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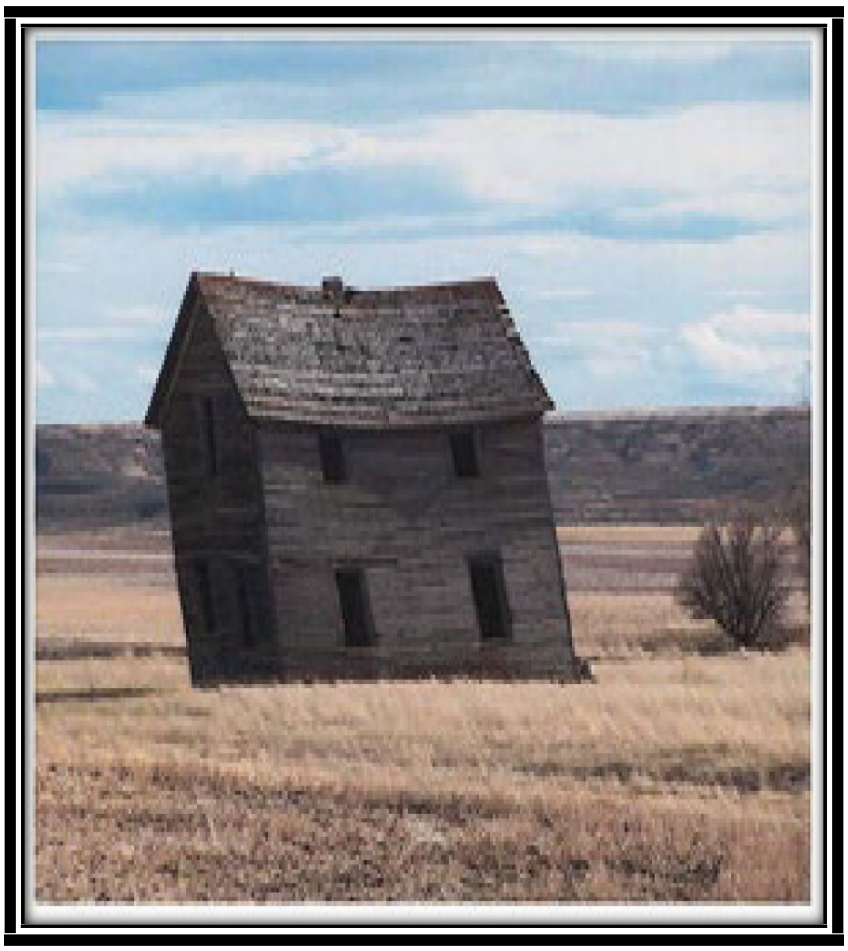

Valley County Long Range Plan

MONTANA NRCS GLASGOW FIELD OFFICE

CUMBER, TRACY - NRCS, GLASGOW, MT

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Contents

SECTION I INTRODUCTION

This Long-Range Plan is a living document that will be reviewed annually with the local citizens, producers and partners in Valley County.

Vision

Enhancing the value in biodiversity, locally led conservation, and productive working lands in harmony with a healthy environment.

Mission

To build alliances and strategically invest to effectively solve natural resource problems in Valley County. We will achieve this by providing voluntary assistance through strong partnerships with private landowners, managers, and communities to protect, restore, and enhance the lands and waters upon which people and the environment depend.

Purpose

The NRCS in Valley County presents this Long-Range Plan as an overarching guide for implementation of a focused approach to conservation. The overall purpose of this plan is to outline a more effective process for delivery of conservation assistance to agricultural producers and for addressing priority resource concerns identified by the local farmers, ranchers and partners in Valley County, Montana. The NRCS Glasgow Field Office developed this plan to help effectively address priorities provided locally.

Partners

Partnerships expand the reach and depth of conservation on the land. Conservation partners have a diversity of expertise and offer a variety of programs toward the mutual goal to maintain and improve the natural resources of the state.

There are many partners active in Valley County, including Valley County Conservation District (VCCD), Farm Service Agency (FSA), Montana Fish, Wildlife & Parks (FWP), Northern Great Plains Joint Venture (NGPJV), Montana Watershed Coordination Council (MWCC), Montana Department of Natural Resources and Conservation (MT-DNRC), Soil and Water Conservation Districts of Montana (SWCDM), Montana Association of Conservation Districts (MACD), Valley County

Weed District, Montana State University Extension Service (MSU), Bureau of Land Management (BLM), Montana Department of Environmental Quality (MT-DEQ), US Bureau of Reclamation (BOR), Valley County Schools, Valley County Local Working Group, Rocky Mountain Elk Foundation (RMEF), Mule Deer Foundation (MDF), Army Corps of Engineers, Milk River Watershed Alliance (MRWA), Wild Turkey Foundation (WTF), Trout Unlimited (TU), The Nature Conservancy (TNC), U.S. Fish and Wildlife Service (USFWS), Ranchers Stewardship Alliance (RSA), Glasgow Irrigation District, Fort Peck Tribes, Valley County and landowners.

Montana Focused Conservation

The NRCS in Montana is implementing a Focused Approach to Conservation with the overall goal of improving the effectiveness of addressing priority resource concerns within specific geographic focus areas of the state. The basis of this approach is locally led conservation. This means that the local NRCS field office, in collaboration with the Local Work Group (which includes Conservation Districts, the local community and other partners), will identify priority resource concerns and develop innovative strategies for addressing these concerns.

Another key goal of the Focused Approach to Conservation is to target conservation program expenditures through the Local Work Group to increase the total environmental benefit from such expenditures within a geographic focus area. The geographic focus areas may be watershed areas, specific land uses, soil types, or another basis. Through the conservation efforts of multiple land managers and owners within a geographic focus area, resource concerns are addressed on a larger scale. As a result, the overall condition of natural resources is improved within a watershed or other identified area.

For each geographic focus area, a Targeted Implementation Plan (TIP) will be developed consistent with the information contained in this Long-Range Plan. One of the anticipated benefits of TIPs is to streamline the planning process by conducting area-wide planning to the extent possible and minimizing the amount of planning required for individual conservation plans within a geographic focus area.

The area-wide planning process as outlined in the NRCS National Planning Procedures Handbook (NPPH), along with specific guidance provided by the NRCS- Montana State Leadership Team.

In general, each TIP will provide a general description of the geographic focus area, summarize natural resource conditions, identify priority resource concerns, state the desired future conditions, propose strategies for addressing the resource concerns, and present a targeted plan of action. Each Plan will provide the conservation systems practice quantities and costs, along with potential USDA and partner contributions.

SECTION II NATURAL RESOURCE INVENTORY

General Information

Valley County, founded in 1893, is in the northeastern part of Montana. The total area is 5,062 square miles and 2.7% of the county is water.

Valley County is bounded by Daniels and Roosevelt Counties on the east, McCone and Garfield Counties on the south, Phillips County on the west, and Saskatchewan, Canada on the north. The Fort Peck Indian Reservation encompasses much of the eastern portion of the county. The City of Glasgow is the county seat and incorporated towns include Fort Peck, Nashua, and Opheim. Unincorporated areas include Frazer, Lustre, Richmond, Hinsdale, and St. Marie. Fort Peck Reservoir and the Fort Peck Dam form the southern county boundary. The Milk River and Porcupine Creek flow into the Missouri River downstream from the dam. Table 1 lists the incorporated Cities and Towns in Valley County and their population.

