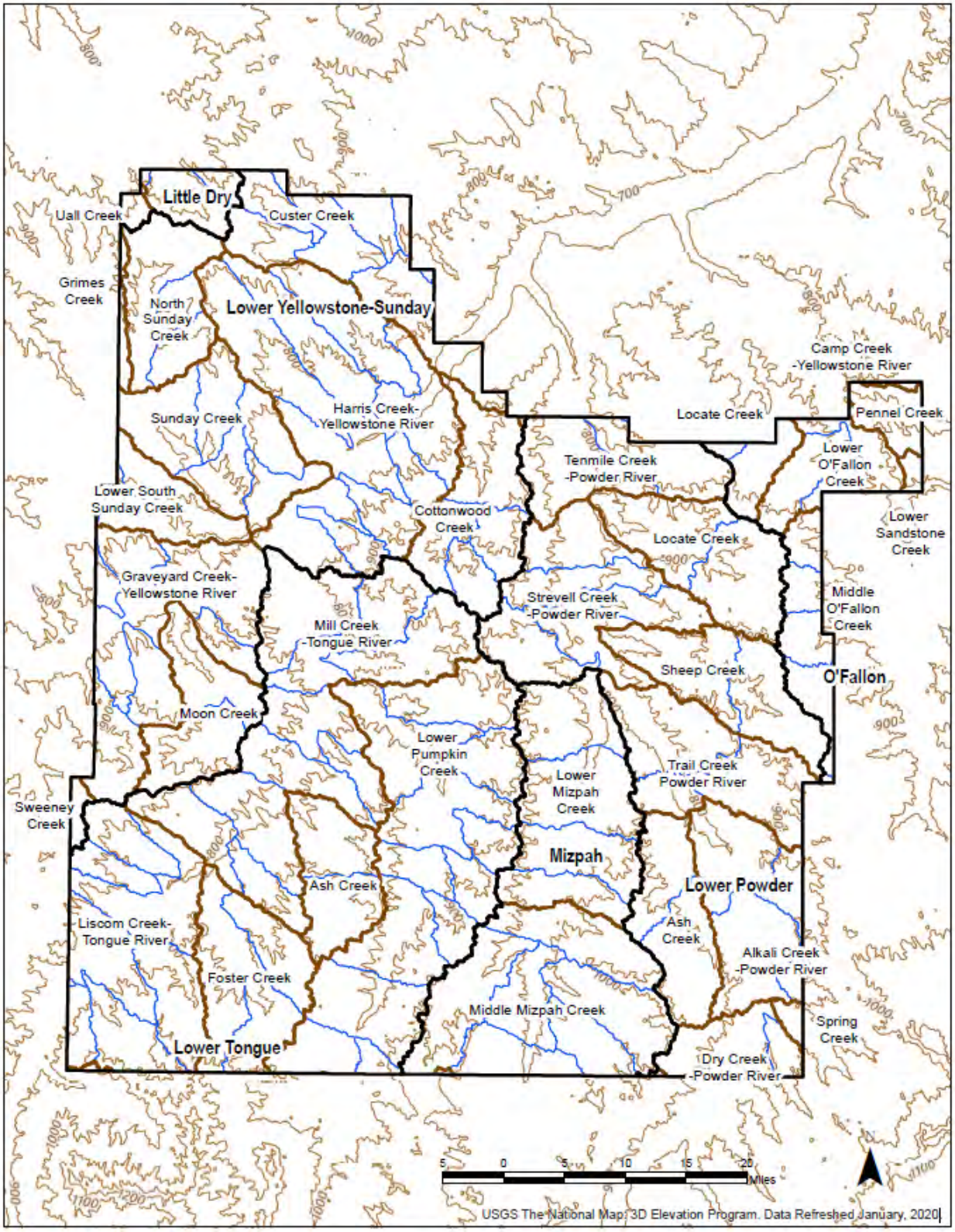


Figure 10. Custer County Sub-regions, Watersheds and Sub-Watersheds

Hydrology

The Yellowstone River flows north and east through the northwest quarter of Custer County. About forty square miles in the extreme northwestern corner of the county lie within the Little Dry Subregion and are emptied by Crow Rock and Hay Creek, which flow north to the Missouri River. Rain and snowmelt in all other watersheds north of the Yellowstone River flow south and east into the Yellowstone. See Appendix A7.

All streams south of the Yellowstone River flow north into the river. The Tongue and Powder Rivers originate in Wyoming. The Tongue River drains most of southwestern Custer County and flows into the Yellowstone River at Miles City. Its major tributaries are Pumpkin, Ash and Foster Creeks. The Powder River lies within the Little Powder subregion; it meets the Yellowstone about seven miles upstream from Terry, Montana in Prairie County. Major tributaries of the Powder are Mizpah, Ash, Alkali, Coal, Sheep and Trail Creeks. O'Fallon Creek runs through the far northeast corner of the county; it flows into the Yellowstone river near Fallon, Montana also in Prairie County.

Surface Water

USGS Wyoming-Montana Water Science Center in cooperation with U.S. Army Corps of Engineers maintains three stream gauges in Custer County as part of the Groundwater and Streamflow Information Program network of Federal Priority Stream Gauges (FPS). The stream gauges are on the Tongue River at Miles City, on the Yellowstone River at Miles City and on the Powder River near Locate, Montana.

Mean Annual output (stream flow) for the three gauging stations is shown in Figures 11, 13 and 15. The highest and lowest values are indicated. Following each **mean annual** stream-flow graph is the same gauging station's record for annual **peak** streamflow shown in Figures 12, 14 and 16. The highest values are labeled, indicating the date of the highest discharge and the amount of water in cubic feet per second (USGS, 2019). [3]

[3] One cubic foot of water is a little less than 7.5 gallons. One cubic foot per second is a little less than 449 gallons per minute.

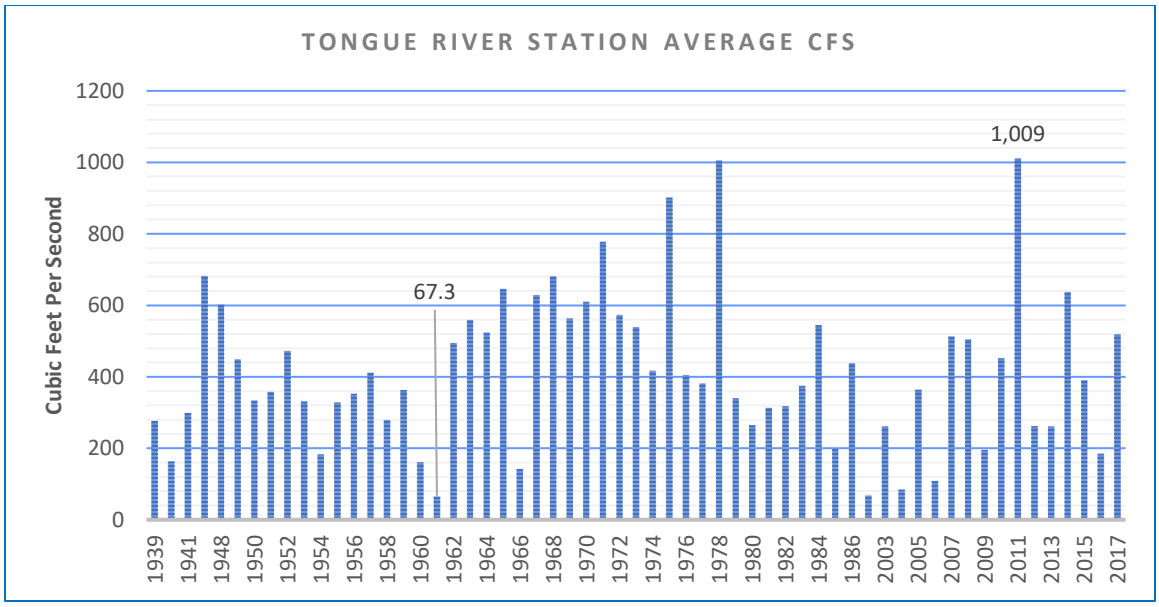


Figure 11. Mean Annual Flow at the Tongue River Station.

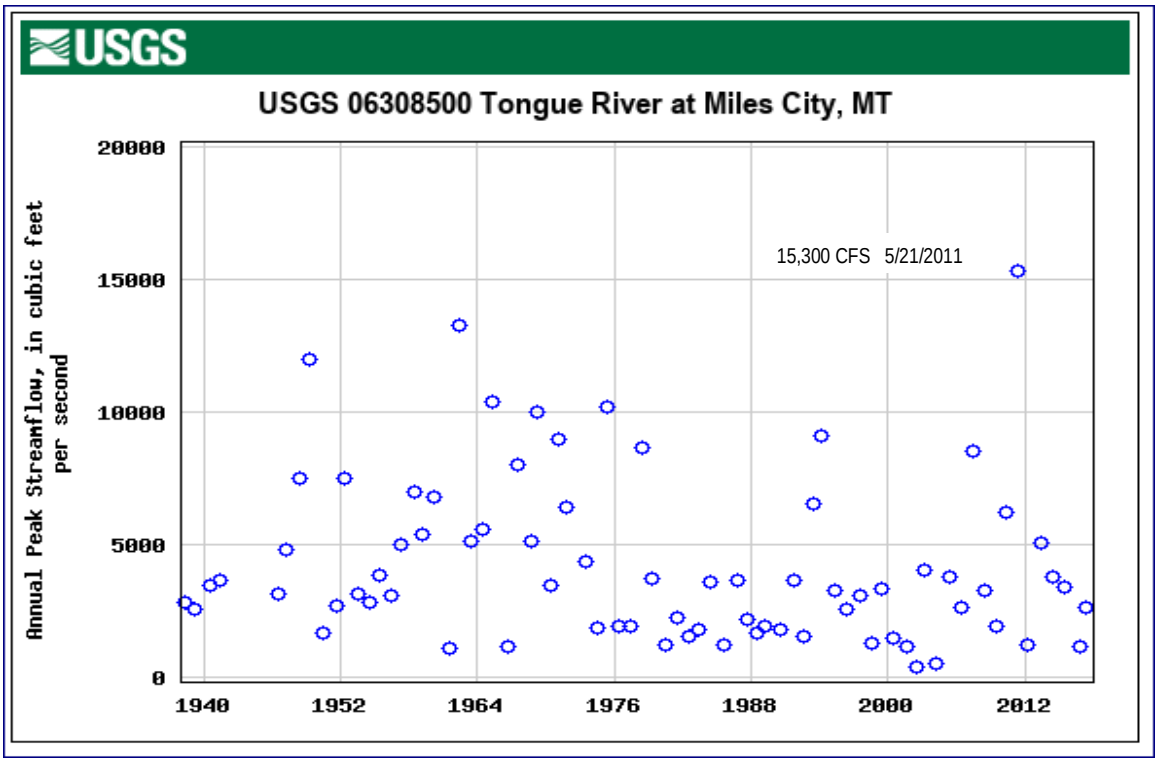


Figure 12. Tongue River Annual Peak Streamflow.

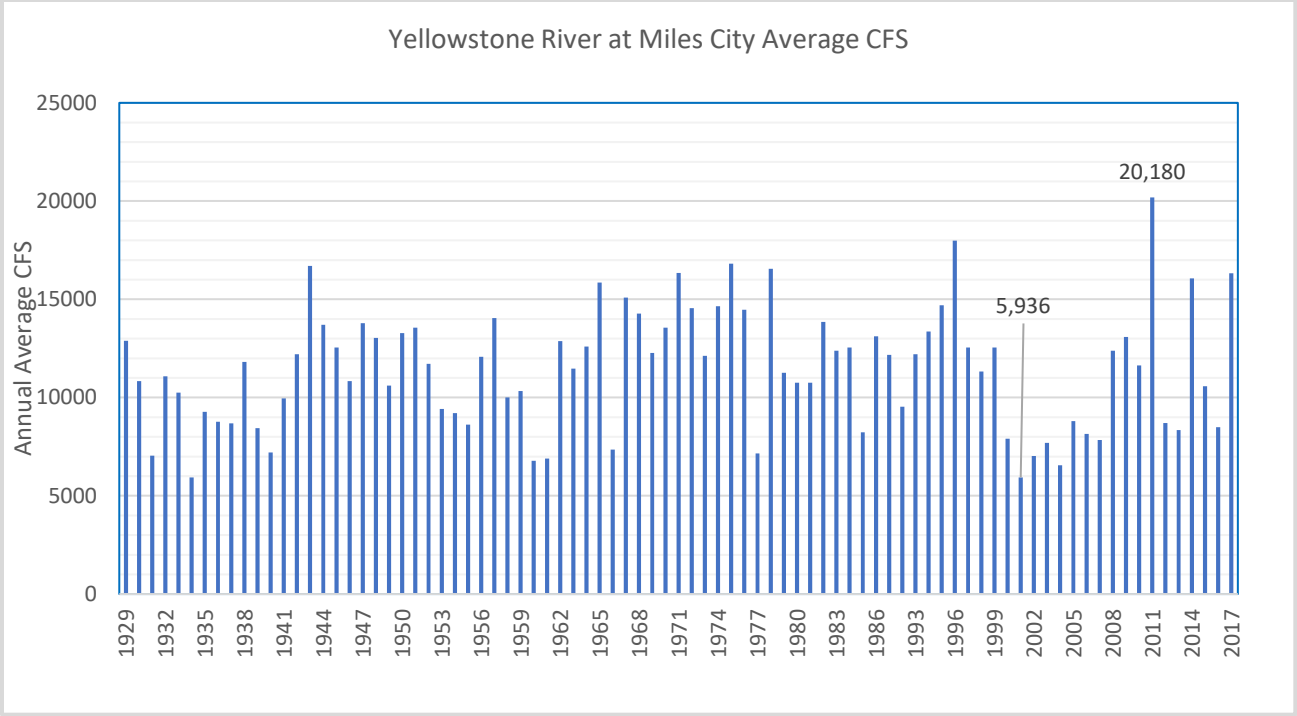


Figure 13. Average Annual Discharge at the Miles City Station.

