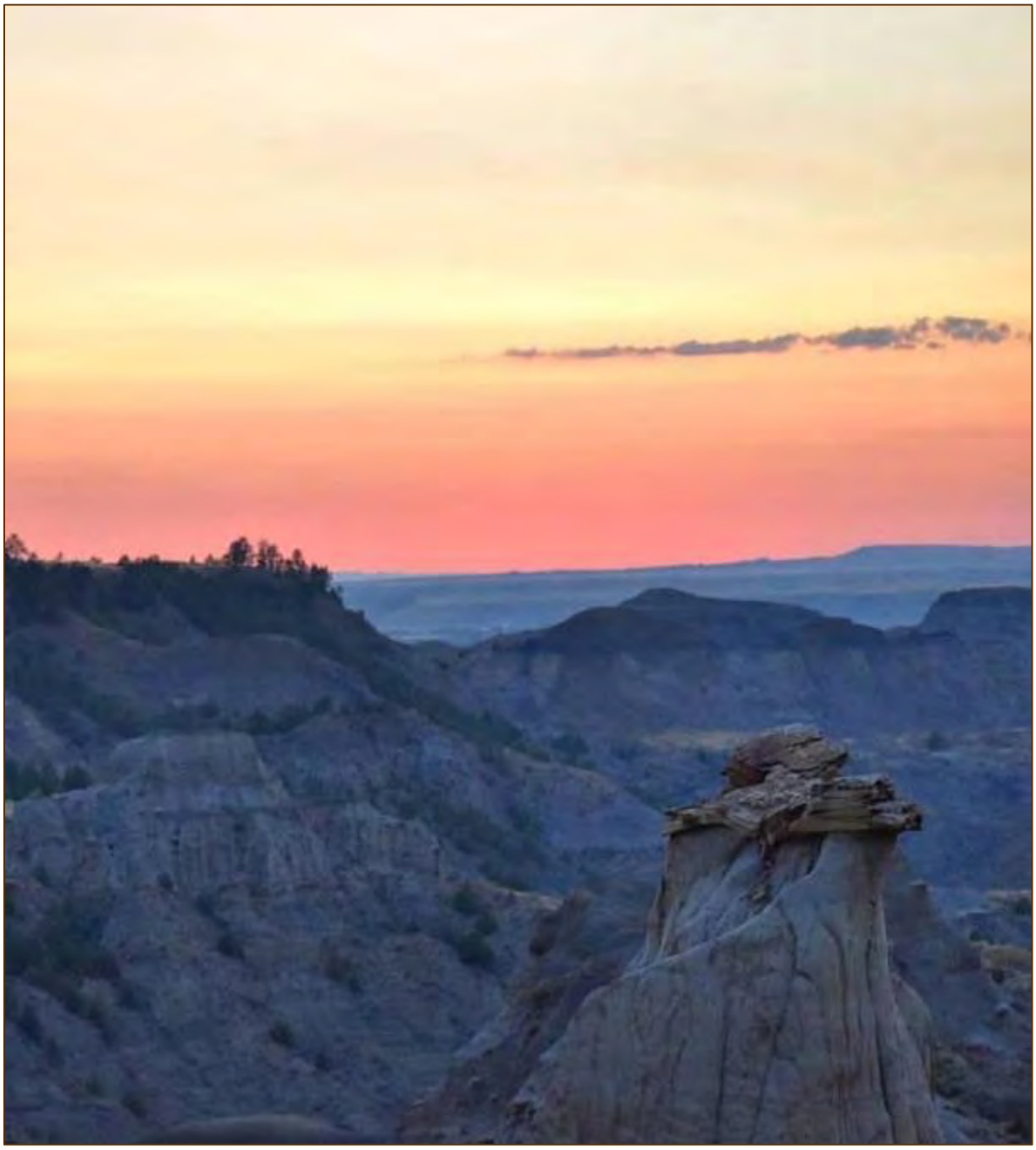
Natural Resources Conservation Service

Long Range Strategic Plan

Dawson County, Montana



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SECTION I: INTRODUCTION

The Dawson County Natural Resources Conservation Service (NRCS) has developed a Long- Range Plan for 2019 through 2024 to strategically address specific natural resource concerns within Dawson County, Montana. NRCS is collaborating with conservation partners that includes federal, state, local agencies and local organizations to fulfill the objectives of this plan. The purpose of this plan is to examine the natural resources inventory of Dawson County as it relates to Soil, Water, Air, Plants, Animals, Humans and Energy.

The NRCS takes a leadership role in Dawson County addressing natural resource concerns through both technical and financial assistance. Over time, the political structures have changed, as did the way NRCS does its work, so planning for the long term is an important strategy to ensure that NRCS is engaging in projects that will provide beneficial outcomes in the long-term regarding priority resource concerns.

The Dawson County Local Working Group (LWG) is one way that NRCS gathers information to identify resource concerns. The LWG meets annually during the winter to allow farmers, ranchers, landowners, conservation partners and other members of the community to discuss the natural resource needs of the county. Based on feedback from the meetings, NRCS will update the county's Long-Range Plan and develop new Targeted Implementation Plans (TIPs), to address those resource concerns. You may contact us anytime to express concerns or comments about the conservation needs in the county and we encourage you to attend the next LWP meeting in Dawson County.

The Dawson County LWG includes the Natural Resources Conservation Service, Dawson County Soil and Water Conservation District, Dawson County Farm Service Agency, private landowners, Buffalo Rapids Irrigation District 1, Montana Department of Natural Resources and Conservation (DNRC), Bureau of Land Management, Montana State University Extension Service, American Bird Conservancy, Montana Fish Wildlife & Parks and other organizations. The LWG meeting provides a forum for dialogue among different stakeholders giving NRCS feedback on their efforts in identifying and addressing primary resource concerns within Dawson County.

Welcome to Dawson County, the home of Makoshika State Park.

Figure 1. Makoshika State Park (MT FWP, 2019)

Dawson County History

Figure 2 Piegans by Charles M. Russell

An ancient village of earthen lodges (over 11,500 years ago) where early farmers that cultivated tobacco and squash, possibly the home of Montana's Crow Indians, was discovered in a plowed field near Glendive. Later the Blackfeet, Assiniboine, Crow and Lakota Sioux used this area with French and American trappers. William Clark camped near the mouth of Glendive Creek on August 1, 1806, as the Lewis and Clark Expedition returned from the Pacific Ocean.

Dawson County was the tenth state-organized county in the Montana Territory, four and a half years after Montana Territory was organized. It was established in 1869 from the northern half of Big Horn County. It was named after Major Andrew Dawson, manager of the Fort Benton Trading Post for the American Fur Company from 1856 to 1864. Military expeditions lead by Captain William F. Raynolds, who explored this area in 1860, reported its potential as livestock and farm land.

The 1868 Treaty of Fort Laramie defined the land south of the Yellowstone River as Sioux territory. This all changed in the late 1860s, when the northern transcontinental railroad route was surveyed. With the influx of miners, ranchers and railroad crews, the Sioux tribal hunting grounds were encroached upon, which lead to conflicts.

The United States Army established a series of small military posts like Camp Canby, Glendive Cantonment, and Stanley's Stockade, which was a supply depot at Glendive Creek in 1873, to protect ranchers and railroad survey crews. At Camp Canby, the cavalry ran their horses along the Yellowstone River north of Glendive during the winter and would cut hay in the meadows during the summer. Dawson County was involved in the Great Sioux War of 1876- 1877. The Battle of Cedar Creek (also called Big Dry Creek or Big Dry River) occurred on October 21, 1876 after talks between Colonel Nelson A. Miles and Chief Sitting Bull broke down. The battle ended six days later when 400 Lakota lodges with approximately 2,000 men, women, and children surrendered to Colonel Miles (Wikipedia, 2019).

In the 1870's, the cattlemen who brought in large herds of cattle were the first settlers in the county. Later, owners of great herds of sheep and horses made their headquarters here. Homesteaders moved into the area in large numbers between 1900 and 1930 and dryland grain farming began on most of the nearly level benches and in large areas of undulating to rolling upland. With the growth of the railroad, permanent settlements began to establish.

Figure 3. Cowhands with Cattle (Montana History Conference, 2019)

Figure 4. Glendive Montana, 1904

Glendive, “The Gate City”, is the county seat, which is tucked between the Yellowstone River and the soaring badlands. Glendive was established in 1881, after the arrival of the Northern Pacific Railway. Glendive’s name has two possible origins; it may have been named after Glendive Creek or for a well- known thirst emporium with the name of “Glenn’s Dive”, shortened to Glendive by the railroad men.

In the 1870’s, the Northern Pacific Railway built the transcontinental railroad across the northern tier of the western United States from Minnesota to the Pacific Coast. In 1895, the Bell Street Bridge was built across the Yellowstone River in Glendive. This gave stockmen and farmers access to the railroad on the east side of the river and eliminated the need for stagecoaches to wait for the less reliable ferryboat.

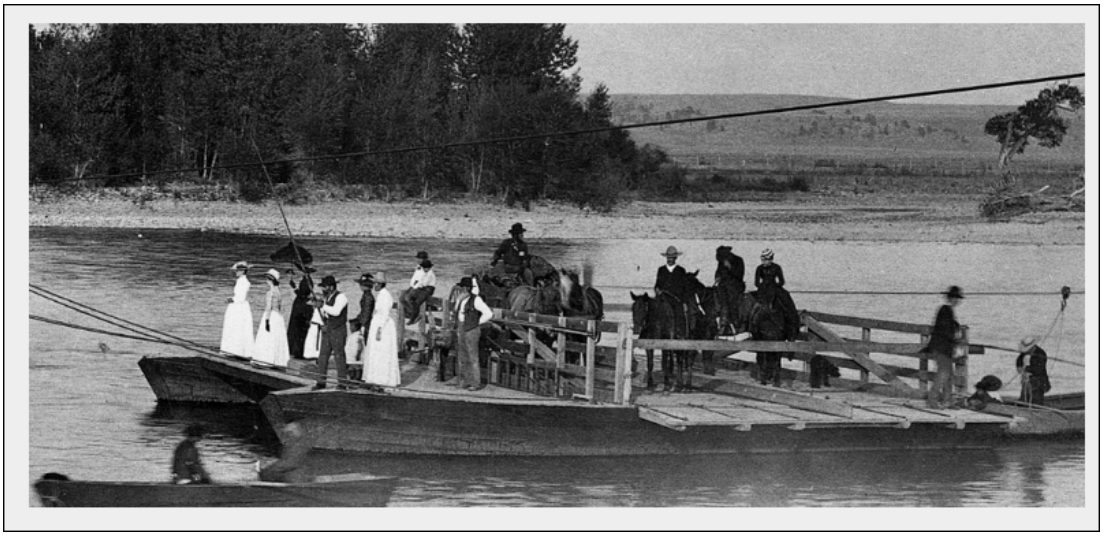


Figure 5. Ferry on the Yellowstone River (Our Montana Inc., 2019)

In 1940, the Dawson County Junior College was established to provide for the educational needs of eastern Montana. In 1964, it was renamed Dawson Community College, and is now a public one- to two-year college.

Figure 6. Aerial View of the Dawson Community College Campus and Dormitories.

No visit to Dawson County would be complete without visiting the largest of Montana's state parks, Makoshika State Park, which is considered the "jewel of eastern Montana". Established in 1953, it is named from the Lakota Sioux phrase meaning "*land of bad spirits"* or "*badlands*". It consists of 11,531 acres of badlands, containing dinosaur fossils, walking trails, plant fossils and rock formations.

In 1932, a group of eastern Montana farmers, ranchers, and businessmen formed the Mid-Yellowstone Recovery Association to investigate ways of ameliorating the prevailing drought conditions. They were especially interested in the possibility of irrigating the agricultural lands along the Yellowstone River between Glendive and Miles City.

The Irrigation boom started in 1904, when the Newlands Reclamation Act of 1902 brought the Lower Yellowstone Irrigation Project to eastern Montana. Forty surveyors mapped the lower Yellowstone Valley in 1904, and engineers planned construction to start the next spring.

In 1905, construction commenced with a canal that ran from the Intake dam located downstream of Glendive to Fort Buford at the confluence of the Yellowstone and Missouri rivers. The Association's organizers began corresponding with other states that had similar irrigation projects.

After raising $6,000 from Custer, Prairie, and Dawson County residents, the group subsequently obtained funds under the National Industrial Recovery Act for a Bureau of Reclamation investigation on the proposed Buffalo Rapids Irrigation Project. Based upon the Bureau's report, the 18,000-acre

Glendive Unit (Division 1) was organized in 1937 and received a $1,600,000 federal allotment. Construction began that same year on the main canal and work was completed in 1941. Construction of lateral canals was completed two years later. Present day, Buffalo Rapids Irrigation District No. 1 provides irrigation water to 20,000 acres of irrigated alfalfa, sugar beets, corn, pinto beans and cover crops.

SECTION II: NATURAL RESOURCE INVENTORY

General Information

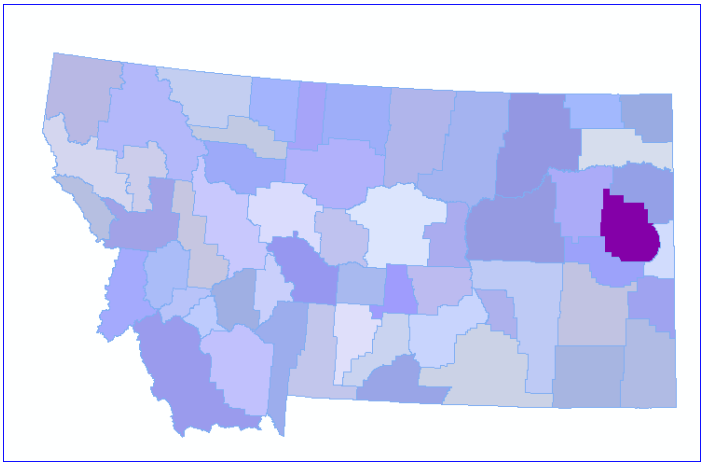


Figure 7. Dawson County, Montana

Dawson County is in central eastern Montana, bordered by McCone County to the west, Prairie County to the south, Wibaux County on the south and east and Richland County to the north (Figure 7). Dawson County has an area of 2,383.5 square miles or about 1,525,440 acres.

The Yellowstone River runs southwest to northeast across the southern half of the county; the Redwater River flows in the same direction through the far north end. Elevation ranges from 1,900 feet to 3,264 feet above sea level. The highest elevation is on the Divide, the ridge that separates the Yellowstone and Redwater River drainages in the northwestern quarter of the county. The high point is west of Highway 200 and north of County Road 450. The lowest elevations occur in the Yellowstone River Valley. See Appendix A1.

Most of the county is in USDA Plant Hardiness Zone 4a (-30 to -25 degrees Fahrenheit). North of the Divide is Zone 3b, and a small area west of Lindsay is Zone 4b. The growing season begins around the 15th of May and ends around the third week of September; it is slightly longer in the Yellowstone River valley and somewhat shorter on the Divide. Average annual precipitation is 13 to 14 inches throughout most of the county. The far southeast corner and areas to the far north receive 14 to 15 inches on average; a small section of the county in the southwest averages 12 to 13 inches per year. 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.

PEOPLE

The population in Dawson County decreased 3.2 percent from 8,966 in 2010 to 8,680 in 2018. Over ninety-two percent of adults are high-school graduates; nearly twenty percent of those have earned a Bachelor's degree or higher. Persons living in poverty total nearly eleven percent of the county population (US Census Bureau, 2019).

Most of the residents of the county (62%) live in the city of Glendive. Richey, Montana, population 187, is the only other incorporated community in the county and has the only other high school. Other communities include Bloomfield, Hodges, Lindsay, Marsh and Stipek. These were towns in the time of

the homesteaders (1900 to 1930). Their populations declined sharply in the 1930s and they are now largely depopulated.

Agriculture

Most of the land in Dawson County is dedicated to agriculture. The United States Department of Agriculture National Agricultural Statistics Service's (NASS) 2017 Census of Agriculture reported that 1.133 million acres, or a little more than 74 percent of the area is in farms, the term including cultivated crops, perennial cropland and rangeland.

Of these, forty-two percent of the farms were one thousand acres in size or greater, the mean size is 1,220 acres. Ninety-three farms are at least partly irrigated and a little over half are also involved in livestock production. Table 1 below is a comparison between 2012 and 2017 crop data. It displays the differences between number of farms, acres per farm and amount of change in acres for seven of the county's most important agricultural commodities.

Table 1 Comparison of Farms and Acres Harvested in 2012 & 2017

	2012	2017	2012	2017	
Crop	**# of Farms**	**# of Farms**	**Acres**	**Acres**	**Change (Acres)**
Winter Wheat	23	19	20,761	7,789	-12,972
Spring Wheat	182	130	137,327	108,651	-28,677
Corn for Grain	27	14	2,167	3,371	1204
Barley for Grain	55	19	7,540	2302	-5,238
Forage	157	159	24,928	29,645	4,717
Sugar Beets	15	10	2,271	2,568	297
Lentils	21	33	8,751	14,281	5,530

Figure 8 illustrates the number of farms producing twelve of the major crops in Dawson County and the acres (times 1,000) of each crop harvested in 2017 (USDA NASS, 2019).

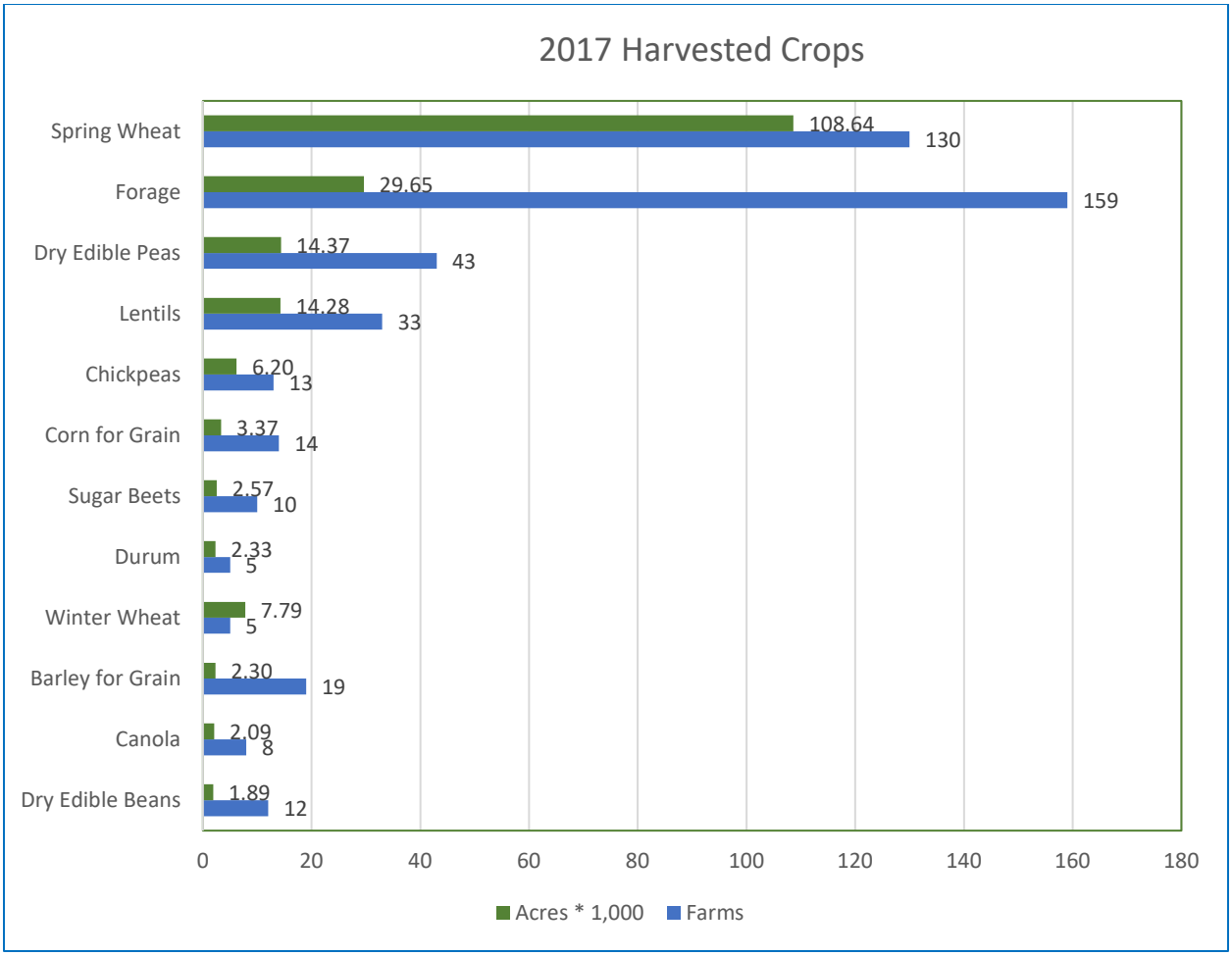


Figure 8 Number of Farms Producing Crops and Acres of Each Crop Harvested, 2017.