TABLE 1 VALLEY COUNTY COMMUNITIES AND POPULATION

City/Town	Population
Glasgow (County seat)	3,250
Fort Peck	233
Nashua	290
Opheim	85
Frazer*	362
Hinsdale*	217
St. Marie*	264

Historical Setting

Glasgow, named after a city in Scotland, was founded in 1887 as a railroad town by James J. Hill, who was responsible for creating many communities along the Hi-Line. Glasgow grew during the 1930s when President Franklin Roosevelt authorized the construction of the Fort Peck Dam, which became a major source of employment for the Glasgow area.

During World War II the Glasgow Army Airfield housed the 96th Bombardment Squadron and 614th Bombardment Squadron, which flew the B-17 Flying Fortresses, at different times during the war. Starting in December 1944 a German POW camp was established at the facility, lasting until the end of the war.

After the war ended the base was closed, and part of the facility eventually became the present-day Glasgow Airport. Glasgow was the death place of Lieutenant Colonel Ronald Speirs, famed member of Easy Company, 101st Airborne.

In the 1960s the population rose to about 6,400 due to the nearby presence of the Glasgow Air Force Base, which was home to the Strategic Air Command (SAC) air command and B-52 bombers, which were used during the Vietnam War and the Cold War. A significant amount of mid-century modern architecture, much of which survives to this day, was built in Glasgow during this period. After the deactivation and closure of the base in 1969, Glasgow's population began declining, reaching about half its pre-base closure maximum by 1990. The population loss rate stabilized in 90s

and Glasgow currently functions as the major regional administrative, shopping, and service hub for Valley County and the areas beyond.

People

Valley County's total population is 7,437, with the largest age group makeup being those 55-59 years old. Approximately 19% of the population is 65 years old or older, and 25% are under 18 years of age.

Ninety-four percent of adults have graduated from high school and 24% have a bachelor's degree or higher. The median household income is $55,267 with 7.4% living below poverty level US Census Bureau 2019.

TABLE 2 POPULATION OF VALLEY COUNTY BY RACE AND ETHNICITY

2018 Total population	7,437
White	6,549
Black or African American	7
American Indian and Alaska Native	696
Asian	28
Native Hawaiian and Other Pacific Islander	24
Some Other Race	8
Two or More Races	249
White alone, Not Hispanic or Latino	6,417
Hispanic or Latino (of any race)	185
Veterans	590

(US Census Bureau, 2019)

Assiniboine and Sioux Tribes

Fort Peck Reservation is home to the Assiniboine and Sioux people, two separate American Indian Nations composed of numerous bands and divisions. There are 12,975 members of the tribes; about

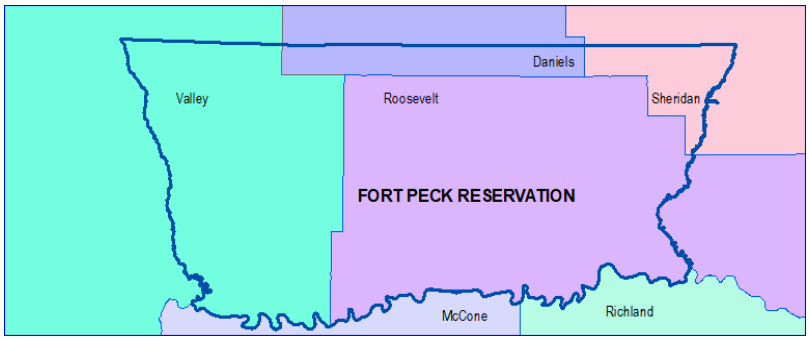

FIGURE 1 FORT PECK INDIAN RESERVATION

6,700 Tribal members live on the Reservation. Tribal Government is headquartered in Poplar, Montana.

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

Of the total area, approximately 378,000 acres are owned by the Tribes, and 548,000 acres are allotted to individual tribal members. Over half of the land on the reservation is owned by persons or entities who are not members of the Tribes. (PWNA, 2019). In Valley County, the reservation encompasses much of the eastern portion of the county. Many important projects have been implemented as a result of the Tribes' dedication to protect and conserve the natural resources on the Fort Peck Reservation.

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

Land Use

Valley County has varied land use but is primarily rural with most of the land use devoted to agriculture. Small communities and individual homes and farms are interspersed. Croplands primarily produce small grains and hay or are idle in the Conservation Reserve Program. Native rangeland and planted pastures provide forage for livestock. Livestock obtains water from dugout impoundments, wells, and surface water.

According to the National Agricultural Statistics Service (*NASS 2018*) and other sources, there are about 404,238.5 acres of non-federal crop and pastureland, 39,526.5 acres of irrigated crop, 238.2 acres of commercial forest, 5,520.1 acres of non-commercial forest acres, and 690,080.4 acres of non-federal

rangeland. There are 557 farms with an average size of 2,926 acres. Total land in farms in 2017 was 1,630,027 acres (NASS, 2017).

Land ownership is predominately public with 65% of the total 3,237,449 acres including 718,761 acres on the Fort Peck Indian Reservation. Private land comprises 35% of the total surface area. State land makes up 1.8% and water, 2.7%.

Economic Conditions

The major economy of Valley is agriculture, including small grains, cattle, pulse crops, and hay. The now abandoned air force base north of Glasgow, known as St. Marie, was a strong influence in the local economy before its closure.

As of May 2012, the major industries present in Glasgow are retail (23% of employment), public administration (16%), construction (14%), and health care and social assistance (7%). Despite its agricultural past, farmers and farm services account for only 4% of employment. The unemployment rate was 4.4% in 2012.

Future Development

Current economic trends for the region are as follows:

- Aspects of agriculture have plummeted in recent years. Counties in the region with the greatest population loss are agriculturally dependent. Population loss is an important issue in many counties.
- Some recent growth in the service and retail portions of the workforce are related to recreational tourism to Valley County and the surrounding area.
- Agricultural lands and natural areas are most of the landscape in the region.

Air

Montana Department of Environmental Quality Air Quality Bureau maintains air quality monitoring stations in 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 eastern Montana

Climate and Precipitation

In its Northeastern Montana setting, some 300 miles east of the Continental Divide, most of Valley County is far enough removed from Rocky Mountain eastern slopes so that it may be considered to have a continental type climate, with warm summers, cold winters; wet springs, and relatively light cold season precipitation. Topography is mostly of a rolling plains or hills type, cut by many coulees as one moves away from the Milk River and Fort Peck Reservoir. With an area just over 5,000 sq. mi., it is a large county with a well-defined annual average temperature gradient between southern and northern boundaries.