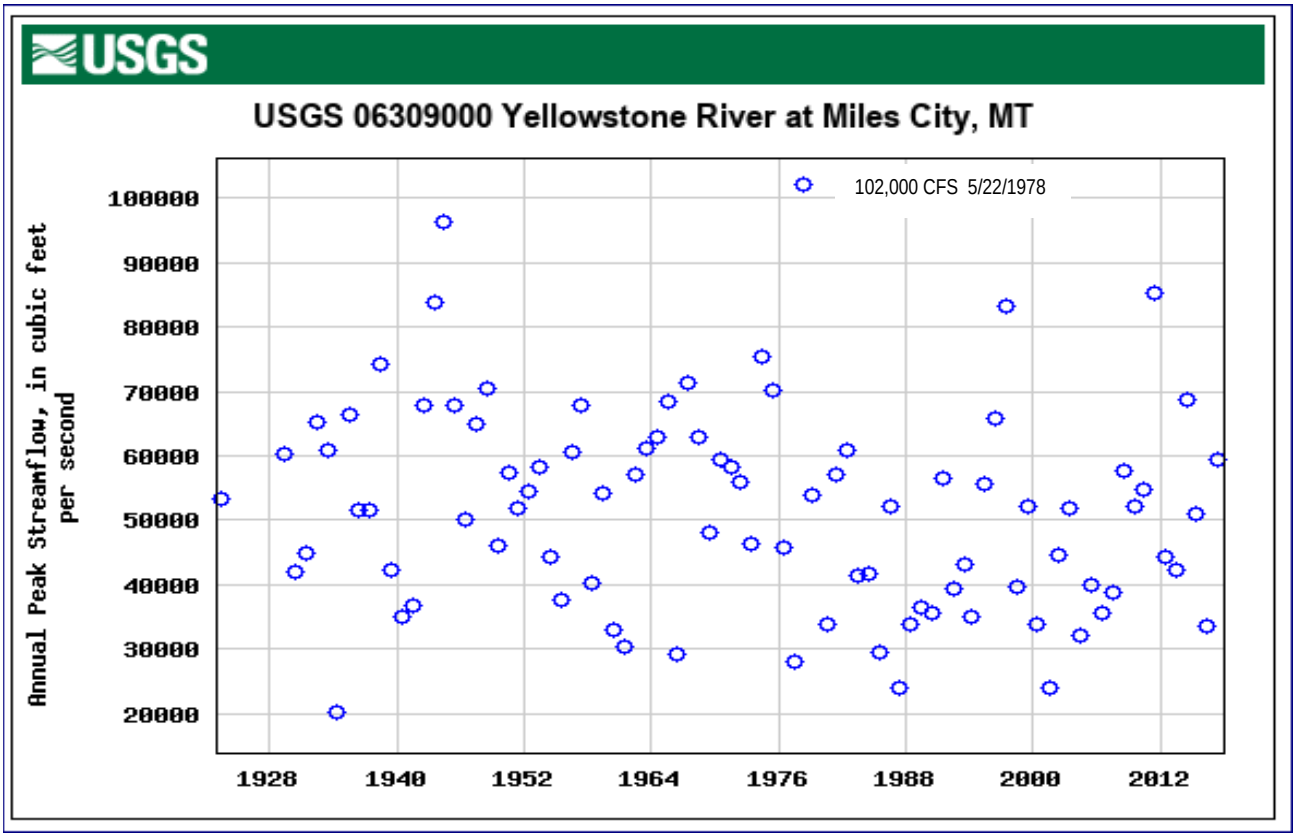


Figure 14. Annual Peak Streamflow on the Yellowstone River at Miles City.

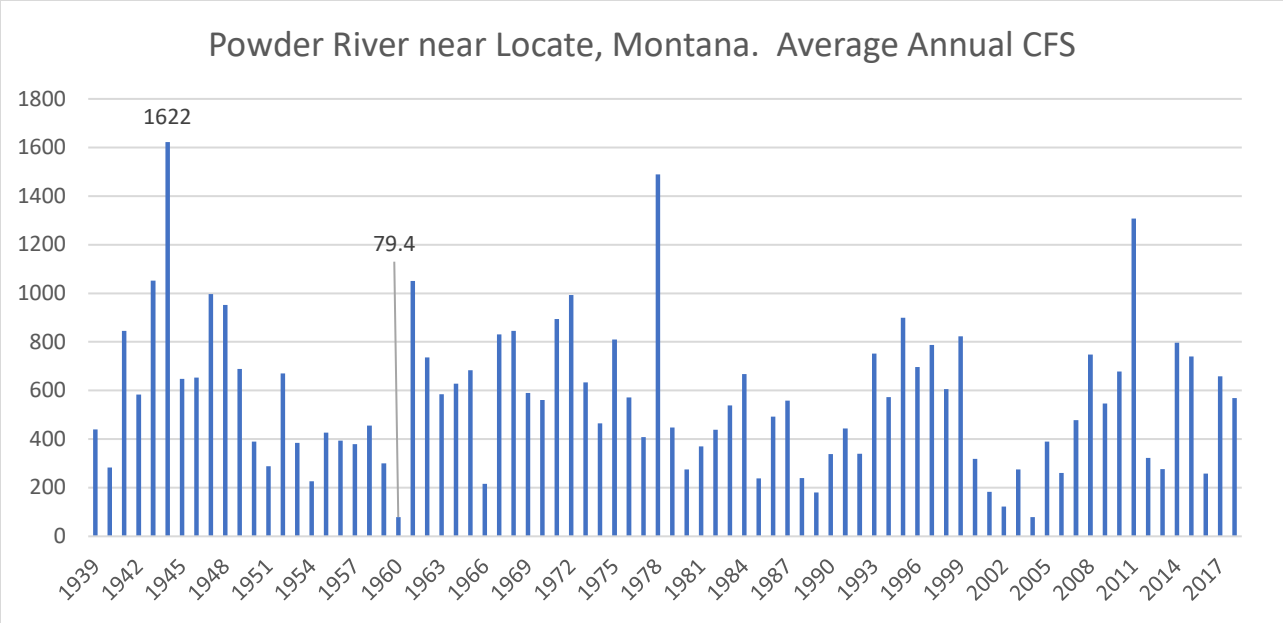


Figure 15. Average Annual Discharge at the Locate Station.

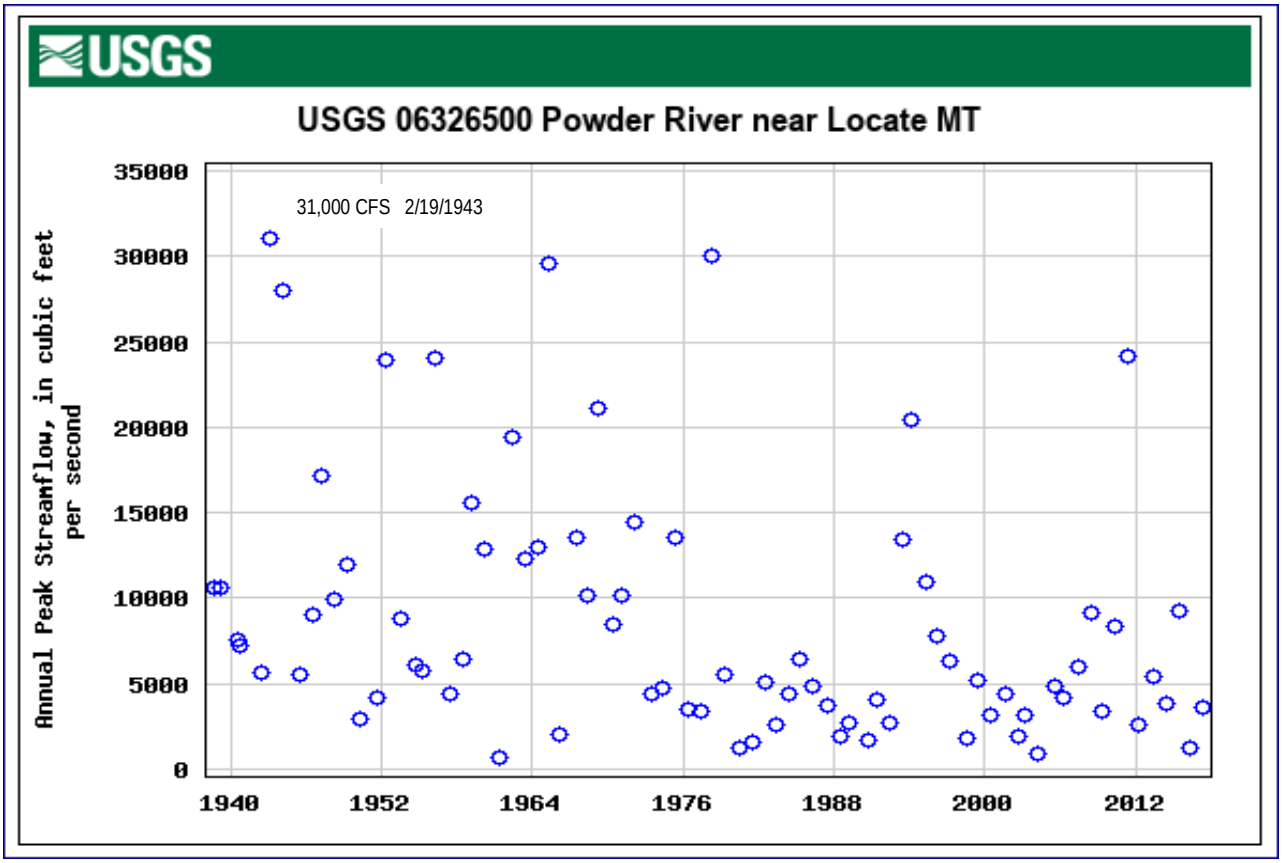


Figure 16. Annual Peak Streamflow on the Powder River near Locate.

Aquatic Community Types

Montana's State Wildlife Action Plan (SWAP) identifies all streams, rivers, floodplain and riparian, and wetland community types across the state as "Community Types of Greatest Conservation Need". The plan defines this as meaning there is a clear obligation to use resources to implement conservation actions that provide direct benefit to these community types. The plan also provides lists of species of concern associated with each community type. Montana's SWAP is available at http://fwp.mt.gov/fishAndWildlife/conservationInAction/actionPlan

SWAP Aquatic Focal Areas were developed based on the largest number of species and communities that would benefit from conservation. Custer County includes the Lower Yellowstone River, Tongue River and Powder River Tier I Aquatic Focal Areas, shown in figure 17. Tier I communities are those is greatest need of conservation, for which there is a clear obligation to use resources to implement conservation actions that provide direct benefit to these areas. In Custer County, Tier I Aquatic Community Types include Mixed System Rivers (the Yellowstone River), Prairie Rivers (the Powder and Tongue Rivers) and Prairie Streams. Each system has its own set of associated species of greatest conservation need.

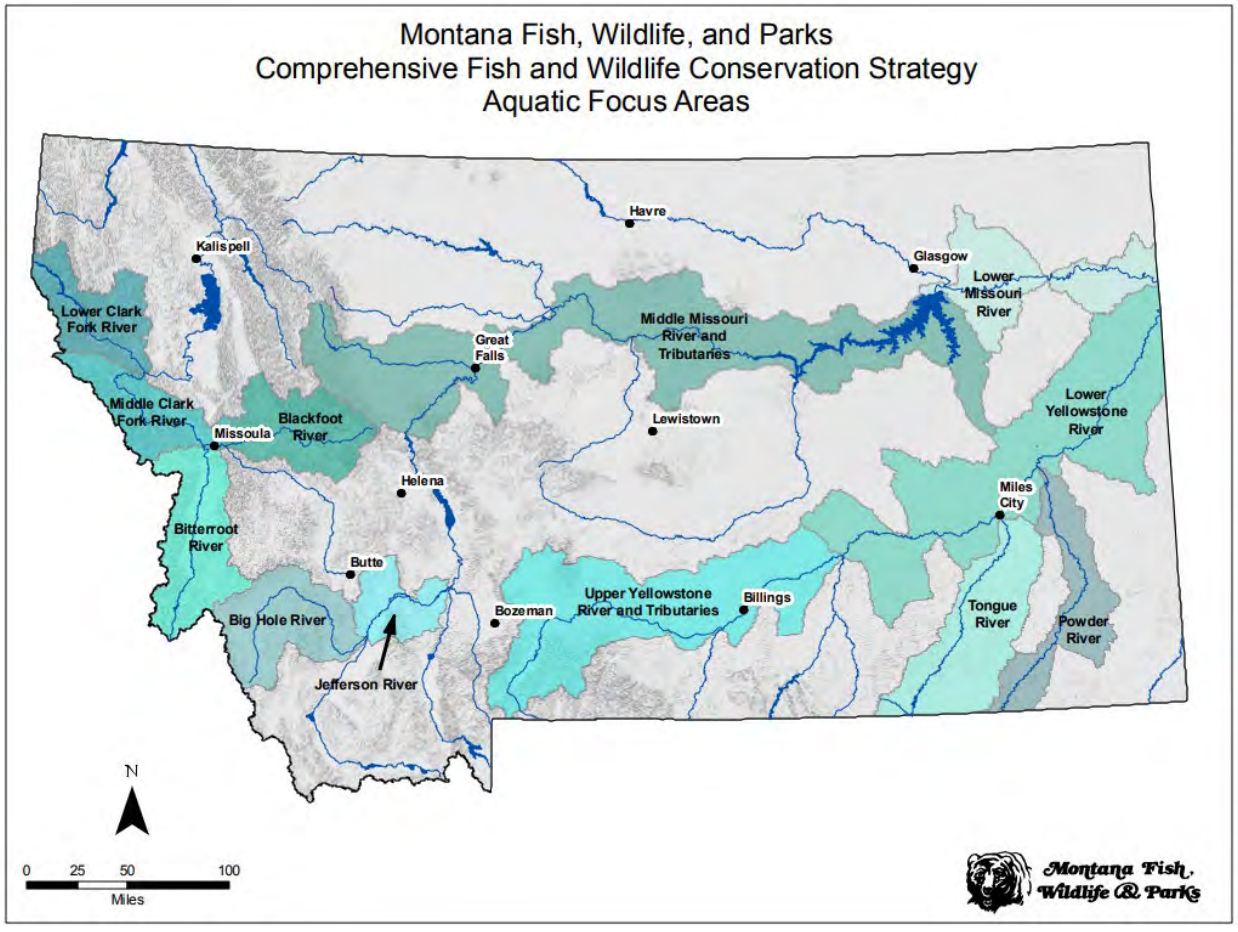


Figure 17

303-d Listed Streams

Montana Water Quality Planning Bureau Water Quality Analysis, Reporting & Documentation System (WARD) provides reports to the EPA on water quality in all Montana water bodies. Twenty-one stream reaches are listed in one of five categories of impairments in Custer County (Montana DEQ, 2019).

Beneficial uses are primary contact recreation, aquatic life, agriculture, drinking water.

Category 1: *Waters for which all applicable beneficial uses have been assessed and all uses are determined to be fully supported.*

- **Custer Creek**.

Category 2: *Available data and/or information indicate that some, but not all the beneficial uses are supported.*

- **O'Fallon Creek, Fallon**, Carter County border to Mildred, Montana.

Category 3: *Insufficient or no data available to determine whether any beneficial use is attained.*

- **Foster Creek**
- **Sand Creek**

Category 5: *Waters where one or more applicable beneficial uses are impaired or threatened and a TDML is required to address the factors causing the impairment or threat.*

- **Tongue River**, Beaver Creek to Twelve Mile Dam; Twelve Mile Dam to the Yellowstone River.
- **Pumpkin Creek**, headwaters to Little Pumpkin Creek; Little Pumpkin Creek to the Tongue River.
- **Powder River**, Little Powder River to Mizpah Creek; Mizpah Creek to the Yellowstone River.
- **Harris Creek**
- **Muster Creek**
- **Deadman Creek**
- **Pennel Creek**
- **Sandstone Creek**
- **North Sunday Creek**, Custer/Rosebud County border to Sunday Creek.
- **Mizpah Creek**, headwaters to Corral Creek; Corral Creek to the Powder River.
- **Sunday Creek**, North and South Forks to the Yellowstone River.
- **Yellowstone River**, Cartersville Diversion Dam to Powder River.

