JANUARY 1, 2024

DANIELS COUNTY LONG RANGE PLAN

USDA NRCS SCOBEY FIELD OFFICE

Contents

SECTION I INTRODUCTION

Vision

Our vision for natural resources conservation in Daniels County is the realization of increased levels of stewardship on all land uses.

Mission

Our mission is to simultaneously promote environmental and economic sustainability.

Purpose

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

Partners

The entities who have assisted in the development of the Long-Range Plan are:

- Montana NRCS Scobey Field Office
- USDA Farm Services Agency Daniels County Committee
- Daniels County Weed District
- Montana State University Extension Service
- Daniels County Conservation District
- Local Landowners, Farmers and Ranchers
- Montana Fish Wildlife & Parks
- Ducks Unlimited
- US Fish & Wildlife Service
- Pheasants Forever

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

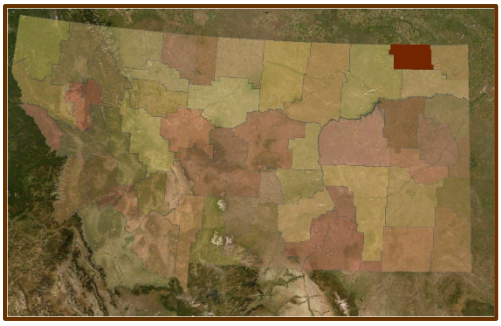


Figure 1. Daniels County, Montana

Daniels County is in the northeast corner of Montana. It borders Saskatchewan, Canada, on the north, Sheridan County to the east, Roosevelt County on the south and Valley County to the west. The total area of the county is 1,425 square miles or a little over 904,688 acres. See Appendix A1.

Elevation ranges from 2,201 feet above sea level in the West Fork of the Poplar River valley at the Roosevelt County border to 3,134 at the high point shown on the map (Appendix A1) where North Bench Road crosses into Valley County.

The growing season averages 90 to 110 days a year; precipitation averages between 10 and 13 inches per year with an annual mean of 12.56 inches. See Appendix A2. Relative effective precipitation can be thought of as usable rainfall, the portion of the total precipitation which becomes available for plant growth. Relative effective precipitation throughout the county is depicted in Appendix A3. Valley bottoms and other lower areas are designated as USDA Plant Hardiness Zone 3b, which indicates that average annual minimum winter temperatures can be as cold as -30 to -35 degrees Fahrenheit. Higher elevations in the county are designated Zone 4a, where average annual minimum winter temperatures can drop to -25 to -30 degrees Fahrenheit.

People

In the year 2000, Daniels County was designated the most rural county in the continental United States. Daniels County's current population is estimated to be 1,628, less than half of what it was (3,964) in 1950 (DCCD, 1976). Approximately 26% of the population is 65 years old or older, and 22% are under 18 years of age. Ninety-six percent of adults have graduated from high school and 26% have a bachelor's degree or higher (US Census Bureau, 2019). The county has one K-12 school, located in Scobey. The Daniels County Courthouse in Scobey was added to the National Register of Historic Places on May 4, 1995. The town of Flaxville is home to 63 people. Other unincorporated communities are Carbert, Peerless, Four Buttes, Pleasant Prairie, West Fork and Whitetail.

Assiniboine and Sioux Tribes

Fort Peck Reservation is home to the Assiniboine and Sioux people, two separate American Indian Nations composed of numerous bands and divisions. There are 12,975 members of the tribes; about 6,700 Tribal members live on the reservation. Tribal Government is headquartered in Poplar, Montana.

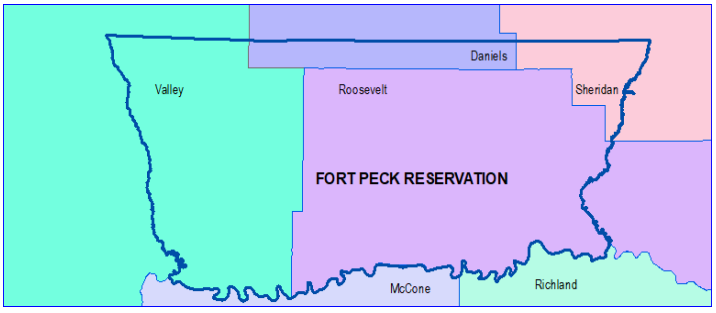


Figure 2. Fort Peck Indian Reservation with Respect to County Boundaries

The Reservation encompasses 2.1 million acres, an area approximately 100 miles long by 40 miles wide (Fort Peck Tribes, 2013). It covers areas of Daniels, Valley, Roosevelt, and Sheridan Counties as shown in Figure 2.

Of the total area, approximately 378,000 acres are owned by the Tribes, and 548,000 acres are allotted to individual tribal members. Over half of the land on the reservation is owned by persons or entities who are not members of the Tribes. (PWNA, 2019). In Daniels County, the area included in Fort Peck Reservation is approximately 220 square miles or 142,230 acres. See Appendix A6. Appendix B1 is the story of the Tribes' collaboration with the NRCS Montana Poplar Field Office. Many important projects have been implemented as a result of the Tribes' dedication to protect and conserve the natural resources on the Fort Peck Reservation.

Bison remain important to historic and current culture. The Tribes have been working to build a sustainable bison herd since 1999. The Turtle Mound Buffalo Ranch is located twenty-five miles northeast of Poplar, Montana. The Turtle Mound Ranch currently runs 200 head (FPTFGD, 2019). Five mature bulls were transferred from Yellowstone National Park to the Reservation in February 2019 as part of a program to enhance the Tribes' breeding stock and develop the bison herd.

Agriculture

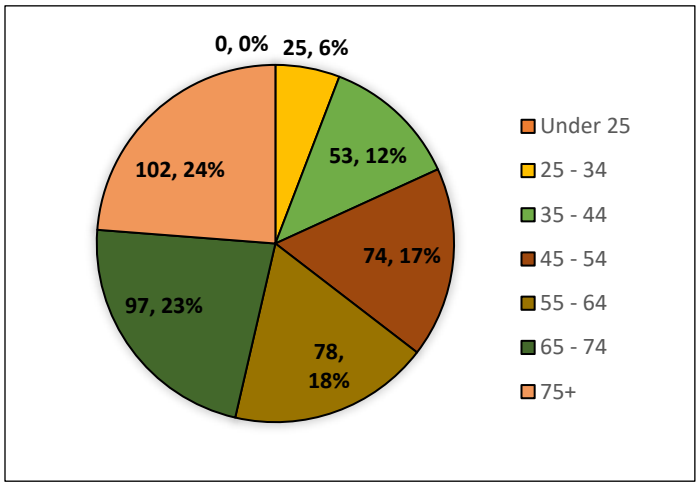


Figure 3 Age Ranges of Daniels County Producers

According to the USDA National Agriculture Statistics Service (NASS), there were 429 producers in the county in 2022. About half of the farm operators' primary occupation is something other than farming. Most producers are male. Nearly three-quarters were age 55 or older with over 18% of all producers in the county age 75 or higher. Figure 3 shows the number and percent of producers by age group.

NASS data indicates that there were 261 farms in Daniels County in 2022, operating on 667,686 acres. The census definition of a farm 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. Of the 261 farms, 148 harvested crops on 404,637 acres (NASS, 2017).

Daniels County ranks 49th out of 56 in the state for total area. It was ranked first in the state for total number of acres enrolled in the Conservation Reserve Program in 2022 (EWP, 2024).

Figure 4 illustrates that most of the acres of active cropland in the county are used to raise wheat and pulse crops.

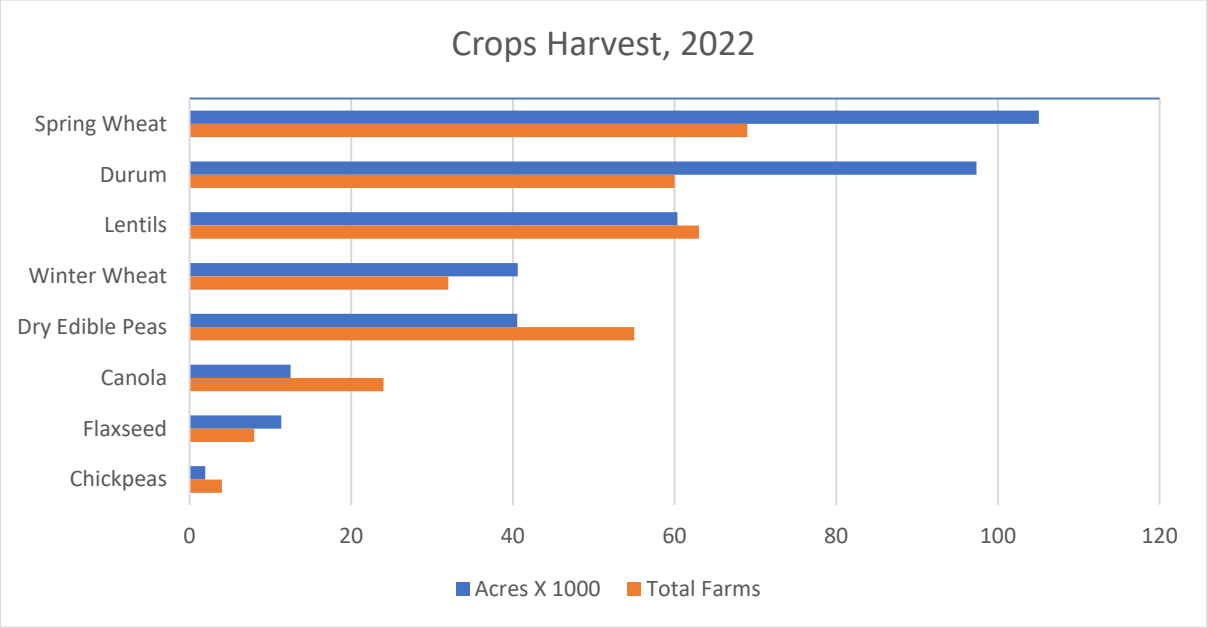


Figure 4: Acres of crop types harvested in Daniels County.

Daniels County producers owned 7,115 head of cattle in 2022, which is down by nearly 50% from 2017. Compared to the 2017 count, the number of sheep also decreased from 286 to 193. Forage crops for livestock were grown on 38,575 acres in 2017, up 26% from 2012 (NASS, 2017).

Landcover/Land Use

Land Resource Region and Major Land Resource Areas

Land Resource Regions (LRR) are geographic areas that are characterized by a pattern of soils, climate, water resources and land uses. See Appendix A4. Major land resource areas (MLRA) are subregions of the land resource regions and comprise smaller, homogeneous areas. Daniels County, most of the land within the counties on the High Line, nearly all of North Dakota and a large area of South Dakota are within the Northern Great Plains Spring Wheat Region, LRR F. All of Daniels County is in the Northern Dark Brown Glaciated Plains MLRA 53A.

MLRA 53A is covered by glacial till plains. Glacial features, such as kettle holes, kames, and moraines[1], are common throughout the plains. There is a limited supply of ground water in the glacial till deposits and the underlying Cenozoic Fort Union Formation. This formation consists of soft, calcareous shales, siltstones, and sandstones. Water from these aquifers is very hard and high in total dissolved solids. The water from the Fort Union Formation is a sodium sulfate type. The dominant soil orders in this MLRA are Inceptisols and Mollisols. They generally are very deep, moderately well drained or well drained, and clayey or loamy (NRCS, 2006).

[1] Kettle holes are hollows that resulted from melting glacial ice deposits. They are usually filled by lakes. Kames are steep-sided mounds of sand and gravel that were deposited by melting ices sheets. Moraines are masses of rocks and sediment carried down and deposited by glaciers, typically as ridges at the edges of the glaciers.

Inceptisols exhibit a moderate degree of soil development and lack significant clay accumulation in the subsoil. They occur over a wide range of parent materials and climatic conditions, and thus have a wide range of characteristics. They are extensive, occupying approximately 17% of the earth's glacier-free surface (SSSA, 2019).

Mollisols are prairie or grassland soils that have a dark-colored surface horizon. They are highly fertile and rich in chemical bases such as calcium and magnesium. The dark surface horizon comes from the yearly addition of organic matter to the soil from the deep roots of prairie plants. Mollisols are often found in climates with pronounced dry seasons. They make up approximately 7% of the glacier-free land surface (SSSA, 2019).

Landcover Types

According to Montana Natural Heritage Program Ecological Systems Field Guide, there are four predominant landcover types in the county. Table 1 shows the land cover types, the percent of land and total acres of each in Daniels County.

Cultivated cropland is used to produce crops, such as corn, soybeans, small grains, sunflowers, or vegetables, typically on an annual cycle. Agricultural plant cover is variable depending on season and type of farming.

The **Great Plains Mixedgrass Prairie** landcover system covers much of the eastern two-thirds of Montana. Soils are primarily fine and medium-textured. Grasses typically comprise the greatest canopy cover, and 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 it, 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 field brome (*Bromus arvense*) increase in dominance.

The **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 (*Hesperostipa comata*) 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.

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 (MNHP, 2019).

Appendix A5 shows the county landcover with data provided by the Montana State Library's Digital Library. Many 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 prairie potholes and wetlands. However,

the map provides a clear visual of the extent of cultivated land throughout the county, and the location of the grasslands, badlands and introduced vegetation.

Table 1

Landcover Type	Percent of Daniels County	Acres
Cultivated Crops	61%	558,354
Great Plains Mixed Grass Prairie	18%	167,332
Great Plains Sand Prairie	11%	99,971
Great Plains Badlands	3%	26,987

Land Ownership

The proportion of land in Daniels County administered by the Montana Department of Natural Resources and Conservation (DNRC) as Montana State Trust Lands is higher than in other counties in the Miles City Area. The DNRC controls 221,377 acres of land, roughly 25% of the county; the Bureau of Land Management (BLM) owns only 200 acres. U.S. Fish and Wildlife Service (USFWS) maintains three Waterfowl Production Areas, discussed further in the Plants and Animals section. Most of the land in the county is privately owned. The Fort Peck Reservation includes about 1/6 of Daniels County. See Appendix A6.

SOILS

Geology

Geologic formations underlying Daniels County are shown in Appendix A7. A formation in this context is a rock unit that has a distinctive appearance compared to surrounding rock layers and is of enough thickness 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. Below are brief descriptions of the formations, members and other geologic elements.

Qac. Alluvium and colluvium (Holocene and Pleistocene epochs). Brown to gray, poorly stratified clay, silt, and sand deposited by sheet-wash on slopes. Thickness is as much as thirty-five feet but generally less than fifteen feet.

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

Qgr. Gravel deposits of various sizes including sand, silt and clay. These are predominantly found on alluvial terraces, abandoned channels and floodplains and local glacial outwash.

Qgl. Glacial lake deposits. Light brown laminated silt, fine-grained sand, and clay.

Qgi. Glacial ice contact deposits including kames, kame terraces and eskers (long ridges of gravel and other sediment, typically having a winding course, deposited by meltwater from a retreating glacier or ice sheet). Pleistocene Age.

Qsg. Quaternary sand and gravel.

Khc: **Hell Creek Formation**. Light gray bentonitic clay stone that alternates with gray to brown sandstone interbedded with carbonaceous shale found on fluvial and flood plains. This formation lies under the Fort Union Formation and above the Fox Hills Formation. Thickness is as much as 1,100 feet. The Hell Creek Formation deposited down by streams on a coastal plain along the edge of the Western Interior Seaway at the end of the Cretaceous period. It is known for an incredible variety of dinosaur, fish, plant, amphibian and other fossils.

TF: Flaxville Formation. The Flaxville Formation is a deposit of the ancestral Missouri River when it flowed northeast in a broad valley towards the Hudson Bay. It is composed of sand, silt, clay, volcanic ash and gravel. Abundant fossils from the Pliocene age including bones from hipparion, procamelus and mastodon are found in the formation.

Figure 5 Hipparion, Procamelus and Mastodon

Tfu: 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. The formation underlies most of the Scobey area.

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.

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.

Tft. Tullock Member of the Fort Union Formation is yellowish-gray, fine- to medium-grained, trough-cross-bedded to planar-bedded or massive appearing sandstone interbedded with brownish-gray or purplish gray claystones, dark-gray carbonaceous shale, and thin lenticular (convex on both sides, shaped like lentils) coal beds. Its origin is the Paleocene era; the member is about 200 feet thick. 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.

Tsg. Tertiary sand and gravel.

Petroleum Resources

Compared to other counties such as Richland and Dawson, Daniels County does not have a history of substantial oil production, and the industry is currently in decline. Figure 6 illustrates oil production over about the last 30 years[2] (MT DNRC BOGC, 2019).