Agricultural practices include rotational grazing on ninety farms, no-till on ninety-nine farms, down from 123 in 2012, intensive tillage on fifty-three farms, decreased from seventy-seven in 2012. Twenty-nine farms planted cover crops in 2017 and five farms hold conservation easements.

Dawson County producers owned 36,427 head of cattle and 2,065 sheep in 2017 (USDA NASS, 2019).

LANDCOVER/LAND USE

Landcover Types

Landcover types in the county are approximately 52 percent grassland and twenty-eight percent cultivated crops with smaller areas of badlands, riparian zones, sagebrush steppe, woody draws and introduced vegetation. See the map of Dawson County and surrounding areas' land cover in Appendix A4. Descriptions of ecological systems follow.

Great Plains Mixedgrass Prairie ecosystem 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 arvensis*) (formerly called Japanese brome) increase in dominance.

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

Great Plains Badlands are areas containing highly eroded, rugged and often colorful landforms with sparse vegetation. Badlands areas provide habitat for mule deer and other wildlife but support only intermittent grazing.

Wooded draws occur on steeper slopes or in canyon bottoms where deep loamy soils and higher moisture levels support Rocky Mountain juniper (*Juniperous scopulorum*) and deciduous trees such as green ash (*Fraxinus pennsylvanicus*) and chokecherry (Prunus virginiana). Although they are relatively few and scattered, wooded draws are valuable habitat for many species of birds, small mammals and mule deer.

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

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

Areas of the **Great Plains Riparian** system occur along the Yellowstone River, and intermittently along all major drainages. Plains cottonwood (*Populus deltoides*) and narrowleaf cottonwood (*Populus angustifolia*) dominate areas of higher soil water content or higher water tables; an understory of willow (*Salix spp*) is common. While riparian areas cover only around 2 percent of the land in the county, they are considered important for hay production as well as wildlife cover and habitat. In Dawson County, much of this system is infested with salt cedar (*Tamarix ramosissima*) and Russian olive (*Elaeagnus angustifolia*).

Great Plains Floodplains occur along the Yellowstone River and its larger tributaries. Narrowleaf cottonwood and Plains cottonwood are the dominant component. In relatively undisturbed stands, willow, redosier dogwood (*Cornus sericea*) and common chokecherry form a thick, multi-layered shrub understory, with a mixture of cool and warm season grasses below. Box elder (*Acer negundo*) and green ash form a tree understory in mid-seral and late-seral stands. Many areas are now degraded to the

point where relict cottonwood stands with little regeneration are the only remaining natural component. The understory vegetation is dominated by non-native pasture grasses, legumes and other introduced forbs, or by western snowberry (*Symphoricarpos occidentalis*) and rose (*Rosa* spp.) shrub community. Many areas of the Great Plains Floodplains are also infested with salt cedar and Russian olive.

Introduced Upland Vegetation system is described as significantly altered and disturbed by introduced species. Natural vegetation types are no longer recognizable. Typical species that dominate these areas are knapweed (Centaurea *spp*.), Canada thistle (*Cirsium arvense*), leafy spurge (*Euphorbia virgata*[1]), and sweetclover (*Melilotus* spp.) (MNHP, 2019). See Appendix A4.

Land Ownership

Most of the land in Dawson County is privately owned. See Appendix A5. Dawson County owns two small parcels of land, 89.5 acres total, near Glendive. The United States Bureau of Reclamation owns the land surrounding the Lower Yellowstone Diversion, known as Intake, and a much smaller parcel (20.3 acres) about a mile due north for a total of 1,358.6 acres. The State of Montana administers 85.6 acres close to or within Glendive City Limits. Montana State Lands is responsible for 87,270 acres in Dawson County and the Bureau of Land Management controls another 162,592.3 acres. Montana Fish Wildlife and Parks owns Makoshika State Park in the badlands southeast of Glendive. Makoshika is Montana's largest State Park, encompassing 11,538 acres.

GEOLOGY AND SOILS

LRRs and MLRAs

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

The four Major Land Resource Areas in the county are, in order of area, **MLRA 58A**, Northern Rolling High Plains, North Part; **MLRA 53A**, Northern Dark Brown Glaciated Plains; **MLRA 60B**, Pierre Shale Plains, Northern Part, and **MLRA 54**, Rolling Soft Shale Plains.

MLRA 53A and 54 are in the Northern Great Plains Spring Wheat Region, LLR F; MLRA 58A and 60B are in the Western Great Plains Range and irrigated Region, LLR G. See Appendix A6, Land Resource Regions of the United States, and Appendix A7 Major Land Resource Areas in Dawson County, Montana.

Geology

Geologic formations underlying Dawson County are shown in Appendix A8. A formation in this context is a rock unit that has a distinctive appearance compared to surrounding layers and is of enough

[1] Until recently the scientific name for leafy spurge was given as *Euphorbia esula*. According to Montana Natural Heritage Program (2019),"The true *Euphorbia esula* Linnaeus is restricted to certain parts of Europe where it shows little tendency to weediness. *Euphorbia virgata* retains the common name Leafy Spurge".

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.

The following are definitions of the codes that represent different formations, or members of formations, displayed on the map Appendix A8.

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

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

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

- **Qtat.** Alluvial terrace deposit (Pleistocene and Pliocene epochs). Light-brown, yellowish-brown, brown, and light-gray gravel, sand, silt, and clay at elevations higher than Qat. Crudely to well stratified, and poorly to moderately well sorted alluvium of several terraces of different ages and elevations are included in this unit. In places deposits have been cemented to conglomerate by calcium carbonate or iron oxide. Nearly all rock fragments are well rounded and composed dominantly of quartzite, chert, volcanic rocks, ironstone concretions, sandstone, and siltstone with minor amounts of shale, agate, silicified wood, jasper, chalcedony, and clinker. Thickness about thirty feet.

- **Qgr.** Gravel deposits.

- **Qe.** Quaternary eluvium (wind-deposited materials).

- **Qls.** Landslide.

- **Tftr.** Tongue River Member of Fort Union Formation. Yellowish orange sandstone, sandy and silty carbonaceous shale, and coal. Alluvial plain. Thickness as much as 984 feet.

- **Tfle.** Lebo Member of Fort Union Formation. Dark gray carbonaceous shale, bentonitic claystone, sandstone, and coal. Thickness as much as 607 feet.

- **Tfld.** Ludlow Member of Fort Union Formation. Gray and brown shale, siltstone, silty or bentonitic claystone, sandstone, and coal. Alluvial plain deposition with marine-influenced tongues. Thickness as much as 755 feet.

- **Kp.** Pierre Formation. Dark gray, partly silty shale with abundant bentonite beds and zones of gray, calcareous concretions. Marine. Thickness as much as 2,133 feet. Only the upper 164 feet are exposed.

- **Khc.** Hell Creek Formation. Upper Cretaceous. Dominantly gray and gray-brown sandstone, smectitic (two parts clay to one part other) silty shale and mudstone, with a few thin beds of lignite or carbonaceous shale. Sandstones are fine- or medium-grained; calcium carbonate-cemented concretions are common in the fine-grained sandstones. The beds are generally poorly cemented and weather to badland topography. Swelling clays produce characteristic "popcorn" weathering. The upper part of the formation contains the youngest dinosaur remains. The formation ranges from 260 to 330 feet thick.

- **Kftt.** Fox Hills Formation.

  Timber Lake Member—Brownish-gray siltstone and fine-grained sandstone that weathers medium brown. Hummocky bedding and trough crossbedding are characteristic of the member. Thickness up to seventy feet.

  Trail City Member—Interbedded light-gray siltstone and dark gray shale. Member is a transition interval between the underlying Pierre Shale and the sandy Timber Lake Member. Thickness ranges from fifteen to thirty-five feet.

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 Dawson County has grouped soil associations into five general landscapes with characteristic soil associations.

Soils on Low Stream Terraces and Alluvial Fans

Trembles-Havrelon association. This soil association is made up of level to gently sloping deep, fine sandy loams and silt loams underlain by sandy loam and silt loam. It is found on low terraces and flood plains of the Yellowstone and Redwater Rivers and their tributaries. It makes up about seven percent of the county.

Cherry association. Areas of this association are extensive and widely distributed. The soils are nearly level to sloping, deep and dominated by silty clay loam. They are found on alluvial fans and terraces. The association makes up about nine percent of the county.

Soils on Dissected Sedimentary Plains

Lambert-Dimyaw association. The soils in this association mostly support grazing. They are steep to very steep, deep silt loams and silty clay loams over silt loam, silty clay loam or silty clay sedimentary beds. They are found on the uplands on about thirty percent of the county.

Norbert-Vanda association. This association consists of steep soils on clays ridges and adjacent sloping to nearly level soils on alluvial fans and terraces in the Cedar Creek drainage. Soils are steep to very steep shallow clays underlain by claystone shale or nearly level to strongly sloping deep, dense clays over stratified clay and silty clay loam. They occur on uplands, fans and terraces on about one percent of the land in the county.

Badland association. This association is characterized by very steep walls of deeply entrenched coulees exposing the multicolored sedimentary beds of soft, sandy, silty and clayey material that underlie the landscape. Makoshika State Park is in this association. Making up about three percent of the county, the association is mostly Badlands soils. Badlands consists of the very steep sidewalls, fingering ridges and isolated buttes formed by downcutting of deep coulees int the soft, brown sandy beds, buff colored silty beds and gray clay beds. Many thin seams of coal are exposed, as are some strata of reddish clays shale. In some areas, exposed sandy beds have hardened to form ledges of sandstone.

Tinsley-Lambert-Lihen association. This association makes up about six percent of the county. It is found on the breaks between nearly level high benches and the alluvial fans and terraces along the edges of the Yellowstone River valley. Soils are steep and very steep, deep, gravelly sands and silt loams over thick sand and silt loam sedimentary beds.

Soils on Sedimentary Plains

Lambert association. Found in the uplands, these soils are undulating to rolling and hilly, deep silt loams underlain by silty loam sedimentary beds. The association makes up about eight percent of the county; some areas are used for dryland farming, others for grazing.

Shambo-Lambert association. Nearly all this association is used for dryland farming; it covers around thirteen percent of the land in Dawson County. Soils are undulating to rolling and hilly deep loams and silt loams underlain by stratified loam and silt loam alluvium and silt loam sedimentary beds. They occur in the uplands.

Dast-Blanchard association. Making up about two percent of the county, this association is only found on the divide between Cedar Creek and Glendive Creek in the southeastern part of the county. It supports grazing and wildlife and makes up close to two percent of the county. Soils are undulating to rolling and hilly, moderately deep and deep fine sandy loams and loamy sands over soft sandstone.

Soils on High Terraces

Farnuf association. This association covers about eight percent of the land in the county. It consists of nearly level to rolling, deep soils that have a loam surface layer and a clay loam subsoil, underlain by loam to silty clay loam alluvium. It occurs on broad, high benches mainly north of the Yellowstone River. The Farnuf association makes up about eight percent of the land in the county; it is mostly used for dryland crop production.

Soils on Glaciated Plains

Vida-Williams association. Occurring in the northwestern part of the county, this association is recognized as the only one where granitic rock is predominant. These rocks are mainly pebbles with some cobblestones and the occasional boulder. Vida-Williams association is described as gently undulating to rolling and hilly, deep soils that have a loam to clay loam surface layer and a clay loam

subsoil, underlain by friable clay loam glacial till, found on the uplands. More than half of the association is or has been farmed, the remainder is native rangeland. The association makes up about four percent of the county.

Zahill-Lambert association. Soils are steep and very steep loams that are underlain by friable clay loam, or glacial till and silt loams over silt loam sedimentary beds. They occur in the uplands in the northwestern part of the county on narrow ridges and in the valleys between ridges along the edges of the glaciated uplands. Ridges are capped by glacial till containing granitic rocks. On lower slopes and valley bottoms are soft silty sedimentary beds. The Zahill-Lambert association covers about three percent of the county (USDA SCS, 2019).[5]

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. Dawson County has no soils designated as Prime Farmland.

Farmland of Statewide Importance 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. Farmland of Statewide Importance in the county total 110,782 acres.

Soil Map Units 50C, 991B and 991C make up 53.7 percent of the soil that are Farmland of Statewide Importance in the county. These soils share the characteristic of a depth to restrictive layer greater than eighty inches; they are well drained and non-saline to slightly saline.

- 50C—Kremlin Loam, 2 to 8% slopes. This soil is loamy alluvium derived from sedimentary rock.
- 991B—Vida-Zahill Loams, 0 to 4% slopes. Found on low hills on ground moraines, this soil is loam in the Ap horizon and clay loams below.
- 991C—Vida Zahill Loams 2 to 8% slopes. The parent material for this soil is fine-loamy till; it is found on moraines.

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. There are 67,336 acres of soils designated Prime if Irrigated in Dawson County.

Prime if Irrigated soils are mostly (58.8%) Soil Map Units 501B, Ts and Tt.

- 501B—Kremlin-Eapa Loams, 0 to 4% slopes. Derived from loamy alluvium, this soil is deep, well drained, and non-saline to slightly saline.

- Tt—Attewan loam, 2 to 4% slope and Ts—Attewan Loam, 0 to 2 % slope. Parent material is loamy alluvium over gravel alluvium. The soils are well drained but shallow with low available water storage in the profile.

Appendix A9 shows the locations and extent of Farmland of Statewide Importance soils and Prime Farmland if Irrigated soils in the county.

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.

Dawson County has seven soils that meet the criteria for hydric soils. The total acres designated as Hydric Soils is 9334.5 or just over 0.6 percent of soils in the county. Table 2**,** page 18 displays all hydric soils in Dawson County, the acres of each and the landforms where they most commonly occur.

Hydric Criteria Definitions:

2: Map unit components in Aquic suborders, great groups, or subgroups, Albolls suborder, Historthels great group, Histoturbels great group, or Andic, Cumulic, Pachic, or Vitrandic subgroups 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.

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.

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 (USDA NRCS Montana, 2019).

Table 2 Hydric Soils in Dawson County, Montana

Map Unit Symbol	Map Unit Name	Acres	Landform	Hydric Criteria
215B	Cherry, Havrelon, and Trembles soils, 0 to 4 percent slopes, occasionally flooded	71.1	Flood Plains, Swales	2, 4
38A	Ismay silty clay loam, 0 to 2 percent slopes, rarely flooded	28.3	Draws, Flood Plains	2, 4
58	Saline land	775.2	Flood Plains, Swales	2, 3, 4
991C	Vida-Zahill loams, 2 to 8 percent slopes	250.7	Moraines[2]	2, 3
Ct	Lonna, Havre, and Glendive soils, 0 to 4 percent slopes, occasionally flooded	3199.0	Draws, Flood Plains, Swales	2, 4
Sa	Saline land	4820.2	Flood Plains, Stream Terraces; Depression	2,4
Vk	Zahill-Vida loams, 4 to 15 percent slopes	128.3	Moraines	2, 3
Wm	Williams loam, 0 to 4 percent slopes	52.0	Ground Moraines	2, 3
Wv	Williams-Vida loams, 2 to 8 percent slopes	9.7	Moraines	2, 3

Petroleum Resources

Although Dawson County ranks seventh in Montana for oil production and thirteenth for natural gas, the petroleum industry is not nearly as extensive as it has been in the past. There were only fifty-seven active oil wells in the county as of May 2019 (ShaleXP, 2019).

Figure 9 shows the locations of all recorded wells in the county, including oil and gas, injection wells and water wells. Note that the highest concentration of wells is along the Cedar Creek Anticline in the south, the area enclosed in the red rectangle. DNRC Montana Board of Oil and Gas data indicates that there are nearly thirty active oil wells in this area (MT DNRC BOGC, 2019).

[2] Moraines are accumulations of earth and stone that were carried and eventually deposited by glaciers.

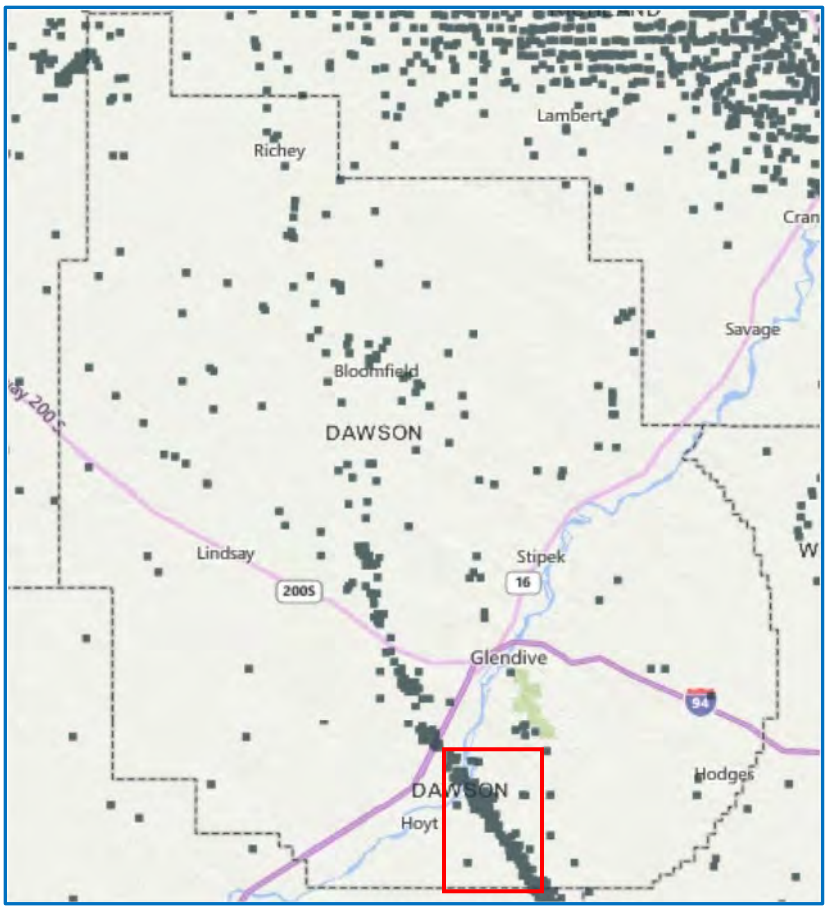


Figure 9. Concentration of Oil Wells along the Cedar Creek Anticline

WATER

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 do not meet one or more Water Quality Standards.