Category 5, 5N: *One or more beneficial use is impaired or threatened and a TDML is required* ***AND*** *available date and or information indicate that a water quality standard is not met due to an apparent natural source in the absence of any identified man-mand sources.*

- **Stump Creek**

Specific information about beneficial use, impairments and causes is available on the Montana DEQ Clean Water Act Information web page at http://svc.mt.gov/deq/dst/#/app/cwaic.

303-d listed streams are shown on the map in Appendix A7, Custer County Surface Water.

Ground Water

According to the Ground Water Information Data Center for the Montana Bureau of Mines and Geology, (MBMG) there are 3,169 water wells in the County. The oldest well on record was drilled in 1880. One thousand ninety-one wells supply water for domestic use; 121 are used for irrigation, 40 are for public

water supply and 1,883 are livestock water wells. There are 287 monitoring wells in the county. The number of wells by category of depth are shown in Figure 18.

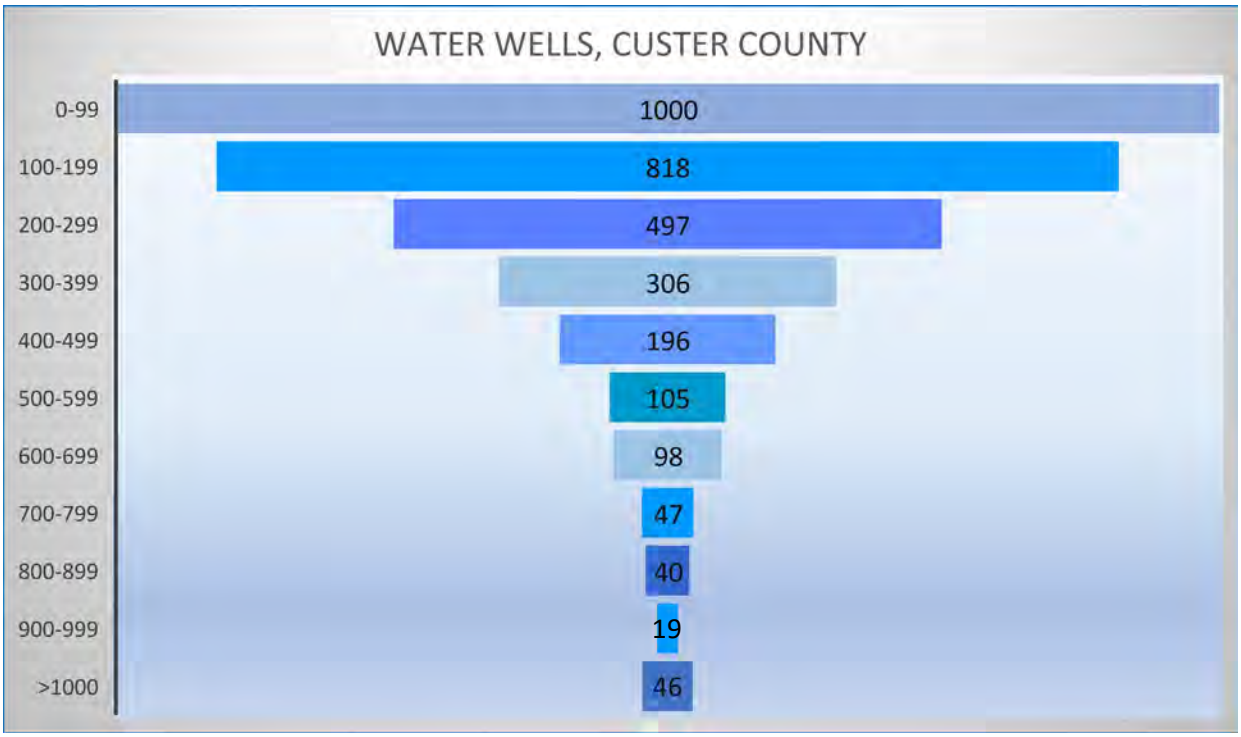


Figure 18. Categories of Well Depths in Custer County

MBMG also provides information on the ground water sources for most of the wells in the county. This is shown in Table 3.

Table 3. Geologic Sources of Ground Water, Custer County

Geologic Source	Number of Wells
Tullock Member of Fort Union Formation	966
Tongue River Member of Fort Union Formation	155
Lance-Hell Creek Undifferentiated	137
Sand and Gravel	104
Fox Hills-Hell Creek Aquifer	76
Quaternary Alluvium	37
Hell Creek Formation	28
Fort Union Formation	24
Fox Hills Formation	12
Other (12)	25

MBMG maintains three wells as part of the statewide monitoring network. These are used to measure normal water levels, changes in water levels relative to climatic conditions, responses of water levels to development and long-term water-quality trends (MBMG, 2019). Information on the locations of the wells, static water level changes over time and other information is available at

http://mbmggwic.mtech.edu/sqlserver/v11/data/dataProject.asp?MTCounty=CUSTER&project=GWAAMON&datatype=swl& .

AIR AND ENERGY

Air Quality

Montana Department of Environmental Quality (DEQ) Air Quality Bureau maintains air quality monitoring stations throughout the state. Those closest to Custer County are located in Broadus, Birney and Sidney, Montana. Ambient temperature, wind speed and direction and pollutants including NO, NO2, NOX, ozone and particulate matter are monitored. The Health Effects Categories for the Birney, Broadus and Sidney stations are typically 'Good', meaning visibility is more than 13.4 miles and no health effects are expected (MT DEQ, 2019).

Utilities

Miles City and Ismay are served by Montana Dakota Utilities, headquartered in Bismarck, North Dakota. MDU is a subsidiary of MDU Resources Group, Inc., a diversified natural resources company that provides retail natural gas and electric services to parts of Montana, North Dakota, South Dakota and Wyoming. MDU's service area covers more than 168 thousand square miles (5.5 percent of the continental United States), serving about 410 thousand customers.

Most rural areas in the county purchase electricity from Tongue River Electric Co-op (TRECO) of Ashland, Montana. TRECO serves 2,677 members with 2,894 miles of line.

The northeast corner of the county is served by McCone Electric, headquartered in Circle, Montana which covers 14,400 square miles in eastern Montana. A small area on the eastern side of the county receives electricity through Southeast Electric Co-op of Ekalaka, Montana which provides power to 2,070 members through 1,719 miles of electrical power lines.

PLANTS AND ANIMALS

Federally Listed Species

The U.S. Fish and Wildlife Service (USFWS) has determined that there are four species of native animals listed as endangered or threatened under the Federal Endangered Species Act (ESA) in Custer County as of June 10, 2020.

Pallid Sturgeon (*Scaphirhynchus albus*). Endangered
Pallid sturgeon are bottom dwelling, slow growing fish that feed primarily on small fish and immature aquatic insects. Adults have a flattened snout, a long slender tail and are armored with lengthwise rows of bony plates instead of scales. Pallid sturgeon can grow up to six feet long and weigh up to 80 pounds. The species is adapted to living close to the bottom of large, silty rivers; their preferred habitat has a diversity of depths and velocities formed by braided channels, sand bars, sand flats and gravel bars.

The pallid sturgeon is one of the rarest fishes in North America. It was federally listed as endangered in 1990 due to population decline caused by human alterations of the environment such as impoundments, channelization and altered river hydrography, turbidity and temperature. The pallid sturgeon is currently listed as "S1" in Montana due to extremely limited or rapidly declining population numbers, range or habitat, making it highly vulnerable to global extinction or extirpation in Montana (MTNHP, 2019). Any NRCS undertaking that impacts the Yellowstone Riverbank below the ordinary high-water mark will require a consultation with the Corp of Engineers as well as a consultation with USFWS (Ellenburg, 2019).

Whooping Crane *(Grus americana)*. Endangered
Whooping cranes are the world's rarest crane and the tallest birds in North America. Adult height is about five feet, wingspan can be up to seven- and one-half feet. Average adult weight is about 15 pounds. Once found throughout North America, the last wild flock of whooping cranes had been reduced to fewer than 20 birds by the 1940's due to habitat loss and hunting. Intensive conservation efforts and international cooperation between Canada and the United States rescued the species from extinction, but they remain extremely rare.

Habitat loss remains one of the biggest threats facing wild whooping cranes. Collisions with wind turbines and power lines are an ongoing threat. Whooping crane utilize migratory habitat in eastern Montana, although their main migratory corridor is found to the east in the Dakotas. They are not known to breed in the state (Audubon, 2019). Observations of these birds in the state have been in grain and stubble fields, wet meadows, and wet prairie habitat (MTNHP, 2019).

Interior Least Tern (*Sternula antillarum*)— Endangered
Least terns are North America's smallest tern. These little shorebirds are easily recognized by their yellow bills and legs. The interior population has been listed as endangered because of loss of habitat. The interior population declined by about 88% between 1966 and 2015; Interior Least Tern have been federally listed as endangered since 1985.

Least terns often nest in colonies; nesting sites are shallow scrapes on open ground near lake shores, on sandbars or along the riverside. Unfortunately, prime nesting habitat is often used by humans for recreation or residential development. Additionally, alterations to stream flows caused by dams, reservoirs, water diversion and other changes to river systems have eliminated most historic Least Tern nesting habitat. Wide channels dotted with sandbars, which are preferred by least terns, have been replaced by narrow, armor-banked rivers with highly altered flows. Fluctuating water levels from reservoir releases often destroy nesting sites (MTNHP, 2019). Least terns nest on unvegetated sand-pebble beaches and islands of large reservoirs and rivers in northeastern and southeastern Montana, specifically the Yellowstone and Missouri river systems (MTNHP).

Northern Long-Eared Bat (*Myotis septentrionalis*). Threatened
In Montana this species is known to occupy specific habitat within a limited range along the Missouri and Yellowstone river drainages near the North Dakota border, as shown in Figure 19 from the MTNHP Northern Myotis Field Guide. The species may be partially migratory in far eastern Montana between riparian forest and hibernacula in mines or other suitable features. In the summer they roost in riparian forested areas dominated by cottonwood trees. They emerge to feed at dusk using echolocation to hunt moths, flies, leaf hoppers and beetles.

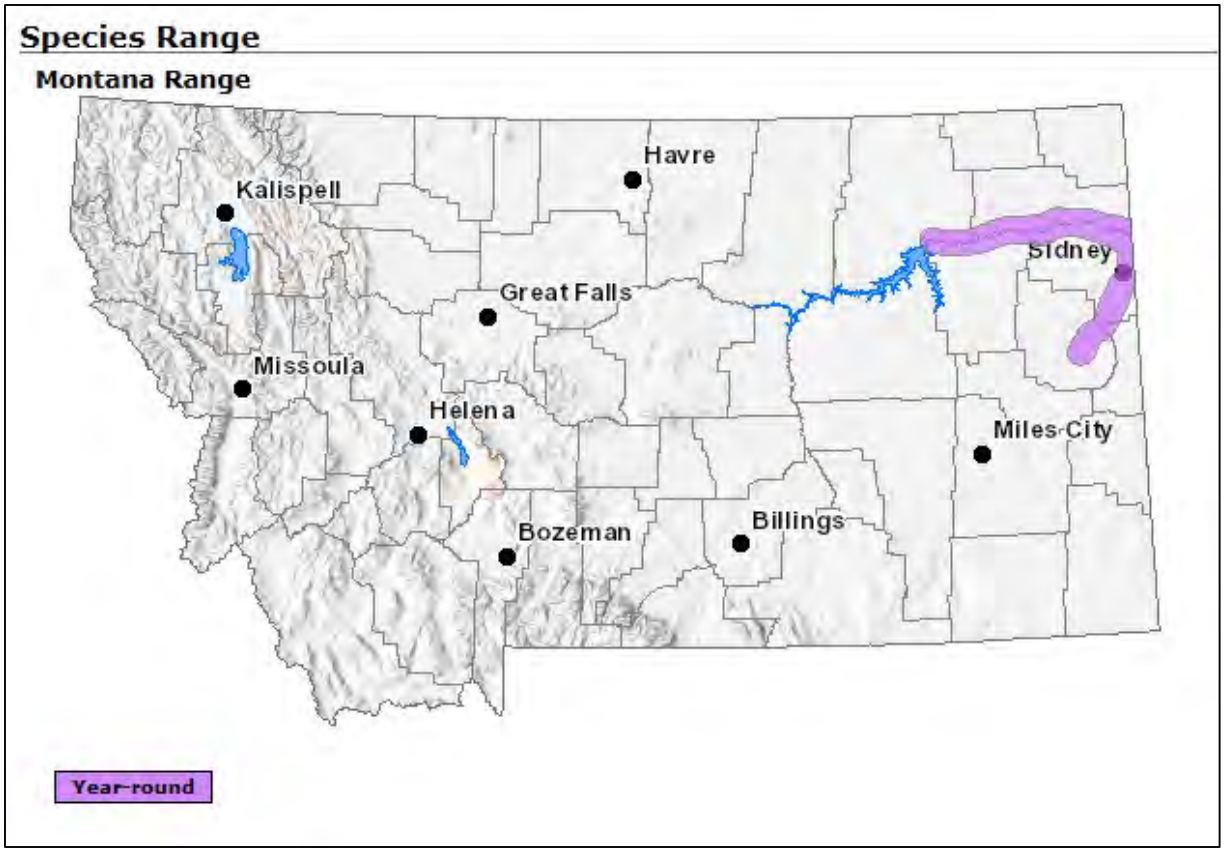


Figure 19. Limited Range of The Northern Long-Eared Bat (MTNHP, 2019)

Long-eared bat populations in other areas of the country have suffered tremendous losses due to white nose syndrome (WNS). Regional extinction has occurred in some locations. WNS is caused by the fungus *Pseudogymnoascus destructans* which attacks the bare skin of bats while they're hibernating causing bats to become active during hibernation, using up the stored fat that they need to survive the winter. WNS continues to spread rapidly across the United States and Canada, mostly through bat-to-bat contact. According to the WNS Response Team, there were no reported occurrences of the disease in long-eared bats in Montana as of August 2019 (WNS Response Team, 2019). Other causes of population decline are due to extensive logging or tree thinning, human disturbance during hibernation and mortality from collisions with wind turbines. The species was officially listed as Threatened on April 2, 2015, under the Endangered Species Act (MTNHP, 2019).

Greater Sage-Grouse

Montana along with several other western states has been the focus of multiple recent petitions to list the greater sage-grouse (*Centrocercus urophasianus*) under the ESA. The primary concerns for sage-grouse are loss and fragmentation of their habitat. In Montana, habitat loss due to conversion of sagebrush steppe to cropland and energy development is thought to be the biggest threat to greater sage-grouse.

On September 22, 2015, the USFWS determined that the greater sage-grouse did not warrant listing protection under the ESA. It was decided that the primary threats to populations had been ameliorated by conservation efforts implemented by Federal, State, and private landowners. However, MTNHP

Species of Concern Report lists greater sage grouse as category S2: At risk because of very limited and/or potentially declining population numbers, range and/or habitat, making it vulnerable to global extinction or extirpation in the state (MTNHP, 2019).