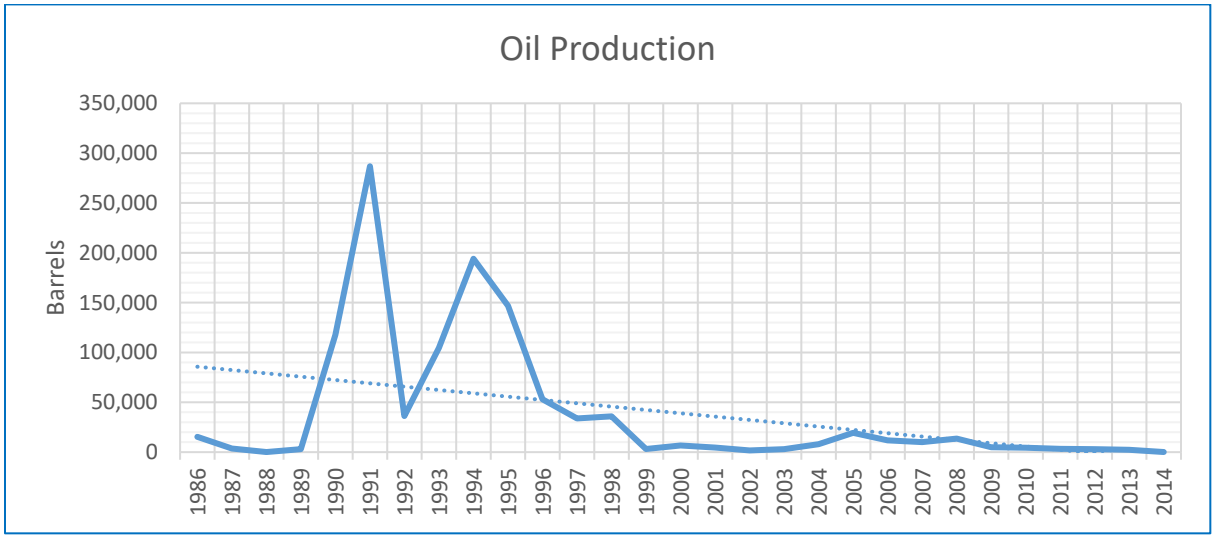


Figure 6. Oil Production in Daniels County 1986 through 2014

HEL Soils

Soils are designated as highly erodible (HEL) based on their susceptibility to movement caused by the actions of wind or water. In Daniels County, 25 of the 78 soil map units are designated non-HEL; the other 53 soil map units are highly erodible.

Soil Associations

Soil associations are made up of adjacent soils that occur as areas large enough to be shown individually on the soil map but are shown as one unit because the time and effort of delineating them separately cannot be justified. A soil association is a landscape that has distinctive proportions and patterns of soils. It usually consists of one or more major soils and at least one minor soil and is named for the major soil(s). Soils in one association may occur in another, but in a different pattern. The Soil Survey of Roosevelt & Daniels County has grouped soil associations into three general landscapes with characteristic soil associations.

Soils on Flood Plains

The soils in this group are nearly level. They are deep and well drained to very poorly drained; they were formed in alluvium. This group is used mainly for non-irrigated and irrigated crops and as rangeland. Included are: Haverelon-Trembles-Lohler, Haverelon-Trembles-Lohler, protected, Harlem-Havre-Glendive, protected and Lallie-Nobe-Lohler. Harlem and Havre soils are non-HEL; the others are considered highly susceptible to erosion.

[2] In the oil industry, one barrel, or BBL, is equivalent to forty-two US gallons at 60 degrees Fahrenheit.

Soils on Moderately Steep to Steep Uplands, Terraces and Outwash Plains

The soils in this group are shallow to deep and are well drained to excessively drained. They formed in glacial till, outwash, consolidated shale and weakly consolidated sedimentary beds. These soils are used to provide sand and gravel; they support grazing and wildlife. The main limitation for most uses for this group is slope. Soil associations are: Wabek-Tinsley-Cabba, Cabba-Cambert-Rock Outcrop, Zahill-Tinsley-Wabek, Zahill-Cabba-Cambert and Hillon-Tinsley-Thebo. All the soil map units in this association, except for Rock Outcrop, are HEL soils.

Soils on Nearly Level to Strongly Sloping Uplands, Fans and Terraces

These soils are deep and well drained. They formed in glacial till, alluvium, outwash and eolian (wind) deposits. The soils are mainly used for dryland crops, rangeland, and wildlife habitat. These include: Farland-Cherry-Farnuf, Turner-Beaverton-Tally, Williams-Zahill-Farnuf, Telstad-Hilton-Evanston and Dooley-Talley-Parshall. Of the individual map units in this association, Cherry, Evanston, Farland, Farnuf, Telstad and Williams are designated non-HEL (SCS, 1985).

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

Prime farmland is a designation assigned by U.S. Department of Agriculture defining 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. Daniels County has no soils designated as Prime Farmland. Farmland of Statewide Importance soils total 197,136 acres, almost 22% of the land area in the county. There are 12,020 acres of soils designated Prime Farmland if Irrigated.

Farmland of Statewide Importance Soils

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.

Three soils make up almost 60% of the Soils of Statewide Importance in Daniels County. These are:

- MU18, **Farnuf loam, 2-8% slopes**. Non-HEL. This soil is deep and well drained. It was formed on alluvium and is found in the uplands on fans and terraces. Effective rooting depth is 60 inches or more. Runoff is medium, the hazards for water erosion and wind erosion are moderate.

- MU47, **Tully sandy loam, 2-8% slopes**. HEL. Formed on alluvium and eolian deposits, this is a deep, well-drained soil found on terraces and foot slopes in the uplands. Effective rooting depth is 60 inches or more. Runoff is slow, and the hazard of water erosion is slight, the hazard of wind erosion is high.

- MU 69, **Williams loams, 2-8% slopes**. Non-HEL. Soils are deep, well drained and droughty. Depth to a restrictive layer is 60 inches. Runoff is medium; potential for wind and water erosion is high.

Prime Farmland if Irrigated Soils

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.

Three soils make up all the Prime Farmland if Irrigated in the county.

- MU7, **Bowbells silty loams**, **0-4% slopes**. Non-HEL. This unit is in drained depressional areas in the uplands. It was formed in glacial till. It is deep and well drained with depth to a restrictive layer greater than 60 inches, moderate permeability, slow runoff, and slight hazard of water erosion. Wind erosion hazard is moderate.

- MU22, **Grail silty clay loam, 0-4% slopes**. Non-HEL. This deep well drained soil is in drained depressional areas on uplands. It formed from alluvium. Permeability is slow, available water capacity is high. Effective rooting depth is sixty inches or more. Runoff is medium, the hazard of water erosion is moderate, and the hazard of wind erosion is slight.

- MU68, **Williams loam, 0-2% slopes**. Non-HEL. The deep, well-drained soil is found in the uplands. Permeability is slow, available water capacity is high. Effective rooting depth is sixty inches or more. Runoff is slow, water erosion hazard is slight, wind erosion hazard is moderate.

Appendix A-7 shows the locations of the Prime Farmland if Irrigated soils and Farmland of Statewide Importance.

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.

Daniels County has thirty soils that meet the criteria for hydric soils totaling 76,241 acres or just over 8.4% of soils in the county. Table 2 displays the 15 hydric soils in Daniels County that each cover more than 200 total acres.

Hydric Criteria Definitions:

- Criteria 1--All Histels except Folistels and Histosols except Folists.

- Criteria 2--Map unit components that, based on the range of characteristics for the soil series, will at least in part meet one or more Field Indicators of Hydric Soils in the United States, or show evidence that the soil meets the definition of a hydric soil.

- Criteria 3--Map unit components that are frequently *ponded* for long duration or very long duration during the growing season that, based on the range of characteristics for the soil series,

will at least in part meet one or more Field Indicators of Hydric Soils in the United States or show evidence that the soil meets the definition of a hydric soil.

- Criteria 4--Map unit components that are frequently *flooded* for long duration or very long duration during the growing season that, based on the range of characteristics for the soil series, will at least in part meet one or more Field Indicators of Hydric Soils in the United States, or show evidence that the soils meet the definition of a hydric soil.

Table 2: Daniels County Hydric Soils

Map Unit Symbol	Map Unit Name	Acres	Landform	Hydric Criteria
34	Lallie silty clay, saline, 0 to 2 percent slopes	19,390.5	Oxbows	2, 3
60	Typic Fluvaquents, 0 to 2 percent slopes	18,639.0	Flood Plains	2, 3
20	Fluvaquents, saline, 0 to 2 % slopes	11,542.5	Flood Plains	2, 3
19	Fluvaquents, ponded, 0 to 1 % slopes	6,380.2	Flood Plains	2, 3
70	Vida-Zahill loams, 2 to 8 % slopes	4,799.0	Moraines	2, 3
39	McKenzie clay loam, 0 to 2 % slopes	4,714.6	Depressions	2, 3
40	Nishon clay loam, 0 to 2 % slopes	2,942.2	Depressions	2, 3
69	Williams-Vida loams, 2 to 8 % slopes	1,544.3	Moraines	2, 3
71	Zahill-Vida loams, 4 to 15 % slopes	1,484.6	Moraines	2, 3
13	Dimmick silty clay	1,310.0	Depressions	2, 3
26	Havrelon loam, 0 to 2 % slopes, occasionally flooded	917.6	Channels, Oxbows	2, 3, 4
41	Nobe silty clay, flooded, 0 to 2 % slopes	648.5	Oxbows	2, 3, 4
7	Bowbells complex, 0 to 4 % slopes	364.6	Depressions	2, 3
37	Lohler silty clay, protected, 0 to 2 % slopes	245.3	Oxbows	2, 3, 4
68	Williams loam, 0 to 4 % slopes	215.6	Ground Moraines	2, 3

Water

Surface Water

The Poplar River originates near Wood Mountain in Saskatchewan, Canada, and flows 167 miles south and east to the Missouri River at Poplar, Montana. The East Fork of the Poplar River meets with the Poplar River near the town of Scobey, while the West Fork enters the Poplar River just south of the Fort Peck Reservation border in Roosevelt County. Big Muddy Creek originates in the Big Muddy Lake area north of the international border and flows in a southeast and south-southwest direction to join the Missouri River a short distance upstream from Culbertson, Montana. Smoke Creek, Eagle Creek, Wolf Creek and Whitetail Creek are tributaries of Big Muddy Creek. Major water ways are shown in Figure 7.

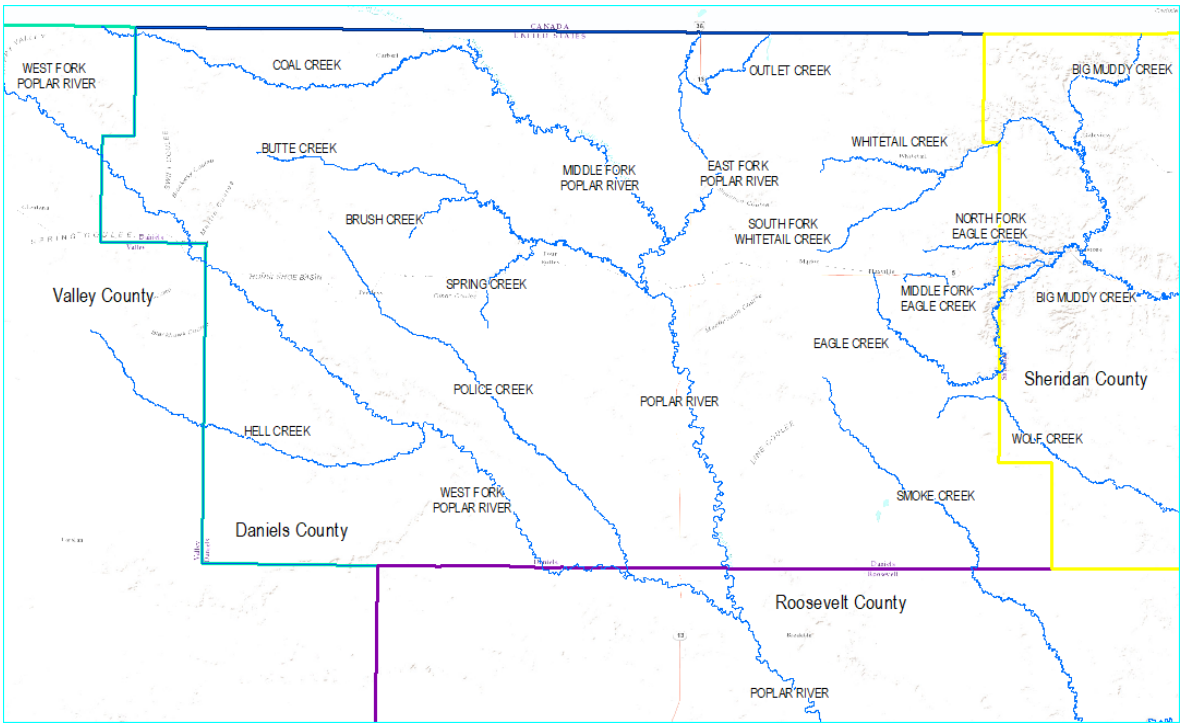


Figure 7 Daniels County Montana, Rivers and Major Streams

U.S. Geological Survey (USGS) Wyoming-Montana Water Science Center in cooperation with U.S. Army Corps of Engineers maintains one stream gauge in Daniels County as part of the Groundwater and Streamflow Information Program network of Federal Priority Streamgages (FPS). The stream gauge is near the international border on the Poplar River.

Figures 8 and 9 are records of the average annual discharge of the Poplar River at the Canadian border in cubic feet per second (cfs)[3] from 2010 through 2019 (Figure 8) and peak annual streamflow 1930 to present (Figure 9) (USGS, 2019).

[3] One cubic feet per second is equal to 7.8 gallons per second or about 448.8 gallons per minute.

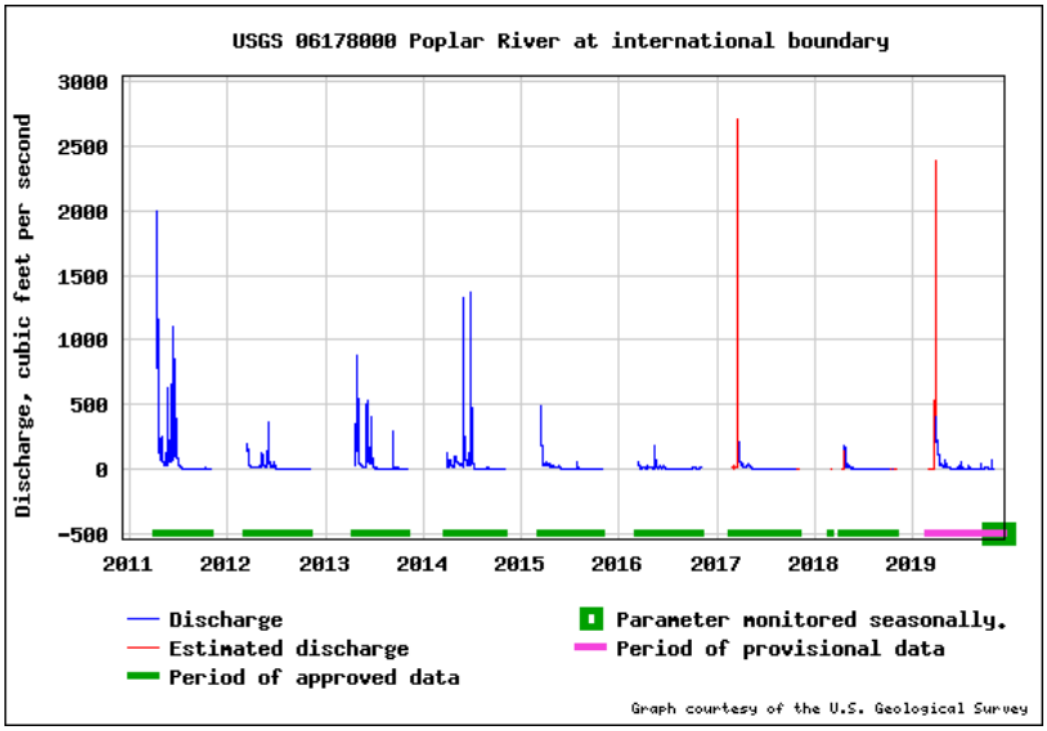


Figure 8 Average Annual Discharge

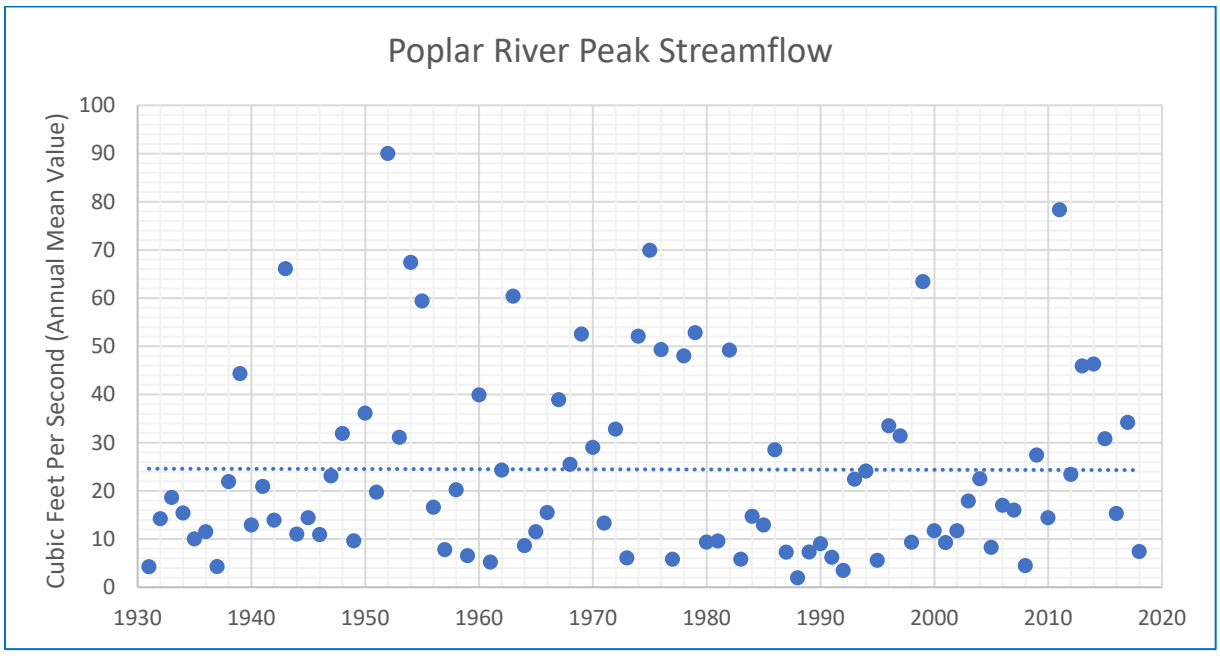


Figure 9 Peak Streamflow

Dry Prairie Rural Water

Dry Prairie Rural Water (DPRW) was organized to provide sources of safe, reliable water to homes, farms and ranches in Roosevelt, Daniels, Sheridan and Valley counties and the Fort Peck Reservation. DPRW describes the resource concern:

> "Ground water in northeastern Montana contains concentrations of sulfates and total dissolved solids that exceed the safe drinking water guidelines set forth by the Environmental Protection Agency (EPA). These contaminants affect the taste and general acceptability of water. More than 80% of the private systems on the Fort Peck Reservation have documented nitrate levels above safe drinking standards. The region's ground water also suffers from contamination resulting from oil and gas development. High levels of iron and manganese are additional water quality issues.
>
> Many rural residents cannot use their existing water source without extensive treatment. Reverse osmosis, filtering, distilling or softening will not be necessary when using treated Missouri River water. Offensive color, odor, and taste will be eliminated. Additional cost savings include extending the usable life of faucets, hot water heaters, appliances, and clothes. Eliminating the need for bottled water, water softening, and excessive cleaning supplies will also reduce water related expenses." (DPRW, 2019)

The system draws water from the Missouri River near Wolf Point, Montana. The treatment plant can supply 13 million gallons of treated water per day to a service area of over 8,000 miles. Projects began in 2004 with a system to deliver water to the small communities of Froid and Medicine Lake, Montana. Bainville and surrounding areas, Nashua, East Medicine Lake, Culbertson and other small northeastern Montana communities are now on the DPRW system. Extensive plans are in development for other areas throughout the four counties and Fort Peck Reservation. Plan maps and other information is available on DPRW's website at http://dryprairie.com/index.html.

Hydrology

Subregions, Watersheds and Sub-watersheds

The Hydrologic Unit Code (HUC) is a 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 HUC 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 three levels of HUCs: 8-digit HUCs for large watersheds known as sub-regions, 10-digit HUCs for watersheds, and 12-digit HUCs for smaller or sub-watersheds.

See Appendix A9. Three major sub-basins known as fourth-level or 8-digit watershed divide Daniels County, shown as black polygons and labeled in black. Fifth-level (ten-digit) watersheds are labeled and bordered in blue; twelve-digit watersheds are shown as rose-toned or tan polygons and are not labeled.

Poplar River Bilateral Monitoring Committee

Recognizing that each country is affected by the other's actions in lake and river systems along their shared border, Canada and the United States created the International Joint Commission (IJC) in 1909. The IJC is an independent organization that acts as an advisor to the two governments. Guided by the Boundary Waters Treaty, the IJC provides general principles for preventing and resolving disputes over waters shared between the two countries and for settling other transboundary issues.

The IJC's recommendations and decisions consider the needs of a wide range of water uses, including drinking water, commercial shipping, hydroelectric power generation, agriculture, ecosystem health, industry, fishing, recreational boating and shoreline property (SWSA, 2019). The IJC Poplar River Bilateral Monitoring Committee monitors water quality objectives and oversees monitoring programs to evaluate water quality and quantity in the Poplar River. It also monitors options by which water users in Montana

could seek compensation for losses that might be attributed to the Poplar River Power Station. Figure 10 shows the area administered by the Committee. The Poplar River Power Station is a coal-fueled electric power facility capable of generating 615 megawatts of power at maximum capacity. It is the home of the SaskPower Emissions Control Research Facility. The power station location is located within the red shape in Figure 10. The large blue polygon represents the jurisdiction of the Poplar River Bilateral Monitoring Committee.

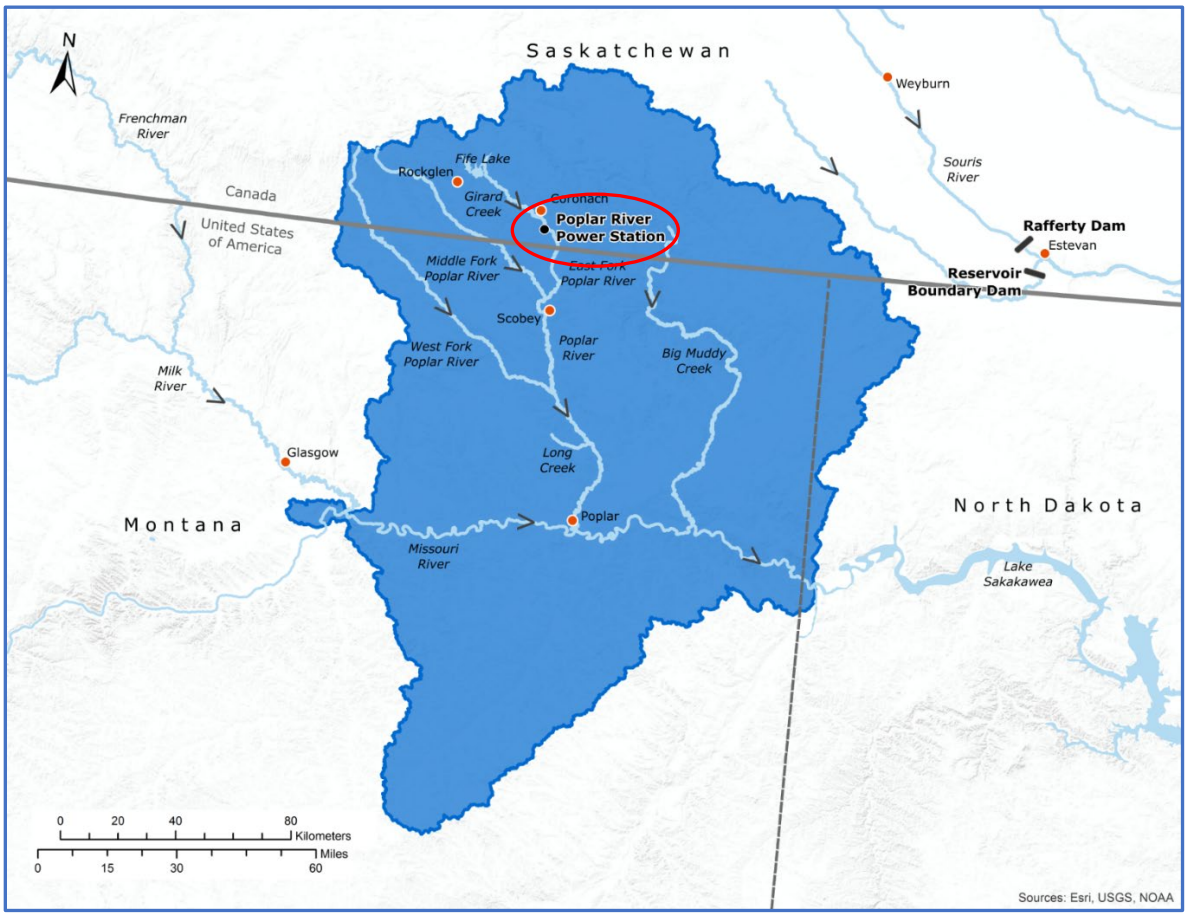


Figure 10. Jurisdiction of the Poplar River Bilateral Monitoring Committee and Location of the Poplar River Power Station

303-d Listed Streams

Section 303(d) of the Clean Water Act requires states, territories and authorized tribes to develop, and update every two years, lists of water that are impaired or threatened by one or more pollutants. Impaired waters are those that don't meet one or more Water Quality Standards.

A Total Maximum Daily Load (TMDL) is the calculation of the maximum amount of a pollutant allowed to enter a waterbody for the waterbody to meet water quality standards for that pollutant. Information about the Clean Water Act, impaired waters, TMDL calculations and other topics pertaining to water quality can be found on the Environmental Protection Agency's Impaired Waters and TMDLs website at: https://www.epa.gov/tmdl/overview-total-maximum-daily-loads-tmdls#1

Five streams appear in Montana DEQ's Clean Water Information Act 303-d List in Daniels County as Category 3, Category 5 or Category 5,5N. The impaired waters are listed below and shown in Figure 11.

Category 3: *Insufficient or not data available to determine whether any beneficial use is attained.*

- The West Fork of the Poplar River from the Canadian border to Fort Peck Reservation boundary.

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.*

- Butte Creek: All reaches. All surface waters have designated beneficial uses that may include: agriculture, drinking water, primary contact recreation, aquatic life, and industry. Beneficial Use Support Information is missing from the report. Impairments listed are: Iron from unknown or natural sources; nitrate-nitrite, total nitrogen, total phosphorus, sodium and specific conductivity from natural and unknow sources and crop production; total nitrogen from the same sources.

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 me due to an apparent natural source in the absence of any identified man-made sources.*

Poplar River from the confluence of East and Middle Forks to the Fort Peck Reservation boundary. Beneficial Use Support Information is missing from the report. Impairments are E. coli (*Escherichia coli*) from livestock affecting primary contact recreation and sedimentation-siltation and temperature from natural and unknown sources affecting aquatic life.

- Middle Fork of the Poplar River, all reaches. Impairments are the same as above.

- East Fork of the Poplar River, Canada border to confluence of Poplar River. Beneficial Use Support Information is missing from the report. Impairments to primary contact recreation are caused by chlorophyll-s from unknown sources. Agriculture and aquatic life are impaired by impacts from hydro-structure flow regulation modification and aquatic life is impaired by iron from natural sources.

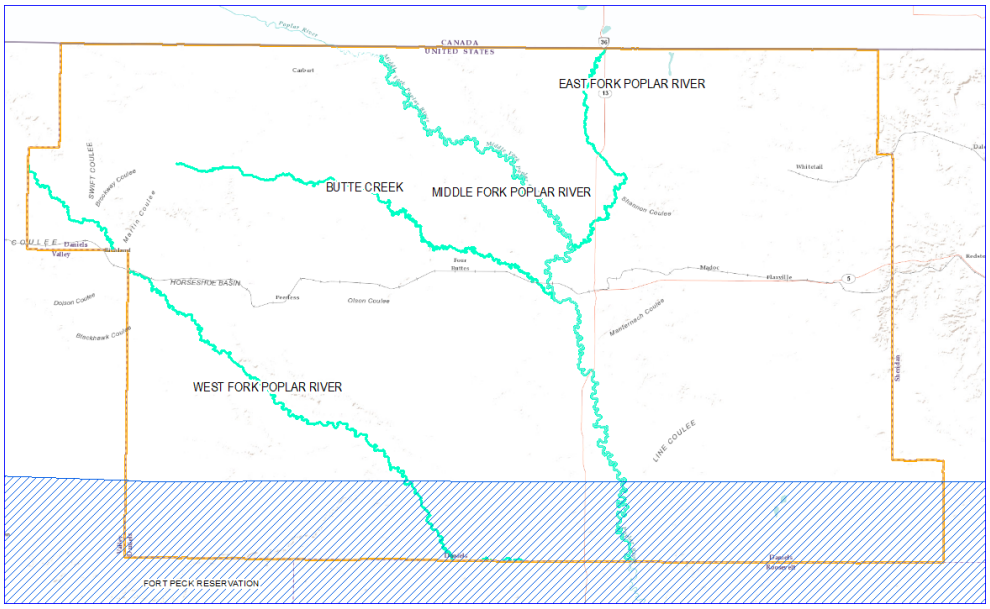


Figure 11. 303(d) Listed Streams in Daniels County

Ground Water

According to the Ground Water Information Data Center for the Montana Bureau of Mines and Geology (MBMG), there are 1,671 ground water wells in Daniels County. Two hundred forty-one are unused. Thirty-four percent of the others are used for livestock water, 33% are for domestic use. Seventeen wells provide irrigation water, 34 are for testing and research, and 117 are monitoring wells. The oldest well on record was drilled in 1901; the deepest well is 1,400 feet. MBMG shows the following statistics for wells in Daniels County (no correlation is given between groundwater source and well depth):

Table 3 Source and Depth of Ground Water Wells in Daniels County

GEOLOGIC SOURCE	**DEPTH**
56% Fort Union Formation	71.0%, 0-99 feet
15% Flaxville Gravel	19.6%, 100-199 feet
9.5% Alluvium	8.8%, 200-400 feet
4.5% Hell Creek Formation	1.0%, > 401 feet
4.7% Glacial Till	n/a
3.7% Glacial Outwash	n/a
6.6% Other Sources	n/a

Ground-water levels and water-quality measurements are collected over time to determine normal water levels in wells, changes in water levels relative to climatic conditions, responses of water levels to development, and long-term water-quality trends. MBMG has seventeen monitoring wells in Daniels County. Locations, histograms of static water level and other information can be accessed at:

http://mbmggwic.mtech.edu/sqlserver/v11/data/dataProject.asp?MTCounty=FALLON&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. Nearest to Daniels County are the stations in Malta and Sidney, Montana. Ambient temperature, wind speed and direction and pollutants including NO, NO2, NOX, ozone and particulate matter are monitored. Air quality in Daniels County is typically 'good' or better (MT DEQ, 2019).

Utilities

Two electric co-operatives provide most of the electricity to Daniels County homes and businesses. Sheridan Electric Co-Op serves areas of Daniels, Roosevelt and Valley counties. It was created in 2008 as the result of a merger of Northern Electric in Opheim and Valley Electric in Glasgow. The co-op serves 1,925 members on 2,011 miles of line. Norval Electric Co-op came online in 1948. It provides power to 1,836 members in Daniels, Valley and Roosevelt counties with 2,836 miles of line.

Plants and Animals

Waterfowl Production Areas

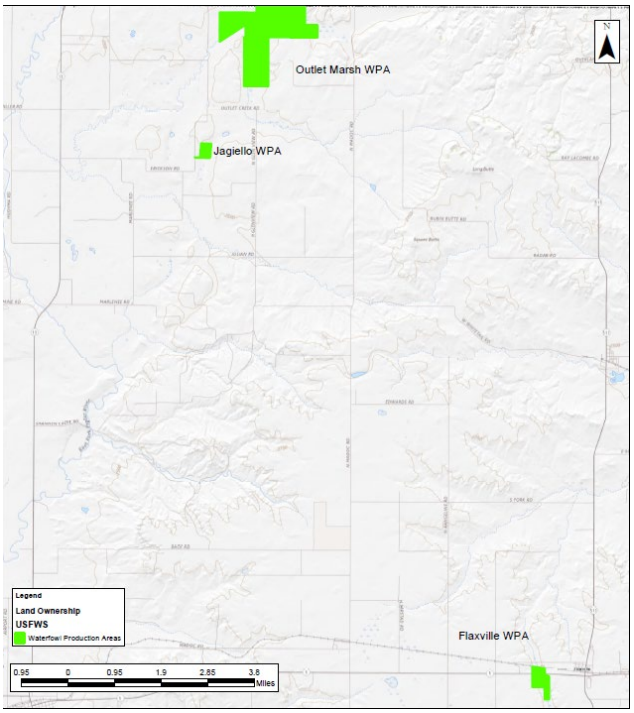


Figure 12. Waterfowl Production Areas in Daniels County

USFWS's National Wildlife Refuge System includes three waterfowl production areas (WPAs) in Daniels County. WPAs are maintained to preserve wetlands and grasslands that provide essential habitat to waterfowl and other wildlife. Jagiello, Outlet Marsh and Flaxville WPAs provide critical stopover areas for migrating waterfowl as well as habitat for shorebirds, grassland birds, plants, insects and wildlife (USFWS, 2019). Additionally, these areas provide opportunities for hunters, bird watchers and other outdoor enthusiasts to enjoy nature in beautiful places.

Figure 12 shows the locations of the three Waterfowl Production areas in Daniels County. For reference, Montana Highway 13 runs due north up the left side of the image in Figure 12. The city of Scobey, obscured by the scale bar, is in the lower left corner and the small town of Flaxville is in the lower right corner just east of the Flaxville WPA.