A 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

Eleven Dawson County waterbodies appear on the Montana DEQ 303d List of impaired waters; these are shown in Figure 10.

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

Redwater River, Buffalo Springs Creek to Pasture Creek.

Category 3: *Waters for which there is insufficient data to assess the use-support of any applicable beneficial use; no use-support determinations have been made.*

- Deer Creek from the confluence of Middle Fork of Deer Creek and South Fork of Deer Creek to the Yellowstone River**.**
- Middle Fork of Deer Creek
- South Fork of Deer Creek.

Category 4A: *All TMDLs needed to rectify all identified threats or impairments have been completed and approved*.

Pasture Creek from headwaters to the Redwater River is listed for not fully supporting aquatic life due to excess nitrogen from agriculture and TKN from livestock feeding operations.

Category 4C: *Identified threats or impairments result from pollution categories such as dewatering or habitat modification and thus a TMDL is not required.*

- Redwater River, Pasture Creek to the Missouri River is listed for impairment to aquatic life due to alteration of stream side littoral cover or physical substrate habitat.
- Yellowstone River from the Powder River to the Lower Yellowstone Diversion Dam is listed for impairment to aquatic life due to the fish passage barrier at Intake.
- Morgan Creek, all reaches, does not fully support aquatic life due to changes in stream side or littoral vegetative cover caused by grazing.

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

Yellowstone River from the Lower Yellowstone Diversion Dam to the North Dakota border is listed for impairment to aquatic life due to:

- Alteration in stream-side or littoral vegetative cover due to agriculture,
- Chromium, copper lead, nitrogen, and phosphorus from agriculture and natural and unknown sources and total dissolved Solids and pH from natural and unknown sources,
- Fish passage barrier from impacts of hydro-structure flow regulation modification.

- Cottonwood Creek, all reaches, is listed for impairment to aquatic life for cadmium from natural and unknown sources, iron from natural sources, fish passage barrier due to hydro-structure and physical substrate habitat alterations from water diversions and channelization.
- Burns Creek does not fully support primary contact recreation or aquatic life due to chlorophyll-a, total nitrogen and total phosphorus from agriculture, sediment from natural sources and agriculture, iron from natural sources and flow regime modification due to irrigation.
- Glendive Creek, all reaches, is listed for impairment to aquatic life for cadmium, chromium, copper, iron, lead, nickel, selenium and zinc from natural and unknown

sources. Grazing in riparian or shoreline zones is the source impairments caused by alterations in stream-side or littoral vegetative covers and sediment.

- Cedar Creek from twenty-six miles upstream to the mouth at the Yellowstone River is listed for impairments to aquatic life due to arsenic, iron and lead in the water caused by truck spills, copper from natural sources and alterations in stream-side or littoral vegetative cover caused by grazing in the riparian zones.
- Cabin Creek, all reaches, is listed for impairments to aquatic life due to dissolved oxygen from natural sources, dams or impoundments and grazing, nitrogen from grazing and sedimentation from natural sources, grazing and dams or impoundments.

Category 5,5N: *Available data and/or information indicate that a water quality standard is exceeded due to an apparent natural source in the absence of any identified manmade sources.*

Cedar Creek from tributary confluence at 12N 57E Section 35 to tributary confluence at 13N 56E Section 27 is listed as impaired or partially impaired in its ability to support aquatic life owing to copper, iron, lead and selenium from natural sources. (Montana DEQ, 2019).

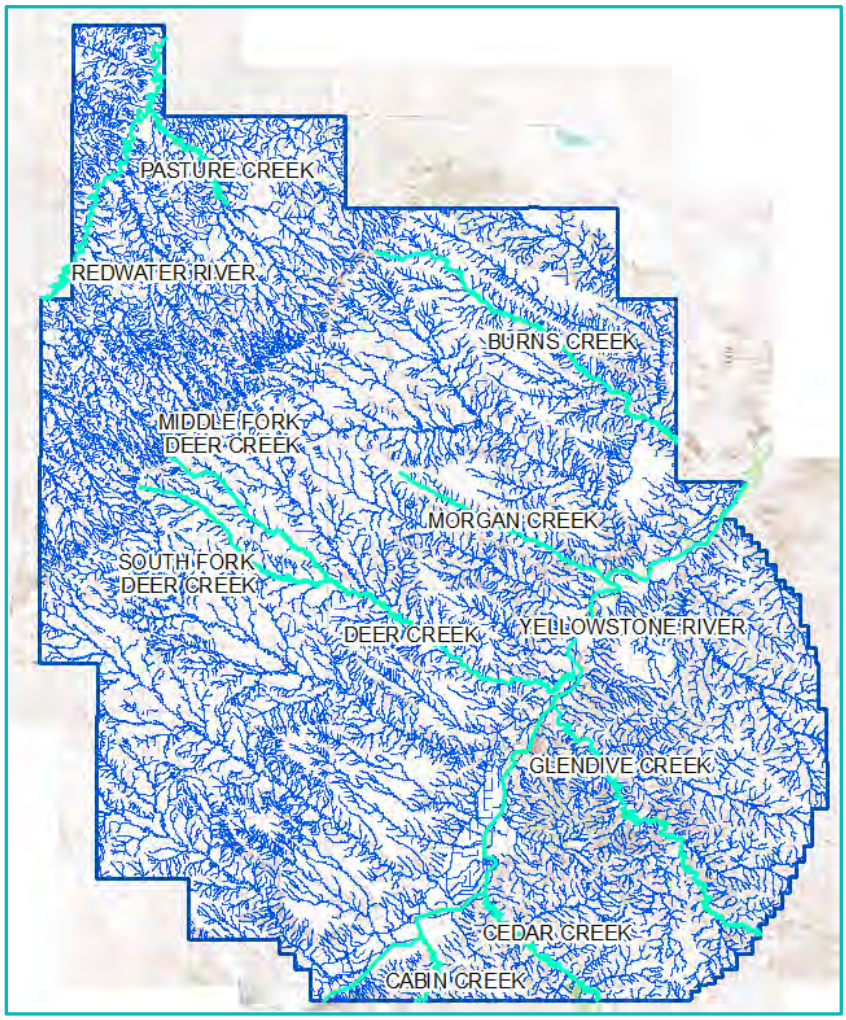


Figure 10. 303(d) Listed Waters in Dawson County, Montana.

Hydrology

The principal tributary streams that enter the Yellowstone River from the south are Box Elder Creek, Glendive Creek, Cedar Creek and Cabin Creek. The tributaries that enter the Yellowstone River from the north and west are Burns Creek, Thirteen Mile Creek, Morgan Creek, Deer Creek, Seven Mile Creek, Clear Creek, Cracker Box Creek and Bad Route Creek. See Appendix A12.

Groundwater

Most of the wells in the county produce water from sand and gravel contained in the alluvium and from sandstone, fractured coal and clinker in the Tongue River Aquifer which lies beneath the Fort Union geologic formation, shown in Appendix A-8, Dawson County Geology. The water contained in Fox Hills Sandstone and the lower part of the Hell Creek Formation are a single aquifer because of similar lithology and hydraulic connection. Therefore, the Fox Hills-Lower Hell Creek aquifer contains the Fox Hills Sandstone and from zero to 200 feet of the overlying Hell Creek Formation. These aquifers underly the formations shown in green in the southern end of the same map.

Wells in the Fox Hills-Lower Hell Creek aquifer may yield as much as forty gallons per minute (gpm). Wells in other bedrock aquifers commonly yield eight to fifteen gpm (Slagle, 1984).

The Ground Water Information Center MBMG Data Center for the Montana Bureau of Mines and Geology shows the following statistics for wells in Dawson County:

Table 3. Groundwater Sources and Ranges of Well Depths

Groundwater Source		Depth
37% Tongue River Member of the Fort Union Formation		**55.5% 0-99 feet**
21% Hell Creek Formation		**28% 99-199 feet**
16% Fort Union Formation		**9.2% 200-299 feet**
17% Unspecified		**3.4% 300-399 feet**
10% Quaternary Alluvium		**3.9% 400 feet or more**
5% Fox Hill-Hell Creek Aquifer		

Forty-three percent of all wells are for livestock water, another thirty-two percent are for domestic use. Eighty wells provide water for irrigation. MBMG has twelve monitoring wells in Dawson County; data is collected to monitor changes in water quantity and quality over time (MBMG, 2019).

Surface Water

Headwaters of the Yellowstone River are the Yellowstone Lake in Yellowstone National Park, Wyoming. The Yellowstone River flows 676 miles to its confluence with the Missouri River with no impoundments. The Lower Yellowstone Diversion at Intake is the only in-stream structure in the river.

Dawson County has one stream gauge station operated by the USGS Wyoming-Montana Water Science Center in cooperation with U.S. Army Corps of Engineers and as part of the Groundwater and Streamflow Information Program network of Federal Priority Streamgages (FPS). The stream gauge is in Glendive.

Over the ten years between 2007 and 2017, the average stream flow was around 14,310 cubic feet per second (cfs) although flow varied greatly depending on precipitation throughout the vast Yellowstone River Basin, an area of approximately 69,105 square miles (USGS, 2019). During the same time, the

lowest annual average stream flow, 8,715 cfs, was recorded in 2007 whereas the highest, 23,150 was recorded in 2011 (USGS, 2019). Figure 11 is a graph of Yellowstone River streamflow over the last ten years.

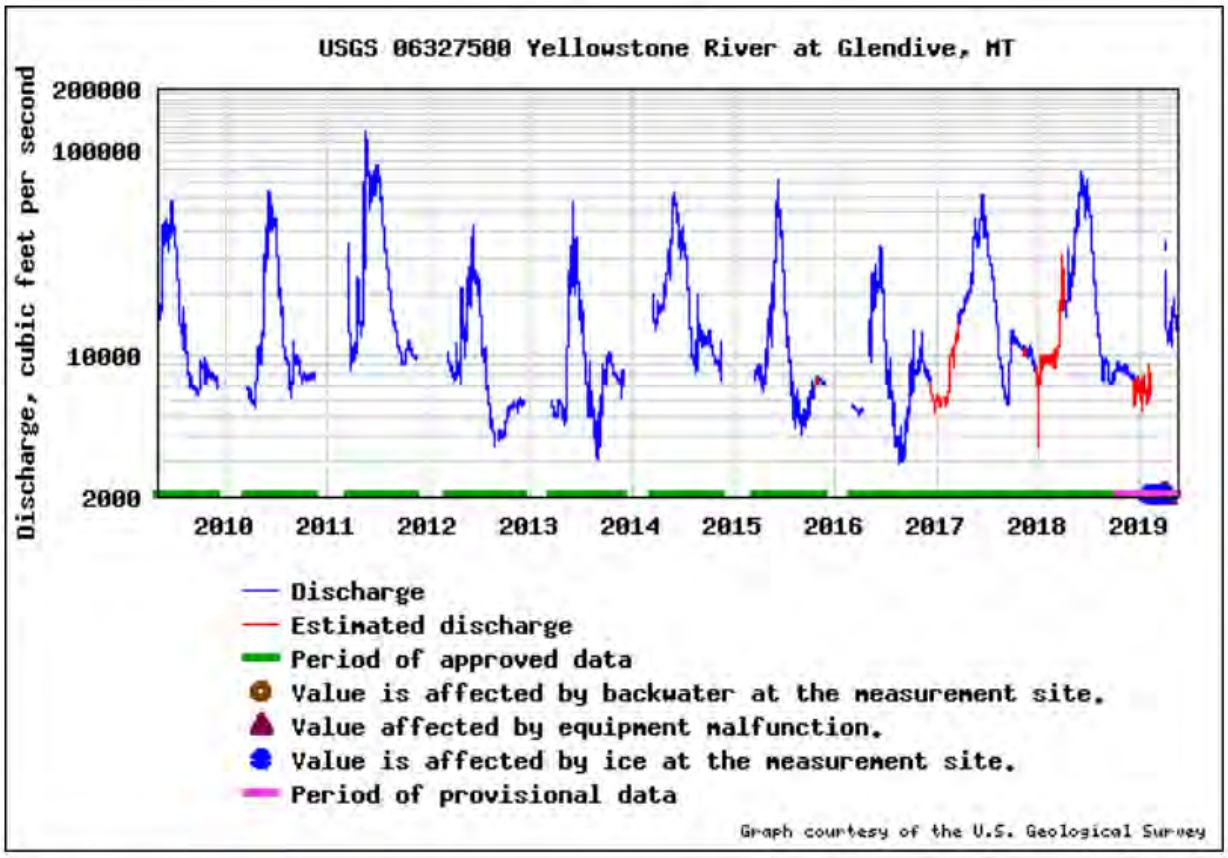


Figure 11. Yellowstone River Stream Flow 2010 to 2019

Montana Fish Wildlife and Parks State Wildlife Action Plan

Montana's Fish Wildlife and Parks State Wildlife Action Plan (SWAP) identifies community types, Focal Areas, and species in Montana with significant issues that warrant conservation attention. The SWAP lists the Yellowstone River as one of the top 13 Aquatic Focal Areas in the State (Zieglar, 2019). The area of Yellowstone River and its tributaries (Figure 12) is one of 13 Tier I Aquatic Communities in the State. Tier I Communities are those with the 'greatest conservation need'. The SWAP states, "There is a clear obligation to use resources to implement conservation actions that provide direct benefit to these community types" (MT FWP, 2015).

The associated Species of Greatest Conservation Need (SGCN) are:

Blue Sucker, Iowa Darter
Northern Redbelly Dace, Paddlefish
Pallid Sturgeon, Sauger
Shortnose Gar, Sicklefin Chub and Sturgeon Chub

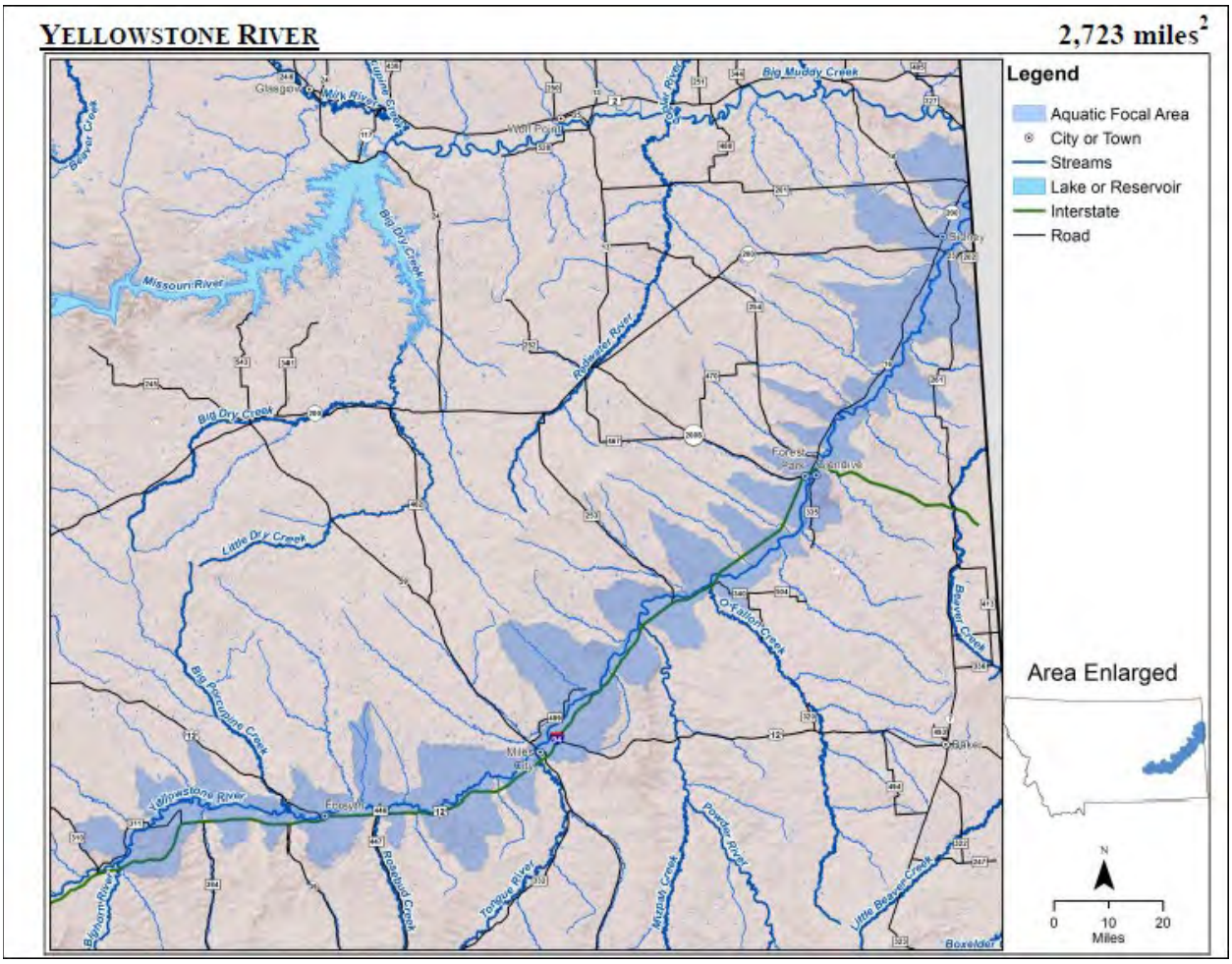


Figure 12. The Tier 1 Aquatic Community of the Yellowstone River (MT FWP, 2015)

The SWAP states,

"The Yellowstone River mainstem is home for many aquatic Species of Greatest Conservation Need (SGCN), native species, and a great diversity of game fish. It is an important river for spawning by the federally endangered pallid sturgeon. It also is an important river for a spawning migration of paddlefish from Lake Sakakawea. The paddlefish migration creates a high angler interest. There are several partnerships in this area including local conservation districts, state and federal agencies, and occasionally individual landowners. The majority of this watershed is held in private ownership. This area is heavily used by anglers, hunters, wildlife watchers, and other river recreationists.