Most of Custer County has been determined to be 'General Habitat" for greater sage-grouse. There is only one area in the county designated as part of the species' core area, defined as the area that contains the species of concern, having, exemplary natural plant and animal communities, or exceptional native diversity. See Appendix A8.

Grassland Birds

There are several species of grassland birds that are considered species of concern in Custer County like the Baird's sparrow, chestnut-collared longspur, Sprague's pipit, Brewer's sparrow and the long-billed curlew. Vickery, et al. (2000) explain the recent decline of grassland nesting birds and probable causes of their decline in *Grassland Birds: Av Overview of Threats and Recommended Management Strategies*.

"During the past quarter century, grassland birds have experienced steeper, more consistent, and more widespread population declines than any other avian guild in North America. While some grassland species are Neotropical migrants, most are short-distance migrants that winter primarily in the southern U.S. and northern Mexico. The winter ecology of most grassland birds is poorly known; winter survivorship could be a critically important factor in the long-term declines that some species have experienced.

Shortgrass prairies evolved under intense grazing by prairie dogs and bison. Consequently, the shortgrass prairie bird fauna evolved to select a variety of different site characteristics, created within landscapes receiving grazing pressure ranging from light to severe. Unfortunately, current range management practices strive to graze rangelands uniformly. These practices remove or inhibit heterogeneous grazing impacts across landscapes, and do not favor the specific habitat requirements of many species. For example, Mountain Plovers require heavily grazed sites for breeding, but Lark Buntings prefer denser vegetation. Thus, moderate grazing everywhere is unlikely to result in suitable habitat for either species. In many locales, insufficient grazing has led to the invasion of grasslands by shrubs and forbs. Rather than opposing grazing as a management tool in all grasslands, conservation groups should encourage grazing that imitates natural conditions as closely as possible." (Vickery, 2000).

Table 4. Custer County Grassland Birds Species of Concern

Baird's Sparrow *Centronyx bairdii* 	• Prefers to nest in native prairie; requires a relatively complex plant structure including areas of light to no grazing. Feeds on seeds, insects and spiders. • Migrates from winter habitat in Mexico to the grasslands of the northern plains in Montana, North Dakota and Canada. • Loss of native prairie habitat due to agricultural conversion and loss of winter habitat due to overgrazing are thought to be causes of population decline. (MNHP, 2019)
Chestnut-collared Longspur *Calcareous ornatus* 	• Prefers open, sparse vegetation in native pastures with short-to-medium grasses that have been recently disturbed (grazed, mowed or burned). • Winter habitat is the grasslands of the southwestern United States and north-central Mexico. Breeding grounds are grasslands in Montana and North Dakota and southern Canada. • Conversion of native prairie to agriculture and urban development has eliminated the Chestnut-collared Longspur from much of its historical breeding range (MNHP & FWP, 2019)

Sprague's Pipit *Anthus spragueii* 	• Do not nest in cropland and are uncommon or absent in non-native grasslands. They tolerate some grazing of this habitat but do not nest where it is overgrazed. Prefer scattered shrubs and relatively little bare ground. • Summer diet is mostly insects and other arthropods, with some seeds. Little is known about the winter ecology and diet of Sprague's Pipit. • Breeds in the north-central United States in Minnesota, Montana, North Dakota and South Dakota as well as south-central Canada. Wintering occurs in the southern US. • Conversion from prairie to cropland and pasture along with excessive grazing are identified as the cause of this species' decline. (MNHP & FWP, 2019)
Brewer's Sparrow *Spizella breweri* 	• Prefers shrub-steppe habitat dominated by sagebrush. • Builds nests six to eight inches above the ground in big sagebrush. • The primary threat to Brewer's Sparrow breeding populations is fragmentation and loss of sagebrush shrubland and shrub-steppe habitats (MNHP & FWP, 2019).

Long Billed Curlew *(Numenius americanus)* 	Breeds in areas with sparse, short grasses, including shortgrass and mixed-grass prairies and agricultural fields. Outside of the breeding season it is found in wetlands, tidal estuaries, mudflats and beaches. Degradation or loss of grassland breeding habitat to agricultural and residential development is the greatest threat to the Long-billed Curlew. Additionally, other human disturbances such as off-road vehicle travel and agricultural practices such as chaining or dragging to remove sagebrush can destroy nests if done in the spring (MTNHP, 2019).

Animal Species of Concern

MTNHP Field Guide describes Animal Species of Concern as, "native taxa that are at-risk due to declining population trends, threats to their habitats, restricted distribution, and/or other factors". There are 47 animal species of concern in Custer County, shown in Appendix B1.

Plant Species of Concern

The MTNHP Plant Species of Concern Report last updated on April 16, 2020, lists 11 plant species of concern for Custer County. These are shown in Appendix B2.

Wetlands/ Riparian Areas

Wetlands are areas where water covers the soil or is present at or near the surface of the soil all year or for periods of time during the year, including during the growing season. The prolonged presence of water creates conditions that favor the growth of specially adapted plants and promotes the development of characteristic wetland (hydric) soils. Riparian areas are lands that occur along watercourses and water bodies. Typical examples include flood plains and streambanks. They are distinctly different from surrounding lands because of unique soil and vegetation characteristics that are strongly influenced by the presence of water.

Wetlands or riparian systems occur on nearly eighty thousand acres in Custer County. Figure 20 shows the acres and relative proportion of each wetland or riparian area type.

- Emergent wetlands are those that are dominated by erect, rooted, water-loving plants. They may be persistent or ephemeral.
- Ponds are bodies of water less than twenty acres in size. Throughout the county, dams were installed in the uplands to capture water for livestock.
- Riparian Forested systems occur along rivers and streams and are dominated by woody species that are greater than twenty feet tall.
- Scrub-shrub systems are dominated by woody vegetation less than 20 feet tall.

- Riverine areas are perennial streams comprised of the deep-water habitat contained within a channel; they do not include adjacent floodplains (NRCS, 2019).
- Creek bottoms and overflow areas often support small freshwater emergent plant communities and less frequently riparian forested areas.

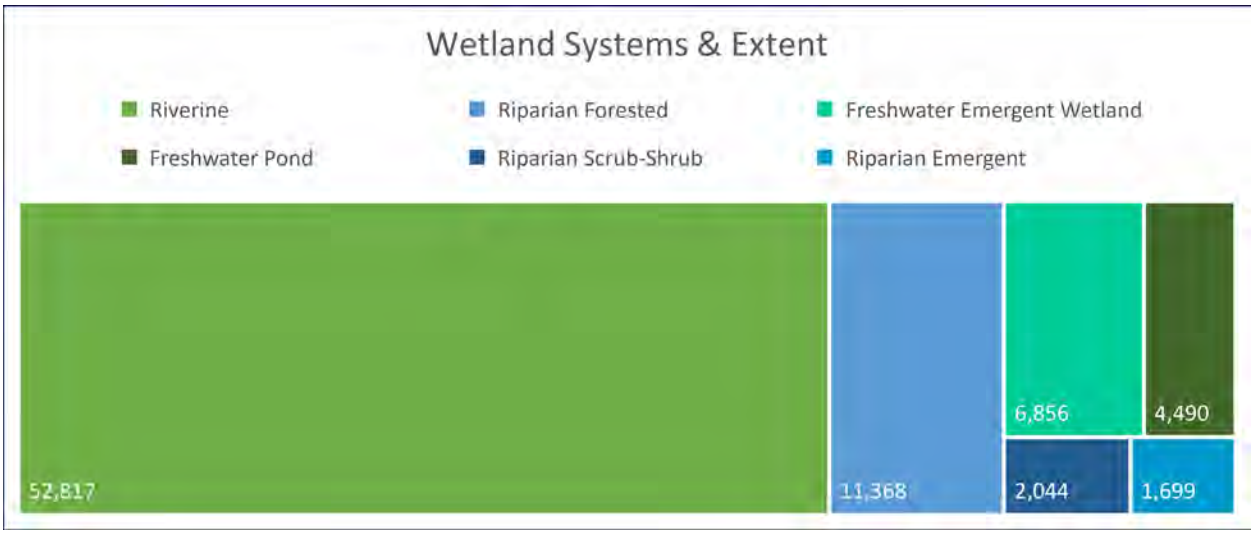


Figure 20. Acres and Types of Wetlands Systems, Custer County.

Figure 21 depicts a small area of the county where Harris Creek flows out of the Badlands to join the Yellowstone River at Shirley, Montana. The Buffalo Rapids irrigation canal appears as a blue line in the lower right.

Riparian Forested areas occur along the Yellowstone River, Harris Creek and on the big island in the river. Low spots and sandbars support emergent wetlands and scrub-shrub communities dominated by willows grow in between. This scenario is common along the banks of the three rivers in Custer County in areas that are not suitable for crop production.

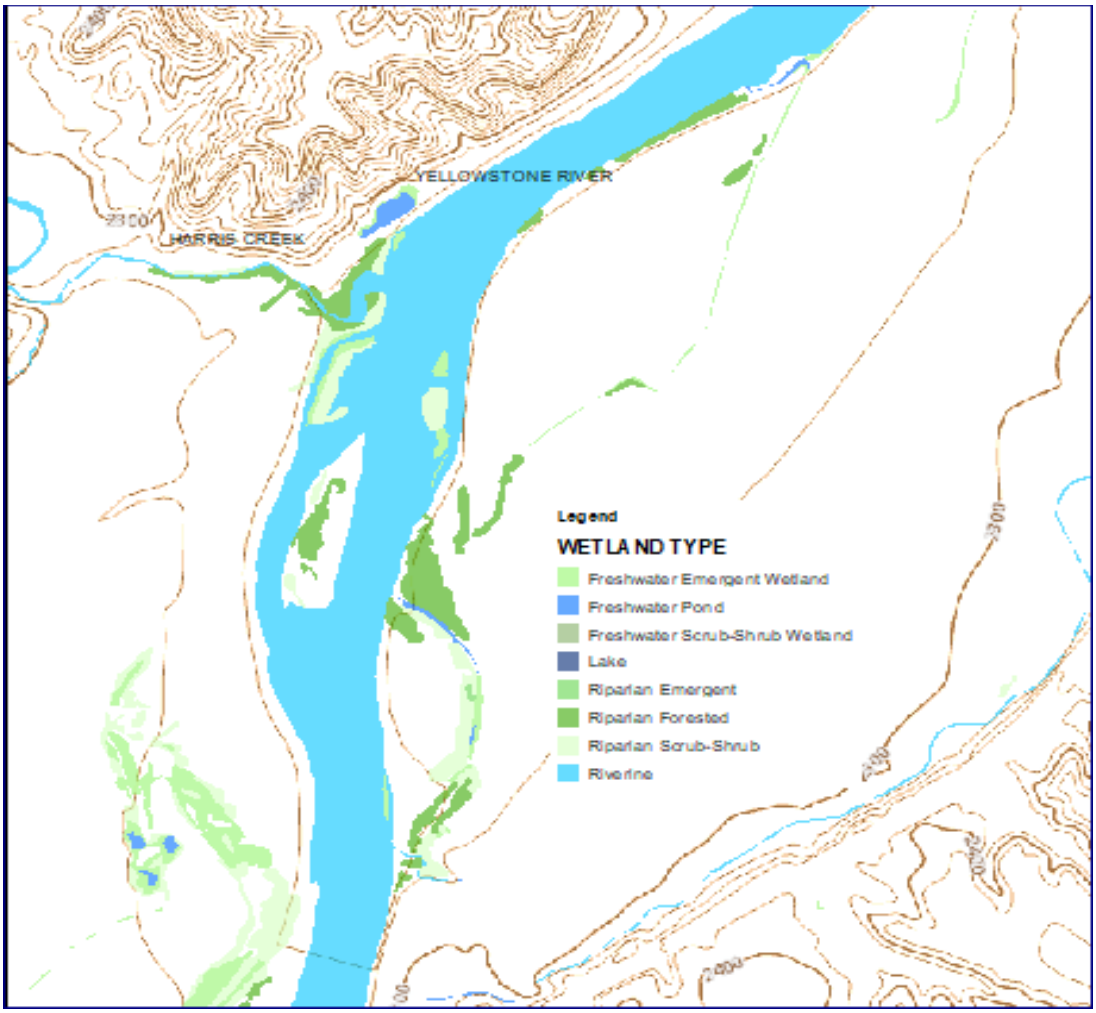


Figure 21. Wetlands and Riparian Areas at the Confluence of Harris Creek & the Yellowstone River

SECTION III CONSERVATION ACTIVITIES

Farm Bill Programs

Environmental Quality Incentive Program

The Environmental Quality Incentive Program (EQIP) provides agricultural producers with financial resources and technical assistance to plan and implement practices intended to protect, conserve or enhance natural resources on private lands. Using these practices can lead to cleaner water and air, healthier soil and better wildlife habitat, all while improving agricultural operations. Practices applied through EQIP in Custer County between 2008 and 2018 were mainly:

- Livestock water wells, pipelines, and tanks
- Fences
- Irrigation Water Structures
- Irrigation Water Management
- Residue and Tillage Management
- Prescribed Grazing

Conservation Stewardship Program

The Conservation Stewardship Programs (CSP), the first iteration of the program, and CStwP, the current version, help producers advance their existing conservation plan and improve their business operation. In Custer County, cropland enhancements that mitigate the loss of nutrients (fertilizer) and off-target herbicide application were common components of conservation plans, as well as crop rotation. Range and pasture activities mainly focused on promoting ecosystem health through more even grazing distribution, herbaceous pest control and enhancements to benefit wildlife habitat. Forest land conservation plans typically included grazing and forest stand improvement practices and enhancements and activities intended to benefit wildlife.

Wildlife Habitat Incentive Program

The Wildlife Habitat Incentive Program (WHIP) was a voluntary program for conservation-minded landowners who wanted to develop and improve wildlife habitat on agricultural land, nonindustrial private forest land, and Indian land. With the enactment of the Agricultural Act (February 7, 2014), funding provided for the Wildlife Habitat Incentive Program (WHIP) in FY-2014 is no longer available for obligations (NRCS, 2020). Practices installed between 2008 and 2018 were mainly Upland Wildlife Habitat Management, Prescribed Grazing and the installation of livestock watering facilities.

Conservation Reserve Program

The Conservation Reserve Program (CRP) is a soil conservation program administered by the Farm Service Agency (FSA). In exchange for a yearly rental payment, producers agree to remove environmentally sensitive land from crop production and plant species that will improve the environment. The long-term goal of the program is to re-establish valuable land cover to improve water quality, prevent soil erosion, and restore habitat for wildlife. In addition to the rental agreement, many Custer County land managers have elected to apply conservation practices under CRP to further benefit natural resources on their former crop fields. Conservation Cover, Upland Wildlife Habitat Management, Integrated Pest Management and Range Planting were the most commonly applied practices in CRP conservation plans written with assistance from the Miles City Field Office.

Total acres by land-use to which Farm Bill Program practices or enhancements were applied are shown in Table 5.