Animal Species of Concern

Montana Natural Heritage Species of Concern Report lists 22 animal species of concern (SOC) for Daniels County. The list is included as Appendix B2. For complete information on Montana SOC, along with field guides describing each species, the reasons for concern and Montana counties where the species have been located, visit the Montana Natural Heritage SOC website at http://mtnhp.org/SpeciesOfConcern/?AorP=a.

Endangered Species Act Listed Species

The United States Department of the Interior Fish and Wildlife Service (USFWS) has determined that there are two species of native animals designated to be listed endangered or listed threatened under the Endangered Species Act in Daniels County.

Whooping Crane *(Grus americana)* –Listed 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 7.5 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 cranes utilize migratory habitat in eastern Montana. They are not known to breed in the state (MNHP, 2019).

Piping Plover (*Charadrius melodus*)—Listed Threatened, Designated Critical Habitat
Piping plover populations are also in decline due to habitat loss caused by alterations to river systems. These small shorebirds are distinguished by a single black band around their necks and very short yellow-to-orange bills with black tips. Piping plovers nest on shorelines and islands of alkali lakes in North Dakota and Montana and on sandbar islands and reservoir shorelines along the Missouri River. Dam construction, water diversion and water withdrawals change river flow and drastically reduce the amount of available nesting habitat. Human activity has increased predation which decreases nest success and chick survival. USFWS range map of breeding and wintering habitat shows piping plover use the northwest area of the county for breeding habitat (USFWS, 2019).

Northern Long-eared Bat (*Myotis septentrionalis)* – Listed Endangered
Northern long-eared bats are distinct by their long ears that extend beyond the nose when pushed forward. They are found in drainages extending off areas near the Missouri and Yellowstone rivers bordering North Dakota. Winter hibernacula are often abandoned mines or narrow crevices, while the bats will use cavities behind peeling bark of trees as summer roost sites. Bats have been located in Richland County, with current models predicting suitable habitats extend farther north into Daniels County.

The northern long-eared bat was recently listed as endangered as of March 30, 2023. Population declines have been linked to effects of white-nose syndrome affecting bats during winter hibernation (MNHP, 2023).

Grassland Birds

Several species of grassland birds are Montana species of concern in Daniels County. Vickery et al. explain the recent decline of grassland birds and probable causes of their decline in *Grassland Birds: An 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. Montana Species of Concern Grassland Birds of Daniels County

 **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).
 **Thick-billed Longspur** *(Rhynchophanes mccownii)*	Prefers semi-arid shortgrass steppe, open with sparse vegetation. Migrates in large flocks between breeding ground in the Canadian Prairie Provinces and northwestern Great Plains and wintering grounds in the southwestern US and northern Mexico. Decreasing range-wide abundance can be attributed to conversion of short-grass prairie to agriculture and urban development (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 U.S. and north-central Mexico. Breeding grounds are grasslands in Montana and North Dakota and southern Canada. Summer diet includes insects, especially grasshoppers, caterpillars and spiders, and seeds. In the winter it eats seeds from grain, sunflowers and grasses. Conversion of native prairie to agriculture and urban development has eliminated the Chestnut-collared Longspur from much of its historical breeding range (MNHP, 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, 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 (MNHP, 2019).

Burrowing Owl
(Athene cunicularia)

Breeds and nests in open grassland habitats by using abandoned animal burrows.

Burrowing owls migrate south for winter. The most common time owls will be on the landscape in Daniels County is from April – September.

Suppression of prairie dogs and other ground rodents by recreational shooting and agricultural agencies has the highest impact on reducing burrowing owl habitat by the loss of appropriate nesting burrows (MNHP, 2023).

Photo: U.S. Fish and Wildlife Service Mountain-Prairie

Plant Species of Concern

Montana Natural Heritage Field Guide describes plant 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." The Montana Natural Heritage Plant Species of Concern Report last updated on March 1, 2022, does not list any plant species of concern in Daniels County (MNHP, 2023).

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 (US EPA, 2019).

Wetlands play an integral role in the ecology of the landscape. The combination of shallow water, high levels of nutrients and primary productivity is ideal for the development of organisms that form the base of the food web. Many species of birds and mammals rely on wetlands for food, water and shelter, especially during migration and breeding. Wetlands also function as sponges, retaining water on the landscape through periods of drought, and as a source of recharge for aquifers. They act as filters where sediment often containing fertilizer or chemicals can settle out before reaching creeks and streams. Wetlands absorb rain, snowmelt and floodwaters, reducing the risk of downstream flooding (EPA, 2019).

Appendix A10 is a map of a small area east of the Poplar River on Outlet Creek. The county's most common wetland types appear in this area. The smaller, isolated freshwater emergent wetlands are prairie potholes, depressional wetlands found in formerly glaciated landscapes. These are common throughout the county although many have been eliminated by conversion to agriculture.

The prairie potholes that remain on the landscape support small freshwater marshes. Some marshes are temporary, while others may be essentially permanent. The Prairie Pothole Region of North America provides breeding and nesting habitat for upwards of two-thirds of the ten to twelve million waterfowl in the continental US (EPA, 2019).

Emergent wetlands are those that are dominated by erect, rooted, water-loving plants. They may be persistent or ephemeral. Freshwater forested/scrub wetlands support woody vegetation, either evergreen, or most commonly in Daniels County, deciduous tree or shrub species. Riverine areas are

perennial streams comprised of the deep-water habitat contained within a channel; they do not include adjacent floodplains.

The three areas designated as lakes on the county-wide wetlands map layer are two man-made reservoirs and one relatively large prairie pothole. Freshwater forested shrub wetlands are a few, very small areas of trees and shrubs scattered along some of the creeks. Ponds are almost exclusively very small (82% of the ponds are less than once acre in size) and most likely non-permanent. Only three of the ponds are greater than ten acres. Many of the ponds appear to be small sections of abandoned stream channels and oxbows on some of the larger creeks.

Wetlands and riparian areas cover about 6,350 acres in the county. Table 4 shows the distribution of the different types by acre.

Table 2

Wetland Type	Acres	Percent of All Wetlands
Freshwater Emergent	4,840	76.3
Forested Shrub	18.49	0.3
Freshwater Pond	537	8.5
Riverine	775	12.2
Lake	74	1.2
Other	101	1.6
Total	6,345.49	100.0

SECTION III CONSERVATION ACTIVITY ANALYSIS

Farm Bill Programs

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 Daniels County land managers have elected to apply conservation practices under CRP to further benefit natural resources on their former crop fields. Conservation cover, forage and biomass planting, integrated pest management and range planting were the most commonly applied practices in CRP conservation plans assisted by the Scobey field office.

Conservation Stewardship Program

The Conservation Stewardship Programs, CSP, the fist iteration of the program, and CStwP, the current version (2017), help producers advance their existing conservation plan and improve their business operation. In Daniels County, cropland enhancements that mitigate the loss of nutrients (fertilizer) and off-target herbicide application were common components of conservation plans, as were activities that benefit wildlife.

Conservation Technical Assistance

Conservation technical assistance (CTA) is the help provided by NRCS or other agencies under the technical supervision of NRCS, to address natural resources concerns on private land. CTA provides land users with conservation technology and the delivery system needed to realize their conservation goals. The most commonly applied CTA practices in Daniels County have been:

- Conservation Crop Rotation
- Forage Harvest Management
- Integrated Pest Management
- Nutrient Management
- Upland Wildlife Habitat Management
- Prescribed Grazing
- Residue and Tillage Management-No Till
- Residue and Tillage Management-Reduced Till
- Residue Management, Seasonal
- Wetland Wildlife Habitat Management

Wildlife Habitat Incentives Program

The Wildlife Habitat Incentive Program (WHIP) was a voluntary program for conservation-minded landowners who wanted to develop and improve wildlife habitat on private and Tribal land. It has been folded into EQIP. Two conservation contracts were administered under WHIP in Daniels County including a tree planting project with the City of Scobey.

Environmental Quality Incentives Program

The Environmental Quality Incentives Program (EQIP) is a voluntary conservation program that helps producers promote agricultural and environmental quality as compatible goals. Through EQIP, producers receive financial and technical assistance to implement structural and management conservation practices that optimize environmental benefits on working agricultural land.

The most common EQIP practices in Daniels County from 2009 to 2018 include:

- Cover Crop
- Forage and Biomass Planting
- Residue and Tillage Management, No-Till
- Salinity and Sodic Soil Management
- Fence
- Waste Recycling
- Integrated Pest Management
- Nutrient Management
- Livestock Pipeline
- Livestock Watering Facilities

Wetlands Reserve Program

The Wetlands Reserve Program (WRP) was a voluntary program that offered landowners the technical and financial support to protect, restore, and enhance wetlands on their property. The goal of NRCS was to achieve the greatest wetland functions and values, along with optimum wildlife habitat, on every acre enrolled in the program (NRCS , 2019). Daniels County assisted with one conservation plan under WRP between 2008 and 2018.

Figure 13 compares the acres of conservation activities applied through NRCS programs, 2008 through 2018.

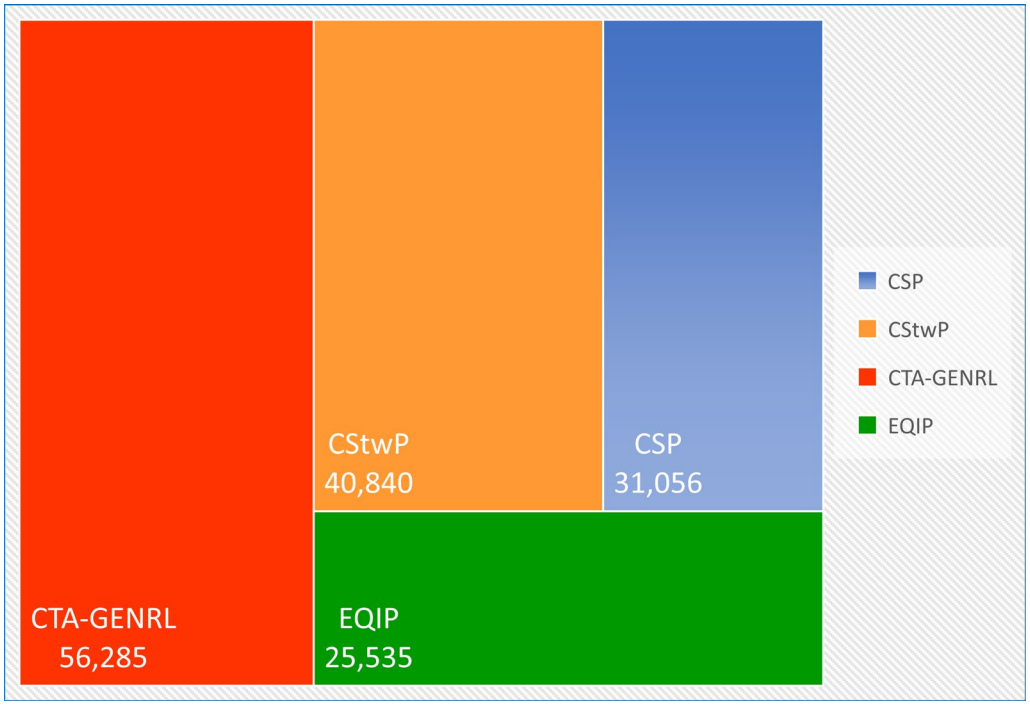


Figure 13. Acres of Conservation Program Practices Applied in Daniels County, 2008 through 2018

Table 3. NRCS Scobey Field Office Conservation Activities and Applied Amounts, 2008 Through 2018.

Conservation Practice or Enhancement	Amount Applied	Measure
Conservation Cover	42,859	acres
Use drift reducing techniques to reduce pesticide drift	22,890	acres
Integrated Pest Management	19,611	acres
Residue and Tillage Management, No-Till	15,876	acres
Nitrification inhibitors or urease inhibitors	14,086	acres
Nutrient Management	9,412	acres
Use of Cover Crop Mixes	8,910	acres
Conservation Crop Rotation	8,727	acres
Renovation of a windbreak etc. for wildlife habitat	7,008	acres
Leave standing grain crops un-harvested to benefit wildlife	5,176	acres
Precision application technology to apply nutrients	5,176	acres
Split nitrogen applications 50%	5,176	acres
Prescribed Grazing	5,113	acres
Upland Wildlife Habitat Management	4,238	acres
Access Control	3,732	acres
Salinity and Sodic Soil Management	3,129	acres
Watering Facility	20	number
Residue and Tillage Management, Reduced Till	2,880	acres
Fence	45,226	feet
Establish pollinator and/or beneficial insect habitat	2,588	acres

Livestock Pipeline	56,250	feet
Forage and Biomass Planting	1,911	acres
Range Planting	1,740	acres
Forage Harvest Management	1,439	acres
Cover Crop	2751	acres
Residue Management, All	9126	acres
Strip-cropping	524	acres
Critical Area Planting	519	acres
Field Border	508	feet
Waste Recycling	508	acres
Restoration of Rare or Declining Natural Communities	495	acres
Rotation of supplement and feeding areas	295	acres
Grassed Waterway	286	acres
Harvest crops to allow wildlife to escape	156	acres
Reduce risk of pesticides in surface water IPM PAMS techniques	156	acres
Wetland Wildlife Habitat Management	151	acres
Heavy Use Area Protection	117	acres
Retrofit watering facility for wildlife escape	98	number
Water Well	5	number
Pumping Plant	7	number
Windbreak/Shelterbelt Establishment	9	number
Firebreak	31	feet
Early Successional Habitat Development/Management	28	acres
Harvest hay to allow wildlife to escape	19	acres
Comprehensive Nutrient Management Plan	19	number
Spring Development	17	number
Tree/Shrub Establishment	10	acres

Scobey Field Office Highlights

CSP and CStwP enhancements have encouraged crop producers to apply split nitrogen applications. Most of the cropland soils in the county are sandy, so this activity is a huge step toward reducing nitrogen leaching. The practice also saves producers money otherwise spent in overapplied nitrogen. CSP and CStwP include activities that facilitate higher levels of Integrated Pest Management; by switching to low-drift application nozzles, herbicide drift is reduced, decreasing off-target application. Variable rate fertilizer application has also been adopted by many Daniels County producers. This has led some progressive farmers to investigate variable application rates of seed as well, to learn about increasing crop production by varying plant densities. Removal of old, dilapidated fences and woven wire fences as part of CSP or CStwP conservation plans has greatly improved wildlife habitat continuity.

The field office has been developing conservation plans through EQIP for previously ungrazed areas of land around and between crop fields. Livestock water and fence have made it possible to manage these areas as grazing land. Some EQIP participants improve soil health by planting marginal cropland to

perennial vegetation, by restoration of saline seeps and by including cover crops in crop rotations to boost soil organic matter and improve soil structure.

The Field Office puts on at least two educational events for Daniels County youth every year. Grade school classes take a noxious weed tour with the NRCS and Daniels County Weed District. NRCS staff presents information at various stations during Conservation Days for kindergarten through sixth grade.

Partner Conservation Efforts

Daniels County Conservation District

"We want to plant as many trees as we can!" says Conservation District Administrator Mike Bjarko. In an average year the Conservation District sells three to four thousand trees to local landowners. In a real good year, the number can be as high as 7,000 trees. Trees are used for new windbreaks, windbreak renovation, and wildlife habitat improvement.

Figure 14. Tree Spade (Machinery.com)

The Conservation District owns a 15-foot no-till drill, a tree planter, fabric layer and a tree spade. The tree spade is an apparatus used to transplant larger trees. It is attached to an old tractor. In 2019 the District purchased a small seed spreader designed to be pulled behind an ATV for planting very small areas such as pollinator habitat plots. All the equipment is available for rent. Instructions and assistance from District staff are part of the rental agreement.

The most important contribution to conservation in recent years has been the assistance, encouragement and energy provided to organize and execute the Dry Prairie Rural Water project. The Daniels County Conservation District has been a very active partner in this venture since the beginning. Development of infrastructure in Daniels County is planned to commence in 2020.

Daniels County Weed District

In addition to the youth weed tour, Weed District staff regularly present information to Daniels County students with emphasis on weed identification. The District pays a bounty to any young person who discovers a new patch of noxious weeds.

Canada thistle is the District's worst problem according to District Supervisor Connie Wittak. Spotted knapweed (*Centaurea stoebe*), leafy spurge (*Euphorbia esula)* and field bindweed (*Convolvulus arvensis)* occur in areas throughout the county, and a relatively new invader, baby's breath (*Gypsophila paniculata*), has been identified as a serious problem in several areas. The District works with MSU Extension, Montana State University, Roosevelt and Valley County Weed Districts, Pheasants Forever and private landowners to attempt to control noxious weeds on public and private land in Daniels County. Recently leafy spurge, Canada thistle and spotted knapweed were targeted in the Whitetail area with resources from a Montana Department of Agriculture Noxious Weed Trust Fund Grant. The project was completed in the fall of 2019.

Montana State University Extension, Daniels County

One of the reasons for the explosive invasion of baby's breath in Daniels County and across northeast Montana is that, "We don't know what to do with it." MSU Extension Agent Inga Hawbaker explains,

"Landowners don't know how to treat it…We don't know what works, or when is the best time to spray it. It is very hard to see in the spring, especially when it's in alfalfa."