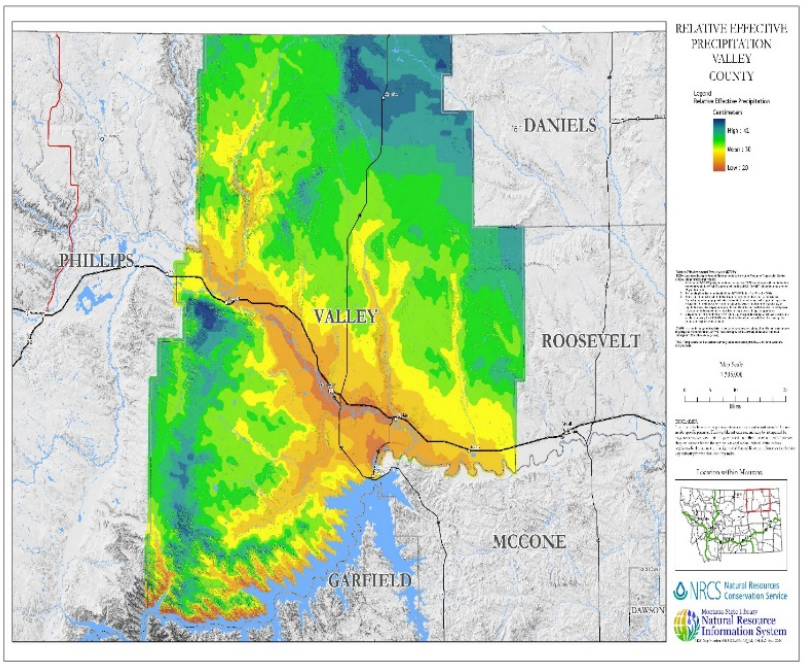

FIGURE 2 RELATIVE EFFECTIVE PRECIPITATION, VALLEY COUNTY

In this county, in contrast to more mountainous Western Montana sections, the difference in latitude from south to north appears to be more responsible for climatic variations than topography--although the familiar hill-valley effects on drainage winds, nighttime minimum temperatures, etc. also are factors. The climate element showing the largest latitude effect is temperature, areas along Fort Peck Reservoir, and Milk and Missouri Rivers averaging two to three degrees warmer, on an annual basis, than sections in the northern end of the county. This difference south to north is demonstrable in several ways, but one particularly significant point is the growing season (between 32° occurrences) which runs 124 days at Glasgow (5/19 to 9/20) on the average, but only 99 days at Opheim 12 SSE (5/31 to 9/7). Midsummer afternoon high temperatures average in the middle 80s south to about 80 north, while midwinter low temperatures run from around zero degrees Fahrenheit south to 5 below zero along the Canadian Border.

Although summers are warm, hot spells are not common, the number of days exceeding 90 F averages from 10 to 25 days per year, depending on location. Record high temperatures commonly exceed 100 F across the county. Particularly along the river bottoms (Milk and Missouri), oppressive summer heat and humidity combinations may occur for a few days in an occasional year, but such spells usually last only a day or two. Winters are normally quite cold. Several days of subzero cold occur in all years, averaging 41 days a year at Glasgow, and 50 or more along the Saskatchewan Border. This combination of warm summers and cold winters means, of course, that seasonal changes spring and fall are very rapid. May averaging about 30° colder than October.

Although not showing the wide variations common to Montana's mountainous counties, average annual precipitation ranges from about 10 to 14 inches across the county, with no definitive pattern, except that the hills northeast of Opheim tend to receive precipitation at the upper end of the range. Most importantly, 75 to 85 percent of the annual average occurs during the growing season from April through September, with June averaging 3 inches or more across most agricultural areas. Snowfall averages 25 to 35 inches a year.

Stormy weather of several kinds is observed in Valley County with some frequency. Thunderstorms occur most years and cause crop damage. Rapid snowmelt in early spring, and heavy late-spring rains, either singularly or in combination, may cause serious flooding along the Milk River and its' tributaries.

Geology

Valley County is in northern Montana in the Great Plains Physiographic Province, covering approximately 3,175,040 acres or 4,961 square miles (NRCS 1984). Surface exposures consist primarily of Tertiary and Cretaceous aged marine- and fresh-water sedimentary rock, capped by alluvium, mostly along stream, river, and tributary channels, and glacial deposits (K Scannella, NRCS Montana State Geologist, 2019).

Bedrock includes interbedded sandstones, shales, and mudstones of the Fort Union and Hell Creek Formations; beach sands of the Fox Hills Formation;

Bearpaw Formation marine shales; and fresh to brackish Judith River Formation sandstones and shales. Some deposits from the Claggett Formation marine shales are exposed at the surface. Subsurface formations are, from youngest to oldest, Eagle Sandstones, directly below the Claggett Formation, thick sequences of Colorado Group shales, and the Kootenai sandstones.

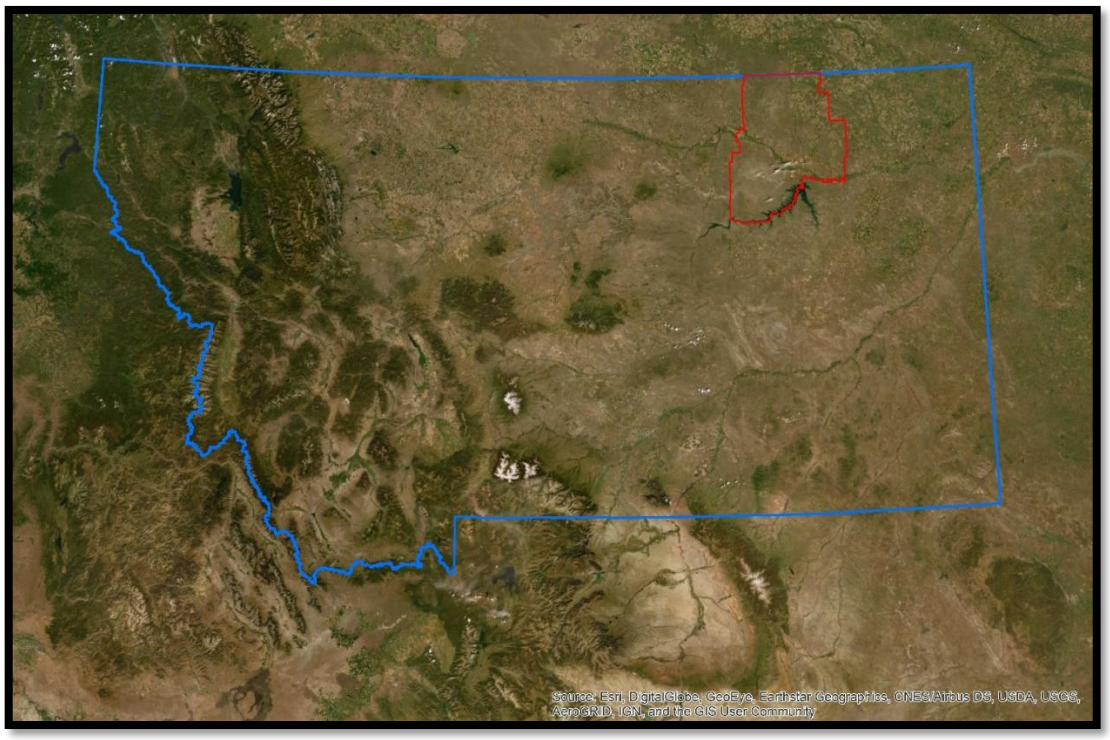

FIGURE 3 AERIAL MAP SHOWING VALLEY COUNTY IN RELATION TO THE STATE OF MONTANA

The geology of the area consists mostly of Cretaceous aged rocks.

Descriptions courtesy of Bergantino and Wilde (1998):

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

Qg. Pleistocene Glacial Drift. Generally till and outwash in deposits in Weldon-Brockton-Froid structures.

Tf. Miocene-Pliocene Flaxville Formation. Maximum thickens is about 100 feet. May include extensive gravels of Pleistocene age.

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

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

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

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

Kfh. Upper Cretaceous Hell Creek Formation. Thickness is from 230 to 280 feet.

Kb. Upper Cretaceous Bear Paw Shale.