Table 5. Farm Bill Program Treated Acres 2008 – 2018 in Custer County, Montana.

Program/Land Use	**Acres**
CRP Cropland	16,352
CSP Cropland	18,522
CSP Pasture	838
CSP Range	10,402
CStwP Cropland	72,594
CStwP Forest	57,640
CStwP Pasture	25,063
CStwP Range	1,247,414
EQIP Cropland	26,286
EQIP Forest	16,922
EQIP Pasture	4911
EQIP Range	321,970
	Total
Cropland	144,156
Pasture	30,812
Range	15,797,86
Forest	57,640

Partner Conservation Efforts

MSU Extension

Across the western US, alfalfa weevils (*Hypera postica*) have begun to develop resistance to the pyrethroid insecticides which are relied upon in weevil management plans. Once resistance establishes in an insect population, it continues to increase if insecticide use continues. Weevils resistant to a given pyrethroid will likely be cross-resistant (or quickly develop cross-resistance) to all pyrethroid insecticides, rendering the most commonly used and affordable insecticide class ineffective (Montana State University, 2020). Damage by alfalfa weevil threatens both short- and long-term economic goals. Defoliation, reduced yield and quality are immediate concerns. In addition, loss of yield in the current crop, inhibition of growth in subsequent cuttings, increased susceptibility to disease and early weed encroachment can further decrease stand life (Oklahoma State University Extension, 2020).

Custer County MSU Extension has established test plots of three varieties of sainfoin (*Onobrychis viciifolia*) to evaluate its potential as an alternative forage crop. The objective is to determine whether sainfoin can be grown in rotation with alfalfa to break the life cycle of the alfalfa weevil. One of the biggest challenges in the project is control of weeds introduced through irrigation water.

MSU Extension is also involved with the Custer County Weed District to conduct trials related to reseeding areas previously treated for Canada thistle (*Cirsium arvense*) and leafy spurge (*Euphorvia virgate*). Aggressive introduced grass species are interseeded by broadcasting grass seed over 'controlled' (previously treated) weed patches. These trials, as with the sainfoin experiments, are still in the early stages.

Custer County Weed District

Custer County Weed District coordinates and applies noxious weed control for the BLM, Montana Department of Transportation and private landowners. Currently, leafy spurge and Canada thistle are the two noxious weed species causing greatest concern in Custer County. Leafy spurge is found in all major drainages and smaller areas countywide. Canada thistle is widespread as well. Spotted knapweed (*Centaurea stoebe)* occurs in patches along the Baker Highway (MT Highway 12), Tongue River Road and MT Highway 59. Eliminating spotted knapweed infestations is a high priority.

District Weed Coordinator Byron Gould believes that the Weed District is making good progress in controlling some of the larger known infestations of Canada thistle and leafy spurge. Crews had a good season in 2020 and had "really good luck with fall spraying". In 2020, sales of pesticide increased by around 15% over the previous year, indicating that more landowners were treating more acres than in the past.

Attempts to establish an insectary for biocontrol of leafy spurge have not met with much success, but Gould hopes to keep trying. Some thought has been given to implementing grazing to control leafy spurge, but the District has nothing set in place at this time (Gould, 2020).

SECTION IV NATURAL RESOURCE ISSUES & DESIRED OUTCOMES

Local Work Group Priorities

The Custer County Local Work Group met twice in 2019 to discuss natural resource issues, concerns and priorities. Those in attendance included representatives of the Custer County Conservation District, Montana NRCS Miles City Area and Field Office, Custer County FSA, American Bird Conservancy, the BLM, Montana DNRC, T&Y Irrigation District, Kinsey Irrigation Company, Yellowstone River Conservation District Council and USDA ARS Fort Keogh Livestock and Range Research Laboratory. Custer County farmers and ranchers were also represented. Meeting minutes are in Appendix C.

Several priority resource concerns were identified:

- Irrigation Infrastructure
- Grazingland Health (Degraded Plant Condition) and Inadequate Livestock Water
- Noxious and Invasive weeds
- Conifer Encroachment

The office is continuing to survey and collect information regarding resource concerns and desired outcomes from producers within the county. Since the LWG Meetings – it has become apparent the following resource concerns are also common within the county:

- Soil Health on Annual Cropland
- Soil Health on Perennial Hayland
- Forest Fuels Management

- Mesic, Riparian, and Wetland Health
- Wildlife Habitat

Irrigation Infrastructure and Associated Resource Concerns on Irrigated Land

Degraded and inefficient irrigation systems were identified by the LWG as one of the county's priority resource concerns. Irrigation is an integral part of agricultural operations along the Yellowstone, Tongue, and Powder Rivers within the county. Structurally sound, efficient, and reliable irrigation systems facilitate maintaining economically viable farms and a path to improved soil health on the most productive soils within Custer County.

Producers, partners, and state/federal agencies are concerned about the integrity and efficiency of conveyance structures and on-farm irrigation use. The existing delivery systems include earthen supply laterals that often cause unnatural saline seeps. These earthen delivery systems also cause water erosion, especially when paired with flood irrigation and conventional tillage. Tillage is thought to be necessary to prepare the fields for flood irrigation through furrowing, border dikes, and land leveling. Additionally, the use of flood irrigation systems or systems without proper irrigation water management often leads to sediment runoff, soil erosion, saline seeps, nutrient leaching, and inconsistent water application resulting in reduced yields (parts of fields are over-irrigated while other parts are not irrigated enough).

Irrigation water losses through inefficient/degraded infrastructure and over-irrigation result in higher energy use. Additionally, the tillage frequently associated with irrigated land and lack of proper irrigation water management also lead to increased energy use.

The primary goals of the LWG are to convert the least efficient/highest-eroding earthen laterals to irrigation pipeline, to convert flood irrigation systems to sprinklers, to upgrade old conveyance systems and to provide education about irrigation water management and soil health. More specifically, there are concerns over the seepage out of the canal of the T and Y Irrigation System and all associated laterals. The LWG is also concerned about irrigation water quality coming out of the Tongue and Powder Rivers – updates to irrigation infrastructure could help producers deal with salinity issues in those areas.

NRCS recognizes that improving soil health on irrigated land is integrally tied to reducing the amount of tillage. Under sprinkler irrigation, fields can be converted to no-till and the five soil health principles (see page 41 for the 5 principles) can be more easily adopted.

Updated conveyance systems and replacing flood irrigation with sprinkler irrigation would significantly reduce on farm energy use and management inputs. Advances in soil health and reduced tillage would further reduce energy use.

Analysis of Products and Services Needed

Existing irrigation systems need completed inventories that locate structures and identify concerns. On individual farms inventories of current infrastructure, management, resource concerns/opportunities need to be completed. From there, Targeted Implementation Plans and conservation plans can be developed that meet individual producer's and irrigation district goals. A preliminary inventory of the T and Y has been completed by the Yellowstone River Conservation District Council (YRCDC) and is available for NRCS to use in planning.

Where salinity in irrigation water is a concern, water and soil tests will be integral in determining associated conservation strategies – which may include water filtration infrastructure.

Since NRCS recognizes that improvements in irrigation systems can often be tied with improvements in soil health - conservation plans are likely to include converting earthen ditch to irrigation pipeline, converting flood irrigation to sprinkler or gated pipe, residue management in the form of reduced-till or no-till, irrigation water management, cover crops, conservation crop rotation, and nutrient management.

Statement of Desired Future Condition

NRCS has a long history of addressing resource concerns on irrigated cropland in Montana. The concerns brought forth by the LWG are very common and widespread resource concerns on irrigated land throughout the state, so much so, that the agency resources are often spread thin in the attempt to address them all. Additionally, farm resources are also limited – without financial assistance many irrigators or canal users have not been able to afford to maintain and upgrade irrigation systems. With that in mind, to use the agency's resources effectively in the county – efforts need to be focused and strategic.

Long Term Goals:

- Improve the integrity and efficiency of delivery systems to a point where resource concerns caused by irrigation systems are minimal.
- Of the existing irrigated land, maximize the amount of land irrigated by sprinkler systems. On other fields, in which sprinklers are not economical or feasible, improve infrastructure and irrigation water management as much as possible.
- Improve soil health on irrigated land by pairing management practices with infrastructure upgrades and education.
- Improve economic viability of irrigated farms in the county and reduce over-all energy consumption.

Grazingland Health (Degraded Plant Condition) and Inadequate Livestock Water

The LWG identified "Degraded Plant Condition on Grazingland" and "Inadequate Livestock Water Quantity, Quality and Distribution" as the county's second highest priority resource concern group. These resource concerns are frequent and widespread throughout the entire county. Rangeland grazing units in Custer County often contain several factors that limit proper grazing use – including rough terrain, lack of reliable livestock of adequate quality, lack of interior fences, and conifers that can contribute to encroachment and pine-needle abortion. Dryland pasture in Custer County often consists of very old and unhealthy stands of crested wheatgrass (*Agropyron cristatum*) that no longer provide essential ecological functions. Though facilitating practices (fence and livestock water) and grazing management alone may improve some stands, renovation may be desired on severely degraded stands.

There is an increasing number of failing stockwater pits, reservoir, and wells within the county. Additionally, as old reservoirs and pit in the county silt-in water quality declines. Research completed by the Fort Keogh Livestock Range and Research Laboratory showed that stockwater reservoirs and pits in the county often have poor water quality due to nitrates and total dissolved solids.

Without reliable quality livestock water distributed across a grazing unit, grazing rotations and proper control of forage utilization by grazing animals is very limited. Poor control over livestock utilization often

contributes to over-grazing near reliable water sources, under-grazing away from reliable water, and long grazing periods that do not allow time for plant recovery. Repeated patch grazing without adequate plant recovery has contributed to declines in rangeland health, plant community composition, and productivity across the county. Though rangeland degradation can encompass numerous resource concerns, it can be broadly categorized into: Degraded Plant Structure and Composition, Degraded Plant Productivity and Health, Soil Erosion, and Soil Organic Matter Depletion.

Analysis of Products and Services Needed

Conservation plans developed on grazing lands require thorough field inventories, analysis of existing infrastructure and resources, and one-on-one planning with the producer. Each conservation plan must be uniquely adapted to the grazing unit to be successful. Prescribed grazing is an essential practice to address grazing health and should be included in all conservation plans written.

The Field Office may request assistance from the Montana Bureau of Mines and Geology to determine feasibility of wells and from NRCS engineers for assistance in planning and designing livestock pipeline systems, pipeline extensions, and solar and electrical pumps.

Education events, workshops, and grazing schools may create interest and facilitate success in addressing rangeland related resource concerns. Existing EQIP applications, producer surveys, and input gathered from the LWG can be used to focus conservation efforts within the county. Additional public announcements seeking interest in the county may also be used.

Since grazing land health and inadequate livestock water are very common throughout the county, further work will need to be completed to focus efforts.

Statement of Desired Future Condition

The majority of grazing land in Custer County has adequate quality livestock water and other facilitating practices to implement a grazing rotation that improves health, productivity, and resilience; ultimately making the operation more profitable and economically viable, even through droughts and natural disasters.

Outcomes may be measured through utilization mapping and the rangeland monitoring techniques best suited for each unique grazing unit. Often this may include permanent photo points, data from line-point intercept transects to document ground cover, and ground cover photos. Comparative baseline data will be collected during the inventory phase.

Invasive and Noxious Weeds

The LWG's third priority resource concern within the county pertained to invasive and noxious weeds, which falls under the NRCS Plant Pest Pressure resource concern. Leafy spurge (*Euphorbia esula*) is particularly prevalent along the Powder River and houndstongue (*Cynoglossum officinale*), salt cedar (*Tamarix spp*.), and Russian olive (*Elaeagnus angustifolia*), are very common along the Yellowstone River. Canada thistle (*Cirsium arvense*), spotted knapweed (*Centaurea maculosa*), field bindweed (*Convolvulus arvensis*), and invasive annual grasses such as cheatgrass (*Bromus tectorum*), and field brome (*Bromus arvensis*), are also common within the county. Further investigations need to occur in order refine the location, abundance, and possible causes of invasive and noxious weeds in the county.

Invasive species have a negative economic impact, often degrade ecosystem function, and can reduce wildlife habitat quality. Though it may not be possible to eradicate all invasive plant species, efforts should be made to reduce their spread.

On grazingland, weed pressure may be closely associated with or a result of improper grazing management, historic wildlife or grazing use, or soil disturbance. However, weeds are highlighted as an issue on all land uses within the county.

Due to its success in other areas, a group of stakeholders along the Powder River corridor have been working together towards utilizing custom goat grazing to target leafy spurge in the area. Adding targeted biological control in conjunction with traditional chemical application is thought to increase success in achieving control. The Bureau of Land Management (BLM), has shown interest into collaborating in this effort as a way of reducing spread to BLM Lands.

Analysis of Products and Services Needed

Further investigations are needed to determine where each weed species is prevalent in the county. Weeds are generally a symptom of a larger problem. Measures should be taken to identify and resolve problems that may be contributing to the weed's abundance in each area. Conservation plans developed to address noxious and invasive weeds through chemical or biological control methods should have field confirmations and GPS location data.

If the targeted species is a result of historic or current management, such as field brome or cheatgrass on degraded rangeland, more in-depth field inventory and planning may be necessary to effectively reduce abundance of the plant long-term. In many cases, invasive annual grasses are best addressed through grazing management for long term effectiveness.

The Miles City Field Office may request assistance from the Custer County Weed District and other partners to identify focus areas, conduct field inventories, and create conservation plans. The efforts by the local work group along the Powder River to address leafy spurge can be supported, expanded, and hopefully implanted with assistance from NRCS.

Education events may promote interest and facilitate success in controlling noxious and invasive weeds, especially where degraded rangeland, cropland, or pastureland may a major contributing factor to the plant's abundance.

Statement of Desired Future Condition

Long Term Goal: Custer County producers have the tools and knowledge required to effectively control, reduce spread, and manage against invasive and noxious weeds. Natural areas have robust, diverse plant communities that resist weed invasion. Outcomes may be measured weed mapping and monitoring.

Conifer Encroachment

In several parts of Custer County, especially south of the Yellowstone River, Rocky Mountain juniper (*Juniperus scopulorum),* and ponderosa pine (*Pinus* ponderosa), are encroaching onto native grass, shrublands, and overflow ecological sites. The encroachment impacts forage quality and production and reduces habitat value to grass and shrubland species of concern such as greater sage-grouse, chestnut-collared longspurs, Baird's sparrow, Sprague's pipit and long-billed curlew.

Encroachment in these areas can also result in changes to localized hydrology.

Analysis of Products and Services Needed

Geospatial analysis should be conducted to identify potential encroachment areas. Identified areas should be field verified and prioritized for treatment within the county.

Statement of Desired Future Condition

Decrease the amount of encroachment in the county to preserve habitat quality for sage-grouse and other grassland species of concern while maintaining forage quality and quantity for livestock.