Coal and gas development are a current impact to this Focal Area. Dewatering, as it relates to instream flow and fish habitat, and fish passage at multiple low head diversion dams, are other issues for the Focal Area. The future threats remain the same as current impacts if they are not addressed." (MT FWP, 2015)

Yellowstone River Corridor Study

From 2011 to 2016 The US Army Corps of Engineers and the Yellowstone River Conservation District Council collaborated to research a 565-mile reach of the Yellowstone River, from Gardiner, Montana to the confluence on the Missouri River in North Dakota. The This Cumulative Effects Analysis serves

as the base tool for analyzing all hydraulic, biological and socio-economic impacts of human activity on the Yellowstone River. See Appendix A13. Each of the ten reaches contained in Dawson County were thoroughly examined. The study can be found in its entirety at:

http//ftp.geoinfo.msl.mt.gov/Documents/Projects/Yellowstone_River_Clearinghouse/Yellowstone-River-Cummulative-Effects-Study.pdf.

Irrigated Land

Dawson County includes two irrigation districts; sixty producers farm 26,000 acres of irrigated lands each year. Project soils are fertile and produces a large variety of crops when irrigated. Principal crops produced are alfalfa, sugar beets, pinto beans, corn, soybeans and wheat.

Buffalo Rapids Irrigation District 1 extends from the pumphouse in near Fallon, Montana to Glendive, serving 20,000 acres. Principal structures include five pumping plans that pump water directly from the Yellowstone River and one re-lift pumping plan to provide irrigation water for 22,719 acres of land around Glendive, Fallon and Terry, Montana. Buffalo Rapids Irrigation District 1 was established in 1937 to irrigate an estimated 15,500 acres with funds provided under the Emergency Relief Appropriation Act of 1937. The Glendive Extension was approved by President Franklin D. Roosevelt on May 15, 1940 for 3,000 acres under the Water Conservation and Utilization Act of May 10, 1939 (53 Stat.675). The Glendive Unit and the Extension constitute the First Division.

The Lower Yellowstone Irrigation District was built in 1906. The District starts at Intake, about 18 miles northeast of Glendive. Nearly 72 miles of main canal provide water for 34,755 acres in Dawson and Richland Counties in Montana and 17,378 acres in McKenzie County, North Dakota.

Water Rights

Water rights in Dawson County are largely held by private landowners in conjunction with Buffalo Rapids District 1 and as reserved water held by the Dawson County Conservation District. At the end of the 2016 irrigation season, there were a total of 222 Conservation District water reservation projects in the Yellowstone River basin. These projects use approximately 76,798 acre-feet of water. Dawson County currently holds a water reservation of 45,855 acre-feet. There are currently ten permits issues account for 5,243 acre-feet of water from the Yellowstone River.

Drinking Water

Rural households typically have private wells for domestic use. The City of Glendive has a public water system with intake from the Yellowstone River, serving about 5,500 people on 2,050 connections. Richey's public water system draws from two wells and serves 180 people with 140 connections.

DryRedwater Regional Water Authority

Dry-Redwater Regional Water Authority (DRWA) was formed in 2005 for developing a regional water system to provide a reliable source of safe, high quality drinking water to small communities and rural homes. The project includes an intake and water treatment plant on Fort Peck Reservoir and extensive water pipeline systems. DRWA is locally owned by the McCone, Dawson, Garfield and Richland County Conservation Districts. The DRWA coverage area includes 11,791 square miles in McCone, Dawson, Garfield, Richland, northern Prairie Counties, and McKenzie County, North Dakota west of the

Yellowstone River. DRWA serves the communities of Richey, Glendive and Bloomfield Dawson County as well as Brockway, Brusett, Cohagen, Lindsey, Sand Springs, Vida, Circle, Jordan, Sidney, Fairview, Lambert, and Savage.

The City of Sidney and Richland County partnered with DRWA to construct the first DRWA pipeline south of Sidney. The Sidney South line was active with the first DRWA users in September 2014. Earlier that year DRWA decided to move forward with efforts to fund construction of a pipeline that would include Culbertson (Roosevelt County), Lambert and Fairview (Richland County) serving rural users in between. DRWA is currently working on funding sources to make the Culbertson Lambert Fairview line a reality and would use the Culbertson Water Treatment Plant as an interim source. The number of sign-ups for rural water through DRWA continues to increase (DRWA, 2019).

Irrigation

There are around 20,000 acres of irrigated land in Dawson County. The majority is within the Buffalo Rapids Irrigation District 1 and some within the Lower Yellowstone Irrigation District. There are a few producers that pump irrigation water directly out of the Yellowstone River.

The Buffalo Rapids Project in southeastern Montana is divided into the First and Second Divisions. Principal structures include five pumping plants that pump water directly from the Yellowstone River and one re-lift pumping plant to provide irrigation water for 22,719 acres of land near Glendive, Fallon, and Terry, Montana. The Buffalo Rapids Irrigation Project was funded by the U.S. Bureau of Reclamation and the Work Projects Administration. The eighteen thousand-acre Glendive Unit (Division 1) was organized in 1937. The main canal was completed in 1941; laterals were finished in 1943.

The First Division is comprised of an intake channel of 1,000 feet, a three-unit pumping plant with a capacity of 330 cubic feet per second (cfs) and 103-foot lift, over thirty-three miles of canal, and more then fifty-six miles of laterals.

The Bureau of Reclamation, in cooperation with other federal, state, and local sponsors, has developed an agricultural weather information system called "AgriMet," with the purpose of promoting water and energy conservation. AgriMet is currently a network of more than ninety automated weather stations that collect and telemeter site-specific weather data. The data collection platform samples sensors on a preset schedule, stores, and then transmits the data through a geostationary satellite.

Each AgriMet station is equipped to monitor air temperature, solar radiation, relative humidity, wind speed and direction and precipitation. This information is translated into crop-specific water use information. The primary emphasis is on irrigation management – applying the right amount of water at the optimal time. The Buffalo Rapids AgriMet station is about ten miles southwest of Glendive. It was installed in 1999 (US BOR, 2019).

AIR AND ENERGY

Air Quality

Montana Department of Environmental Quality Air Quality Bureau maintains air quality monitoring stations in Broadus, Malta and Sidney, Montana. Ambient temperature, wind speed and direction and pollutants including NO, NO2, NOX, ozone and particulate matter are monitored. There are no areas of non-attainment in Dawson County. (MT DEQ, 2019)

Utilities

McCone Electric is a rural electrical cooperative that serves 14,000 square miles in McCone, Garfield and Dawson Counties. District 2 serves residents in the Lindsay and Bloomfield areas. Rural residents of southeastern Dawson County purchase electricity from GoldenWest Electric Cooperative which serves areas in Dawson, Fallon and Wibaux County with 1,120 miles of line. Most of Dawson County, including the City of Glendive, is serviced by Montana Dakota Utilities which provides retail natural gas and electricity to parts of Montana, North Dakota, South Dakota and Wyoming in an area covering more than 168 thousand square miles.

PLANTS AND ANIMALS

Plant Species of Concern

Montana Natural Heritage Program 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 six plant Species of Concern for Dawson County are very rare and exhibit traits of environmental specificity allowing them to survive only in very particular niches. State Ranking is categorized as follows:

- **S1:** At high risk because of extremely limited and/or rapidly declining population numbers, range and/or habitat, making it *highly vulnerable* to global extinction or extirpation in the state.
- **S2:** At risk because of very limited and/or potentially declining population numbers, range and/or habitat, making it *vulnerable* to global extinction or extirpation in the state.
- **S3:** Potentially at risk because of limited and/or declining numbers, range and/or habitat, even though it may be abundant in some areas (MNHP, 2019).

Table 4. Montana Plant Species of Concern

Common Name	Scientific Name	Family	Habitat	Rank
Pottery Milkvetch	*Astragalus ceramicus var. filifolius*	Pea Family	Sandy sites, sand dunes	S3
Bittersweet	*Celastrus scandens*	Bittersweet Family	Wetland/Riparian	S1
Pale-spiked Lobelia	*Lobelia spicata*	Bellflower Family	Moist meadows	S2?
Bractless Blazingstar	*Mentzelia nuda*	Blazingstar / Stickleaf Family	Open areas in sandy or gravelly soils	S1S2
Blue Toadflax	*Nuttallanthus texanus*	Plantain Family	Grasslands/woodlands on sandy to clay soils	S1S2
Narrowleaf Penstemon	*Penstemon angustifolius*	Plantain Family	Sandy sites	S2S3

Animal Species of Concern

MNHP's list of animal species of concern includes 38 species. The list is included in the Appendix (A11). Individual species Field Guides are available from MNHP under Animal Information, Species of Concern Report at http://mtnhp.org/SpeciesOfConcern/?AorP=a.

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

Pallid Sturgeon (*Scaphirhynchus albus*). Listed Endangered

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

The Pallid Sturgeon is one of the rarest fishes in North America; only about 200 adults remain in the upper Missouri River. It was federally listed as endangered in 1990 due to population decline caused by human alterations of the environment: impoundments, channelization and altered river hydrography, turbidity and temperature. The Pallid Sturgeon is currently listed as "S1" in Montana due to extremely limited or rapidly declining population numbers, range or habitat, making it highly vulnerable to global extinction or extirpation in Montana (MNHP, 2019).

Any NRCS undertaking that impacts the Yellowstone River bank below the ordinary high-water mark will require a consultation with the Corp of Engineers as well as a consultation with Unites States Fish & Wildlife Service (Ellenburg, 2019).

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 seven- and one-half feet. Average adult weight is about fifteen pounds. Once found throughout North America, the last wild flock of Whooping Cranes had been reduced to fewer than twenty birds by the 1940's due to habitat loss and hunting. Intensive conservation efforts and international cooperation between Canada and the United States rescued the species from extinction, but they remain extremely rare.

Habitat loss remains one of the biggest threats facing wild Whooping Cranes. Collisions with wind turbines and power lines are an ongoing threat. Whooping crane utilize migratory habitat in eastern Montana. They are not known to breed in the state (Audubon, 2019).

Northern Long-Eared Bat (*Myotis septentrionalis*)—Listed threatened

In Montana this species in known to occupy specific habitat within a limited range along the Missouri and Yellowstone river drainages near the North Dakota border, as shown in Figure 16 from the MNHP Northern Myotis Field Guide. These small, light brown bats are most often found hibernating in abandoned mines in the river breaks in Richland County. In the summer they roost in riparian forested areas dominated by cottonwood trees. They emerge to feed at dusk using echolocation to hunt moths, flies, leaf hoppers and beetles.

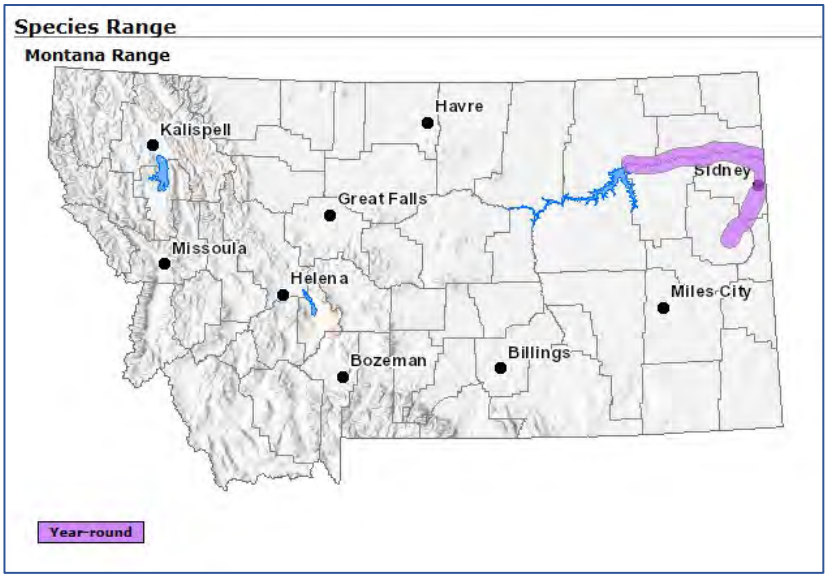


Figure 13 Northern Myotis Range in Montana

Long-Eared Bat populations in other areas of the country have suffered tremendous losses due to white nose syndrome. Regional extinction has occurred in some locations. White-nose syndrome is caused by a fungus, (*Pseudogymnoascus destructans).* It attacks the bare skin of bats while they're hibernating. As it grows it causes changes in bats' behavior, causing them to become active during hibernation, using up the stored fat that they need to survive the winter. White-nose syndrome continues to spread rapidly across the United States and Canada, mostly through bat-to-bat contact.

According to the White-Nose Syndrome Response Team, there were no reported occurrences of the disease in long-eared bats in Montana as of August 2019 (WNS Response Team, 2019).

Other causes of population decline are due to extensive logging or tree thinning, human disturbance during hibernation and mortality from collisions with wind turbines. The species was officially listed as Threatened on April 2, 2015 under the Endangered Species Act (MNHP, 2019).

Least Tern (*Sternula antillarum*)—Listed Endangered

Least Tern are North America's smallest tern. These little shorebirds are easily recognized by their yellow bills and legs. Although the species is widespread and common in places, the interior population has been classified as threatened, endangered or as a species of concern for most states because of loss of habitat. The interior population declined by about eighty-eight percent between 1966 and 2015;

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

The National Audubon Society's map of Interior Least Tern habitat shows that migration and breeding are uncommon in the central eastern Montana (Audubon, 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 (MT NHP, 2019). USFWS Range map of breeding and wintering habitat shows no Piping Plover habitat in Dawson County (USFWS, 2019).

Greater Sage-Grouse

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

On September 22, 2015 the U.S. Fish and Wildlife Service determined that the Greater Sage-Grouse did not warrant listing protections under the Endangered Species Act. It was decided that the primary threats to populations had been ameliorated by conservation efforts implemented by Federal, State, and private land owners. The Montana Natural Heritage Program Species of Concern Report lists the species category S2: At risk because of very limited and/or potentially declining population numbers, range and/or habitat, making it vulnerable to global extinction or extirpation in the state (MNHP, 2019).

Core area is defined as the area that contains the species of concern, having exemplary natural plant and animal communities, or exceptional native diversity. Core areas delineate essential habitat that would not be able to absorb significant levels of disturbance without substantial impact to the species of concern. Sage-grouse core areas provide habitat for seventy-five percent of all known breeding sage-grouse in Montana and represent landscapes of greatest biological importance to the long-term persistence of the species. Although areas in the south of Dawson County have been determined to be general habitat for Greater Sage-grouse, none are said to be part of the species' core area. See Appendix A10 Sage-grouse Habitat in Dawson County.

Wetlands and Riparian Areas

Designated wetland/riparian areas cover nearly eighty thousand acres, or roughly five percent of the land in the county. Figure 15 is an image from the Montana Natural Heritage Map Viewer, Wetland and Riparian mapping feature. The area shown is the confluence of Deer Creek and the Yellowstone River north of Glendive. The image represents typical distribution and composition of wetlands and riparian areas in the county.

- Riverine areas are perennial streams comprised of the deep-water habitat contained within a channel; they do not include adjacent floodplains. Riverine riparian areas and wetlands cover about 50,643 acres in Dawson County.

- Riparian forested areas cover nearly eleven thousand acres in the county. These are wetlands, bogs, swamps or floodplains dominated by large-stature deciduous trees.[24] See also descriptions of Great Plains Riparian and Great Plains Floodplains ecological systems, page 11.
- Emergent wetlands are found on just over 13.8 thousand acres in small areas scattered throughout the county. These areas share the characteristics of temporary, seasonal or semi-permanent flooding. They appear primarily in creek bottoms and in some cases, areas that were diked or otherwise modified for agriculture.

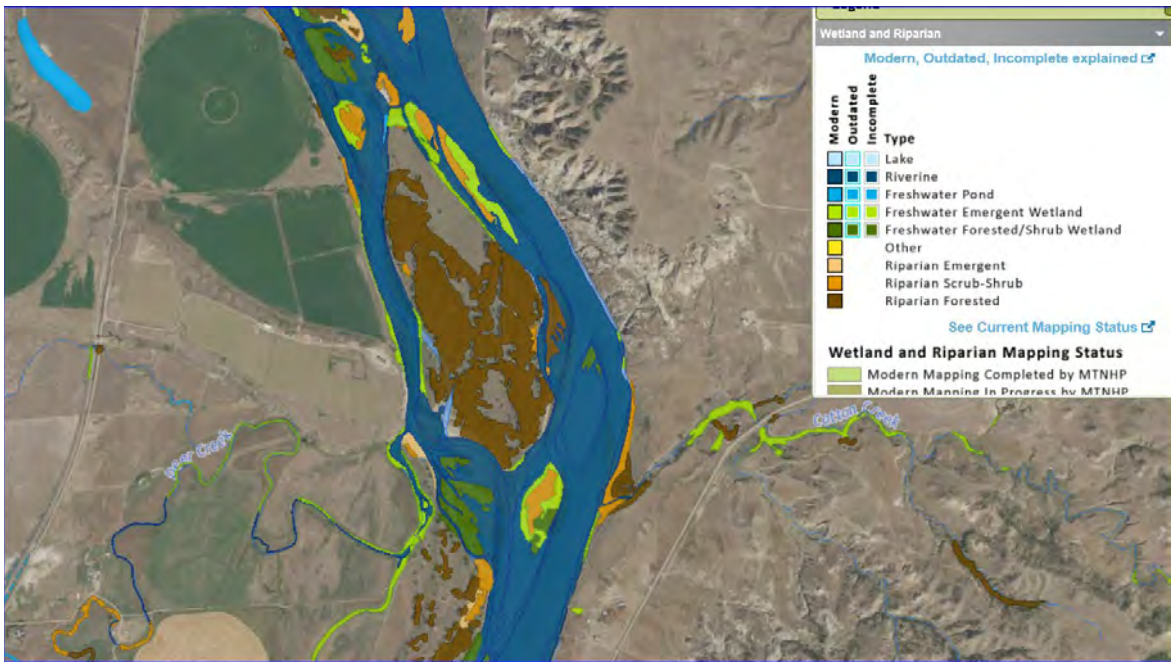


Figure 14. Wetlands and Riparian Areas at the Confluence of Deer Creek and the Yellowstone River, Dawson County, Montana

Major streams such as Burns Creek, Deer Creek, Glendive Creek and others support emergent wetlands and riparian areas as well as isolated forested riparian zones.

Emergent wetlands are common throughout the county as small areas in creeks and coulees. Freshwater ponds are nearly exclusively livestock water reservoirs. Some ephemeral streams support riparian forested zones in patchy patterns along the drainages. Figure 16 shows the distribution of the different wetland types by acre.