MSU Extension in Daniels and Valley Counties have partnered with local weed districts to secure assistance through the Noxious Weed Trust Fund for a series of trials and experiments in Daniels County. The purpose is to determine which treatment methods, agents and timing will have the greatest impact on baby's breath in Daniels and surrounding counties. Work will begin in the spring of 2020. Treatment plots will be established near Scobey with other projects out on in the field. Extension will host meetings with stakeholders, experts and others to discuss what has been learned, what can be done and where to go next.

SECTION IV NATURAL RESOURCE ISSUES & DESIRED OUTCOMES

Local Work Group Priorities

The Daniels County Local Work Group, the Scobey NRCS Field Office, Daniels County Conservation District and partners have identified priority natural resource issues. These are:

1. Noxious Weeds and Invasive Species
2. Inadequate Water for Livestock
3. Soil Health Degradation: Saline Seeps
4. Soil Health on Croplands: Grass Planting to Convert Marginal Cropland to Perennial Species
5. Diminished Wetlands Health and Functionality

Other resource issues brought forward at the 2019 Local Work Group meeting are:

- The need for livestock water sources, fencing and grazing management in land that is coming out of CRP.
- Portable windbreaks to relieve the problems caused by cattle being fed and wintering in drainages.
- Renovation of older windbreaks and shelterbelts.
- The need for more pollinator habitat plantings.
- Deer damage in hay yards.
- Riparian area grazing management.
- Soil health and plant health in croplands:
    - Herbicide resistant weeds
    - The need to diversify crop rotations
    - Residue management
    - Nutrient management
    - Acidity management
- Repairing older dams that have washed out (if the site is suitable)
- Energy efficient cropping.

Resource Concerns Identified by the Scobey Field Office

The average age of producers in Daniels County continues to rise. Many farmers and ranchers are near retirement age or are ready to transfer some or all the ownership and responsibilities of the operation to the younger generation. Unfortunately, drought, low crop yields, and continually low commodity

prices make it difficult for younger family members to come back into the operation. Many producers cannot afford hired labor, so the problem is two-fold: There is a significant lack of human capital in existing agriculture operations in the County, and there are many younger farmers and ranchers who would like to return to agriculture in Daniels County but cannot afford to do so.

The second concern has to do with herbicide resistant weeds in crop systems. Currently the wheat-wheat-pulse crop rotation is the most common crop system in Daniels County, with lentils, peas and chickpeas, and to a lesser extent, canola, flax, mustard and hemp planted as alternative crops. Herbicide-resistant weeds are always a threat in any crop system and must be taken seriously when evaluating chemical pest control options. There is a need for producers to alternate herbicide mode of action in order to deter herbicide resistance in crop pests.

Daniels County has many absentee landowners. Their land is either rented and operated by someone else, is enrolled in CRP or was enrolled in CRP contacts that are now expired. We are getting into the third-generation land managers that have never nor have any desire to ever physically see the land in their control. This poses a large issue with noxious weed control and land stewardship accountability.

Resource Concerns for Potential Targeted Implementation Plans

Noxious Weeds and Invasive Species

The Local Work Group identified noxious weeds as the priority resource issue in Daniels County. Leafy spurge and Canada thistle have several common characteristics that provide exceptional competitive advantages over native plants in the ecosystem. They produce large numbers of seeds. They have extensive root systems that allow for storage of carbohydrate reserves and increased access to soil water and nutrients. The roots support vegetative reproductive structures. These species are drought resistant, resilient and prolifically reproductive. They have almost no native natural enemies in North America.

Wittak asserts, “Canada thistle is everywhere.” Leafy spurge is a problem in the Morgan Creek area and in spots around Whitetail where it was introduced as contaminant in imported hay. If the problems are not addressed, Canada thistle and leafy spurge will begin to occur in large patches and smaller scattered infestations to such an extent that rangeland production, plant community health and structure, wildlife habitat and livestock are all significantly impacted by their domination of the range sites. If no action is taken, entire watersheds will be infested to the level that they no longer support native plants and animals and will no longer be fit to use for livestock grazing.

Narrowleaf hawksbeard (*Crepsis tectorum*) and baby’s breath are new invaders that have not yet been added to the Montana Noxious Weed List (Appendix C1). Legend has it that the baby’s breath invasion is the result of seed that escaped from an old timer’s flower bed. It eventually spread to the banks of the Poplar River and is now moving across the landscape with discouraging momentum. Baby's breath can withstand considerable variation in both temperature and moisture. It tends to be very aggressive in areas of low rainfall. It is commonly found in lightly grazed pastures, roadside ditches, hay fields, and abandoned fields. Baby’s breath spreads by seed. A single plant produces an average 13,700 seeds; these are wind dispersed and can travel great distances. Once established, baby’s breath forms dense stands and is difficult to control (WSNWCB, 2019). Until effective treatments are discovered and applied, baby’s breath will continue to roll across the landscape, displacing desirable plant species and degrading ecosystem function.

Hawksbeard occurs throughout the county. It aggressively invades disturbed ground and has become established in stands of both native and introduced grass. Spotted knapweed is a tap-rooted perennial that spreads by seed. Seed production varies from 500 to 4,000 seeds per plant depending on environmental conditions. Seeds can remain viable for more than eight years. Spotted knapweed also favors disturbed areas and will invade healthy, established plant communities. Human activities are thought to be the most effective vector of knapweed seed distribution.

Knapweeds are associated with reductions in native plants, reduced forage yields and degraded habitats in range, grasslands and agricultural areas. Based on estimates from 1996, knapweeds cost Montana $42 million per year in direct and indirect costs (Duncan, 2017).

A desired future outcome would be control of noxious weeds on 5,000 acres in the next 5 years.

Inadequate Water for Livestock

Season of use on grazing lands is restricted by the lack of water for livestock. Older dams and dugouts on rangeland eventually experience a suite of problems. Many have lost storage capacity due to the natural processes of aging, sedimentation and mechanical failure. Reservoirs are prone to seepage or leaching through the sandy soils of Daniels County. Overall, water sources are inadequate throughout much of the county because they are too far apart, too old, too small or because they were built on unsuitable sites.

MSU publication *Drinking Water Quality for Beef Cattle: An Environment Friendly & Production Management Enhancement Technique* reports the benefits of the availability of fresh, clean water for cattle.

- Cattle are healthier and gain weight faster when they have access clean water.

"Calves start drinking water at an early age and their performance can be highly dependent on the availability of water. Their consumption is dependent on access and quality of the water…Research in Alberta, Canada (1995) showed a 23% increase in weight gains over 71 days for yearling steers drinking well water versus those drinking from a dam/pit. Studies in 1993 showed a 20% difference in animal weights, when exposed to (the) different water sources for a 30-day period."

- Water contamination is much higher in reservoirs, ponds or pits.

"Cattle dependent on [earthen water basins, such as reservoirs, ponds or dugouts]…resuspend sediments as they enter and move through the water to get a drink. Fecal organisms are bound to sediments at the bottom of water sources until disturbed. Livestock or wildlife walking into or through the water source are a typical disturbance. However, livestock drinking from a tank do not resuspend bottom sediments, and rarely deposit urine and manure in the tank, as do those drinking from a dam/pit". (Surber, 2019).

If no action is taken, grazing management will be increasingly limited by the lack of adequate livestock water. Patch grazing, overgrazing and re-grazing are common where the resource concern occurs. These habits are well known to contribute to rangeland degradation. Grasslands rely on disturbance as part of the regenerative process. If no action is taken, a lot of land in Daniels County will remain inaccessible for grazing to the detriment of the ecosystem, while other areas will continue to be improperly grazed or over grazed. Inability to utilize these areas will continue to deter crop producers from integrating livestock into their operations.

These concerns are particularly relevant in the areas between crop fields, on field borders, along creeks and in the roughs. Water development along with fences will help these areas to be utilized by livestock. Forage production will increase with managed disturbance, and plant community and soil health in the project areas will improve.

A desired future condition would be the installation of wells, pumping plants, livestock pipelines, watering facilities, and fencing in areas where the practices would facilitate grazing management plans.

Soil Erosion on Croplands

One factor that contributes to the resource concern is the trend to combine smaller crop fields into fewer, larger fields. Bigger fields can lose topsoil when the crop is damaged or destroyed by hail or some other event and the soil is left with no cover. The extensive reach of the field makes the soils more susceptible to wind and water erosion. If the crop is compromised, smaller fields are less vulnerable to erosion.

Soil erosion on marginal cropland could be eliminated if areas of typically poor crop production were planted to stands of perennial grass, forbs and legumes. This would improve soil health and function in these areas as well.

A desired future outcome would be to increase awareness of soil erosion, promote soil health and encourage crop producers to farm smaller fields and restore perennial vegetation on marginal cropland.

Saline Seeps

Many dryland areas which are now cropped once existed under forest or grass cover. The ecosystem under these conditions was balanced as the grasses and trees utilized all the precipitation in their respective areas and kept the groundwater tables low. Clearing deep rooted perennial vegetation then replacing it with annual crops decreases plant water requirements, causing a surplus of water that exceeds the soil water holding capacity of the root zone (Abrol, 1988). Dryland saline seeps are the manifestation of salt accumulation in low spots or side slopes on the landscape.

The bedrock in northern and eastern Montana has high salt concentrations and it acts as an impermeable layer that minimizes vertical ground water movement. As a result, the ground water builds above the bedrock, causing an elevated (or artificial) water table that exerts increased hydraulic pressure on low lying areas. Where the water table is within four feet of the ground surface, a saline seep forms in the discharge area (MSCA, 2019).

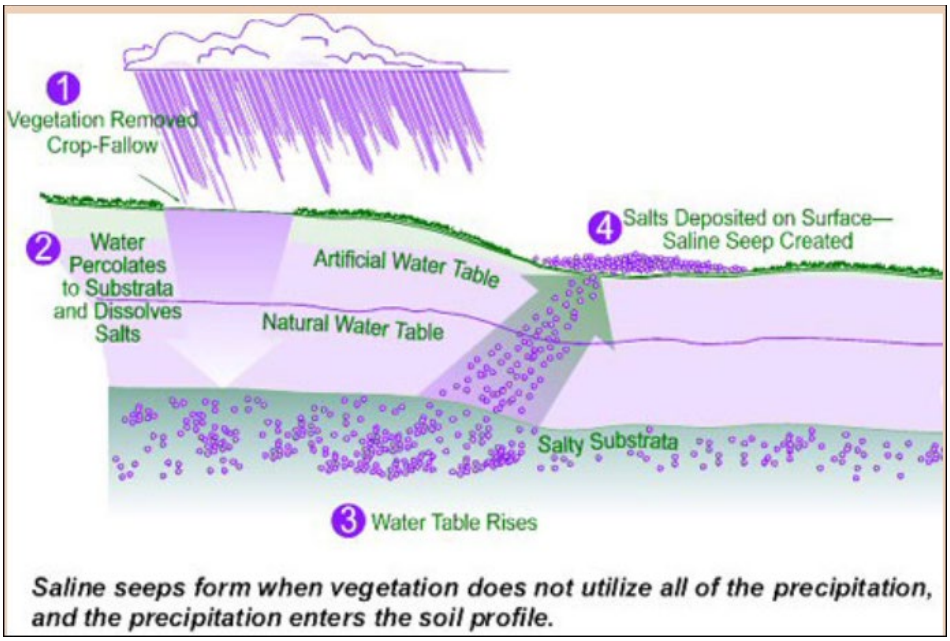


Figure 15. Formation of Saline Seeps (MSCA, 2019)

Saline seeps are common in northeastern Montana. Many resource concerns are associated. If no action is taken, the number and size of saline seeps in Daniels County will likely increase, causing decreased crop production and damaged soils.

If the resource concerns were to be addressed, one option would be to plant recharge and discharge areas to perennial vegetation with species suited to the site. The intent would be to convert from annual crops to a grazing or haying system. Another strategy could be to switch to continuous cropping, rather than a rotation that includes fallow, in the recharge area. Reducing or eliminating fertilizer applications in the discharge area would help.

A desired future outcome would be to treat the causes and symptoms of salinization on 7,000 acres, including both recharge and discharge areas. Increased ground cover would be a parameter to monitor success with a target of 80% ground cover on saline seeps discharge areas.

Diminished Wetlands Health and Functionality

Livestock

Wetland degradation is occurring due to over-use by livestock. Lack of adequate livestock water in the uplands contributes to cattle over-grazing and trampling wetland vegetation, shoreline degradation, and excess nutrients in surface water.

Hall and Bryant describe damage to riparian areas. “Riparian ecosystems have two important areas of concern: (1) woody vegetation for shade, cover, and streambank protection; and (2) streambanks themselves, often called "the green line," with their protective herbaceous vegetation. Cattle can affect each of these in different ways. Direct browsing of shrubs reduces the cover and shade they provide over the stream and could prevent their regeneration. Heavy use of streambanks by cattle may cause direct physical damage through the breakdown of the bank and the overuse of the herbaceous vegetation. Overuse may change the vegetation from protective sedges to open, nonprotective forbs.

This fosters streambank erosion and reduces the filtering action of dense sedges, which tends to reduce sediment loading." (Hall, 1995)

The MSU report by Surber, et al, mentioned earlier, claims that if cattle have a choice they will choose to water outside of the riparian area or wetland. The study showed that providing a water tank for cattle kept them out of the creek. The group of cattle that had equal access to a stream and a tank spent 90% less time in the creek than cattle that had access to water only in the stream. (Surber, 2019).

There is a need for management strategies that keep cattle up in the uplands and minimize use of wetland and riparian areas. If the trend of riparian area impairment continues, hydrologic function will be altered, valuable wildlife habitat will be lost, and degraded aquatic habitat will no longer support associated plants, birds, invertebrates, and fish.

There is a possibility that much can be done to address resource concerns associated with lack of adequate livestock water and wetland degradation through participation in Dry Prairie Rural Water (DPRW). Pipelines and pasture taps will most likely be provided in parts of Daniels County as they have in other DPRW project areas.

Prairie Potholes

Wetland degradation of the prairie potholes is primarily caused the practice of incorporating wetland areas into cropland. Opportunities exist to improve wetland function and wildlife habitat by implementing a Targeted Implementation Plan with individual conservation plans similar to those offered in the Prairie Pothole Wetland & Grassland Retention (PPWGR) program.

The last time PPWRG was offered, the field office was able to convert unproductive cropland acres to perennial cover, meeting the goals of producers and increasing wildlife habitat. It is likely that several contracts resulted in the conversion to perennial cover for the foreseeable future. Converted acres that had not consistently produced a significant crop for many years will likely remain in perennial grass cover well beyond the contract length.

A desired outcome would be to convert 1,000 acres currently in crop production back to natural vegetation.

SECTION V PRIORITIZE NATURAL RESOURCE ISSUES

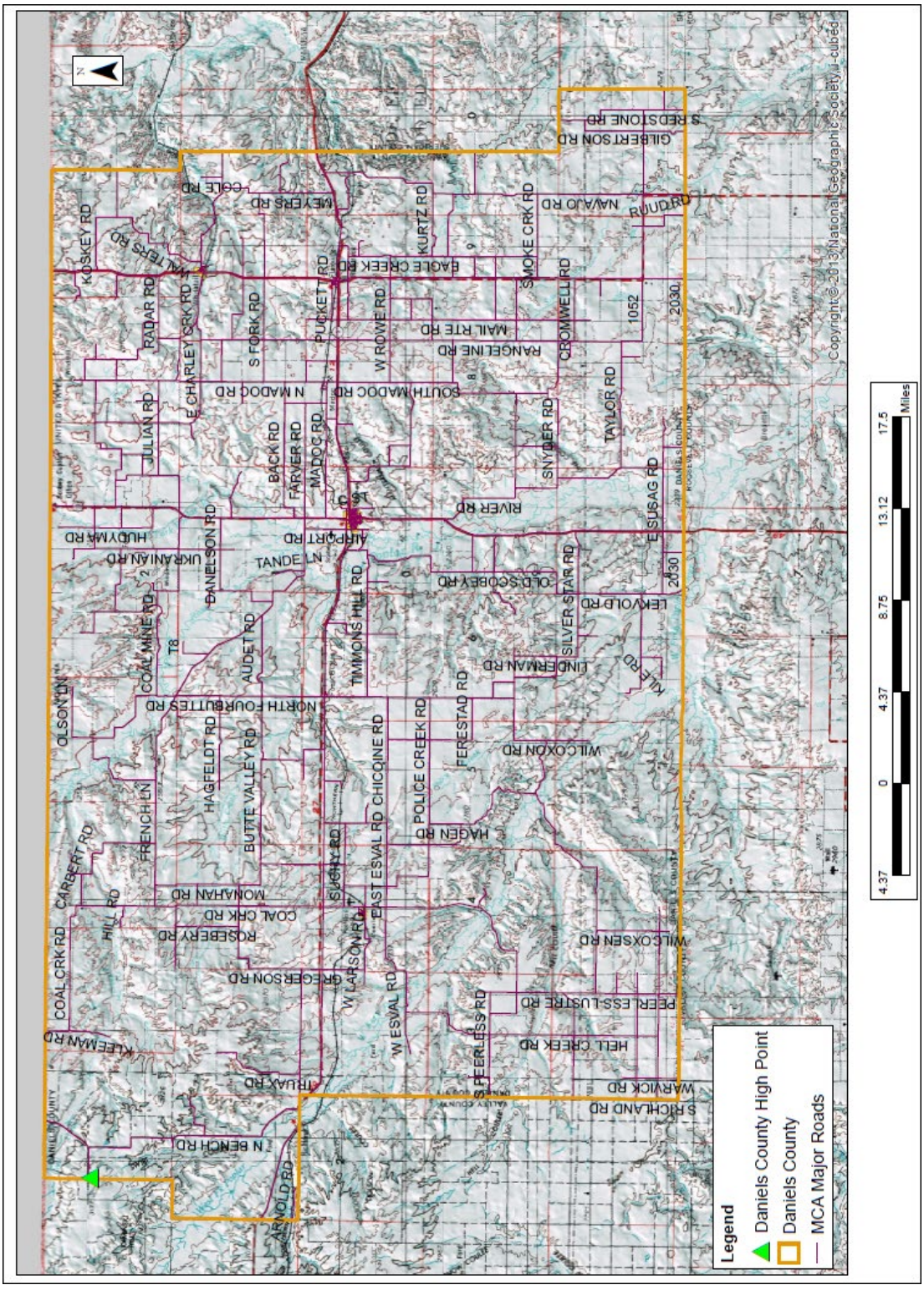
The Scobey Field Office Long-Range Plan represents a dynamic resource conservation strategy. Long Range Planning is the new model for conservation delivery throughout Montana, but it must be recognized the Field Office also has many other commissions such as Natural Resource Inventory (NRI), conservation compliance, emergency programs, et cetera, which must be accomplished concurrently. The resource concerns below are listed in priority order with the knowledge that the NRCS Scobey Field Office Long-Range Plan will change over time as resource concerns in target areas are addressed, as new resource concerns are identified, and as other issues continue to influence natural resources conservation in Daniels County.