Soil Health & Associated Resource Concerns on Annual Cropland

Soil health is the capability of soil to function as a vital living ecosystem. Restoring soil health has become focus of the agency and local producers due to its importance in maintaining economically viable, productive, and resilient farms. Within the county there is abundant opportunity help farmers improve upon their management strategies and strive towards not only sustainable, but regenerative farming practices.

Despite the adoption or no-till and minimum till farming, soil quality degradation, and to a lesser extent, soil erosion, remain widespread concerns on cropland within the county. As the principles of soil health state, reducing tillage alone will not improve soil health. A lack of crop diversity, fallow practices, limited crop rotations and, in some cases, unsuitability of soils for farming contribute to the ongoing degradation of soil resources within the county. Depletion of soil organic matter, soil structure, and soil biology on cropland has led to reduction in water infiltration and a need for higher inputs.

Local goals, all of which can be associated with soil health, include:

- Improved water infiltration and storage
- Increased yields and profitability
- Reduced weed pressure
- Reduced inputs and production costs
- Increased efficiency of agrochemicals
- Reduced soil erosion

Associated NRCS Resource Concerns include:
- Soil Quality: Aggregate Instability, Compaction, Organic Matter Depletion, & Soil Organism Habitat Loss or Degradation
- Soil Erosion: Wind, Sheet & Rill Erosion, Gully Erosion
- Degraded Plant Condition: Plant Productivity and Health
- Plant Pest Pressure
- Field Pesticide Loss and Field Nutrient Loss
- Sediment Transported to Surface Waters

Analysis of Products and Services Needed

Conservation plans must be uniquely developed to fit each individual operation. Efforts to improve soils health need to be focused within the county – this can be done through outreach, questionnaires, analysis of program applications, and local work group meetings.

Education events – including farm demonstrations, producer panels, and workshops will be essential in the acceptability and long-term success of these efforts.

Statement of Desired Future Condition

Improve soil health through cover crops, diverse crop rotations, continuous cropping, reduced and no-till systems, pest management, nutrient management, and where applicable irrigation water management.

Long Term Goals:

- Regenerative farming practices are common within the county and the mindset of improving soil quality is passed on to the next generation
- Increased levels of soil organic matter closer to or exceeding the soils' natural potential
- Reduced farm inputs and increased profitability
- Farms become resilient against drought and other natural disasters

Soil Health on Perennial Hayland

Across the county, fields that have been historically hayed on an annual basis are no longer productive, have poor nutrient cycling, degraded soil health, and increasing weed pressure. Most notably, they have reduced organic matter levels due continual removal of biomass without equivalent returns. Without sustainable management or diverse plant communities, renovations are necessary and often long over-due.

Analysis of Products and Services Needed

Outreach may be needed to further focus efforts within the county. Conservation plans that include forage harvest management, grazing management, and where needed forage and biomass plantings need to be developed for affected fields. Perennial seedings should be diverse and suitable for the intended use and soils. Conservation plans should promote feeding hay on the fields in which the hay was grown and/or rotating grazing in lieu of haying within the rotation.

Statement of Desired Future Condition

The majority of the hayfields in the county are healthy and sustainably managed.

Forest Fuels Management and Wildfire Hazard

Ponderosa pine dominated rangeland and forests are scattered throughout the southern portion of Custer County. As a result, some areas are in need of forest management to reduce fuel load, improve forest health, improve wildlife habitat, and reduce wildfire hazard. Areas of highest risk have ladder fuels in the forms of smaller pines and juniper or other shrubs and closed upper canopies.

Analysis of Products and Services Needed

Outreach may be needed to further focus efforts within the county. Plans to improve forest health would be focused in areas with less than 35% slope (defined as treatable) that present high opportunity for return on investment (forage value, wildlife value, etc). Conservation practices available include pre-forest stand improvement (pre-commercial thinning), brush management, and fuel breaks. Herbaceous

weed control, critical area plantings, and prescribed grazing may be used as associated practices to achieve objectives.

Resource Concerns Pertaining to Riparian, Mesic, & Wetland Health

There are concerns over the general health of riparian areas, mesic areas, and wetlands across the county. It is common to see downcutting along creek systems, gullies within mesic areas, noxious and invasive weeds, and a lack of woody species regeneration. Conservation plans to address these issues may include low-tech mesic restoration structures, off-site livestock water development, riparian fencing, targeted grazing management, and herbaceous weed control.

Resource Concerns Associated with Artesian Wells and Coalbed Methane Wells

Across the county, there are numerous artesian wells and in the southern part to the county there are several free-flowing wells that were created during coal bed methane exploration. The unrestricted surface flow of these wells is resulting in unnecessary aquifer drawdown. The water quality of some well, especially the coalbed wells, is so poor that it causes severely degraded plan condition and soil health in those areas where the wastewater is discharged.

Wildlife Habitat

Overall wildlife habitat can be enhanced by maintaining and improving diversity of native and introduced vegetation.

Pollinators: Pollinators are a crucial part of ecosystem health. Conservation practices that create new pollinator habitat, enhance existing habitat, and reduce negative impacts to pollinators remain a need within the county.

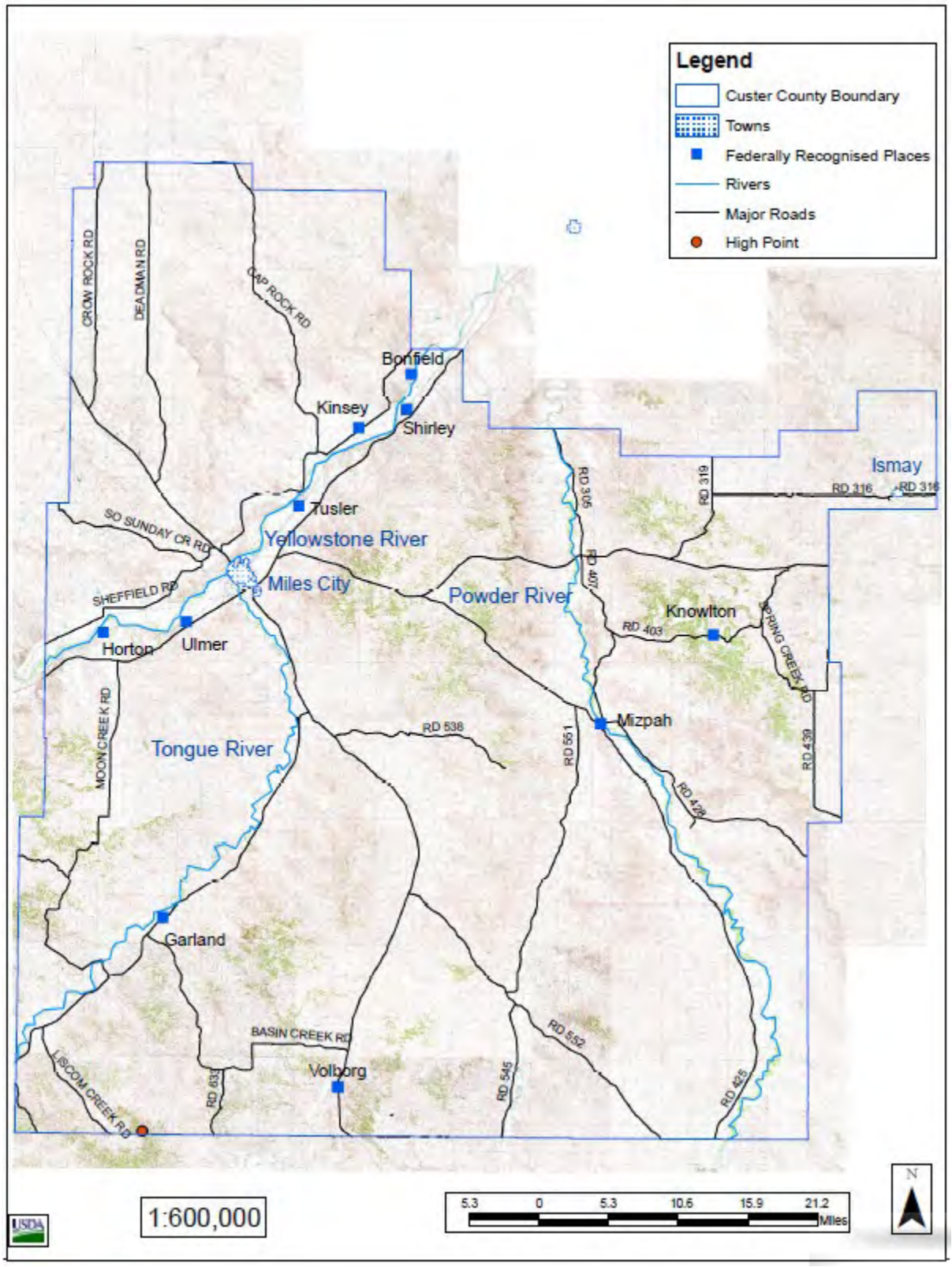
Grassland birds: Custer county provides critical habitat for declining grassland birds such as the chestnut-collared longspur, McCown's longspur (*Rhynchophanes mccownii*), Sprague's pipit, Baird's sparrow, long-billed curlew, and many others. Intact native landscapes that contain a diverse plant communities and varied structure are essential for providing habitat for the large variety of grassland birds that use the area. Habitat can be maintained or enhanced by improving grazing management strategies, reducing habitat fragmentation, reducing the spread of weeds and other invasive species, reducing the occurrence of unnatural perches and predator subsidies (e.g. abandoned buildings, abandoned fence, or other unnatural structures that create habitat for predators), and improving mesic, riparian, and wetland habitats.

Upland game birds: Wild turkeys (*Meleagris gallopavo*), ring-necked pheasants (*Phasianus colchicus*), Hungarian partridge (*Perdix perdix*), sharp-tailed grouse (*Tympanuchus phasianellus*), and greater sage-grouse (*Centrocercus urophasianus*) are present in the county. Custer County has areas of designated core and general habitat for Greater Sage-grouse. Sage-grouse are a state listed species of concern that were once warranted but precluded for listing under the ESA. It is important to continue to address resource concerns and threats related to sage-grouse - including habitat continuity, conifer encroachment, weeds, predator subsidies, wildlife escape ramps, improving mesic habitats and fence markers.

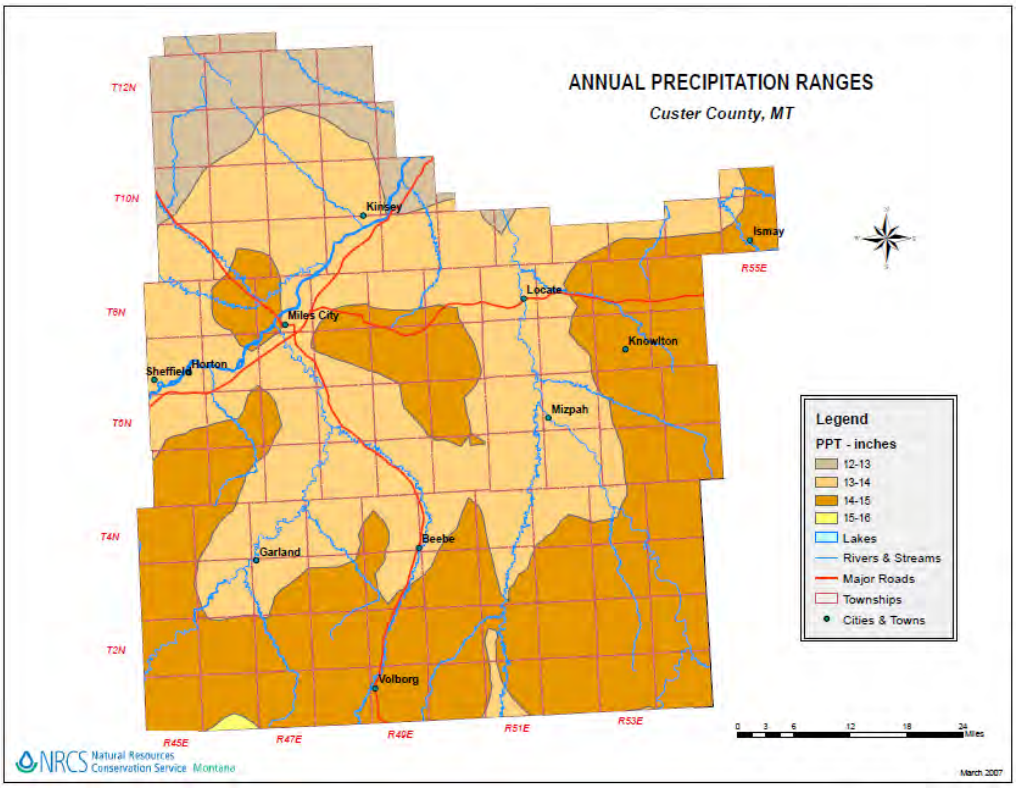
Big Game: Mule deer (*Odocoileus hemionus*), white-tailed deer (*Odocoileus virginianus*), pronghorn (*Antilocapra Americana*), and elk (*Cervus canadensis*), are common in the county. Winter and fawning cover/food, habitat continuity, and riparian health are important habitat criteria. Woven wire, or other wildlife unfriendly fences, hinder and limit big game movement across the landscape.