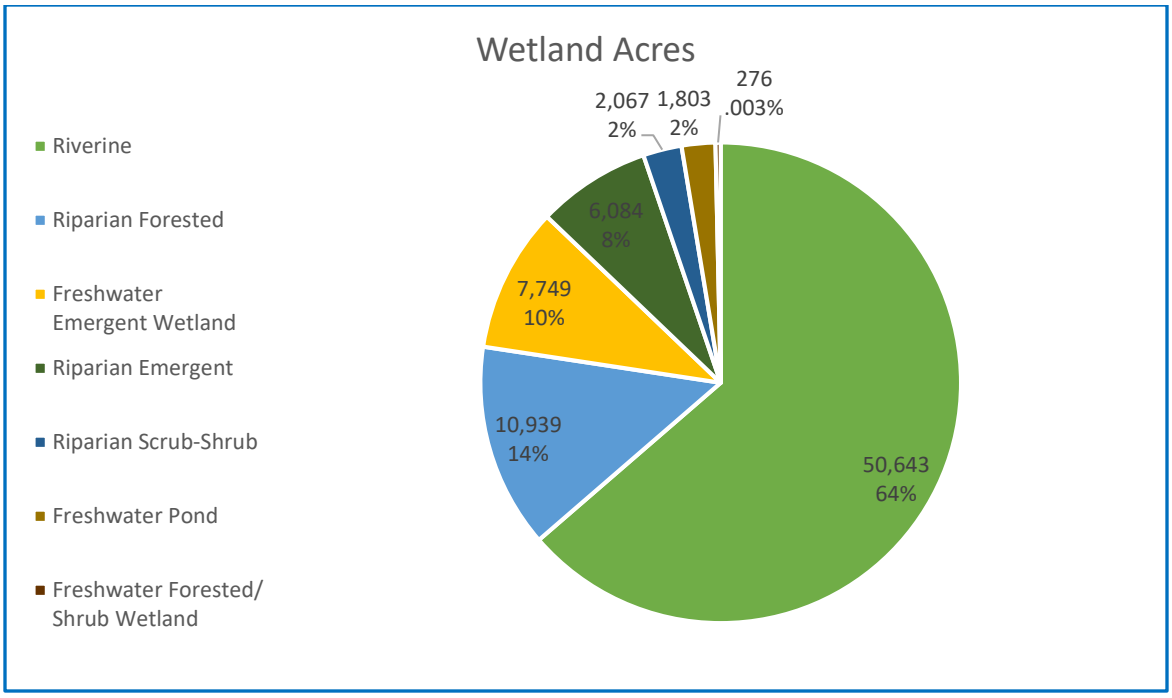


Figure 15. Wetland Types and Riparian Systems Acres and Percent of Total in Dawson County, Montana

SECTION III: CONSERVATION ACTIVITIES

In the past twenty years, NRCS has provided over $38 million in financial assistance to landowners through AWEP, CSP, EQIP and WHIP in Dawson County. This support, together with technical assistance and conservation planning, has resulted in conservation benefits to 1,139,507 acres of rangeland, dryland cropland, irrigated cropland and pasture. Conservation Efforts involved the installation or implementation of:

- 112 watering facilities on 40,757 acres
- 37,332 acres of prescribed grazing management
- 4,295 acres of residue reduced tillage
- 3,300 acres of irrigation water management
- 3,140 acres under irrigation sprinklers
- 2,850 acres of pest management
- 1,017 acres of nutrient management
- 750 acres of range and pasture seedings
- 640 acres of residue no till tillage
- 500 acres of cover crops
- 48 miles of stock water pipelines
- 43 miles of cross fencing
- 51 new wells
- 19 miles of irrigation pipelines
- 33 wells decommissioned
- 5 miles of windbreak establishments
- 2 high tunnels

From 1998 to 2004, Dawson County, Custer County and Prairie County were involved in a major cooperative project with Buffalo Rapids District One and District Two. Many of the earthen, leaking laterals were replaced with high pressured buried pipelines supplying farmers with irrigation water. Several producers installed gated pipe systems, too. With this project, irrigation water management was implemented on over 4,042 acres of cropland.

In 2004-2018, CSP, formerly the Conservation Security Program, now known as the Conservation Stewardship Program has been very popular in Dawson County. The Conservation Stewardship Program was designed to reward resource conservation while offering incentive to move to the next level of stewardship. Since most of our producers are innovators, this program is a good fit to help them achieve their resource conservation objectives.

Dawson County-Lower Yellowstone River Watershed was one of the first eighteen watersheds to get into the Conservation Security Program. NRCS Chief Dave White signed the first CSP contract with local producer Jim Squires. There were twenty-four contracts funded in Dawson County that first year. The appeal of the program continued through the years; the county has 113 CSP contracts including 2019 contracts.

In 2007-2009, a Reduced/Mulch-Till Special Initiative was approved for Dawson County. The initiative had dual goals:

- Reduce wind erosion on irrigated annual row crop fields through reduced tillage operations.
- Improve irrigation water use efficiency by applying residue management to improve water movement through the furrows.

This initiative resulted in 4,295 acres of reduced tillage operations on irrigated cropland. Twenty-three producers participated; some purchased strip till equipment, others adapted existing equipment, rented the equipment or changed their crop rotations. Many of the new reduced tillage operations decreased trips across fields from thirteen to four. Fuel consumption was cut by half, the Soil Tillage Intensity Rating value fell by twenty percent and wind and water erosion dropped fifteen percent.

In 2012 the Dawson County Conservation District(DCC) and the NRCS Glendive Field Office received a grant from the Montana Association of Conservation Districts to promote cover crops on cropland for soil health. The grant paid for 200 acres of multi-species cover crops to improve soil fertility and soil quality. Participants used the cover crops for livestock grazing. There were twenty original participants; fifteen are still growing cover crops to promote soil health and provide forage for livestock.

The NRCS Glendive Field Office has installed forty-eight miles of stock water pipelines, 112 watering tanks and forty-three miles of cross fencing to improve grazing management on 116,891.5 acres.

Partner Conservation Efforts

Dawson County Conservation District has been a very effective partner for conservation projects in the county. The Field Office regularly relies on Montana State University Extension for assistance with outreach and education. Bird Conservancy of the Rockies, Montana Fish, Wildlife & Parks and NRCS have a joint biologist in the Glendive Field Office. This provides additional assistance to local Field Offices with grassland bird habitat conservation and possible sources of additional funding for conservation projects.

SECTION IV: NATURAL RESOURCE PROBLEMS AND DESIRED OUTCOMES

In 2019, the Dawson County Local Working Group (LWG) met to identify and prioritize the natural resource issues in the county. Rangeland Health, Soil Health and Water Quantity, in order of importance, were identified as the most significant resource conservation issues in the county at this time.

Rangeland Health – Proper Grazing Use and Invasive Weeds

The Local Working Group identified Rangeland Health as one of the top resource concerns due to degraded plant condition, conifer encroachment, increasing invasive plant species, lack of reliable livestock water and improper grazing use. This concern covers over one million acres of rangeland of which eighty percent is privately owned. The primary goals of the LWG is to stop the trend of declining rangeland health and promote the sustainability of the rangeland, through the treatment of noxious weeds and conifers encroachment, facilitating practices like fencing, seeding and stock water pipelines and outreach.

Proper grazing use was identified as a rangeland health resource concern. This a priority due to the lack of reliable livestock water, loss of livestock grazing, lost income and degraded wildlife habitat. Improper grazing has contributed to an increase in little bluestem and other invasive plant species. It is important to promote proper grazing to combat invasive plant species.

Rocky Mountain juniper and Ponderosa pine encroachment impacts plant productivity, health and vigor on rangeland. Portions of the Cedar Creek watershed have conifer encroachment that increases in size and density over time. Trees dominate the plant community reducing native grass production. Land ownership is a mix of the Bureau of Land Management, Montana State Trust and private ownership. See Appendix A14.

Prescribed burning was implemented in fall of 1998 and in 1999 in small project areas in the Cedar Creek watershed resulting in reduction of Rocky Mountain juniper. The juniper has begun to increase since then, and leafy spurge is now found in the understory.

Invasive plant species are a major resource concern on the rangeland. Invasive species have a negative economic impact, degrade ecosystem function and impair wildlife habitat. Invasive species are found throughout all watersheds in the county; they will continue to spread rapidly if nothing is done to slow their advance. Noxious weeds include Canada thistle, hound's tongue, leafy spurge and spotted knapweed. Encroaching native species include little bluestem and Rocky Mountain juniper. The LWG knows that it is not possible to eradicate all invasive plant species, but efforts could be made to reduce existing infestations and to develop a quick-response strategy to control any new infestations.

L**ack of adequate livestock water in the uplands** is a resource concern on most of the rangeland in the county. Grazing pressure near natural water sources is the cause of several resource concerns, which includes degraded plant condition, soil erosion, soil compaction and increased likelihood of plant pest infestation in affected areas. These issues result in degraded wildlife habitat, increased wildfire hazard, reduced livestock and wildlife forage availability, and water quality degradation.

Activities to mitigate the resource concerns on rangeland would include herbaceous weed control, upland livestock water developments, brush management, cross fencing, reduce saline seeps near artesian wells and improved grazing management.

Soil Health

Soil health has been identified by the LWG as one of the county's top resource concerns. Soil health or the capability of soil to function as a vital living ecosystem is the key to water movement, the ability to grow crops, filter and buffer potential pollutants, cycle nutrients and maintain soil structure. Declining soil health and excess pressure from weeds are primary resource concerns on dryland crop operations. Recently, producers have begun to include cover crops in their rotations to increase soil organic matter, decrease erosion, improve soils structure and infiltration, and to decrease weed and pest pressure. Some producers are also starting to utilize other tools of soil health, crop rotations with pulse crops and no till operations.

The primary goals of the LWG is to improve soil health through cover crops, crop rotation and tillage operations. To achieve this goal, outreach is necessary to determine producer interest and willingness to participate in planting cover crops, reducing tillage and implementing other facilitating practices.

Water Quantity and Quality

Water quantity and quality has been identified by the LWG as one of the county's top resource concerns. Irrigation is an integral part of the agricultural operations and the economic sustainability of Dawson County. The primary resource concern on irrigated cropland is inefficient use of water, both in conveyance structures and on-farm use. The existing delivery systems include earthen supply laterals that leak, causing saline seeps, water erosion, and reduced available water for crops.

The delivery systems that withdraw water directly from the Yellowstone River are prone to leaking, causing water erosion and insufficient water for crops. The use of flood irrigation systems on cropland leads to sediment runoff, saline spots and nutrient leaching as well as areas of inconsistent water application. Since the Yellowstone River is valuable for spawning and rearing fish there are special concerns with pumping directly from the river.

The primary goals of the LWP are to convert the highest eroding earthen laterals to irrigation pipeline, to convert flood irrigation systems to sprinklers, to upgrade old conveyance systems and to provide education about irrigation water management.

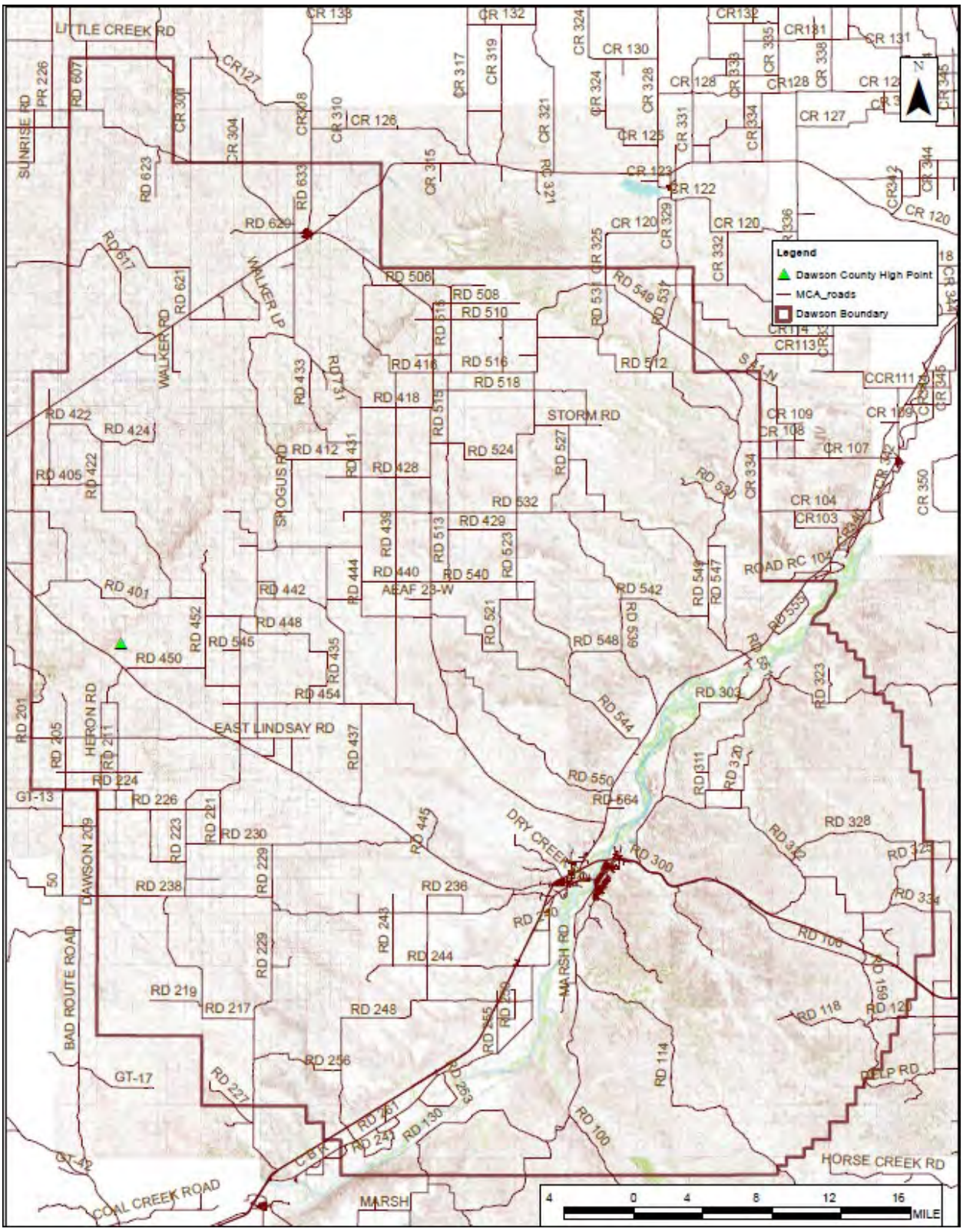
SECTION V: PRIORITIZATION OF NATURAL RESOURCE ISSUES AND DESIRED OUTCOMES

Our eight natural resource issues are prioritized as follows:

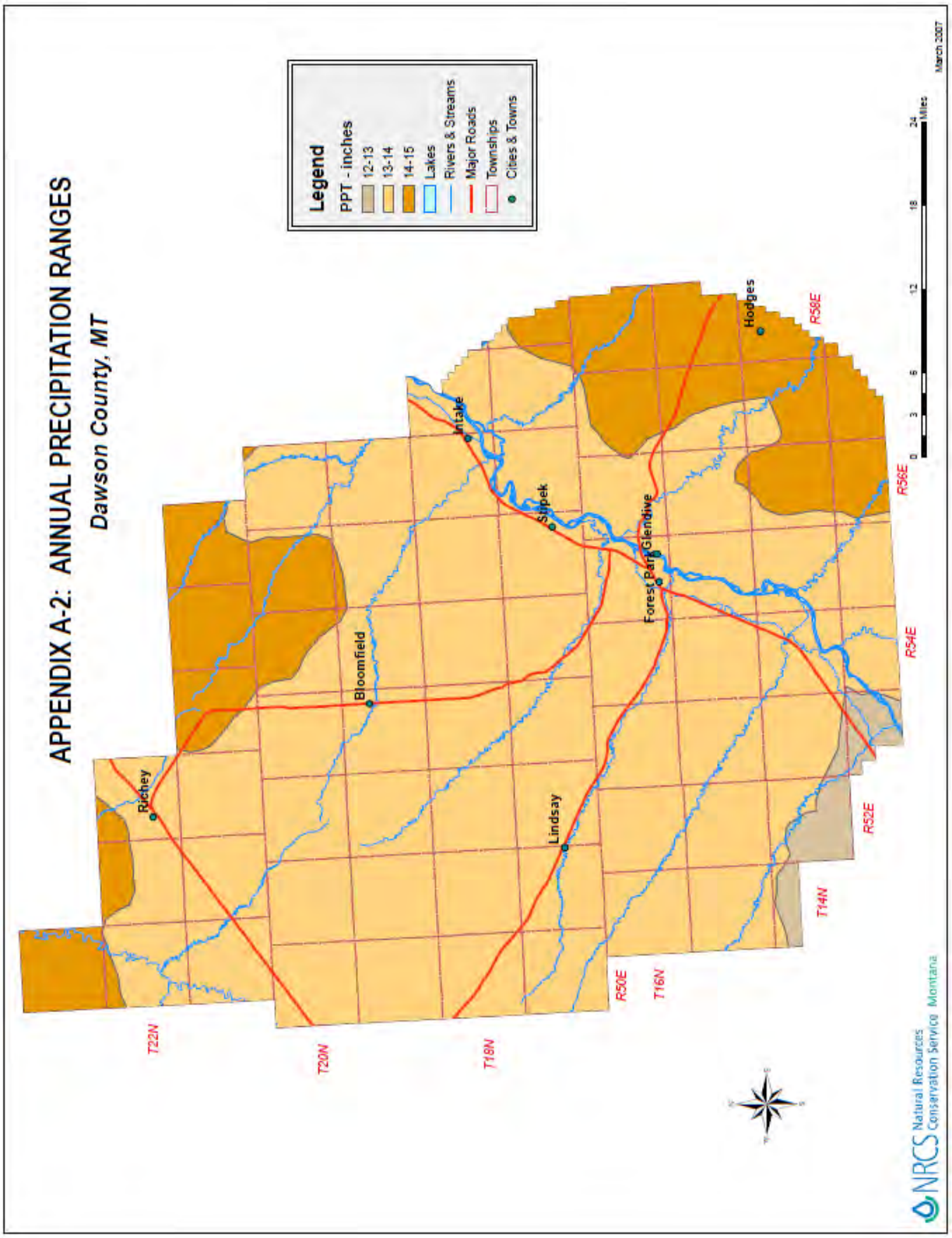
1. Convert earthen lateral irrigation ditches to buried mainlines.
2. Convert flood irrigation systems to sprinklers to increase water-use efficiency.
3. Improve delivery in systems that pump directly from the Yellowstone River.
4. Rangeland Health.
5. Noxious Weeds.
6. Livestock Production Limitation: Inadequate water.
7. Proper grazing use.
8. Conifer Encroachment.
9. Cropland Soil Health.