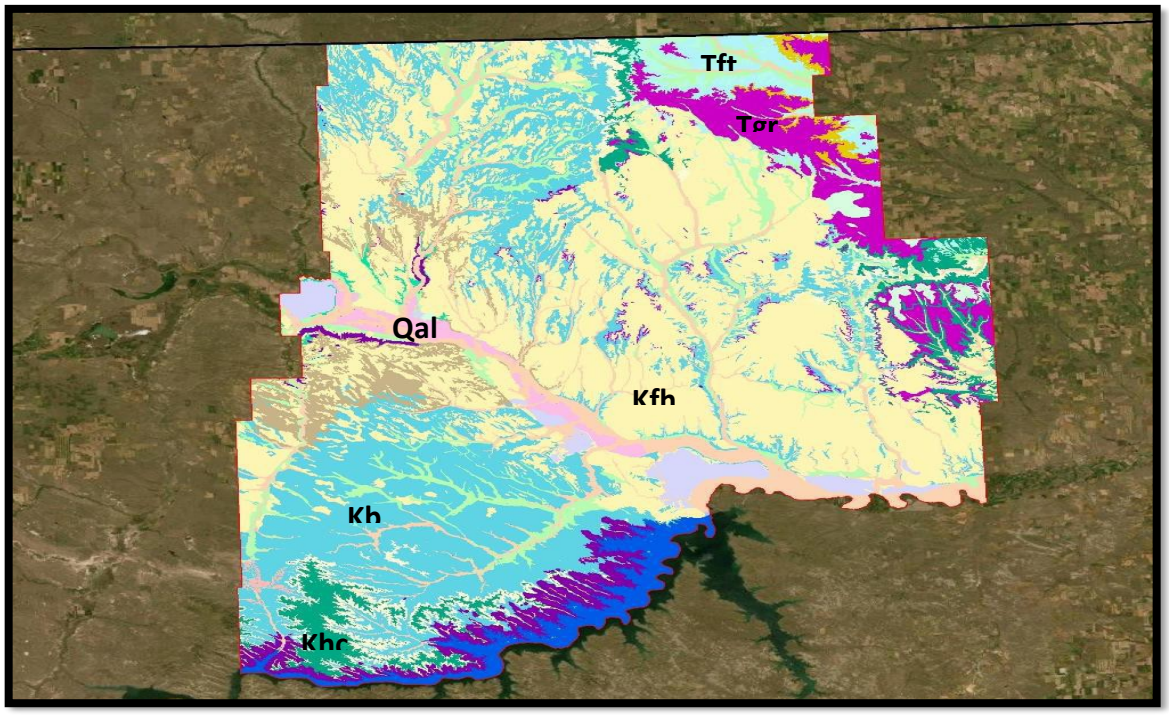

FIGURE 4 GEOLOGIC FORMATIONS IN VALLEY COUNTY

Geography

The Great Plains. Covering the eastern three-fifths of Montana, the Great Plains are part of the Interior Plain of North America that stretches from Canada south to Mexico. The area is characterized by high, gently rolling land interrupted by hills and wide river valleys. The Bear Paws, Big Snowy, Judith, and Little Rocky Mountains lie in this region.

Railroads

Burlington Northern Santa Fe (BNSF) railroad operates a mainline through the county, generally along US Highway 2. BNSF transports goods and raw materials along this line. Amtrak provides passenger rail service as part of the Empire Builder Route and operates a passenger rail station in Glasgow. The railroad runs through Nashua, Whately, and Glasgow in Valley County.

Pipelines

Figure 6 shows the gas transmission pipelines which run through Valley County.

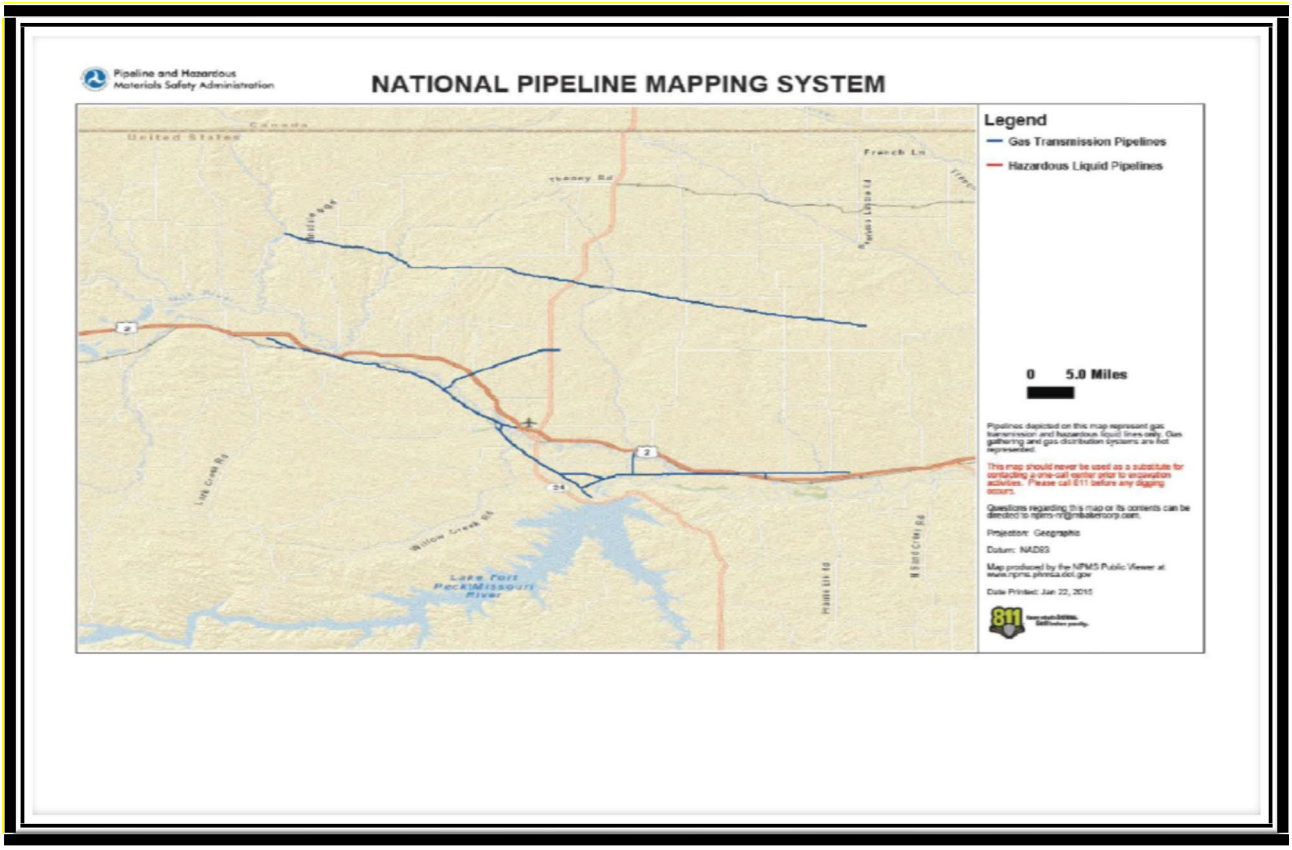

FIGURE 5 GAS TRANSMISSION LINES ACROSS VALLEY COUNTY

Pipelines depicted on this map represent gas transmission and hazardous liquid lines only. Gas gathering and gas distribution systems are not represented.

This map should never be used as a substitute for contacting a one-call center prior to excavation activities. Please call 811 before any digging occurs.

Questions regarding this map or its contents can be directed to npms-nr@mbakercorp.com. Projection: Geographic Datum: NAD83 Map produced by the NPMS Public Viewer at www.npms.phmsa.dot.gov.

Roads

The infrastructure within Valley County includes the road, rail, and air networks.