The Daniels County Local Working Group met in 2019 to discuss and prioritize natural resource concerns. Considering the results of the meeting, requests for assistance with resource conservation in the county, and trends in resource use and agriculture, the field office has selected the following resource concerns:

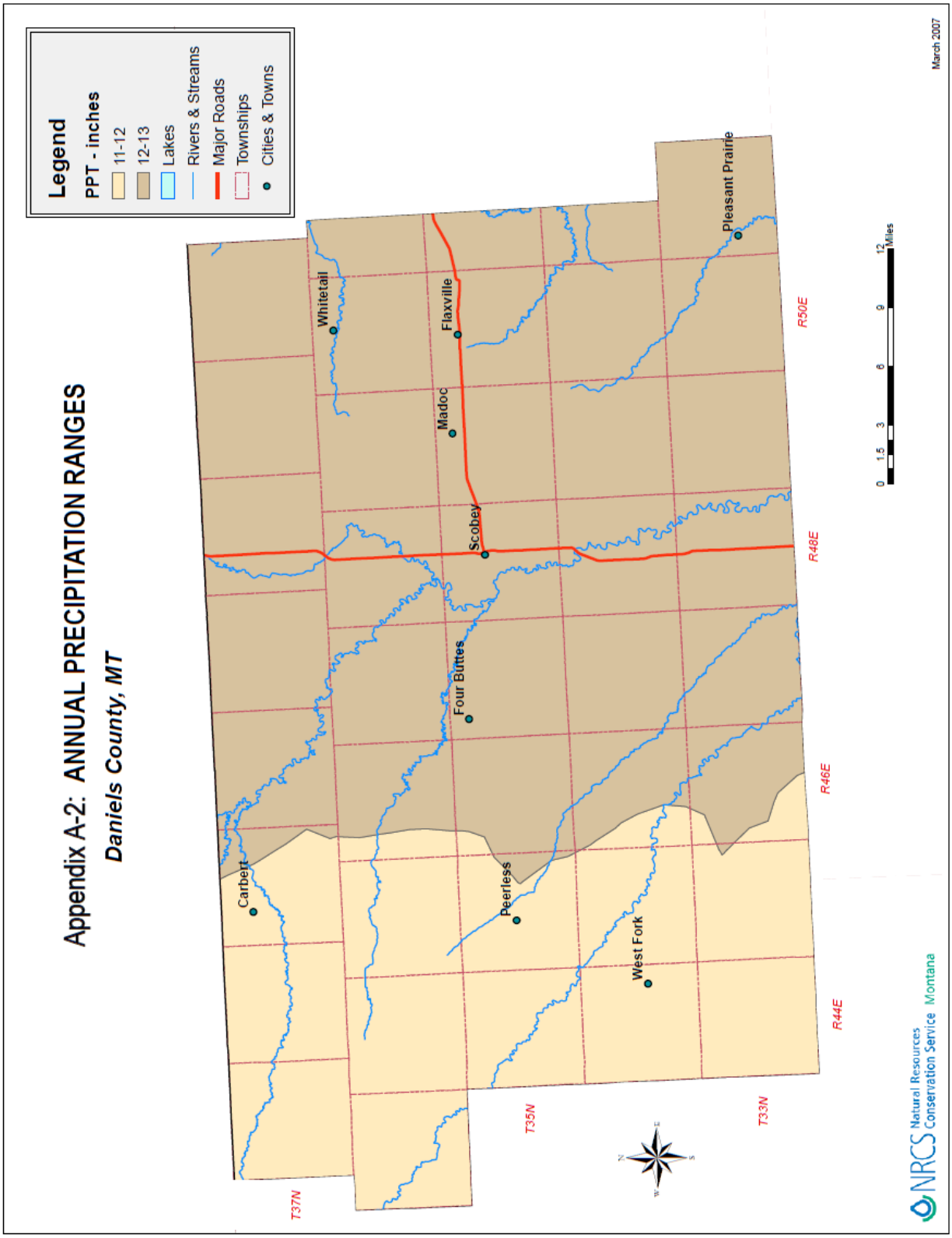
1. Prairie Pothole Wetland Restoration: Diminished Wetlands Health and Functionality
2. Noxious Weeds and Invasive Species
3. Inadequate Water for Livestock
4. Soil Health on Croplands: Grass Planting to Convert Marginal Cropland to Perennial Species
5. Soil Health Degradation: Saline Seeps