APPENDIX A

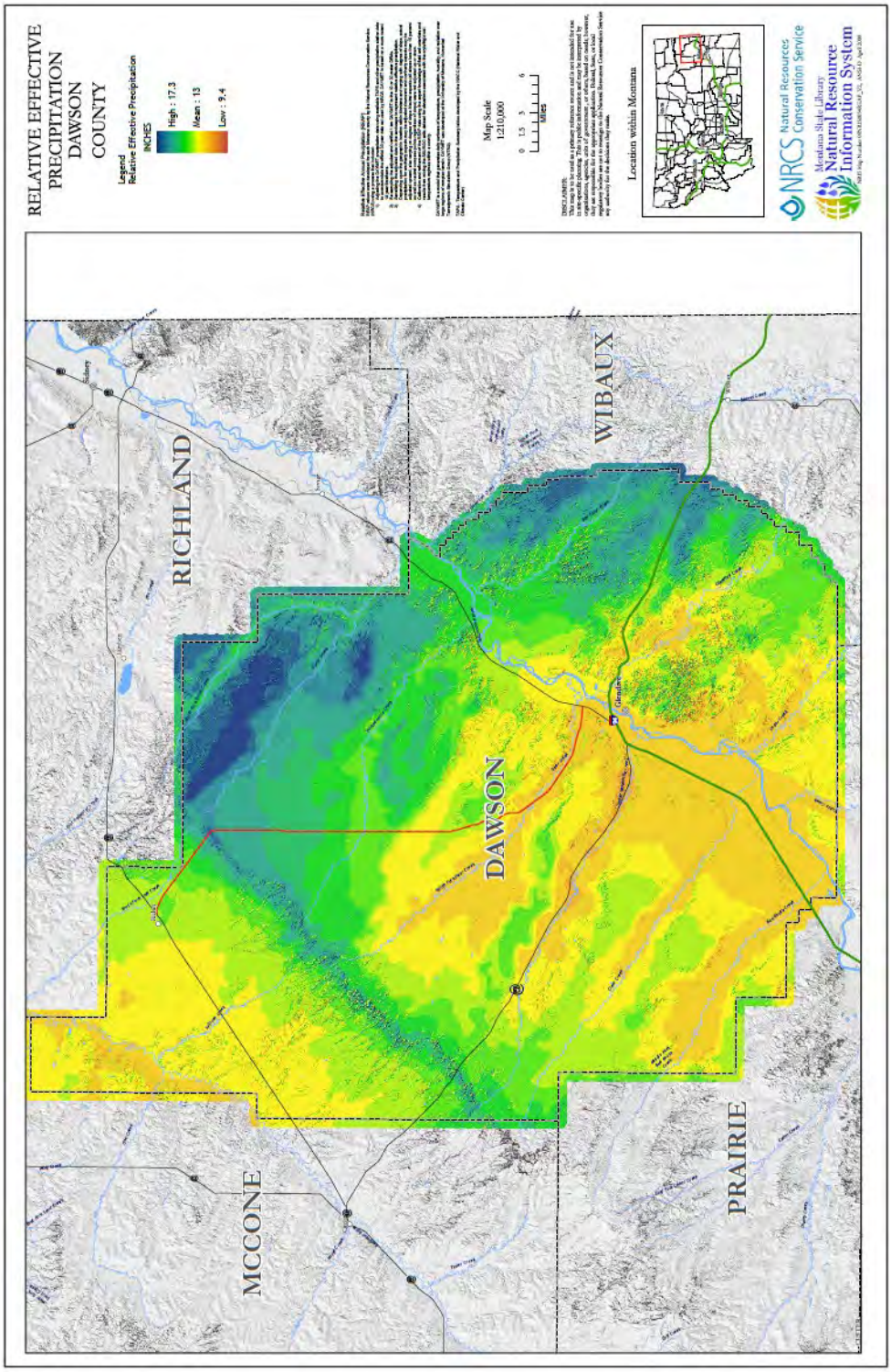
A1 Dawson County, Montana



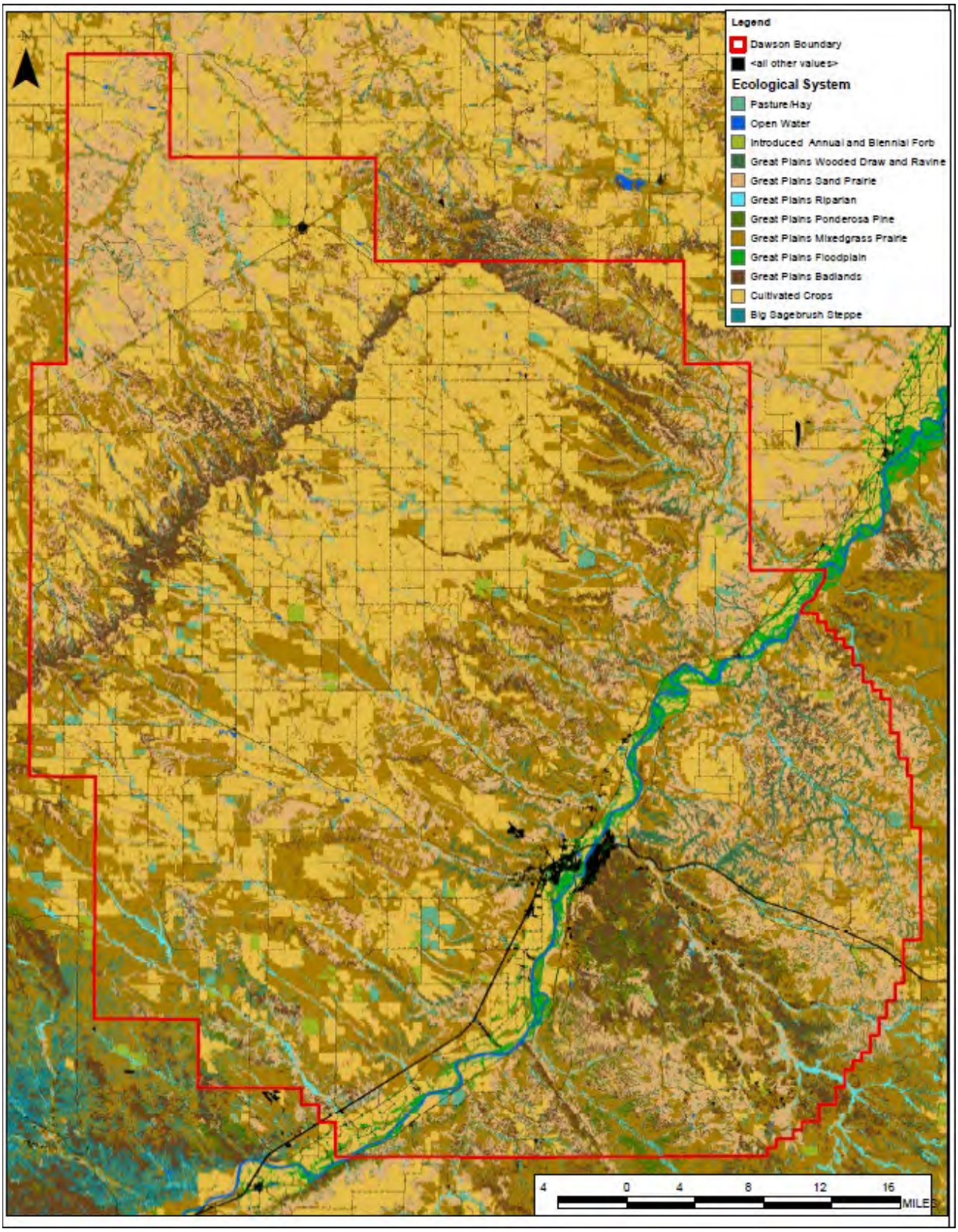
A2 Annual Precipitation Ranges, Dawson County, Montana



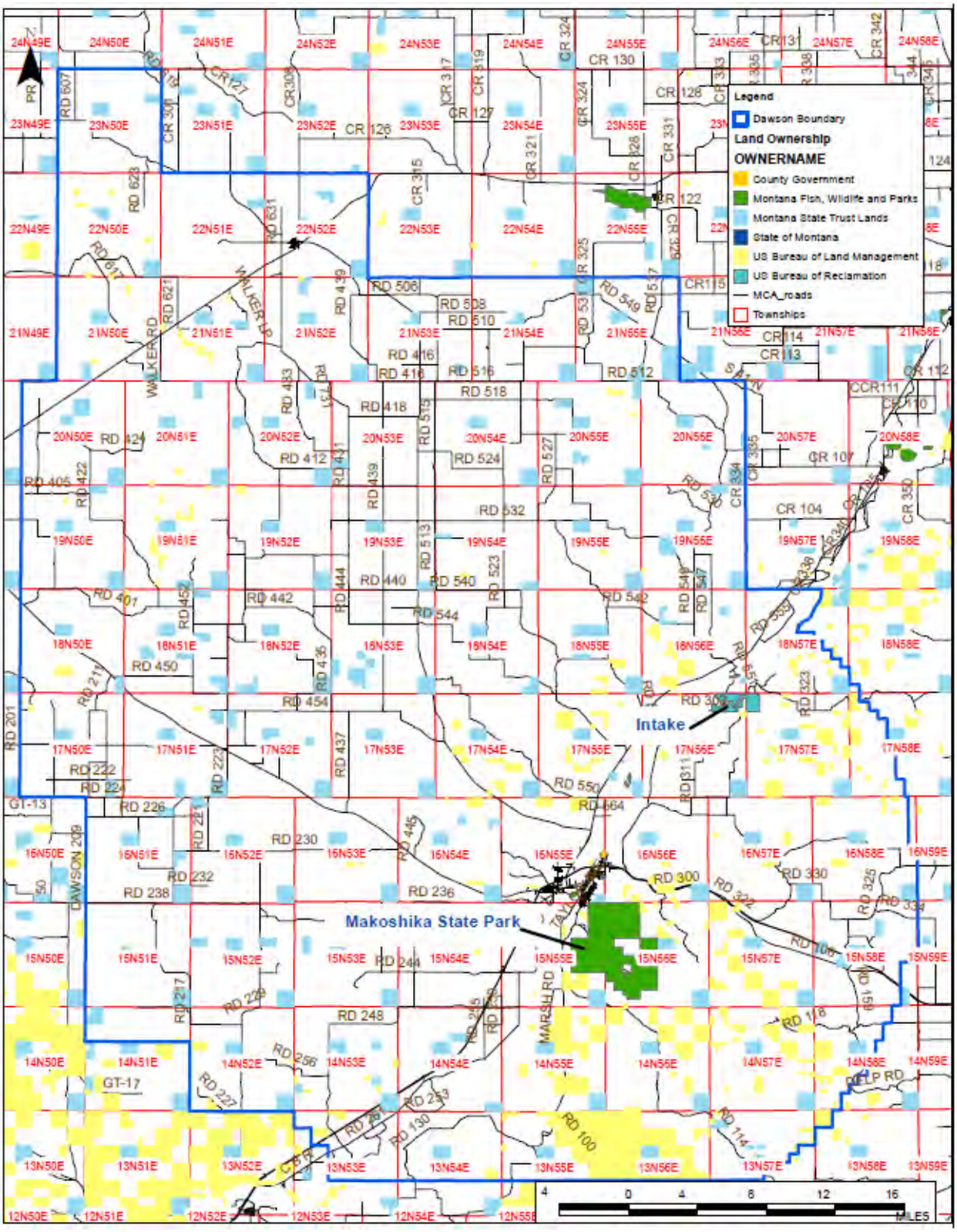
A3 Relative Effective Annual Precipitation, Dawson County, Montana



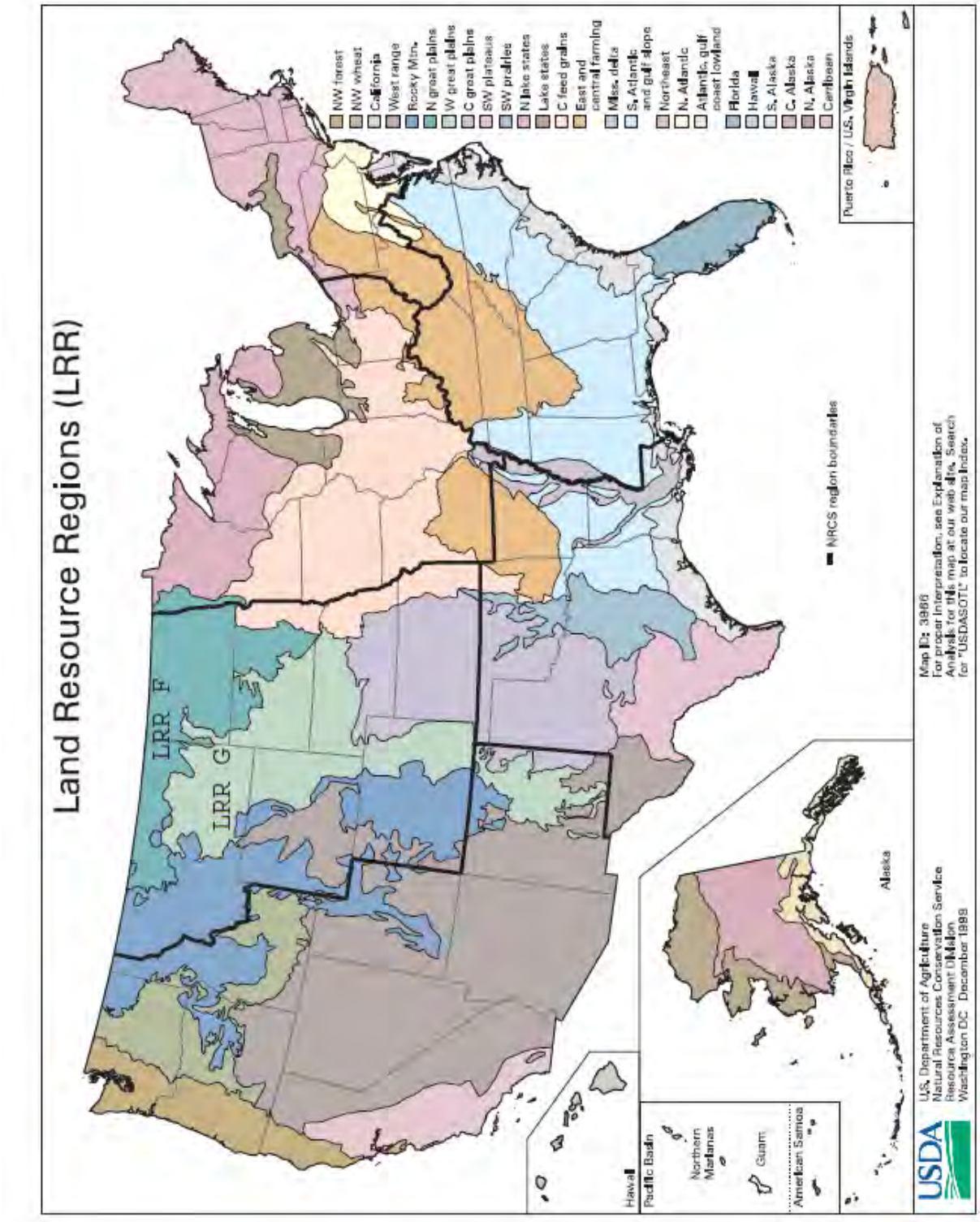
A4 Landcover, Dawson County, Montana



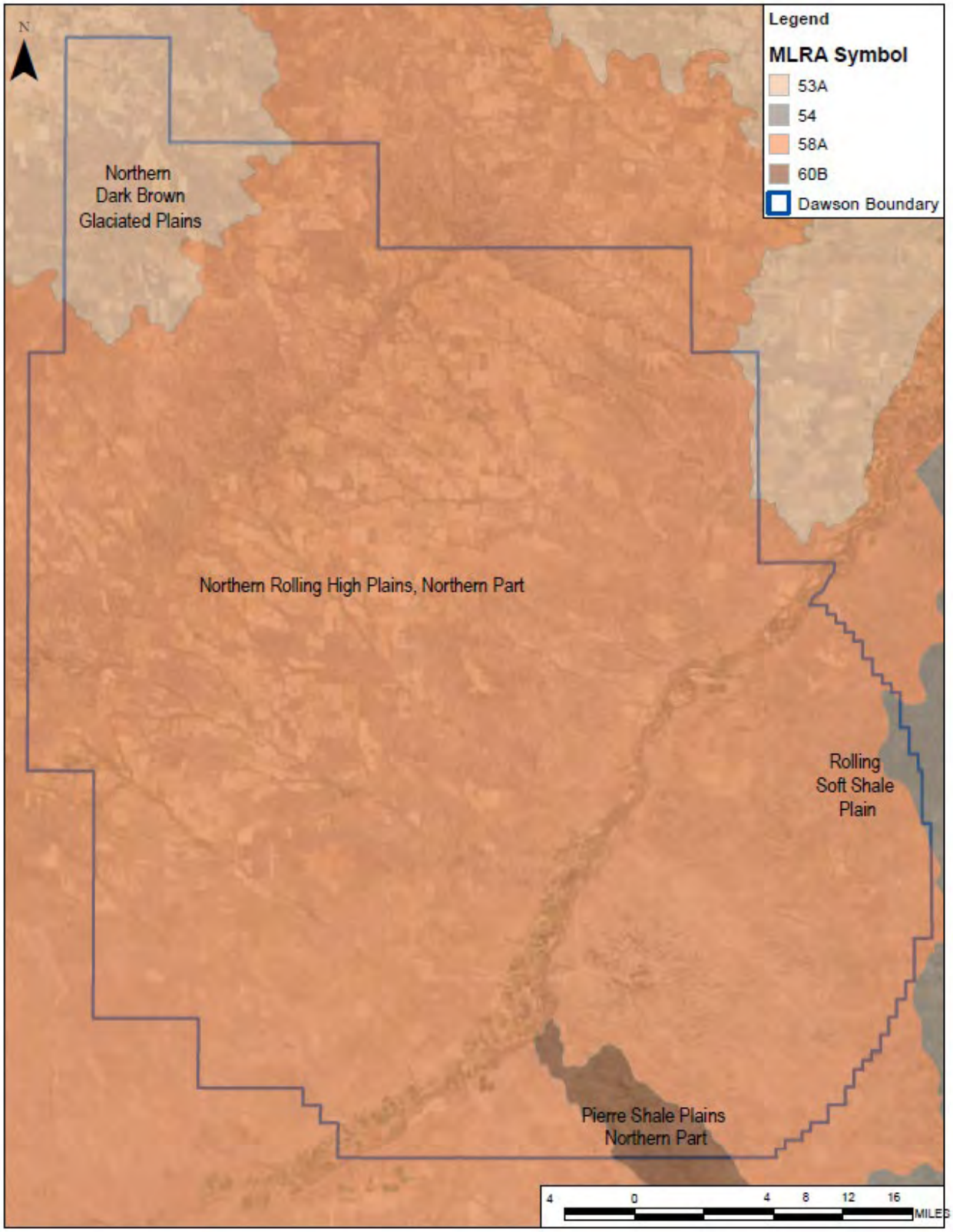
A5 Land Ownership, Dawson County, Montana