APPENDIX A

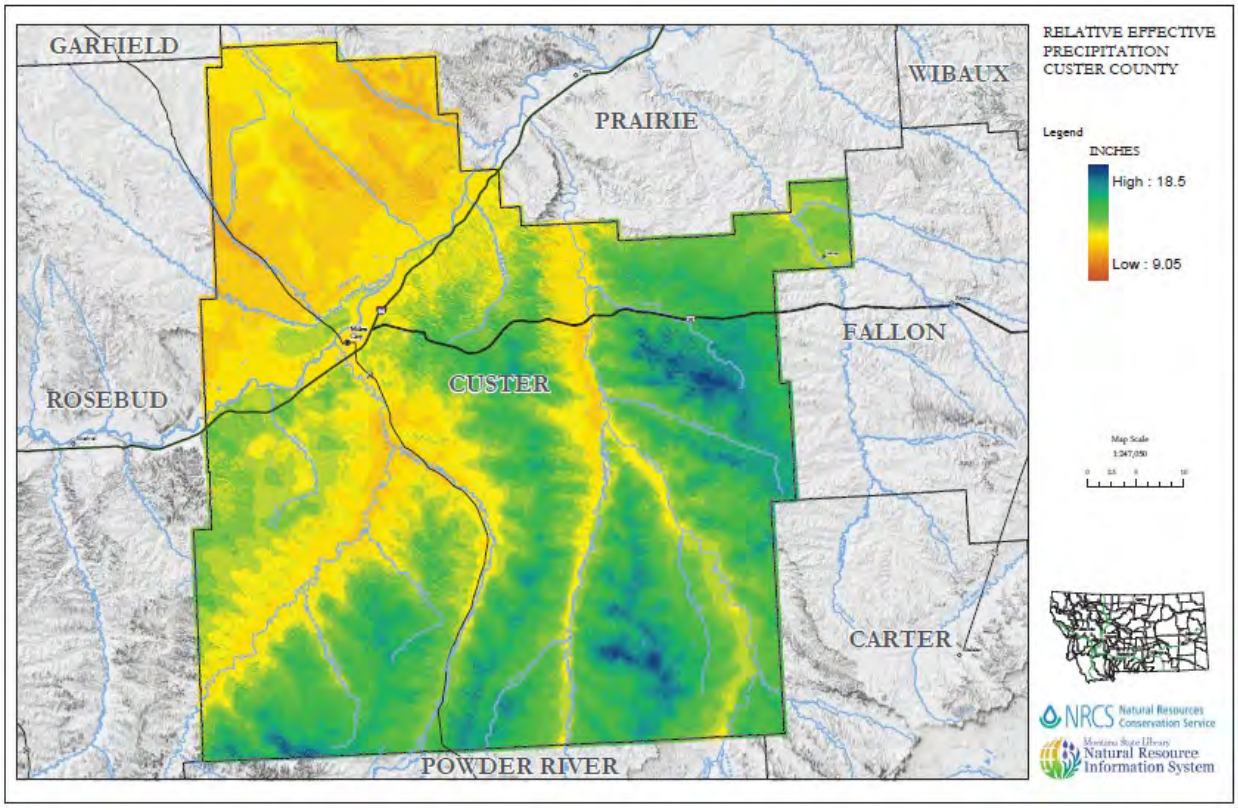
A1. Custer County



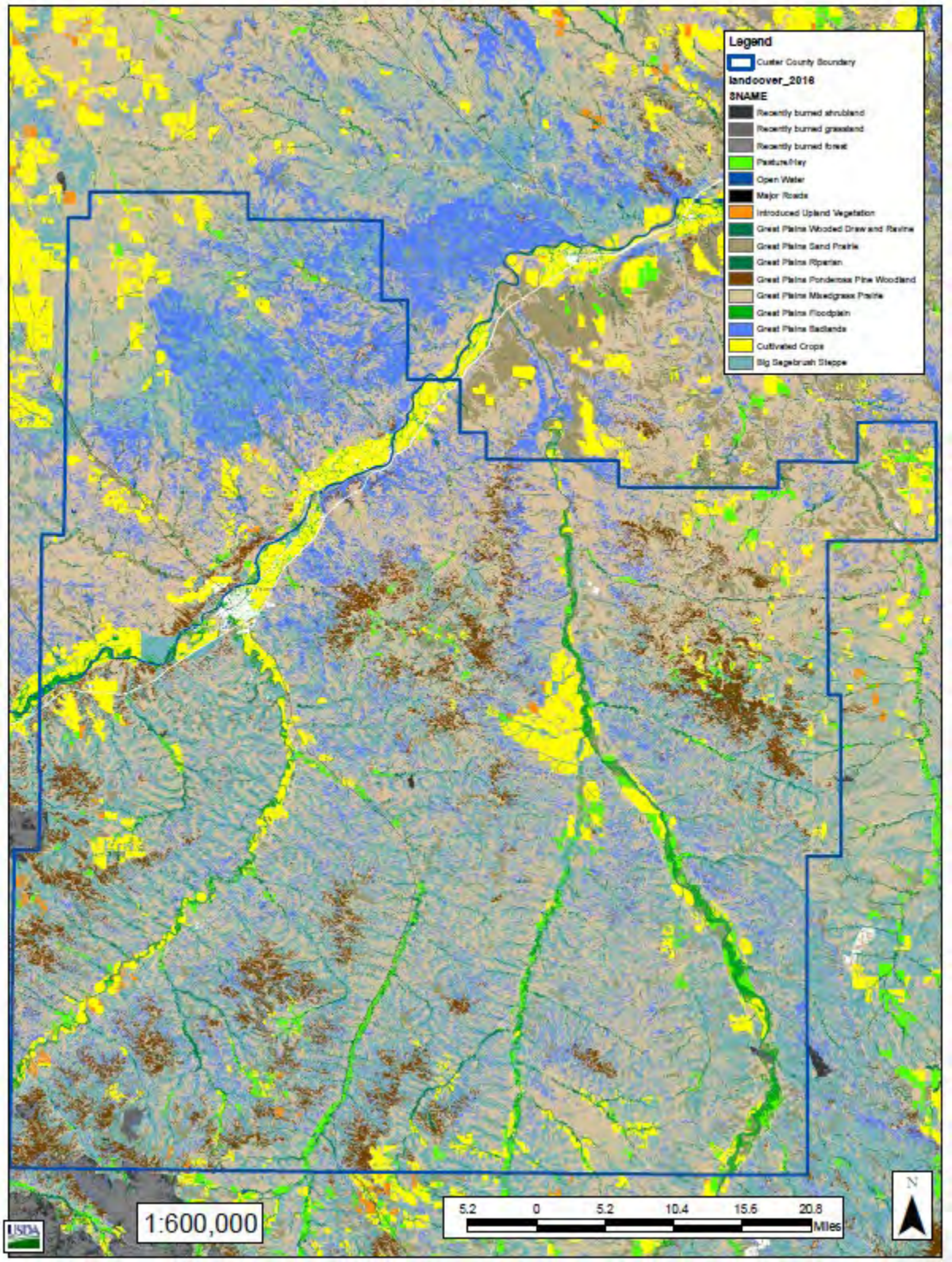
A2 Annual Precipitation



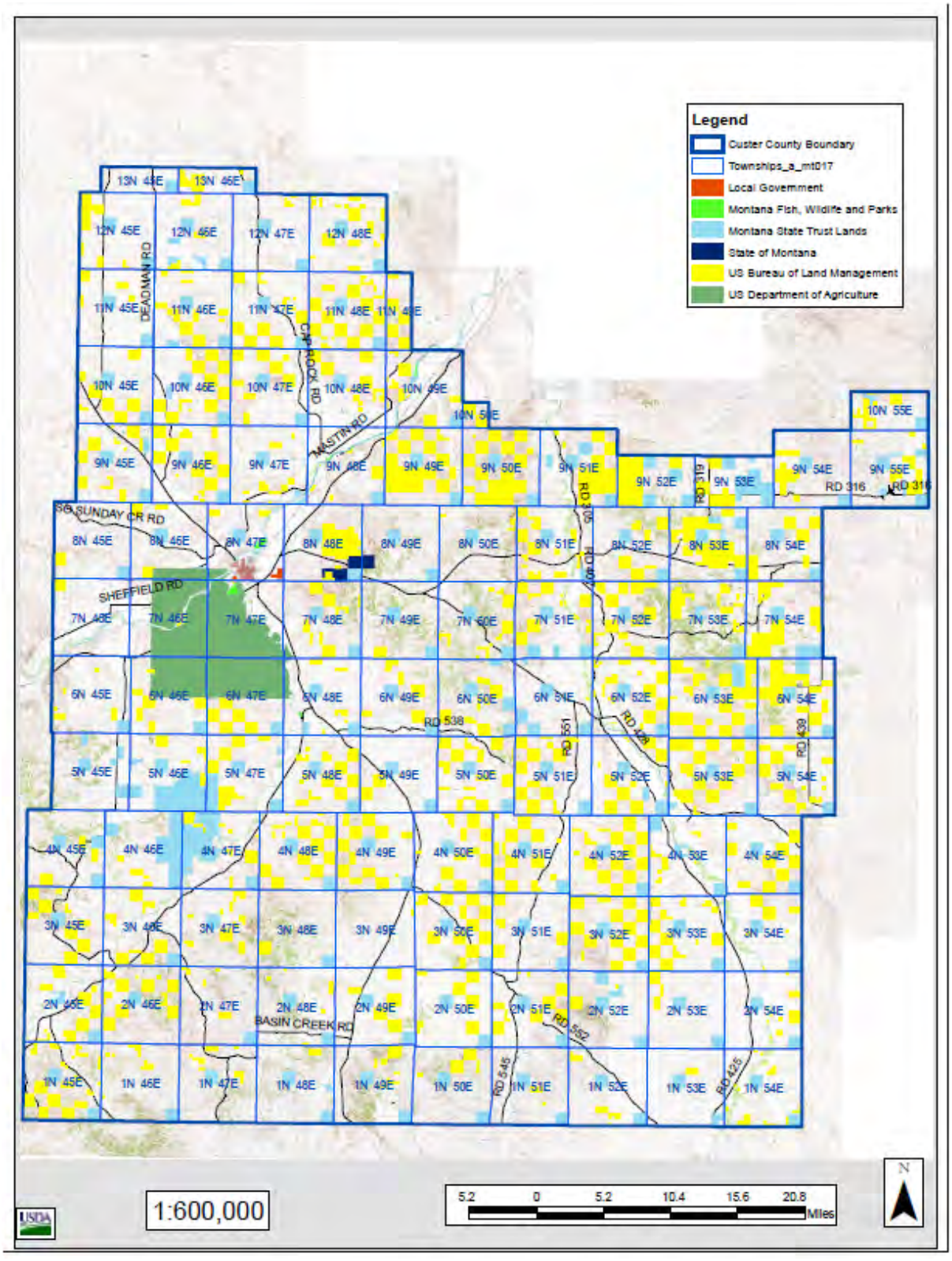
A3 Relative Effective Precipitation



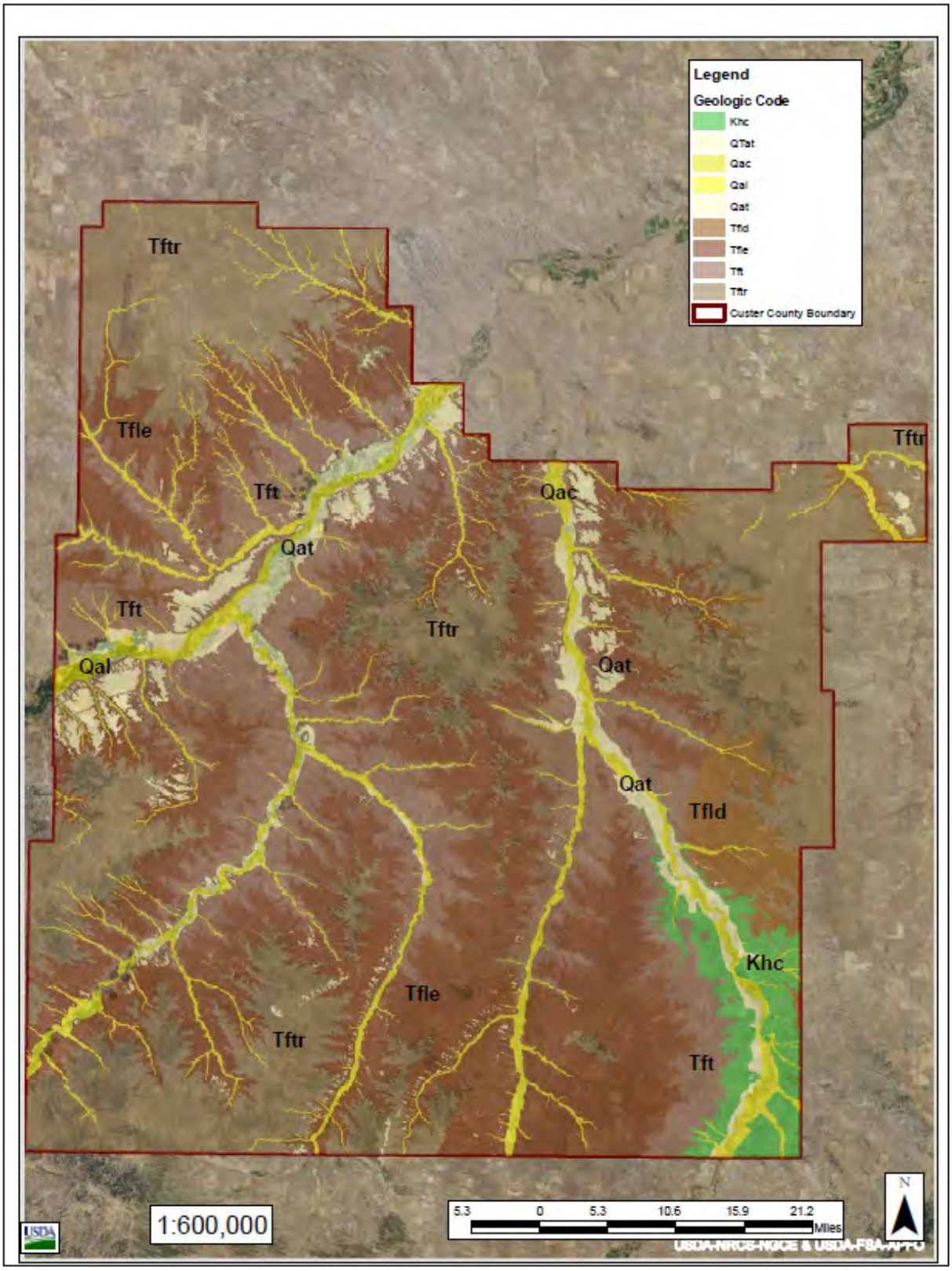
A4 Landcover



A5 Land Ownership



A6 Geology


Legend
Geologic Code
Khc
QTat
Qac
Qal
Qat
Tfld
Tfle
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Custer County Boundary
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Qac
Qat
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Qat
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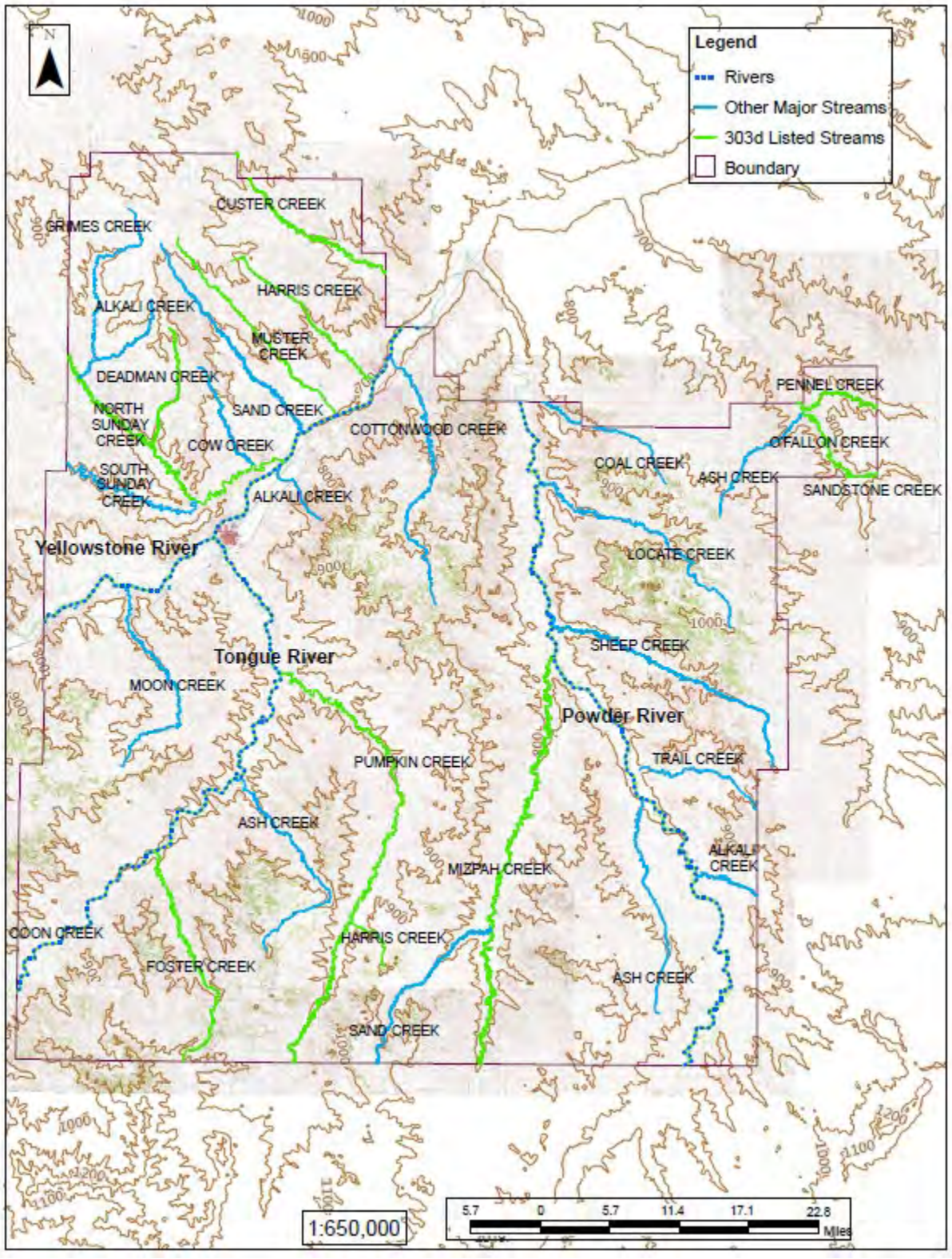
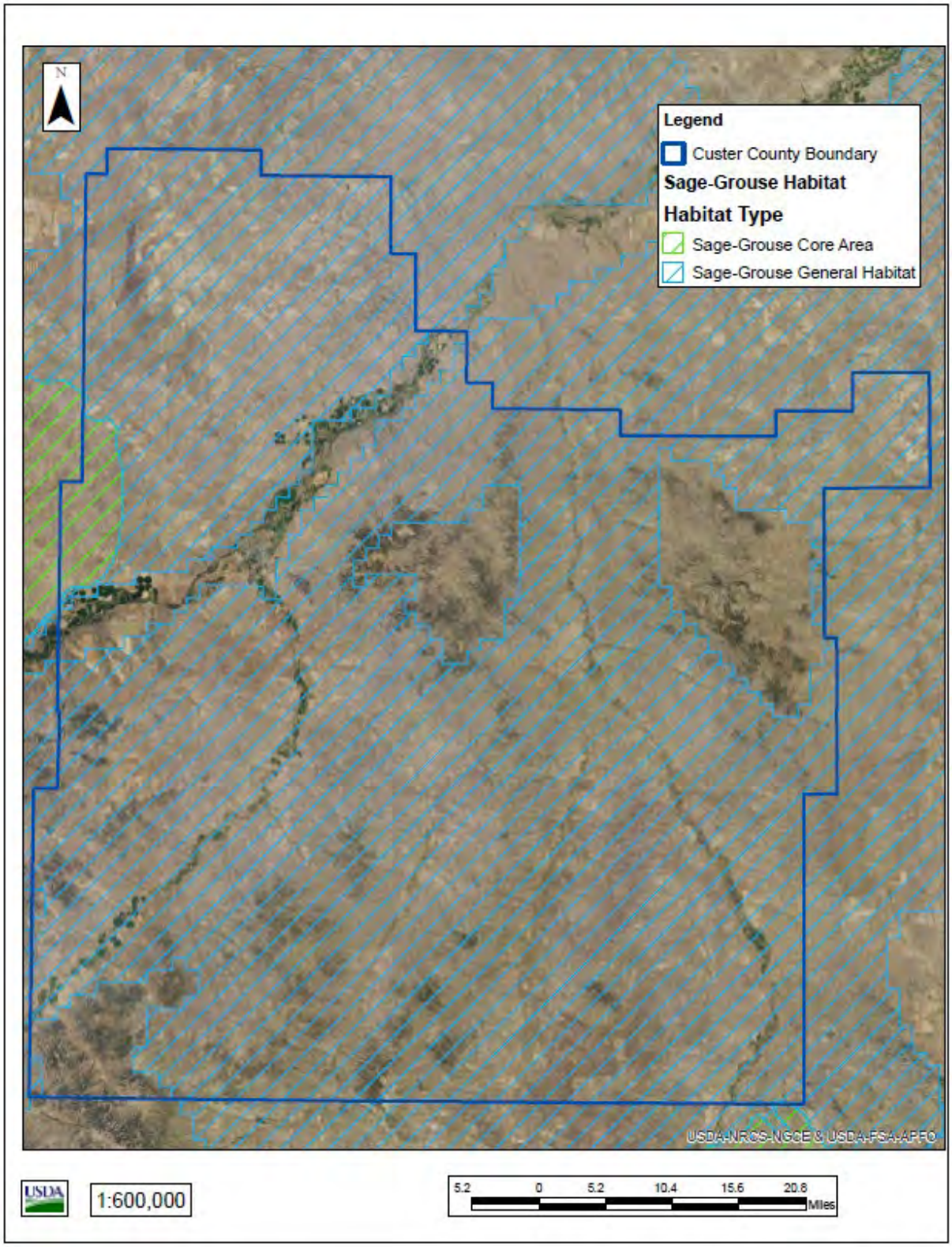
Miles
N

A7 Surface Water



A8 Greater Sage-Grouse Habitat



APPENDIX B

B1 Animal Species of Concern

SPECIES	SCIENTIFIC NAME	COMMON NAME	HABITAT
Mammals	*Corynorhinus townsendii*	Townsend's Big-eared Bat	Caves in forested habitats
Mammals	*Cynomys ludovicianus*	Black-tailed Prairie Dog	Grasslands
Mammals	*Lasiurus borealis*	Eastern Red Bat	Riparian forest
Mammals	*Lasiurus cinereus*	Hoary Bat	Riparian and forest
Mammals	*Myotis lucifugus*	Little Brown Myotis	Generalist
Mammals	*Myotis thysanodes*	Fringed Myotis	Riparian & dry mixed conifer forest
Mammals	*Sorex merriami*	Merriam's Shrew	Sagebrush grassland
Mammals	*Vulpes velox*	Swift Fox	Grasslands
Birds	*Anthus spragueii*	Sprague's Pipit	Grasslands
Birds	*Aquila chrysaetos*	Golden Eagle	Grasslands
Birds	*Ardea herodias*	Great Blue Heron	Riparian forest
Birds	*Athene cunicularia*	Burrowing Owl	Grasslands
Birds	*Buteo regalis*	Ferruginous Hawk	Sagebrush grassland
Birds	*Calcarius ornatus*	Chestnut-collared Longspur	Grasslands
Birds	*Catharus fuscescens*	Veery	Riparian forest
Birds	*Centrocercus urophasianus*	Greater Sage-Grouse	Sagebrush
Birds	*Centronyx bairdii*	Baird's Sparrow	Grasslands
Birds	*Coccyzus americanus*	Yellow-billed Cuckoo	Prairie riparian forest
Birds	*Coccyzus erythropthalmus*	Black-billed Cuckoo	Riparian forest
Birds	*Dolichonyx oryzivorus*	Bobolink	Moist grasslands
Birds	*Gymnorhinus cyanocephalus*	Pinyon Jay	Open conifer forest
Birds	*Haemorhous cassinii*	Cassin's Finch	Drier conifer forest
Birds	*Lanius ludovicianus*	Loggerhead Shrike	Shrubland
Birds	*Melanerpes erythrocephalus*	Red-headed Woodpecker	Riparian forest
Birds	*Nucifraga columbiana*	Clark's Nutcracker	Conifer forest
Birds	*Numenius americanus*	Long-billed Curlew	Grasslands
Birds	*Oreoscoptes montanus*	Sage Thrasher	Sagebrush
Birds	*Pipilo chlorurus*	Green-tailed Towhee	Shrub woodland
Birds	*Spizella breweri*	Brewer's Sparrow	Sagebrush
Birds	*Sternula antillarum*	Least Tern	Large prairie rivers
Reptiles	*Apalone spinifera*	Spiny Softshell	Prairie rivers and larger streams
Reptiles	*Chelydra serpentina*	Snapping Turtle	Prairie rivers and streams
Reptiles	*Heterodon nasicus*	Plains Hog-nosed Snake	Friable soils
Reptiles	*Lampropeltis gentilis*	Western Milksnake	Rock outcrops
Reptiles	*Phrynosoma hernandesi*	Greater Short-horned Lizard	Sandy / gravelly soils
Amphibian	*Anaxyrus cognatus*	Great Plains Toad	Wetlands, floodplain pools
Fish	*Cycleptus elongatus*	Blue Sucker	Large prairie rivers
Fish	*Lepisosteus platostomus*	Shortnose Gar	Large prairie rivers

Fish	*Macrhybopsis gelida*	Sturgeon Chub	Large prairie rivers
Fish	*Macrhybopsis meeki*	Sicklefin Chub	Large prairie rivers
Fish	*Polyodon spathula*	Paddlefish	Large prairie rivers
Fish	*Sander canadensis*	Sauger	Large prairie rivers
Fish	*Scaphirhynchus albus*	Pallid Sturgeon	Large prairie rivers
Butterfly	*Polygonia progne*	Gray Comma	Deciduous & riparian woodland
Mayfly	*Anepeorus rusticus*	A Sand-dwelling Mayfly	Large prairie rivers
Mayfly	*Homoeoneuria alleni*	A Sand-dwelling Mayfly	Large prairie rivers
Mayfly	*Raptoheptagenia cruentata*	A Mayfly	Large prairie rivers

B2 Plant Species of Concern

SCIENTIFIC NAME	COMMON NAME	FAMILY	STATE RANK
Chenopodium subglabrum	Smooth Goosefoot	Amaranth Family	S2
Dalea enneandra	Nine-anther prairie clover	Pea Family	S2,S3
Mentzelia nuda	Bractless blazingstar	Blazingstar / Stickleaf Family	S1,S2
Penstemon grandiflorus	Large Flowered Beardtongue	Plantain Family	S1
Physaria brassicoides	Double Bladderpod	Mustards	S3
Plagiobothrys leptocladus	Slender-branched Popcorn-flower	Borage Family	S2,S3
Rorippa calycina	Persistent-sepal Yellow-cress	Mustards	SH
Senecio integerrimus var. scribneri	Scribner's Ragwort	Aster/Sunflowers	S2,S3
Triodanis leptocarpa	Slim-pod Venus'-looking-glass**	Bellflower Family	S3
Cyperus schweinitzii	Schweinitz's Flatsedge	Sedges	S2
Sporobolus compositus	Tall Dropseed	Grasses	SH