The primary road transportation routes in Valley County are US Highway 2,

Montana Highway 24, Montana Highway 42, and Montana Highway 117. Valley

County maintains about 1,888 miles of gravel roads, 58 miles of paved roads, and 50

bridges. The value of the county road infrastructure is estimated at over $215 million.

Airports

Glasgow has a commercial airport, Wokal Field (GGW) that has regional service to larger airports. The closest primary commercial service airports are in Billings, Great Falls, or Minot, North Dakota over 250 miles away. Other airports serving small private, charter, and/or government aircraft are in Fort Peck (37S), Hinsdale (6U5), and Opheim (S00).

Water Control Structures

According to the National Inventory of Dams database, Valley County has 191 dams, eight of which are significant or high hazard. This table shows the high and significant hazard dams in Valley County. (US Army Corps of Engineers, 2008).

TABLE 3 VALLEY COUNTY DAMS WITH HAZARD RATING OF SIGNIFICANT OR HIGH

STRUCTURE	LOCATION	HAZARD
Fort Peck Dam	Missouri River	High
Frazer Lake Dam East	Tributary of the Missouri River	High
Little Porcupine Dam	Tributary of Little Porcupine Creek	High
Allie Dam	Tributary of the East Fork of Cherry Creek	Significant
Cornwell Dam	Wire Grass Coulee	Significant
Halverson Dam	Buffalo Coulee	Significant
Sweet Carolyn Dam	Tributary of the Milk River	Significant
Tarum #2 Dam	Hell Creek	Significant

The Fort Peck Dam in Valley, McCone, and Garfield Counties is one of six multipurpose main stem projects on the upper Missouri River. Construction began in 1933 and the dam was completed in 1940. Fort Peck Dam is the largest hydraulically filled dam in the United States. The dam measures 21,026 feet in length with a maximum height of 250.5 feet. In addition to power generation, the water is managed for flood damage reduction, downstream navigation, fish and wildlife, recreation, irrigation, public water supply, and improved water quality. The total storage capacity of the reservoir is approximately 18.7 million acre-feet.

According to the Bureau of Indian Affairs (BIA) Dam Safety Program, the Little Porcupine and Frazer Lake Dams are both inactive dams built for irrigation. They are near one another but are separate structures.

Dams upstream of Valley County could also impact the area, including Fresno Dam, Nelson Dikes, and Frenchman Dam. A break on the Fresno Dam, located in Hill County, or a break on the Nelson Dikes, located in Phillips County, could affect areas of Valley County along the Milk River. The Frenchman Dam, located in Phillips County, is considered a low hazard dam, but a break may compound existing flooding.

Water/Wastewater Treatment

Sewer and Water

Municipal water and sewer systems exist within each of the incorporated communities and throughout unincorporated communities in the county. The water systems typically consist of groundwater wells or pumps from a body of water. The sewer systems generally have treatment plants and/or lagoons. Both water and sewer use underground pipes to service customers. The City of Glasgow pumps water from the Missouri River and has a backup well system. County residents outside of the water and sewer districts rely on individual well, and septic systems.

Solid Waste Disposal

Valley County has a landfill located in Glasgow. It has hours of operation Monday through Saturday. The residents of Valley County can dispose of solid waste materials here. Residents can also find solid waste disposal for a variety of other materials by finding locations on the Montana state government website.

Waste Management

The county operates waste management services for the residents in the county. Household waste is picked up by waste management. In addition, the Montana Department of Agriculture has a waste pesticide and metal pesticide container disposal program that residents can participate in.

Fire Protection

Valley County Long Run Fire Department owns and operates ten fire stations in Valley County. These stations are by volunteer firefighters and

located in or near the cities of Opheim, Richland, St. Marie, Lustre, Glasgow, Hinsdale, Nashua, Frazer, Fort Peck, and Pines.

Healthcare

There is one hospital located in Valley County. Frances Mahon Deaconess Hospital is located on 3rd Street in Glasgow. The hospital is a nonprofit healthcare facility that has provided services to the community since 1911.

Public Utilities

Electric providers in Valley County include Northern Electric Cooperative, based in Opheim, Valley Electric Cooperative, based in Glasgow, and Northwestern Energy, based in Sioux Falls, SD. Much of the electric service north of Highway 2 is transmitted through overhead lines. These lines are supported by poles and have key components such as transformers and substations. In south Valley, the electricity is transmitted through underground lines in order to prevent collision or injuries to bird species.

Natural Gas

Natural gas in the area is provided by Montana-Dakota Utilities through an underground pipeline infrastructure.

Propane/Fuel Oil

Buildings heated with propane and fuel oil typically have a nearby tank that is refilled regularly by a local vendor. The vendor uses a truck to transport the propane/oil to the users. Therefore, the vendors rely on accessibility to the communities and rural residents via the road network. Should any areas become isolated due to poor road conditions, the vendor may not be able to access the tanks to refill them.

Telephone

Local telephone services in the county are provided by Nemont based in Scobey. Like electric infrastructure, the telephone can be run through overhead or underground lines. Much of the telephone infrastructure in Valley County lies within the road rights-of-way.

Natural Resources

The Great Northern Development Corporation developed a Regional Needs Assessment for Sheridan, Daniels, Roosevelt, Valley, Garfield, and McCone Counties in 2013. This assessment included information about exploitable natural resources in the region. The area is rich in natural resources such as coal, oil and gas, the wind and solar power. The number of jobs has increased in non-farm industries with a definite increase in oil and gas exploration. Non-farm or service jobs have increased as the Fort Peck water pipeline treatment plant and an inlet for the regional water system implements the installation phase.

Dry Prairie Rural Water Authority & the Assiniboine and Sioux Rural Water System

Collectively, these two systems operate together as the Fort Peck Rural Water System. Fort Peck Rural Water System is a municipal, industrial, and rural water system that operates on and off the reservation in Daniels, Sheridan, Roosevelt and Valley counties. The project brings high quality Missouri River water, treated to meet all national safe drinking water standards, to existing municipal water systems, rural households, and livestock pasture taps throughout northeastern Montana. The two systems share common facilities, including the intake facility and the water treatment plant. The tribal system is operated by the Fort Peck tribes and held in trust by the U.S. government for the tribes. Federal ownership of the system on the reservation cannot change without an act of Congress. Water rights for this project were furnished by the tribes from their water rights from the Missouri River.

The major components of the project are an intake facility on the Missouri River, southeast of Wolf Point. This pumping plant will serve a 13-million gallon-per-day treatment facility. The water will be treated to meet all State and Federal drinking standards, the water will be pumped through 3,200 miles of pipeline by 20 pump stations and will be delivered to a design population of 31,000 persons for municipal, rural, industrial, and livestock purposes in a 7,800-square-mile area of northeastern Montana. In Valley County Dry Prairie currently has lines into Nashua and Glasgow.

Schools

Glasgow Public School District educates the youth of Valley County by providing kindergarten through the 12 thgrade. The district has three schools: Irle Elementary School, East Side School, and Glasgow High School.

Water

Existing water quality reports across Valley County indicate water quality is generally good. However, there is a possibility for high total dissolved solids, sulfate, fluoride, manganese, and iron levels in groundwater. A few wells have mineral contents that exceed safe standards for domestic use but were okay for livestock use. Examined water quality reports included both shallow and deep wells (<2,800-feet-deep). Minerals are mostly byproducts from shale and phosphate rocks.