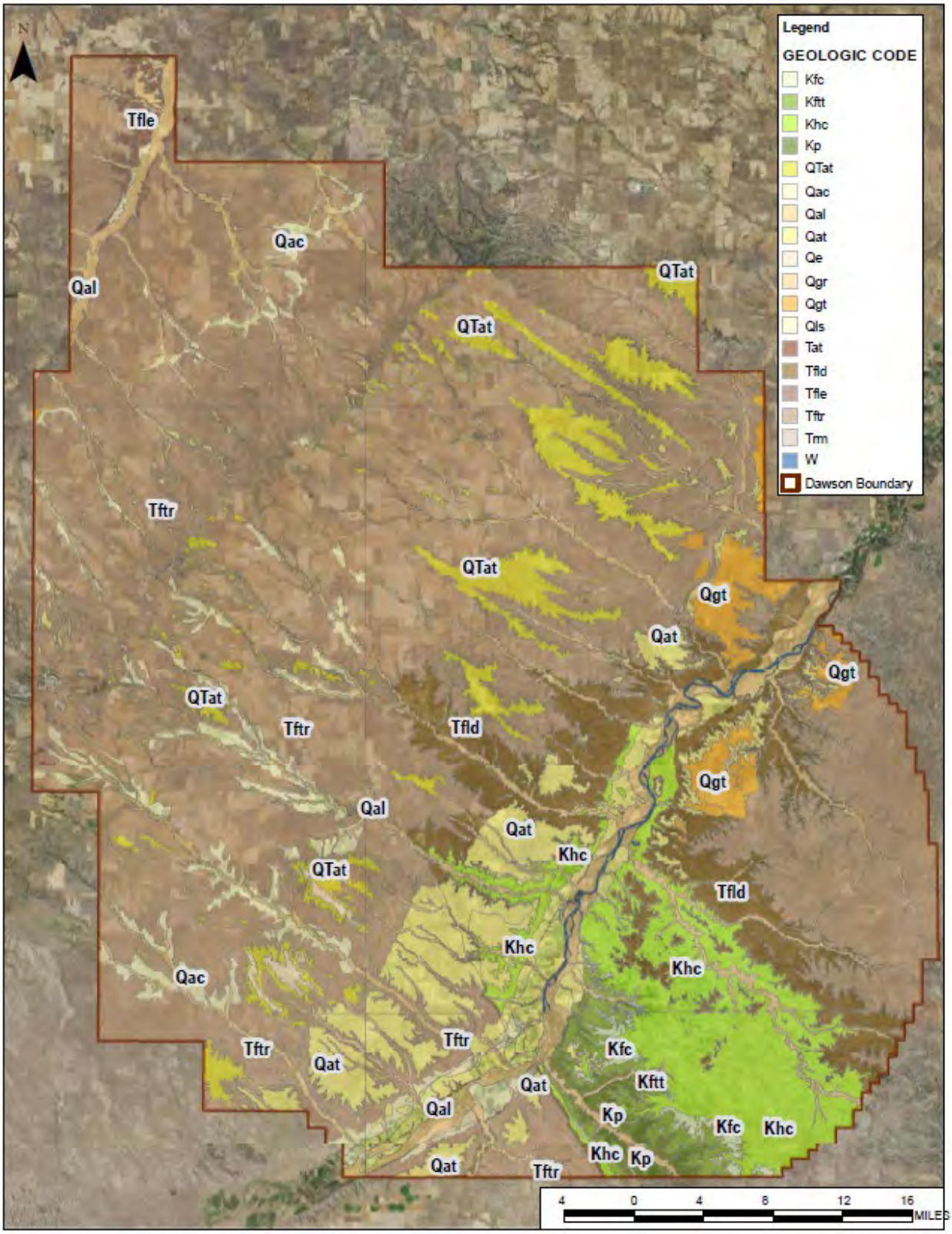
A6 Land Resource Regions of the United States



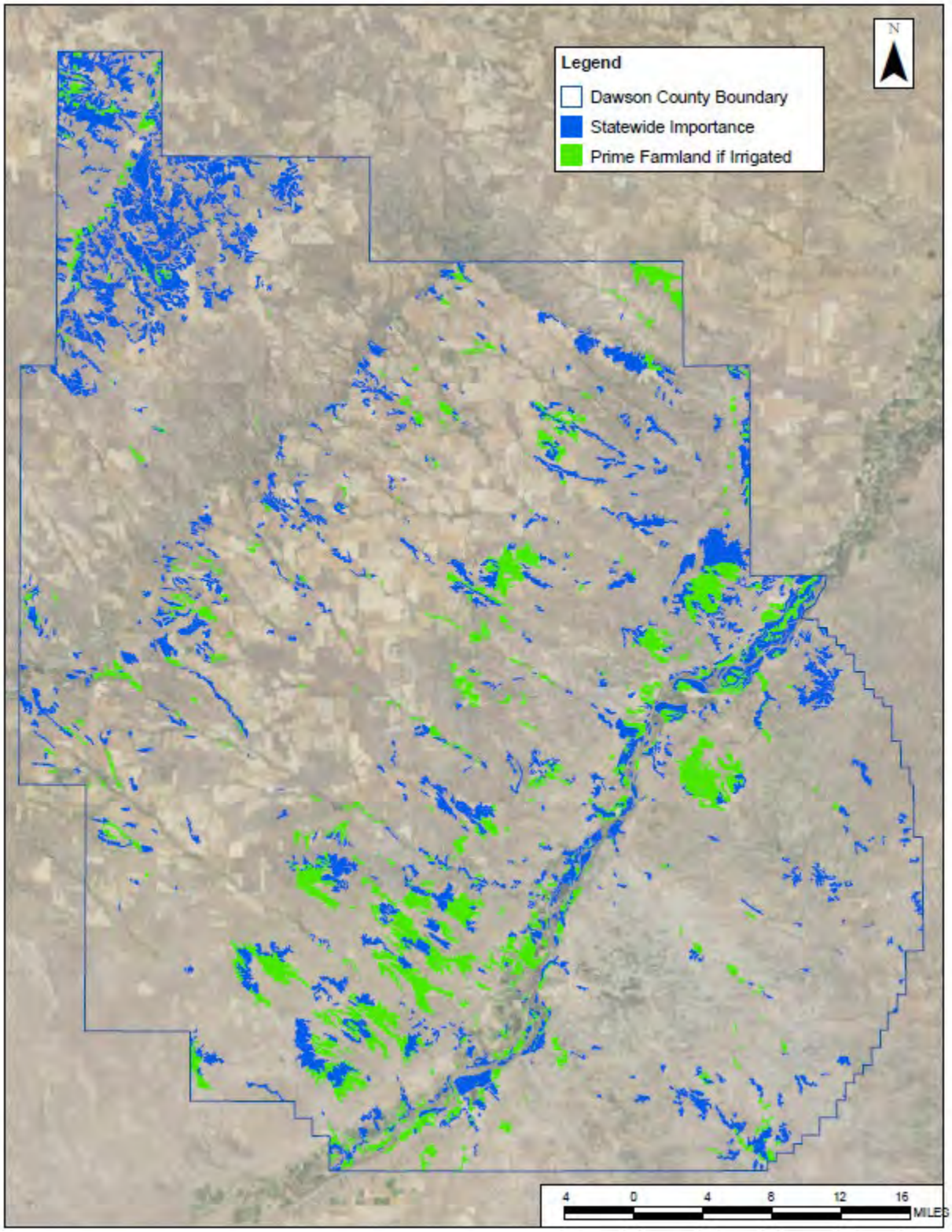
A7 Major Land Resource Areas of Dawson County, Montana



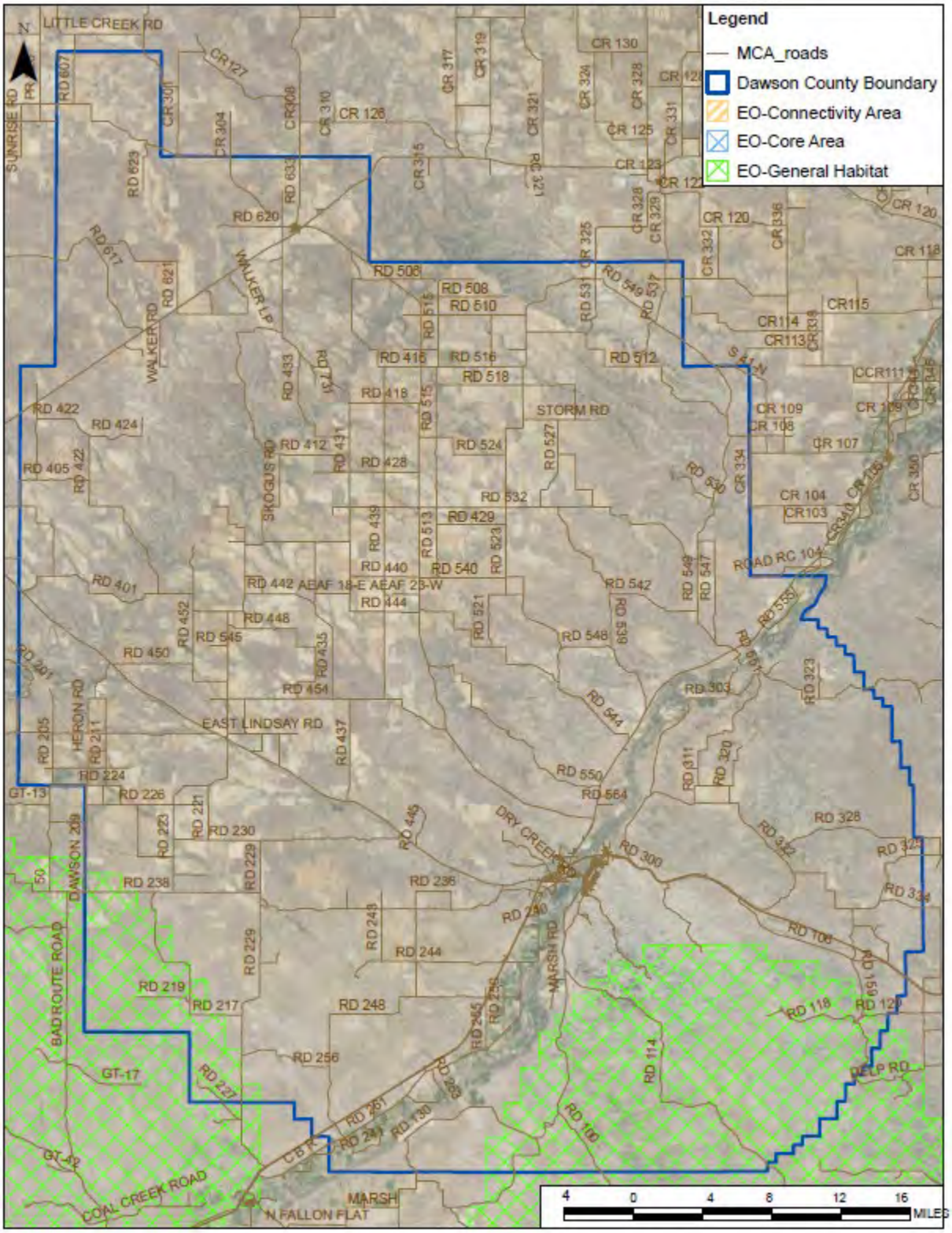
A8 Geology of Dawson County, Montana



A9 Farmland of Statewide Importance and Prime Farmland if Irrigated, Dawson County Montana



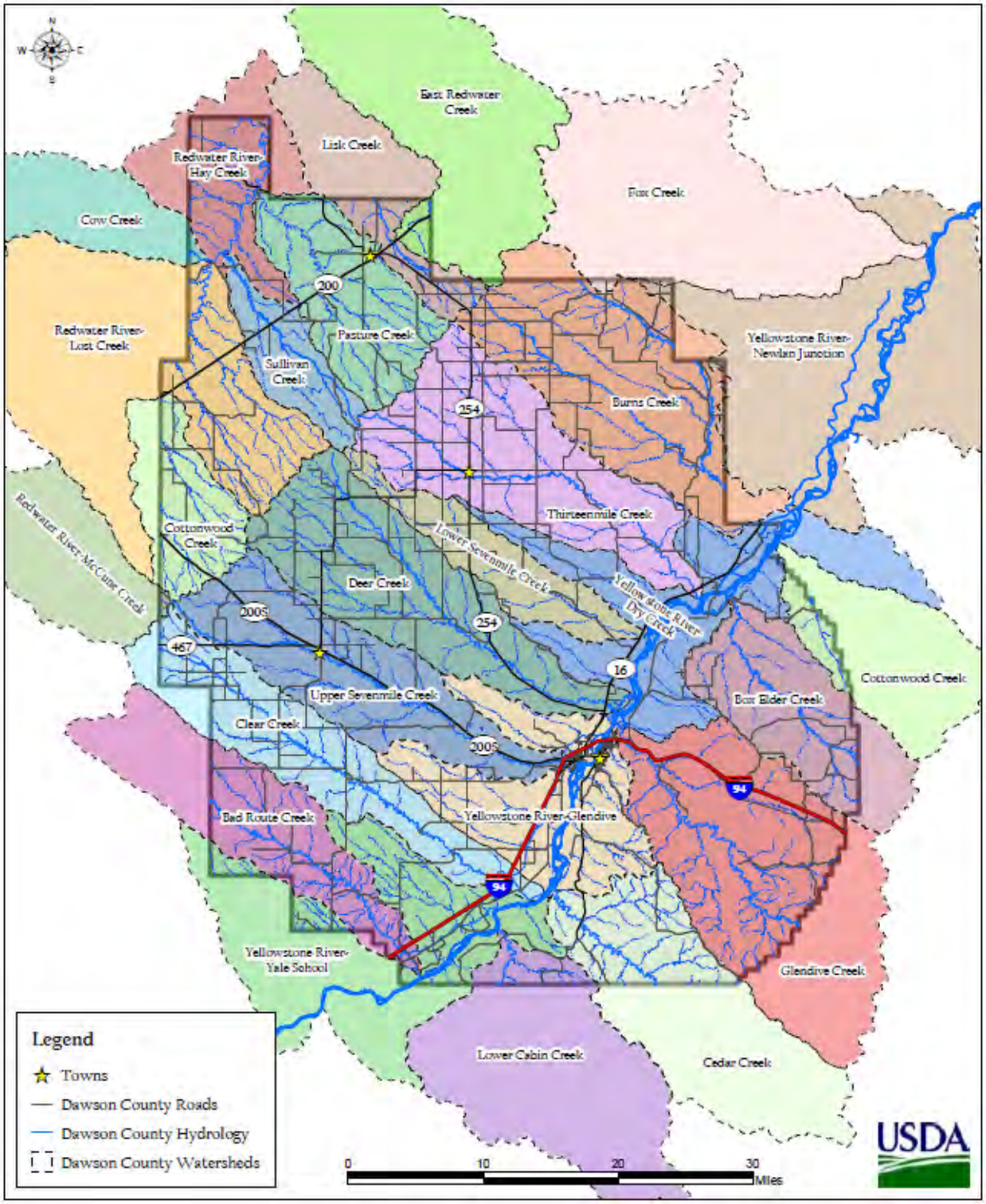
A10 Sage-Grouse Habitat in Dawson County, Montana



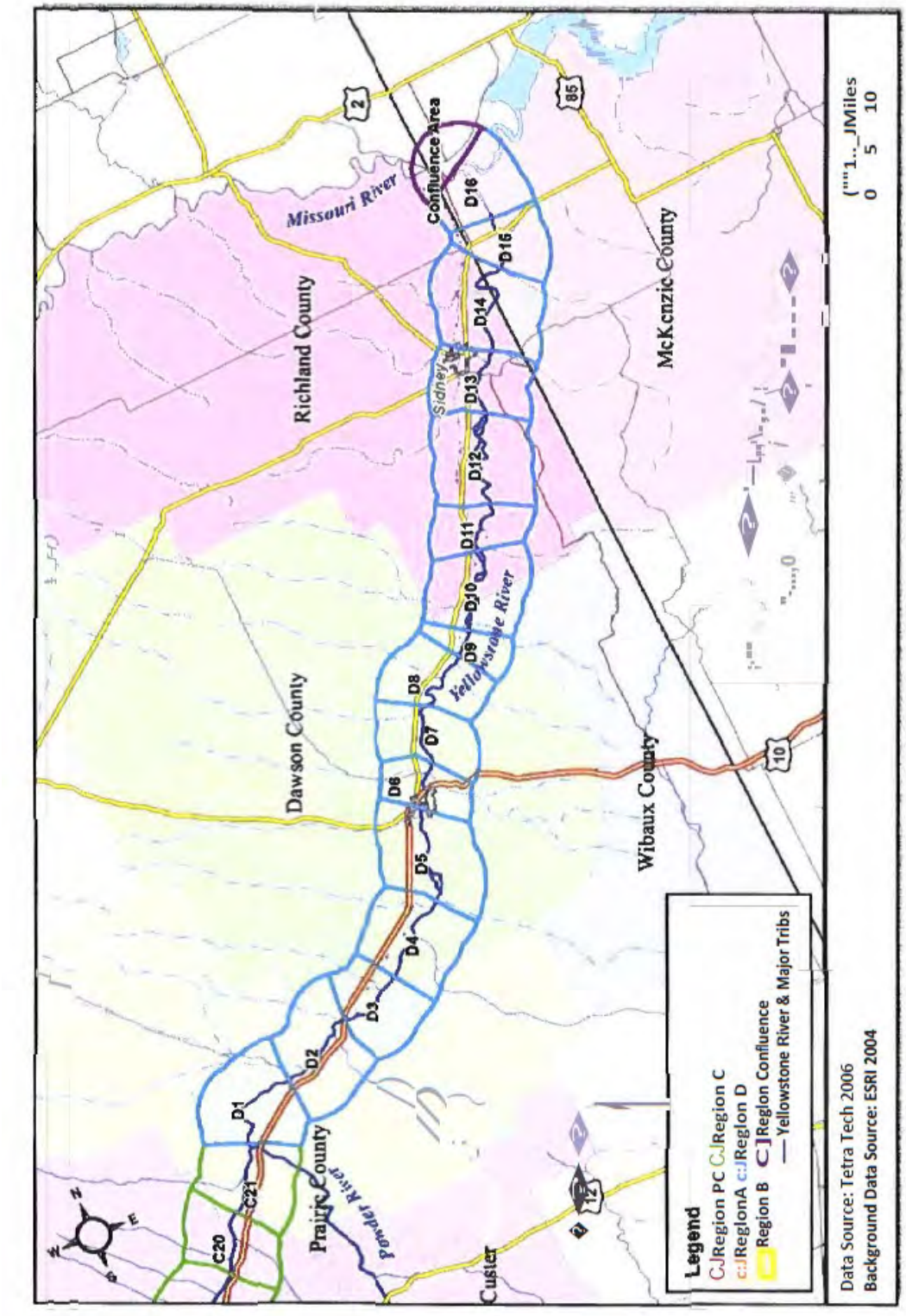
A11 Montana Animal Species of Concern

Species	Scientific Name	Common Name	Global Rank	State Rank	Habitat
Mammals	*Euderma maculatum*	Spotted Bat	G4	S3	Cliffs with rock crevices
Mammals	*Lasiurus cinereus*	Hoary Bat	G3G4	S3	Riparian and forest
Mammals	*Myotis lucifugus*	Little Brown Myotis	G3	S3	Generalist
Mammals	*Myotis septentrionalis*	Northern Myotis	G1G2	S2	Riparian & mixed forest
Mammals	*Sorex nanus*	Dwarf Shrew	G4	S2S3	Rocky habitat
Mammals	*Sorex preblei*	Preble's Shrew	G4	S3	Sagebrush grassland
Birds	*Anthus spragueii*	Sprague's Pipit	G3G4	S3B	Grasslands
Birds	*Aquila chrysaetos*	Golden Eagle	G5	S3	Grasslands
Birds	*Ardea herodias*	Great Blue Heron	G5	S3	Riparian forest
Birds	*Athene cunicularia*	Burrowing Owl	G4	S3B	Grasslands
Birds	*Buteo regalis*	Ferruginous Hawk	G4	S3B	Sagebrush grassland
Birds	*Calcarius ornatus*	Chestnut-collared Longspur	G5	S2B	Grasslands
Birds	*Centrocercus urophasianus*	Greater Sage-Grouse	G3G4	S2	Sagebrush
Birds	*Centronyx bairdii*	Baird's Sparrow	G4	S3B	Grasslands
Birds	*Charadrius melodus*	Piping Plover	G3	S2B	Prairie lakes & river shorelines
Birds	*Coccyzus erythropthalmus*	Black-billed Cuckoo	G5	S3B	Riparian forest
Birds	*Dolichonyx oryzivorus*	Bobolink	G5	S3B	Moist grasslands
Birds	*Lanius ludovicianus*	Loggerhead Shrike	G4	S3B	Shrubland
Birds	*Melanerpes erythrocephalus*	Red-headed Woodpecker	G5	S3B	Riparian forest
Birds	*Numenius americanus*	Long-billed Curlew	G5	S3B	Grasslands
Birds	*Spizella breweri*	Brewer's Sparrow	G5	S3B	Sagebrush
Birds	*Sternula antillarum*	Least Tern	G4	S1B	Large prairie rivers
Reptiles	*Apalone spinifera*	Spiny Softshell	G5	S3	Prairie rivers & streams
Reptiles	*Chelydra serpentina*	Snapping Turtle	G5	S3	Prairie rivers & streams
Reptiles	*Heterodon nasicus*	Plains Hog-nosed Snake	G5	S2	Friable soils
Reptiles	*Lampropeltis gentilis*	Western Milksnake	G5	S2	Rock outcrops
Reptiles	*Phrynosoma hernandesi*	Greater Short-horned Lizard	G5	S3	Sandy / gravelly soils
Fish	*Chrosomus eos*	Northern Redbelly Dace	G5	S3	Small prairie rivers
Fish	*Cycleptus elongatus*	Blue Sucker	G3G4	S2S3	Large prairie rivers
Fish	*Etheostoma exile*	Iowa Darter	G5	S3	Small prairie rivers
Fish	*Lepisosteus platostomus*	Shortnose Gar	G5	S1	Large prairie rivers
Fish	*Macrhybopsis gelida*	Sturgeon Chub	G3	S2S3	Large prairie rivers
Fish	*Macrhybopsis meeki*	Sicklefin Chub	G3	S1	Large prairie rivers
Fish	*Polyodon spathula*	Paddlefish	G4	S2	Large prairie rivers
Fish	*Sander canadensis*	Sauger	G5	S2	Large prairie rivers
Fish	*Scaphirhynchus albus*	Pallid Sturgeon	G2	S1	Large prairie rivers
Butterflies	*Polygonia progne*	Gray Comma	G5	S2	Woodlands, aspen parks
Mayflies	*Lachlania saskatchewanensis*	A Sand-dwelling Mayfly	G4	S1	Large prairie rivers