- State Ranking **S1**: At high risk because of extremely limited or rapidly declining population numbers, range or habitat, making it highly vulnerable to global extinction or extirpation in the state.

- State Ranking **S2:** At risk because of very limited or potentially declining population numbers, range or habitat, making it vulnerable to global extinction or extirpation in the state.

- State Ranking **S3:** Potentially at risk because of limited or declining numbers, range or habitat, even though it may be abundant in some areas (MNHP, 2019).

APPENDIX C

Custer County Conservation District

3120 Valley Drive East
Miles City, MT 59301

Phone: 406-232-7905 ext. 3242
Email: carol.watts@mt.nacdnet.net

LOCAL WORK GROUP MEETING MINUTES

March 5, 2019

CCCD Supervisor Ed Bird called the meeting to order at 2:00 pm. Introductions were made. Also, in attendance were Johnna Cameron, Kathy Meidinger, Michelle Gorder, and Katelynn Hess, NRCS. Cheryl Mandich, ABS; Andy Miller and Aaron Kneeland, DNRC; Cameron Lundby and Mike Blum, T&Y Irrigation District; Byron Hould, Custer Co. Weed; Jesse Blankenship, landowner; Dustin Strong, Fort Keogh; Keith Holmlund, Custer Co. Commissioner.

Ed Bird relinquished the floor to Johnna Cameron who presented a video and explained that NRCS is transitioning from individual conservation plans to long-range, area wide plans. Targeted resource concerns and areas will be decided by the Local Working group.

After everyone there expressed their concerns and those concerns were listed on the on the board, a vote for priorities was taken. Irrigation infrastructure was deemed number one followed by noxious and invasive weeds, number two; livestock grazing and water quality management, number three, and encroachment control of conifer trees number 4.

The group discussed areas to target but did not complete that task.

Another meeting will be held April 2, 2:00-4:30 in the conference room at the USDA Service Center.

The meeting adjourned at 3:22pm.

Respectfully submitted,
Carol Watts, CCCD Administrator

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LOCAL WORK GROUP MEETING NOTES

April 2, 2019

CCCD Chairman Walter Rolf called the meeting to order at 2:00 pm. In attendance were Martin Ellenburg, Johnna Cameron, Kathy Meidinger, Dick Scheetz, and Katelynn Hess, NRCS; Cheryl Mandich, ABS; Andy Miller, Scott Aye and Aaron Kneeland, DNRC; Dawn Doran, BLM; Cameron Lundby and Mike Blum, T&Y Irrigation District; Bill Ziebarth, Kinsey Irrigation Company; Gene Derenberger, landowner; Dustin Strong, Fort Keogh; Dale Barta, FSA; Keith Holmlund, Custer Co. Commissioner; Aaron Kolb, YRCDC and Clark Cameron, landowner. Laurie Zeller and Lance Clark, DNRC also attended part of the meeting.

Walter Rolf relinquished the floor to Johnna Cameron who led the group through the agenda for the meeting and explained what we are doing today. She then gave the floor to Martin Ellenburg who told the group what the NRCS resource concerns are. He also stated that the new plan could be described as a "landscape plan" because larger area will be covered instead of smaller scattered areas. The new plan also will need to bring in partners. The top four concerns from the last meeting were posted on the board and attendees voted by paper vote for their top 2 choices. Those were: Irrigation Infrastructure, Invasive Weeds, Grazing Management, and Conifer reduction. Of those Irrigation Infrastructure and Grazing Management were voted to be the top two.

The group identified Inefficient use of Irrigation Water and Degraded Plant Condition as the two NRCS resource concerns that they'd like the focus to be on going forward.

Clark Cameron questioned how Buffalo Rapids could be considered for a targeted area with a ditch lining project. They have the labor source and equipment but need funding. Clark was advised that other farmers would need to be included in the plan for various projects, which could include pivots and weed control among other items.

Aaron Kolb, Conservation Associate for the Yellowstone River Conservation District Council informed the group of the work he had done with Irrigation Districts.

Dick Scheetz told the group how to contact the field offices. He explained that by several people from the same area contacting the field office for similar projects, a Targeted Implementation Plan could be developed.

NRCS has a deadline of December 31 to develop the Long-Range Plan.

No other working group meeting is planned at this time. The meeting adjourned at 3:30pm.

Respectfully submitted,

Carol Watts, CCCD Administrator

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