APPENDIX A

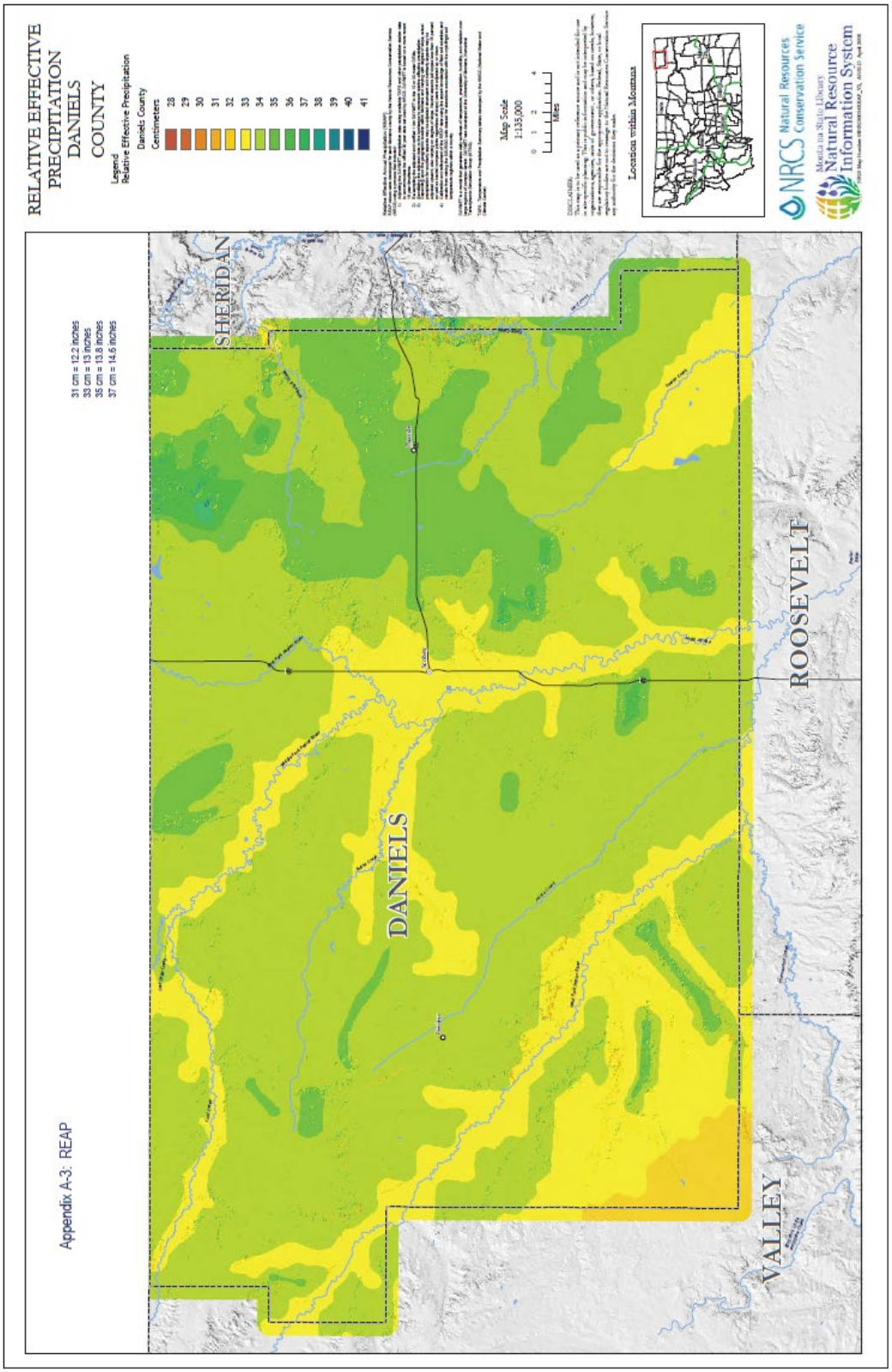
A1 Daniels County, Montana



A2 Precipitation Ranges

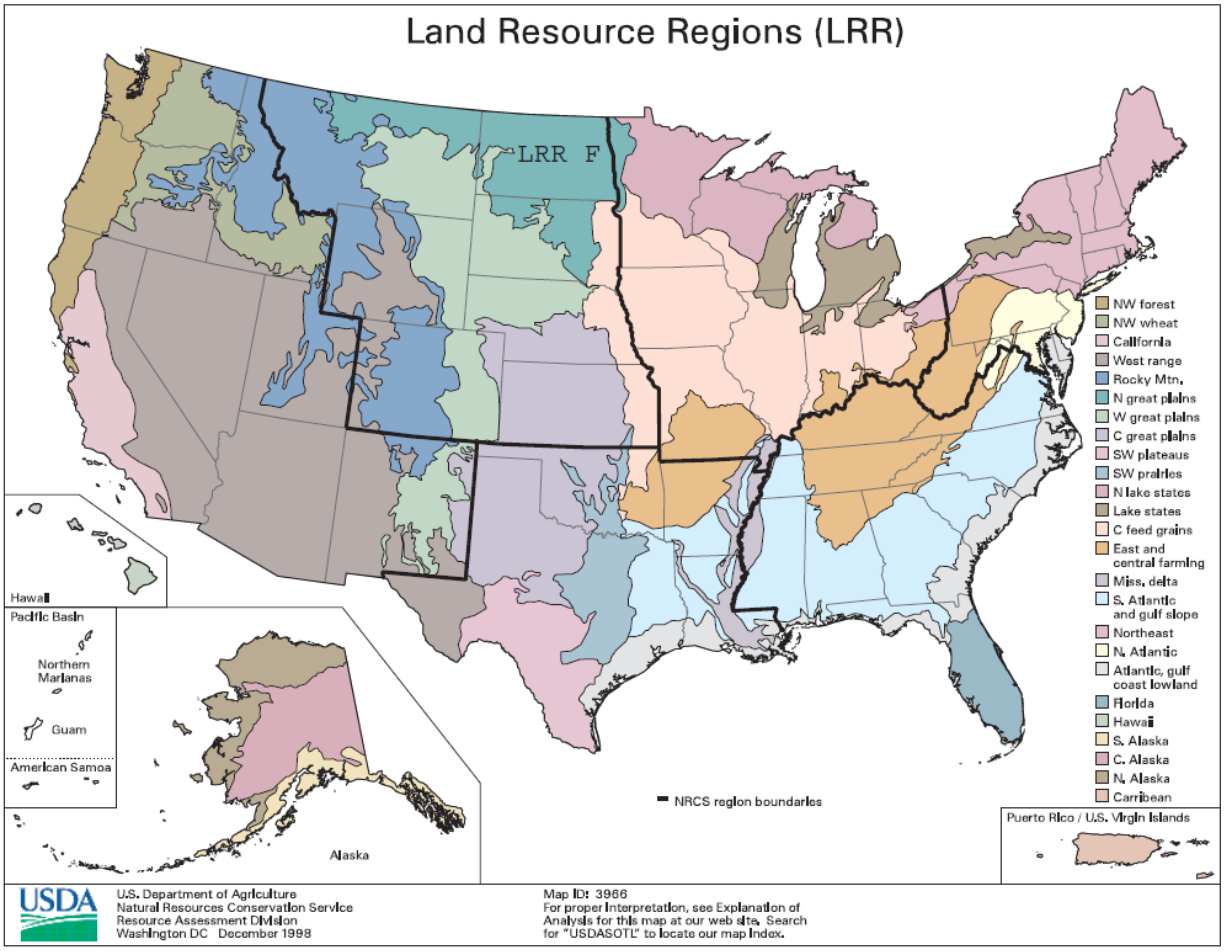


A3 Relative Annual Effective Precipitation



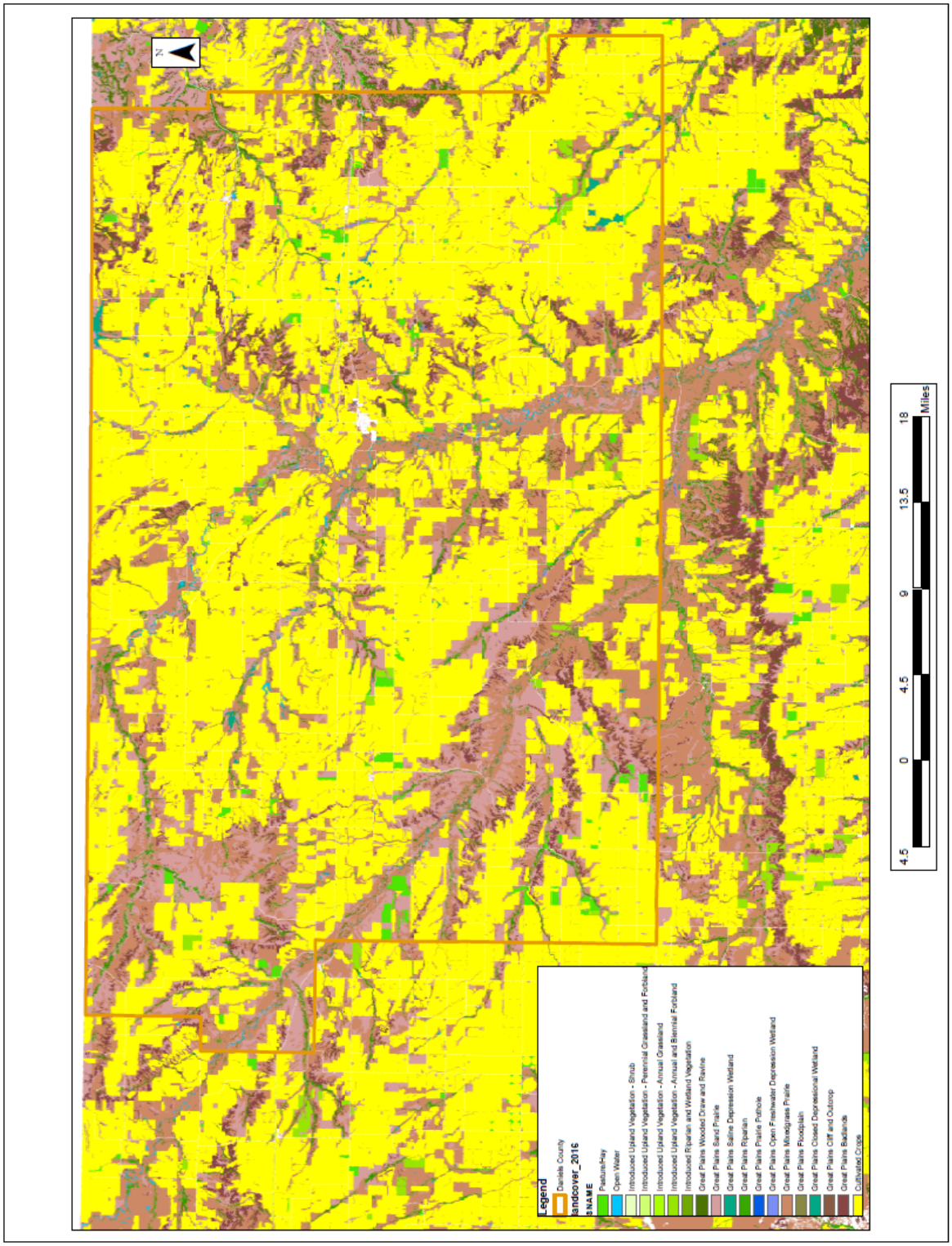
A4 Land Resource Regions

LRRF: Northern Great Plains Spring Wheat Region

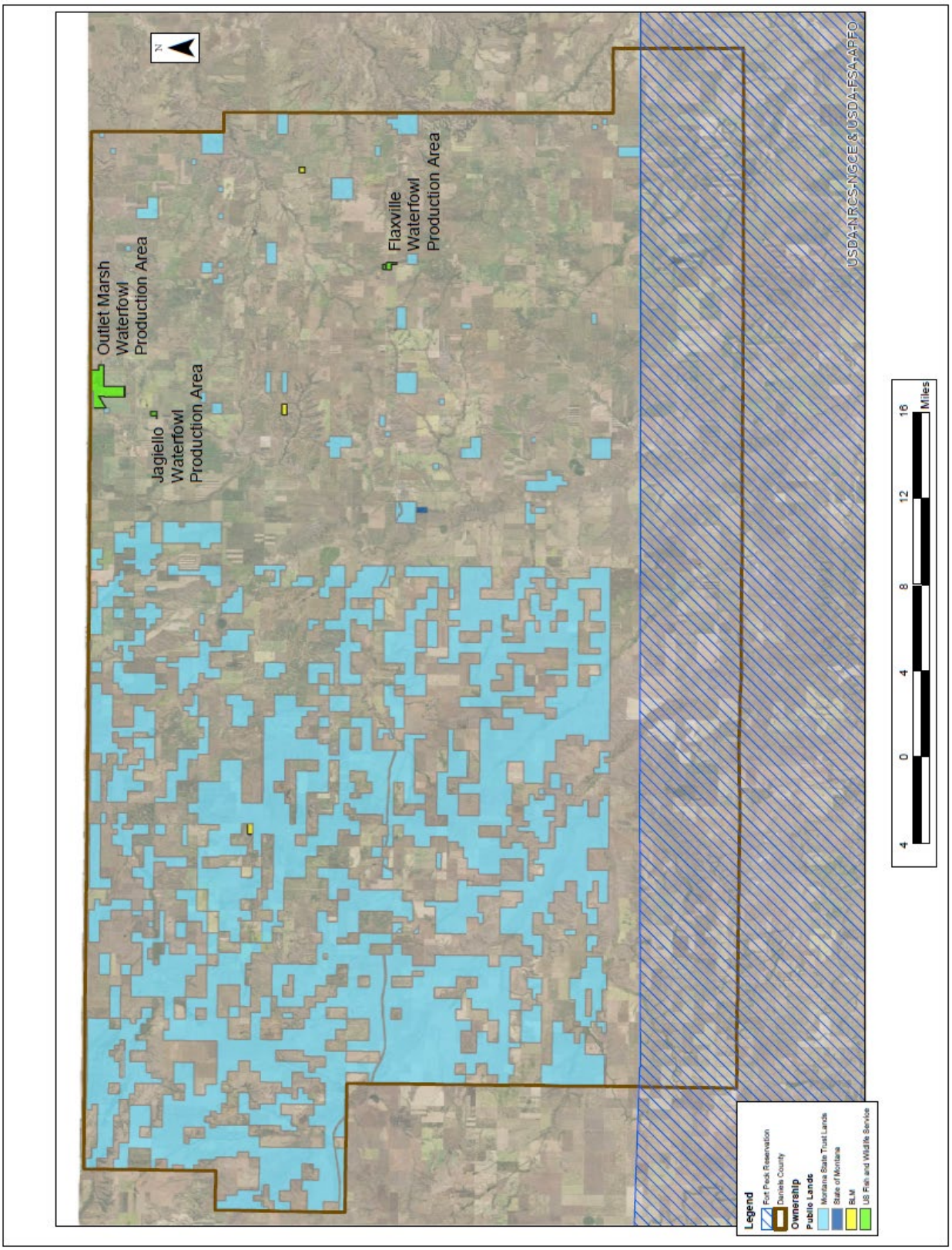


(NRCS, 2006)

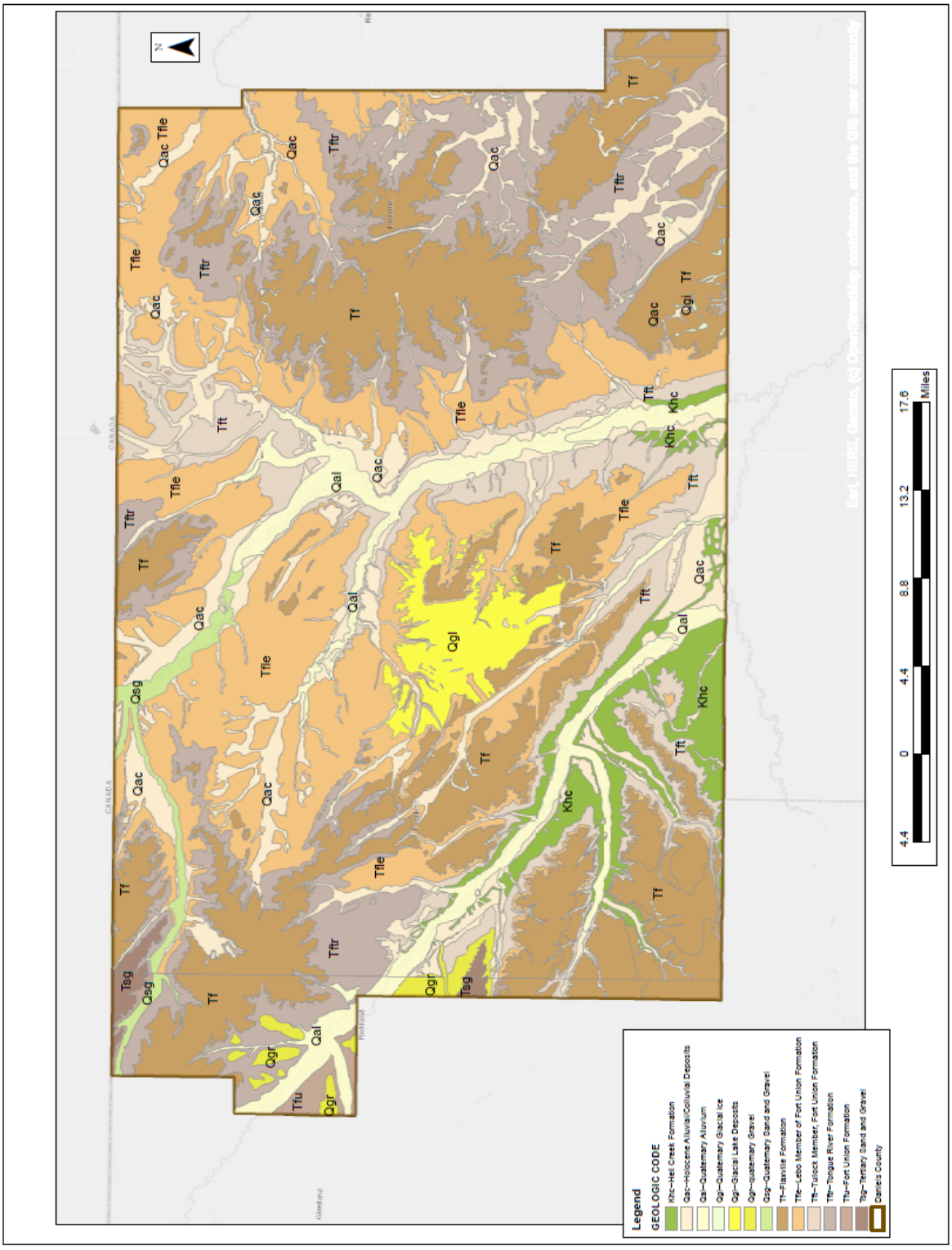
A5 Landcover



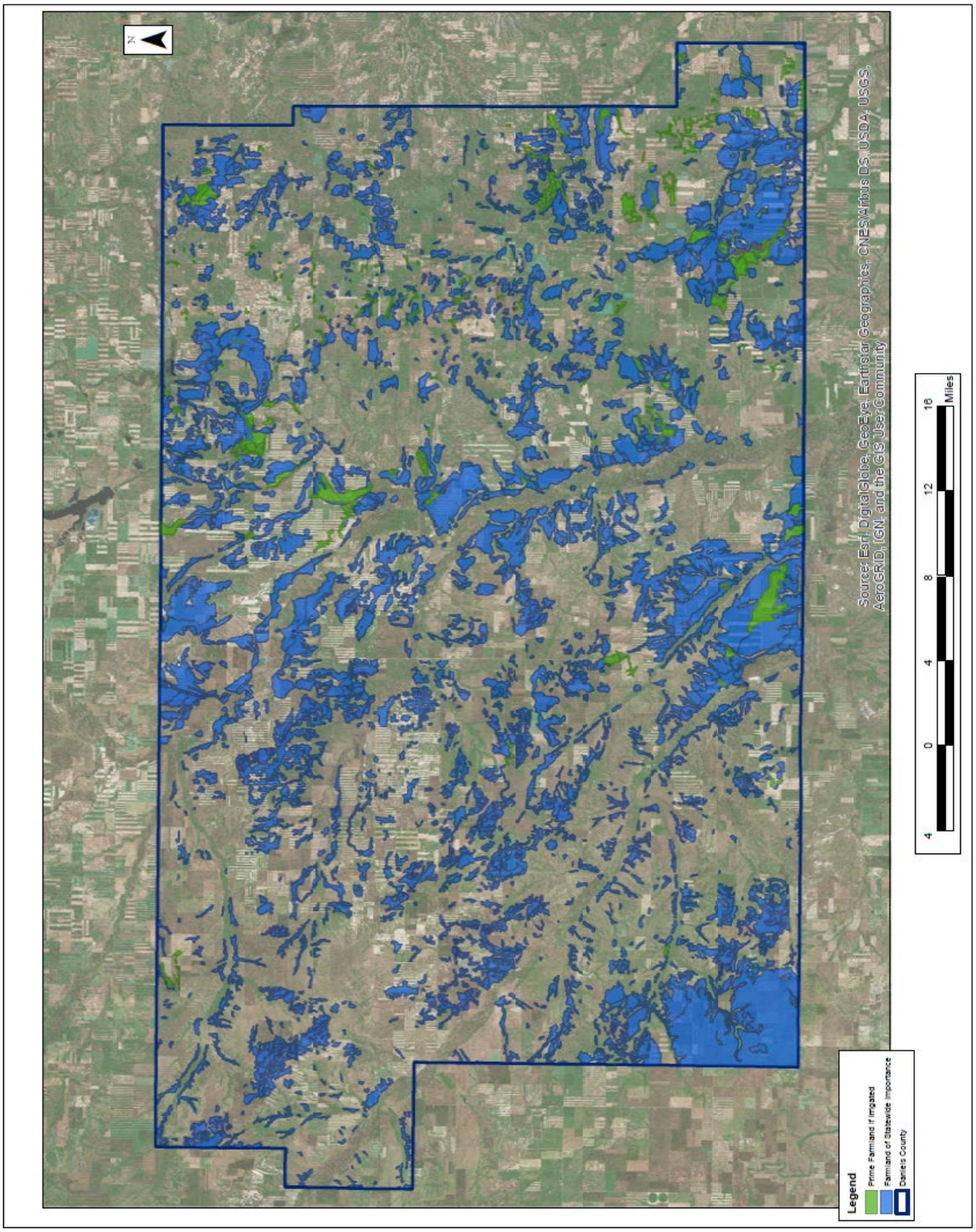
A6 Land Ownership



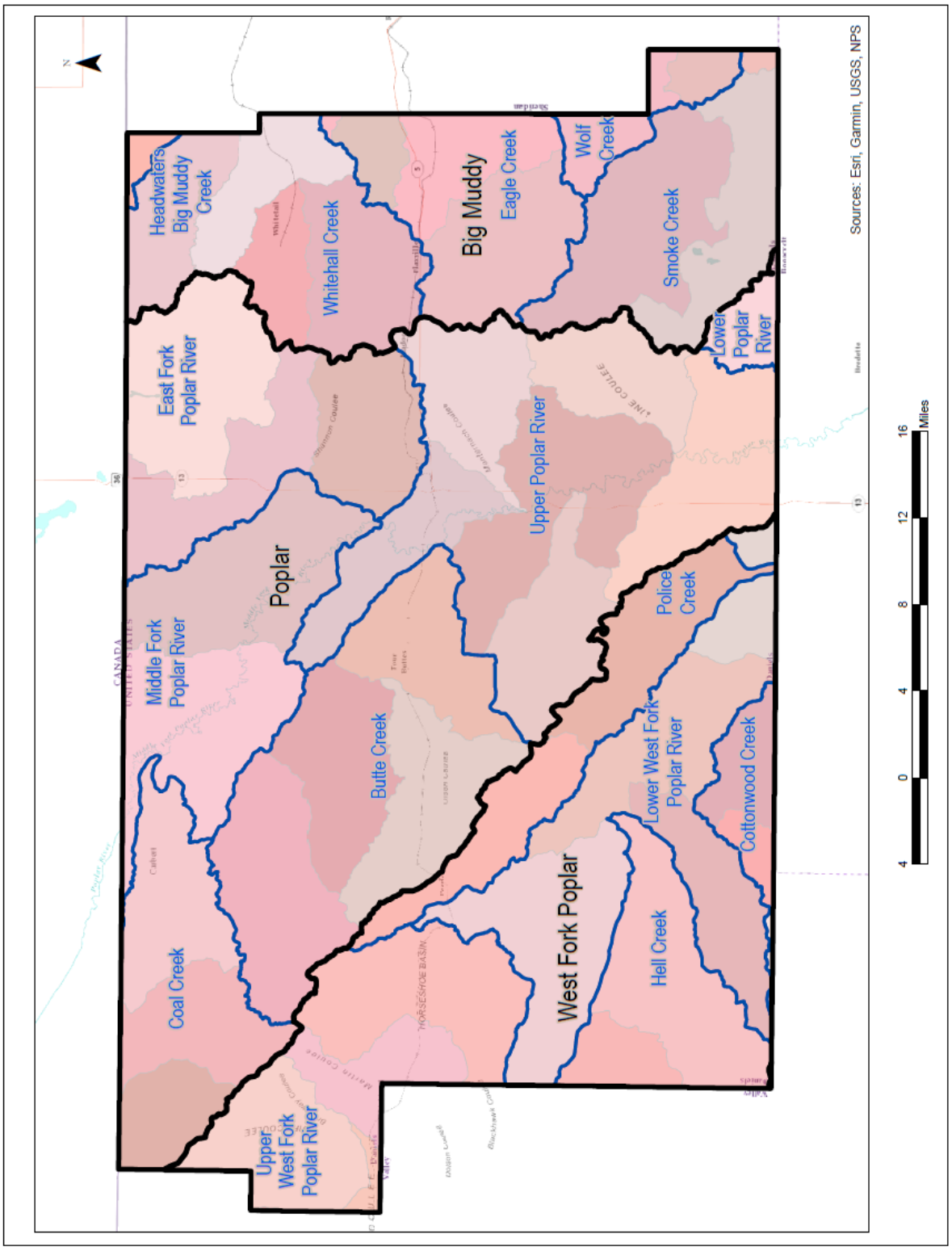
A7 Geology


Legend
GEOLOGIC CODE
Khc—Hell Creek Formation
Qac—Holocene Alluvial/Colluvial Deposits
Qal—Quaternary Alluvium
Qgl—Quaternary Glacial Ice
Qgl—Glacial Lake Deposits
Qgr—Quaternary Gravel
Qsg—Quaternary Sand and Gravel
Tf—Flaxville Formation
Tfle—Lebo Member of Fort Union Formation
Tft—Tullock Member, Fort Union Formation
Tftr—Tongue River Formation
Tfu—Fort Union Formation
Tsg—Tertiary Sand and Gravel
Daniels County
4.4 0 4.4 8.8 13.2 17.6 Miles