Impaired Streams

303(d) listed streams and their impairments for Valley County in 2018 are as follows:

- Beaver Creek (uranium, cadmium, copper, dissolved oxygen)
- Fort Peck Reservoir (lead, mercury, ammonia, un-ionized, nitrate, nitrite, phosphorus)
- Frenchman (mercury, iron, nitrate, nitrite)
- Lower Milk (Escherichia coli, mercury, iron, nitrate, nitrite)
- Middle Milk (Escherichia coli, mercury, iron, nitrate, nitrite)
- Poplar (Escherichia coli, sedimentation, temperature)
- Porcupine (nitrogen, phosphorus, salinity)
- Prairie Elk-Wolf (nitrogen, phosphorus, salinity)
- Rock (mercury, iron, nitrate, nitrite)
- West Fork Poplar (Escherichia coli, sedimentation, temperature) Groundwater

In Valley County, alluvial aquifers consist of fine-grained, consolidated sandstone and siltstone. In these aquifers, water movement is slower. This is due, in part, to lower amounts of precipitation. However, water moves faster in deeper aquifers made of cracked rock, gravel, or coal. Examples of these deep aquifers include the Fort Union Formation and the Eagle Sandstone coal-bearing aquifers.

Lakes

There are 4 natural lakes in Valley County, Montana. The lakes are Lake Elbert, Lake Grable, Dry Lake, and Todd Lakes. There are also over 250 reservoirs in Valley County, Montana.

Rivers

The Missouri River borders Valley County's southern edge and is one of three rivers in the county. The Missouri River is the longest river in North America. Rising in the Rocky Mountains of western Montana, the Missouri flows

east and south for 2,341 miles (3,767 km) before entering the Mississippi River north of St. Louis, Missouri. The river takes drainage from a sparsely populated, semi-arid watershed of more than half a million square miles (1,300,000 km^2), which includes parts of ten U.S. states and two Canadian provinces. When combined with the lower Mississippi River, it forms the world's fourth longest river system.

For over 12,000 years, people have depended on the Missouri River and its tributaries as a source of sustenance and transportation. More than ten major groups of Native Americans populated the watershed, most leading a nomadic lifestyle and dependent on enormous buffalo herds that once roamed through the Great Plains. The first Europeans encountered the river in the late seventeenth century, and the region passed through Spanish and French hands before finally becoming part of the United States through the Louisiana Purchase. The Missouri River was long believed to be part of the Northwest Passage – a water route from the Atlantic to the Pacific – but when Lewis and Clark became the first to travel the river's entire length, they confirmed the mythical pathway to be no more than a legend.

Another river running through the county is the Milk River. The Milk River is a tributary of the Missouri River, 729 mi (1,173 km) long, in the United States state of Montana and the Canadian province of Alberta. Rising in the Rocky Mountains, the river drains a sparsely populated, semi-arid watershed of 23,800 sq. mi (62,000 km^2), ending just east of Fort Peck, Montana. It is formed in Glacier County in northwestern Montana, 21 miles (34 km) north of Browning, Montana, by the confluence of its South and Middle forks. The 30-mile (48 km) long South Fork and 20-mile (32 km) long Middle Fork both rise in the Rocky Mountains just east of Glacier National Park, in the Blackfeet Indian Reservation. Much of the water in the North Fork is diverted from the St. Mary River through a canal and inverted siphon.

The main stream flows east-northeast into southern Alberta, where it is joined by the North Fork of the Milk River, then east along the north side of the Sweetgrass Hills. It flows past the town of Milk River and Writing-on-Stone

Provincial Park, then turns southeast into Montana, passing through the Fresno Dam, then east past Havre and along the north side of the Fort Belknap Indian Reservation. Near Malta, it turns north, then southeast, flowing past Glasgow and joining the Missouri in Valley County, Montana, 5 miles (8.0 km) downstream from Fort Peck Dam.

The Milk River is the northernmost major tributary of the Missouri River and thus represents the rough northern extent of the Mississippi watershed. The small area drained by the Milk River in southern Alberta and southwestern Saskatchewan is one of three areas in Canada that drain into the Gulf of Mexico, the others are the Big Muddy Creek and Poplar River watersheds which extend into Canada in Saskatchewan.

The Milk River was given its name by Captain Meriwether Lewis, of the Lewis and Clark Expedition, who described the river in his journal: "the water of this river possesses a peculiar whiteness, being about the color of a cup of tea with the admixture of a tablespoonful of milk from the color of its water we called it Milk river." This appearance results from clays and silts suspended in its waters. These fine-grained sediments result from the erosion of soft clay-rich rocks along the Milk River basin in southern Alberta, such as the Foremost, Oldman, and Dinosaur Park formations.

At the time of Lewis's exploration, the Milk River drainage was legally part of the United States as a component of the Louisiana Purchase. However, in 1818 U.S. negotiators swapped a portion of the Milk River watershed that lay north of 49° north latitude, receiving in exchange a parcel of Red River of the North drainage that had previously been part of British North America. In 1908, the waters of the Milk River were the subject of a United States Supreme Court case clarifying the water rights of American Indian reservations. The case is known as Winters v. the United States.

The Milk River has several tributaries in Valley County. Going upstream (east to west), the tributaries include Porcupine Creek, Willow Creek, Cherry Creek, Brazil Creek, Antelope Creek, Rock Creek, and Beaver Creek.

Porcupine Creek starts in Northern Valley County south of Opheim and flows east of St. Marie and empties into the Milk River about a mile east of Nashua.

Willow Creek drains a large portion of Southwest Valley County and empties into the Milk River just west of the Highway 24 Bridge near Glasgow. Cherry Creek drains Central Valley County between Glasgow and St. Marie. It flows south through the west end of Glasgow and into the Milk River just southwest of Glasgow.

Both Brazil and Antelope Creeks flows out of the Larb Hills of Western Valley County and into the Milk River between Tampico and Glasgow. Rock Creek forms in Grassland National Park in Saskatchewan just north of the U.S. border. It drains most of Northwest Valley County and flows into the Milk River east of Hinsdale. Beaver Creek forms in the Little Rocky Mountains of Southwest Phillips County and flows northeast into Valley County near Saco. It empties into the Milk River west of Hinsdale. Beaver Creek's tributary in Valley County is Larb Creek. The creek splits the Larb Hills and the Valley/Phillips county line as it flows north from far southwest Valley County into Beaver Creek near Beaverton. The West Fork of the Poplar River is the third river flowing across Valley County. It is formed near Wood Mountain, Saskatchewan just north of the Montana border. It flows southeast into Valley County about a mile east of the Port of Opheim border crossing. The river then flows southeast across the far northeast part of Valley County and initially exits the county about 5 miles northeast of Glentana. The river clips a corner of Valley County near Richland, Montana before exiting the county for the final time.