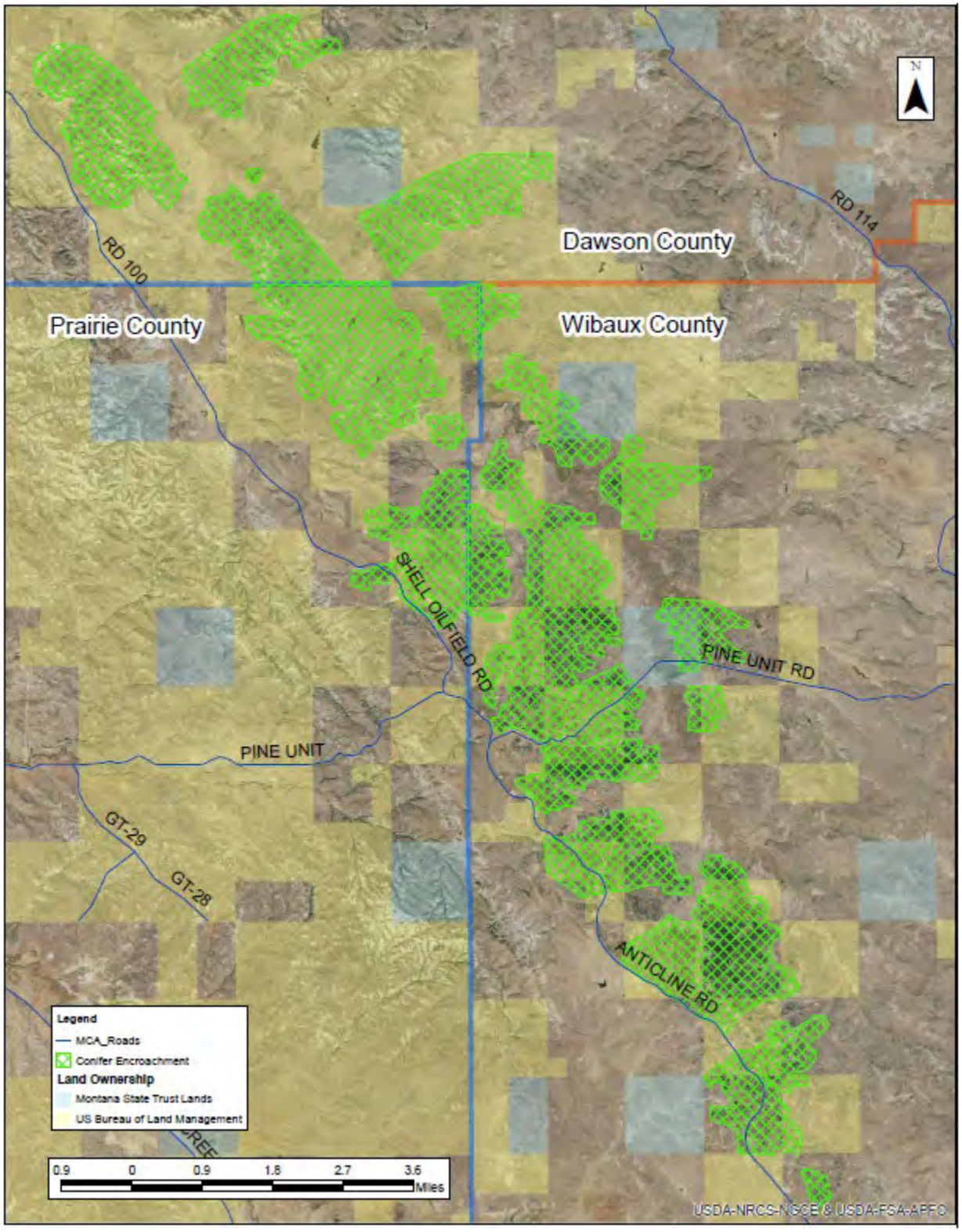
A12 10-Digit Watersheds, Dawson County, Montana



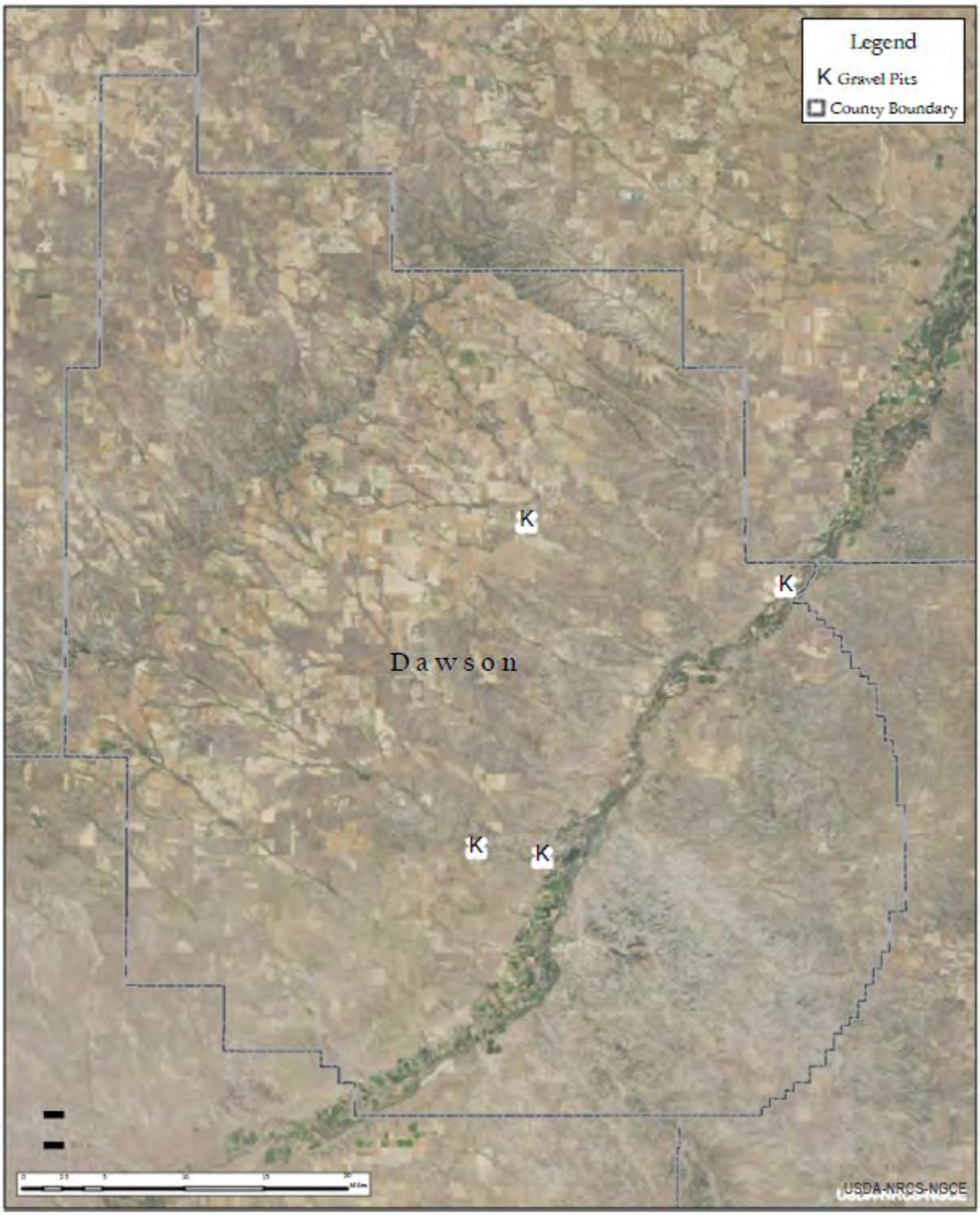
A13 Lower Yellowstone River Assessment Segments, Prairie, Dawson & Richland Counties



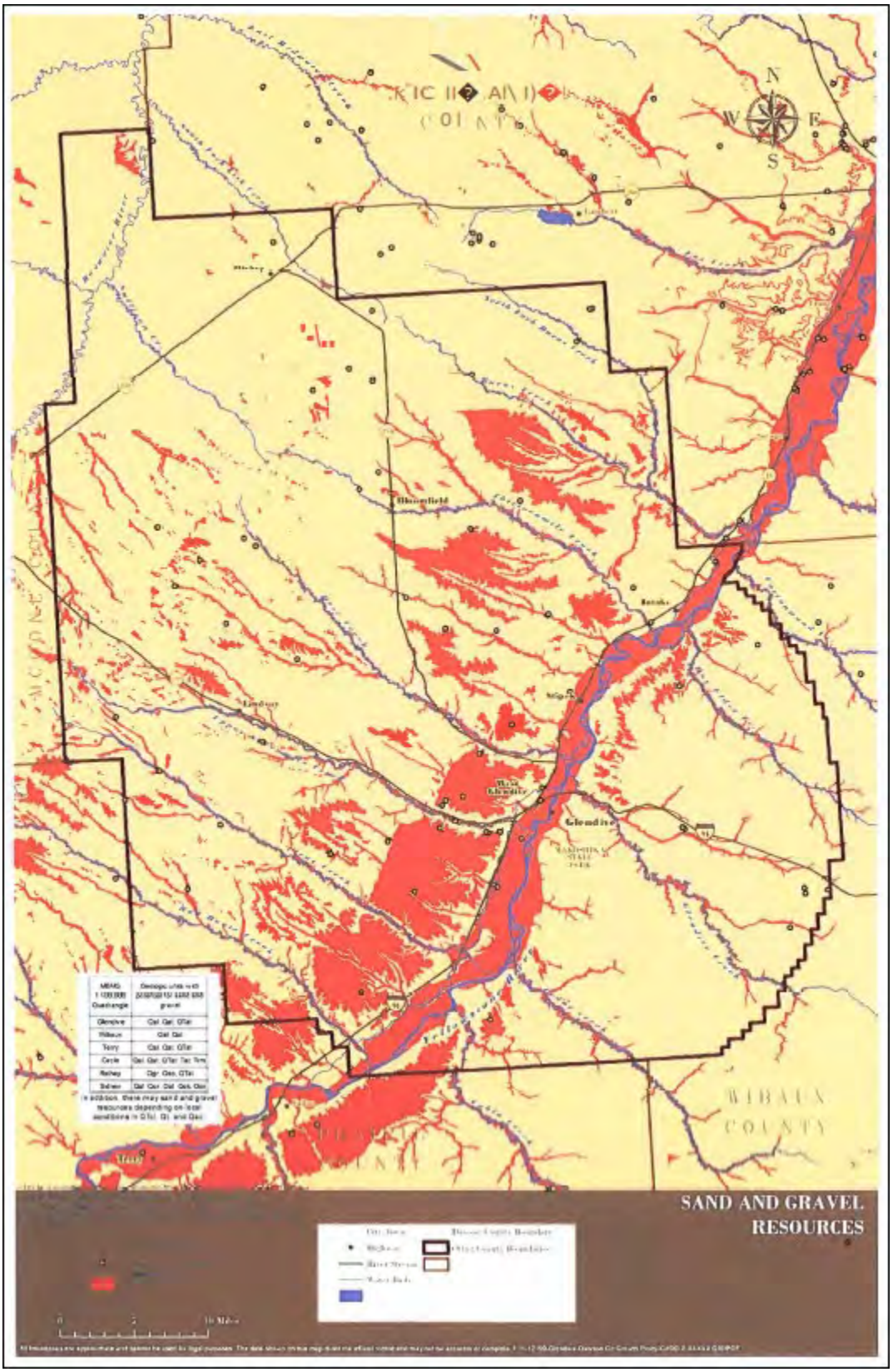
A14 Conifer Encroachment in the Cedar Creek Drainage, Dawson and Adjacent Counties.



A15 Dawson County Gravel Pits



A16 Dawson County Sand and Gravel Resources



APPENDIX B

B1 Local Work Group Meeting Minutes

Dawson County Local Work Group

Minutes 4/3/2019

Meeting was called to order at 1:05pm by Gene Evans, Supervisor, Dawson County CD. In attendance were Shelley Gustafson, Dawson County FSA; Heath Craig, Dawson County Weed District; Scott Aye, State Lands; Andy, State Lands; Cheryl Mandich, American Bird Conservatory; Martin Ellenburg, NRCS Biologist; Johnna Cameron, NRCS Areawide Planner; Tanya Gobbs, Dawson Co. Administrator; Tiffany Salveson and Linda M. Peterson-Lohse, Glendive NRCS. Buffalo Rapids Irrigation District #1; BLM, MFW&P and Dawson Co. Extension Service could not attend but provided input for the meeting.

Linda M. Peterson-Lohse, District Conservationist, welcomed attendees and asked for introductions around the table. Linda explained the purpose of the meeting and reviewed the minutes from 2015. Linda explained that she is going to send out a Resources Survey to over 800 producers in the county with the resource concerns from this meeting.

Linda informed the group about the changes to EQIP and Targeted Implementation Plan for Dawson County for 2020.

Johnna Cameron and Martin Ellenburg, NRCS MCAO, then began facilitating the discussion and went around the group to add to the list of concerns in the County.

1). Soil Health
- soil quality and soil degradation
- Decrease in organic matter

2). Soil Erosion
- tillage (dryland & irrigated), no-till, cover crops

3). Range Management
- Lack of reliable livestock water
- Plant degradation condition through-no change in grazing season

4). Noxious Weeds
- Irrigation Lands-irrigation ditches, Yellowstone River
- Rangeland & Pastures

5). Conifer encroachment – Cedar Creek
- Degraded Plant condition
- Habitat Degradation

1). Water Quantity & Quality
- Lack of water efficiency on earthen laterals, turnouts
  - Conversion from earthen laterals to buried mainline
  - Replacing leaking head gates
- Water quality degradation-sediment and fertilizer runoff
- Excessive irrigation water
  - Saline seeps developing
- Conversion of flood irrigation to sprinklers
- Lining parts of the canal that are leaking
- Cleaning out the tail water ditches and main canal of grasses and trees

2). Artisan Wells – over producing
- Excess water
- Saline Seeps
- Soil Erosion from excessive flows
- Decrease in the Water Table
- Decommissioning or valving artesian wells

Martin had the groups defined the tops 3 resource concerns for NRCs to work on. The group decided as follows for the Targeted Implementation Plans:

#1). Water Quantity & Water Quality –
- Increase water efficiency on irrigated lands through sprinklers, monitoring sensors, buried mainlines
- Decrease Saline seeps from excessive water
- Noxious weeds

#2). Range Management
- Degraded Plant Condition
- Lack of reliable livestock water
- Noxious Weeds
- Proper grazing use – fences, or system

#3). Soil Health
- Soil Quality – no till operations, cover crops, organic matter
- Erosion – Irrigation & Dryland – tillage operations
- Noxious weeds – Irrigated & Dryland Crop

As there was no more further comments or discussions the meeting was adjourned. Linda now has a list of resource concerns to put on her survey to the producers of Dawson County and direction of the resource concerns for the Targeted Implementation Plans.

B2 2015 Local Work Group

Present: Doug Buxbaum, Gene Evans, Clayton walker, Kenny Nemitz, Mark Haas, Nikki Weslock, Linda Peterson-Lohse. Nikki had made a brochure that was sent out to producers and given out at the office.

Terry Heck facilitating

List of resources in the county can lend itself to many things. NRCS looks at this and directs the funds mainly with EQIP projects. CD's help direct efforts.

NRCS asks that LWG meet every couple of years to Re-Evaluate county issues

Amount of $ allocated this year has been generous don't anticipate big swings- looking to fund mainly EQIP

-Primary resource concerns can get elevated and may be allowed additional funding

- Largest fund pool in Eastern Montana is

the grazing pool Doug says the upmost focus for

the irrigation pool will be pivots Concerns: soil

health /Rangeland/cropland

*terry said in the last 5 years there has been a big shift toward it

*one concern Terry sees a lot

*Doug asked about breaking up Rangeland to add different species of plants – terry said to get seed bed cleaned up, then plan forage crops- a lot of talk about rangeland renovations- Plant condition/ excess plant pressure: Crested wheat grass

* pivots more pivots

Erosion Concerns: mostly gully wastes; disk and hoe

drill issues. Noxious weeds in Pulse crops: limited on

what can be used for sprays

*Rotation issue

Water improvements on grazing land

*Grazing rotations

*alternative energy sources

*solar wells are

worthwhile- Doug

Education in management

practices

*Funding could come from other sources

* Soil health priority- still need to choose a specific fund pool Kathy Vogel: Conditioning livestock to eat anything including noxious weeds Priorities:

1- Soil Health

A: Livestock water, and alternate energy B: Plant Condition

- Plant pressure, noxious weeds C:

Erosion (cropland pool)

2- Education in management- new crop species/ crop diversity 3- Water Quality: Irrigation

Leave EQIP where it is at: plant condition and Health Funding Pools

- Planting condition/ grazing
- Cropland
- Dryland
- Forestry
- Soil condition

Ranking

Points for no till with rood crops under pivots Cover crops through CSP

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