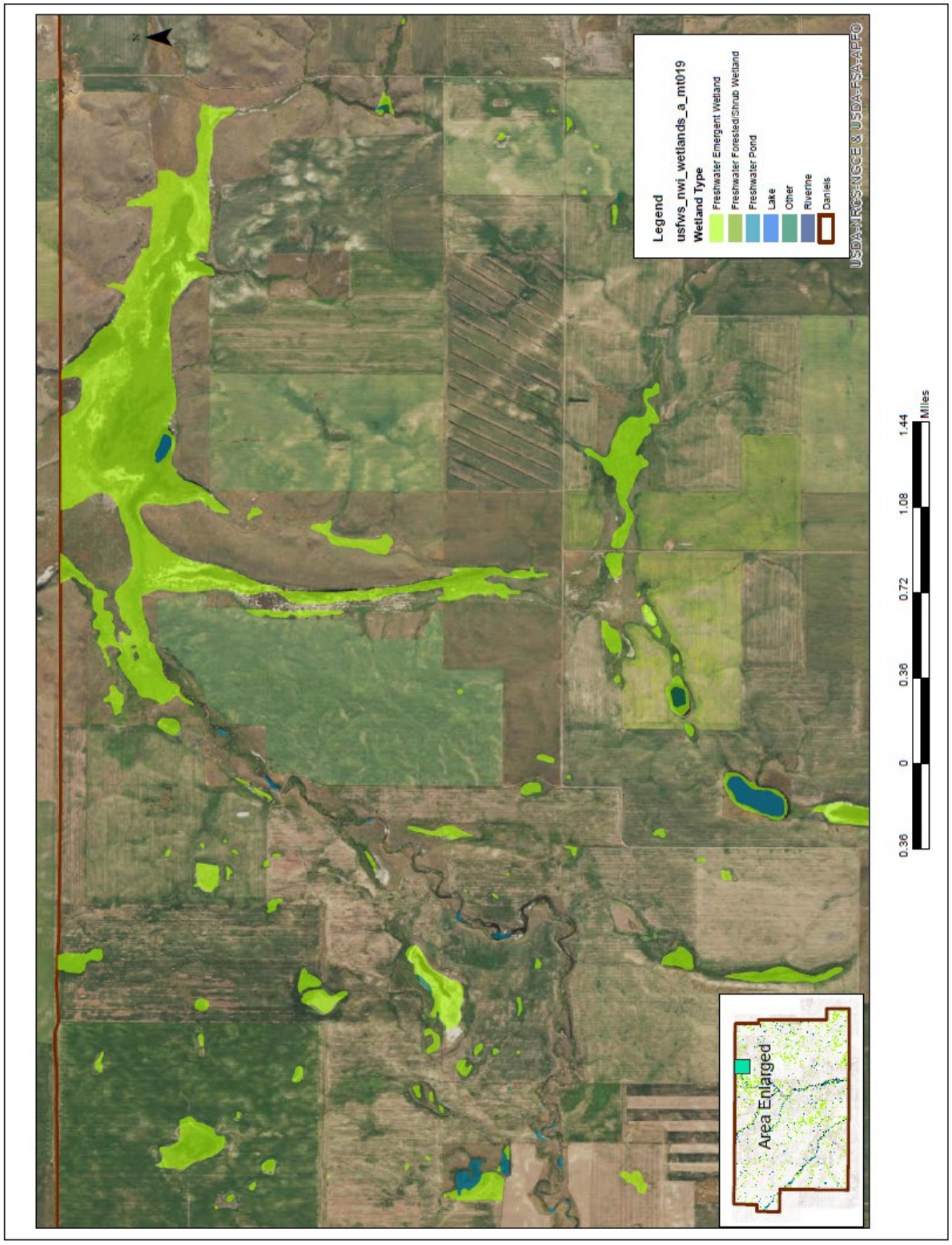
A8 Farmland of Statewide Importance & Prime if Irrigated Farmland



A9 Daniels County Hydrology



A10 Wetlands Areas



APPENDIX B

B1 NRCS Success Story

NRCS Success in Working with the Fort Peck Tribes in Rangeland Conservation

Paul Finnicum, District Conservationist, Poplar Field Office

With the assistance of the NRCS, the Fort Peck Tribes were one of the first Tribal governments to adopt an Agricultural Resource Management Plan (ARMP) which spelled out how the Tribes and their members wanted their natural resources to be taken care of. As a result of the adoption of the ARMP in 2014, the Tribes have developed a new land use policy, drought management plan, cultural resource review policy, and a programmatic Environmental Assessment tool, relying on NRCS standards and specifications to demonstrate how the land should be cared for meeting NEPA compliance. In 2014, the Tribes contributed $300,000 to start implementing the provisions of their ARMP on their native rangelands, specifically their 94 range units comprising over 320,000 acres. In 2015, they decided to apply for federal cost share assistance through the Environmental Quality Incentive Program (EQIP).

Since 2015, utilizing EQIP funding, the NRCS has accomplished the following working with the Tribes and its members:

EQIP contracts on 20 Range Units with 18 different operators.

Obligated $4,032,441.50 dollars through EQIP, including $655,000 for fy19.

Installed over 305 miles of wildlife friendly fence to facilitate management practices.

Developed Prescribed Grazing Plans with a minimum of 4 pastures on 20 range units comprised of 75,140 acres.

Performing range monitoring on all range units, including exclusions and photo plots on all 94 units totaling 320,000 acres.

Controlled Noxious Weeds on over 100 acres.

The Tribes have employed nearly 130 Tribal members to install the wildlife friendly fence since 2014.

The Fort Peck Tribes also have established their own cost share program for range improvements. The Tribes dedicate $3.00 per AUM from range fees for conservation called the Range Improvement Fund. In the past 5 years, utilizing NRCS conservation planning, standards & specifications, they have installed 62 miles of wildlife friendly fence on 20 range units made up of 12,776 acres with prescribed grazing plans containing a minimum of 4 pastures, including monitoring and numerous water developments.

Totals with NRCS Conservation Planning and Financial Assistance:

- Wildlife friendly fence to facilitate management- 367 miles.
- Prescribed Grazing Plans with minimum of 4 pastures – 40 Range Units – 87,916 acres.
- Rangeland Monitoring for utilization and distribution utilizing both exclusions and photo plots- 320,000 acres.
- Noxious Weed Control- 100 acres.
- Expanded the Tribal Buffalo herd from 44 animals on 2500 acres, to nearly 500 head on nearly 26,000 acres.

B2 Daniels County, Montana Animal Species of Concern *(MNHP, 2023)*

Species Subgroup	Common Name	Scientific Name	Family	State Rank	Habitat
Mammals	Eastern Red Bat	*Lasiurus borealis*	Bats	S3	Riparian forest
Mammals	Hoary Bat	*Lasiurus cinereus*	Bats	S3	Riparian & forest
Mammals	Little Brown Myotis	*Myotis lucifugus*	Bats	S3	Generalist
Birds	Nelson's Sparrow	*Ammospiza nelsoni*	New World Sparrows	S3B	Prairie wetland
Birds	Sprague's Pipit	*Anthus spragueii*	Pipits	S3B	Grasslands
Birds	Burrowing Owl	*Athene cunicularia*	Owls	S3B	Grasslands
Birds	Ferruginous Hawk	*Buteo regalis*	Hawks, Kites, Eagles	S3B	Sagebrush grassland
Birds	Chestnut-collared Longspur	*Calcarius ornatus*	Longspurs and Snow Buntings	S2B	Grasslands
Birds	Veery	*Catharus fuscescens*	Thrushes	S3B	Riparian forest
Birds	Baird's Sparrow	*Centronyx bairdii*	New World Sparrows	S3B	Grasslands
Birds	Black Tern	*Chlidonias niger*	Gulls / Terns	S3B	Wetlands
Birds	Bobolink	*Dolichonyx oryzivorus*	Blackbirds	S3B	Moist grasslands
Birds	Loggerhead Shrike	*Lanius ludovicianus*	Shrikes	S3B	Shrubland
Birds	Long-billed Curlew	*Numenius americanus*	Sandpipers	S3B	Grasslands
Birds	Thick-billed Longspur	*Rhynchophanes mccownii*	Longspurs and Snow Buntings	S3B	Grasslands
Birds	Common Tern	*Sterna hirundo*	Gulls / Terns	S3B	Large rivers & lakes
Reptiles	Smooth Greensnake	*Opheodrys vernalis*	Colubrid Snakes	S2	Wetlands
Fish	Northern Redbelly Dace	*Chrosomus eos*	Minnows	S3	Small prairie rivers
Fish	Iowa Darter	*Etheostoma exile*	Perches	S3	Small prairie rivers
Fish	Northern Pearl Dace	*Margariscus nachtriebi*	Minnows	S2	Small prairie streams

APPENDIX C

C1 Montana Noxious Weed List

December 20, 2023

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

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

PRIORITY 1B These weeds have limited presence in Montana. Management criteria will require eradication or containment and education:

(a) Knotweed complex (*Polygonum cuspidatum, P. sachalinense, P. × bohemicum, Fallopia japonica, F. sachalinensis, F. × bohemica, Reynoutria japonica, R. sachalinensis, and R.× bohemica*)

(b) Purple loosestrife (*Lythrum salicaria*)
(c) Rush skeletonweed (*Chondrilla juncea*)
(d) Scotch broom (*Cytisus scoparius*)
(e) Blueweed (*Echium vulgare*)

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

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

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

(a) Canada thistle (*Cirsium arvense*)
(b) Field bindweed (*Convolvulus arvensis*)
(c) Leafy spurge (*Euphorbia virgata*)
(d) Whitetop (*Cardaria draba, Lepidium draba*)
(e) Russian knapweed (*Acroptilon repens, Rhaponticum repens, Centaurea repens*)
(f) Spotted knapweed (*Centaurea stoebe, C. biebersteinii*)

(g) Diffuse knapweed (*Centaurea diffusa*)
(h) Dalmatian toadflax (*Linaria dalmatica*)
(i) Common St. Johns-wort (*Hypericum perforatum*)
(j) Sulfur cinquefoil (*Potentilla recta*)
(k) Common tansy (*Tanacetum vulgare*)
(l) Oxeye daisy (*Leucanthemum vulgare*)
(m) Common hound's-tongue (*Cynoglossum officinale*)
(n) Yellow toadflax (*Linaria vulgaris*)
(o) Salt cedar (*Tamarix ramosissima*)
(p) Curly-leaf pondweed (*Potamogeton crispus*)
(q) Hoary false-alyssum (*Berteroa incana*)

PRIORITY 3 Regulated Plants: (not Montana listed noxious weeds).
These regulated plants have the potential to have significant negative impacts. The plant may not be intentionally spread or sold other than as a contaminant in agricultural products. The state recommends research, education and prevention to minimize the spread of the regulated plant.

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

References

Abrol, I. Y. (1988). *Salt-Affected Soils and Their Managment: Salinity Problems of the Dryland Region.* Retrieved from http://www.fao.org/3/x5871e/x5871e00.htm#Contents

DCCD. (1976). *Daniels County Conservation Distric Long Range Plan.* Portland: USDA SCS. Retrieved from https://archive.org/details/danielscountycon1976dani/page/n63

DPRW. (2019, December 10). *Home*. Retrieved from Dry Prairie Rural Water: http://dryprairie.com/index.html

Duncan, C. S. (2017). *Biology Ecology and Management of Montana Knapweeds.* Bozeman: Montana State University.

EPA. (2019, May 24). *United States Enviornmental Protection Agency*. Retrieved from Wetlands/Prairie Potholes: https://www.epa.gov/wetlands/prairie-potholes

EPA. (2019, may 24). *Wetlands Factsheet Series*. Retrieved from Functions: https://www.epa.gov/wetlands/how-do-wetlands-function-and-why-are-they-valuable

EWG. (2024, March 5). *CRP Acreage in Montana, 2020*. Retrieved from EWG's Conservation Database: https://conservation.ewg.org/crp.php?fips=30019

EWP. (2019, December 9). *CRP acreage in Montana, 2014*. Retrieved from EWP Conservation Database: https://conservation.ewg.org/crp.php?fips=30000

Fischer, A. (2019, November 1). Personal Knowlege.

Fort Peck Tribes. (2013). Retrieved from Fort Peck Reservation Demographic and Economic Information: http://lmi.mt.gov/Portals/193/Publications/LMI-Pubs/LocalAreaProfiles/Reservation%20Profiles/RF16-FortPeck.pdf

FPTFGD. (2019, December 10). *Fort Peck Tribes Fish and Game Department*. Retrieved from Turtle Mound Ranch: http://fortpecktribes.org/fgd/buffalo.htm

Hall, F. a. (1995). *herbacious Stubble Height as a Warning of Impending Cattle Grazing Damage to Riparian Areas.* Portland: US Forest Service.

MBMG. (2019, 6 14). *Montana Bureau of Mines and Geology*. Retrieved from MBMG Data Center: http://mbmggwic.mtech.edu/sqlserver/v11/reports/CountyStatistics.asp?MTCounty=GARFIELD

MNHP. (2023, December 20). *Animal Species of Concern*. Retrieved from Montana Natural Heritage Program -SOC Report: http://mtnhp.org/SpeciesOfConcern/?AorP=a

MNHP. (2023, December 20). *Animal Species of Concern.* Retrieved from Montana Natural Heritage Program: http://fieldguide.mt.gov/speciesDetail.aspx?elcode=AFCAA02010

MNHP. (2023, December 20). *Field Guide Ecological Systems*. Retrieved from Montana Field Guides: http://fieldguide.mt.gov/displayES_LCLU.aspx

MNHP. (2019, November 4). *Kingdom-Animals*. Retrieved from Montana Field Guides: http://fieldguide.mt.gov/displayClasses.aspx?Kingdom=Animalia

MNHP. (2019, November 21). *Montana Field Guide*. Retrieved from Leafy Spurge--Euphorbia virgata: http://fieldguide.mt.gov/speciesDetail.aspx?elcode=PDEUP0Q0L2

MNHP. (2023, December 20). *Montana Field Guide.* Retrieved from Northern Myotis -- Myotis septentrionalis: https://fieldguide.mt.gov/speciesDetail.aspx?elcode=AMACC01150

MNHP. (2019, 11 5). *Plant Species of Concern*. Retrieved from Montana Natural Heritage Program: http://mtnhp.org/SpeciesOfConcern/?AorP=p

MSCA. (2019, December 13). *Saline Seep Formation*. Retrieved from Montana Salinity Control Association: http://montanasalinity.com/gpage.html

MT DEQ. (2019, 6 15). *Current Air Qulity*. Retrieved from Today's Air Quality: http://svc.mt.gov/deq.todaysair/

MT DNRC BOGC. (2019, November 4). *Board of Oil and Gas Conservation*. Retrieved from The Montana Department of Natural Resources and Conservation: http://www.bogc.dnrc.mt.gov/WebApps/DataMiner/UIC/UICWells.aspx

NASS. (2024, March 5October 7). *United States Department of Agriculture National Agricultural Statistics Service 2017 Census.* Retrieved from County Summary Highlights: https://www.nass.usda.gov/Publications/AgCensus/2017/Full_Report/Volume_1,_Chapter_2_County_Level/Montana/

NRCS . (2019, December 10). *Wetlands Reserve Program*. Retrieved from Natural Resources Conservation Service: https://www.nrcs.usda.gov/wps/portal/nrcs/detail/null/?cid=nrcs143_008419

NRCS (CTA). (2019, November 7). *Technical Assistance*. Retrieved from Natural Resources Conservation Service: https://www.nrcs.usda.gov/wps/portal/nrcs/main/national/programs/technical/

NRCS. (2006). *Land Resource Regions and Major Land Resource Areas of the United States, the Caribbean and the Pacific Basin.* U.S.Department of Agriculture Handbook 296.

PWNA. (2019, May 21). *Partnership with Native Americans*. Retrieved from Reservations: https://www.nativepartnerships.org/site/PageServer?pagename+PWNA_Native_Reservations_Fortpeck

SCS. (1985). *Soil Survey of Roosevelt and Danils Counties Montana.* USDA Soil Conservation Service.

SSSA. (2019, December 11). *Inceptisols*. Retrieved from Soil Science Society of America: https://www.soils.org/discover-soils/soil-basics/soil-types/inceptisols

SSSA. (2019, December 11). *Mollisols*. Retrieved from Soil Science Society of America: https://www.soils.org/discover-soils/soil-basics/soil-types/mollisols

Surber, G. W. (2019). *Natural Resources Extension Program.* Montana State University Natural Resources Extension Program. Retrieved December 12, 2019, from http://www.animalrangeextension.montana.edu/natural/drinking_H2O_beef.html

SWSA. (2019, May 17). *Inernational Joint Commission*. Retrieved from Saskatchewan Water Security Agency: https://ijc.org/en/watersheds.poplar-river

US Census Bureau. (2019, November 5). *US Census Quickfacts*. Retrieved from https://www.census.gov/quickfacts/fact/table/US/PST045218

US EPA. (2019, November 5). *What is a Wetland*. Retrieved from Wetlands: https://www.epa.gov/wetlands/what-wetland

USFWS. (2019, December 10). Retrieved from USFWS National Wildlife Refuge System: https://www.fws.gov/refuges/whm/wpa.html

USFWS. (2019, July 15). *Piping Plover.* Retrieved from Endangered Spieces/Birds: https://www.fws.gov/mountain-prairie/es/pipingPlover.php

USGS. (2019, November 01). *National Water Information System: Web Interface*. Retrieved from USGS Water Resources: https://waterdata.usgs.gov/mt/nwis/current/?type=flow&group_key=county_cd&search_site_no_station_nm=Richland&site_no_name_select=station_nm

Vickery, P. D. (2000). Grassland Birds: An Overview of Threats and Recommended Management Strategies. *USDA Forest Service Proceedings RMRS-P-16*, 74.

WSNWCB. (2019, December 11). *Baby's Breath*. Retrieved from Washington State Noxious Weed Control Board: https://www.nwcb.wa.gov/weeds/babys-breath