Watersheds in Valley County

4th order

- Rock Creek
- Frenchman Creek
- West Fork Poplar
- Prairie Elk-Wolf
- Porcupine
- Lower Milk
- Middle Milk
- Beaver Creek

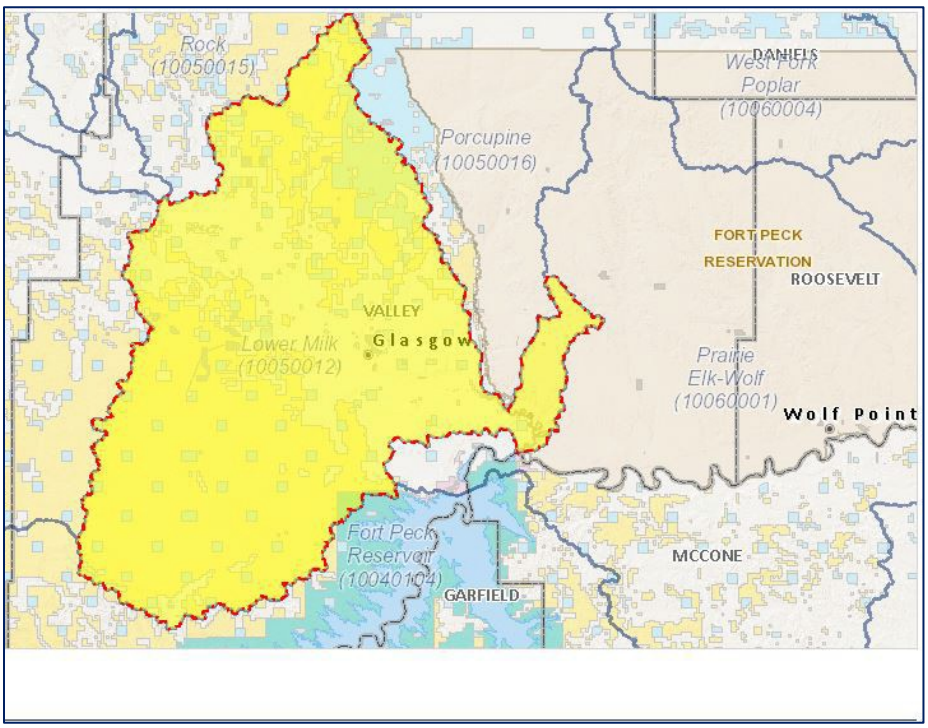

FIGURE 6 WATERSHEDS IN VALLEY COUNTY (US EPA)

Soil

The soils in Valley County formed in glacial till and under prairie vegetation. The average annual precipitation is about 12 inches. The average annual air temperature is about 43 degrees F. The frost-free period is about 115 days. These soils are named for the town of Scobey, in northeast Montana. The series was established in 1928. The original complete soil survey is available for public access online through Web Soil Survey.

There is some prime farmland in the county. Most of the prime farmland occurs along the historic flood plains and alluvial fans of the Missouri River and its tributaries. Soils are largely silty clays, clays, silty sands, and clayey sands weathered from sedimentary and igneous rocks.

Topography

Elevations in Valley County range from about 2,000 to 3,300 feet above sea level. The City of Glasgow is located on the valley floor at about 2,100 feet above sea level. Hills rise sharply from the northern edge of Glasgow to flat tableland about 200 feet higher than the valley. A gradual incline commences 3 to 4 miles

south and southwest of Glasgow and reaches to the rolling hills that separate the Milk River drainage from the Fort Peck Reservoir on the Missouri.

Vegetation

Valley County is a part of the Great Plains Mixed Grass Prairie system. Approximately 36% or close to 2 million acres are prairie grasslands. Grasses typically comprise the greatest canopy cover, and western wheatgrass (*Pascopyrum smithii*) is usually dominant. Other grass 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. Fire and grazing are the primary drivers of this system.

Drought can also impact the prairie grassland, in general favoring the shortgrass component at the expense of the mid-height grasses. With intensive grazing, cool season exotics such as Kentucky bluegrass (*Poa pratensis*), smooth brome (*Bromus inermis*), and Japanese brome (*Bromus japonicus*) increase in dominance; both rhizomatous species have been shown to markedly decrease species diversity. Previously cultivated acres that have been re-vegetated with non-native plants have been transformed into associations such as Kentucky bluegrass/western wheatgrass or into pure crested wheatgrass (*Agropyron cristatum*) stands.

The Sagebrush Steppe system covers over 645,000 acres or approximately 20% of the county. Throughout its distribution, soils are typically deep and non-saline, often with a microphytic crust. Overall shrub cover may be as low as 5 percent, or as high as 25%, but this system is always dominated by perennial grasses and forbs with greater than 25% cover. In northern Valley County, stands are more mesic, with more grass biomass and less shrub diversity than stands farther to the south. Fifty to 90% of prairie grassland occurrences are dominated by Wyoming big sagebrush (*Artemisia tridentata wyomingensis*) with western wheatgrass. Shrubs may increase following heavy grazing and/or with fire suppression. For the past several years there has been an increase of Japanese brome and cheatgrass (*Bromus tectorum*), possibly due to the colder climate and shift in seasons.

Within the Sagebrush Steppe, the Badlands are shaped by the carving action of streams, erosion, and erosible parent material. It is easily recognized by its rugged, eroded, and often colorful land formations, and the relative absence of vegetative cover. In those areas with vegetation, species can include scattered individuals of many dryland shrubs or herbaceous species, including curlycup gumweed (*Grindelia squarrosa*), snakeweed (*Gutierrezia sarothrae*) (especially with overuse and grazing), greasewood (*Sarcobatus vermiculatus),* Gardner's saltbush *(Atriplex gardneri),* buckwheat *(Eriogonum species),* plains muhly *(Muhlenbergia cuspidata),* bluebunch wheatgrass *(Pseudoroegneria spicata),* and Hooker's sandwort *(Arenaria hookeri).* Patches of sagebrush *(Artemisia spp.)* also occur. The sedimentary parent material of exposed rocks and the resultant eroded clay soils are derived from Cretaceous seabeds and are often fossil- rich. Dominant soil types exhibit little to no soil development other than the presence of an identifiable topsoil layer. These mineral soils are found primarily on uplands, slopes, and creek bottoms and are easily erodible. The growing season is short, and land use is limited to incidental grazing.

North Valley County is also part of the Prairie Pothole system and the potholes vary in depth and duration. At the drier extremes, pothole vegetation generally occurs in a concentric pattern from a wetter area dominated by spikerush (*Eleocharis* spp.), a drier ring of foxtail barley (*Hordeum jubatum*), and an outer margin of western wheatgrass or thickspike wheatgrass.

The Great Plains Riparian and Floodplain systems occur along the Missouri and the Milk River. Narrowleaf cottonwood (*Populus angustifolia*) and Plains cottonwood (*P. deltoides*) dominant where the ecological process has allowed. In relatively undisturbed stands, willow (*Salix* spp.), redosier dogwood (*Cornus sericea*) and common chokecherry (*Prunus virginiana*) form a thick, multi-layered shrub understory, with a mixture of cool and warm season graminoid species in the understory. Box elder (*Acer negundo*) and green ash (*Fraxinus pennsylvanica*) form a tree overstory in mid-seral and late-seral stands.

The hydrology of these floodplain systems has been affected by dams, highways, railroads and agricultural ditches, and as a result, they have lost their characteristic wetland /riparian mosaic structure. This has resulted in a highly altered community consisting of relict cottonwood stands with little regeneration. The understory vegetation is dominated by non- native pasture grasses, legumes and other introduced forbs, or by the

disclimax western snowberry (*Symphoricarpos occidentalis*) and rose (*Rosa* species) shrub community.

The northeast portion of Valley County is where the majority or 24% of the cultivated cropland and lands enrolled in the Conservation Reserve Program (CRP) occur.

The hay ground lies along the Milk River where alfalfa, barley hay and mixed grass are irrigated mainly by flood. Agricultural plant cover is variable depending on season and type of farming and may be dry-farmed or irrigated (*mtnhp.org*).

MNHP Plant Species of Concern

Montana Natural Heritage Program (MNHP) describes 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 MTNHP Plant Species of Concern Report last updated on October 31, 2019 lists 13 plant species for Valley County.

- Alkali Marsh Aster
- Scarlet Ammannia
- Lead Plant
- River Bulrush
- Chaffweed,
- Bractless blazingstar
- Slim-pod Venus'-looking glass
- Hot Spring Phacelia
- Silver Bladderpod
- Slender-branched Popcorn-flower
- Platte Cinquefoil
- Dwarf woolly-head
- Scribner's Ragwort,

Animals

North Valley County represents some of the most intact remaining prairie in Montana and the entire North American continent and is of global significance (The Nature Conservancy 1999). Within this unique sagebrush steppe ecosystem, the longest recorded migratory events for both greater sage-grouse (*Centrocercus urophasianus*) and pronghorn (*Antilocapra americana*) have been discovered (*Newton et al. 2017, Jakes et al. 2018b).*

With an estimated 18% of the total greater sage-grouse population and about 20% of the species' occupied range in its borders, Montana is the northernmost stronghold for greater sage-grouse and is key to the species' survival.

The state's greater sage-grouse also play an important role connecting with struggling populations to the north (Canada) and east (the Dakotas).

Unlike some western states, about two-thirds of Montana's sage-grouse habitat is on non-federal land, and often occurs across a mixed, or "patchwork", distribution of private, state, and federal lands. Consequently, management and cooperation that accommodate this mixed ownership distribution is of importance in Montana. In Montana, disturbance related to energy development and infrastructure is a primary threat to greater sage-grouse.

Montana, along with several other western states, has been the focus of multiple past petitions to list the greater sage-grouse under the Endangered Species Act (ESA). 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 threat to greater sage-grouse. On September 22, 2015, the U.S. Fish and Wildlife Service (USFWS) determined that the greater sage-grouse did not warrant listing protections under the ESA. It was decided that the primary threats to populations had been ameliorated by conservation efforts implemented by Federal, State, and private landowners.

In Valley County, marked females moved 21.5-122.1 km between breeding grounds in southern Saskatchewan and wintering grounds south of the Milk River; once on wintering grounds females moved an average linear distance each day of 0.25 km but up to 2.5 km (Tack et al. 2011). Reports also discuss even longer movements (lasting a month) of about 160 km due to deep snowpack on traditional wintering area located in south Valley County (Smith 2013).

Adults eat leaves, buds, stems, flowers, fruit, and insects, but mainly leaves year-round. Sage-grouse do not possess a muscular gizzard, so they do not rely on seeds. Sage-grouse are sagebrush-dependent, and it is essential to their survival. The grouse's diet is dominated by sagebrush in late autumn, winter, and early spring, and sagebrush and forbs in summer, with insects mostly a minor summer component. The diet of juvenile sage-grouse includes a larger proportion of insects (Orthoptera,

Coleoptera, Hymenoptera), especially during first three weeks of life, with the importance of forbs increasing with juvenile age *(Schroeder et al. 1999)*.

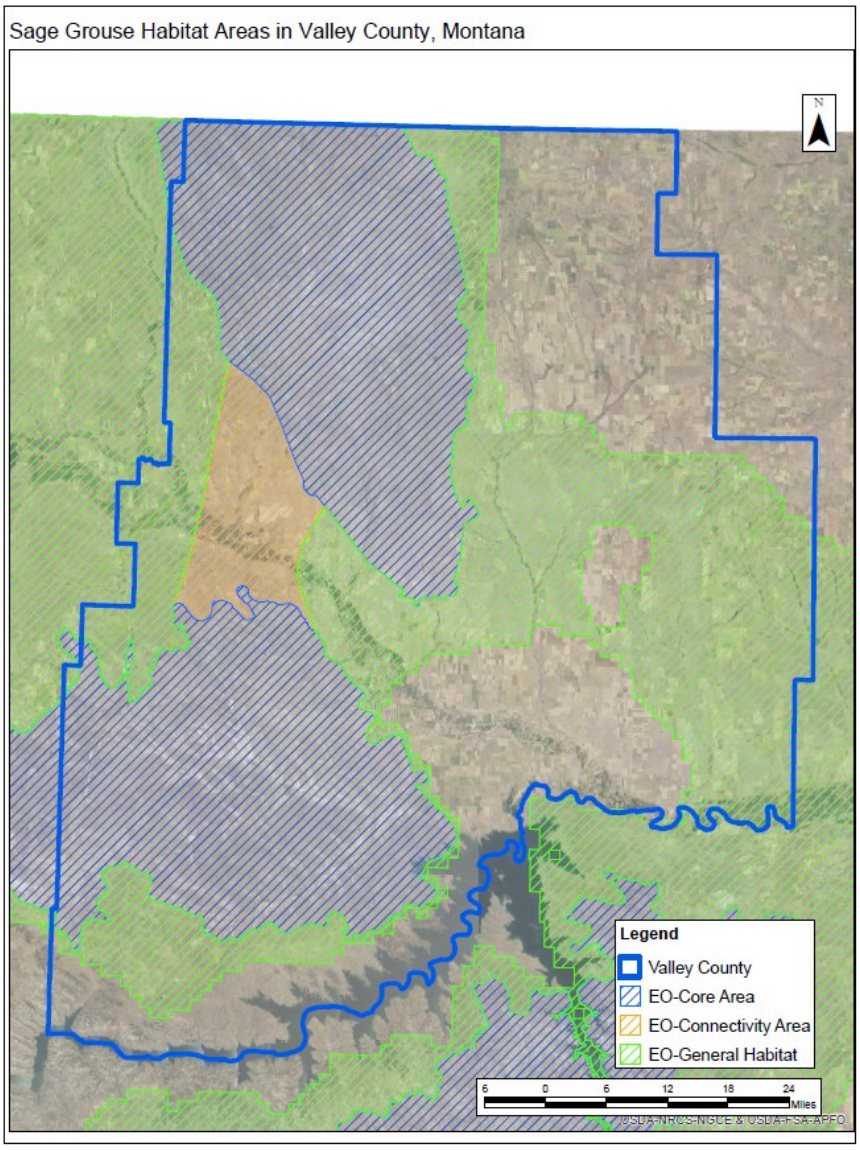

FIGURE 7 GROUSE HABITAT AREAS

Aquatic Focal Areas

Montana's State Wildlife Action Plan (SWAP) identifies the Milk River and the Lower Missouri as two of the top Aquatic Focal Areas in the state for diversity of aquatic SOCs and game fish. The upper portion of the Milk River does not have fish barriers, and riparian and instream habitat are in good condition. The middle and lower Milk River is heavily impacted by many fish barriers that eliminate fish

migration on normal and low water years. The Vandalia Dam is a complete barrier to fish migration (http://fwp.mt.gov/).

Big Game

Pronghorn in Valley County appear to have historic north-south migratory routes to travel between their summering and wintering grounds at the northern periphery of their range and are adapted to open landscapes, including prairies. As a result, pronghorn prefer to crawl under fences as opposed to jumping over them. Consequently, managing for seasonal migrations for pronghorn and sage-grouse can provide insights to conserve or enhance functional connectivity across their geographic range and they may serve as umbrella species for making conservation-related decisions (*Tack et al., In Review*).

The Rancher's Stewardship Alliance and its partners coordinate and implement projects to increase landscape permeability for ungulates moving across the region. A primary conservation focus for big game species in grasslands is to reduce habitat fragmentation to maintain daily and seasonal long-distance movements and overall habitat connectivity (Berger 2004, Hilty et al. 2006, Taylor et al. 2006). Linear anthropogenic features such as fences can be particularly disruptive of daily movement patterns, long- distance migration, and landscape connectivity. Animals can become entangled in fences, sustain injuries from crossing fences, and incur unsustainable metabolic deficits in search of successful migratory pathways (*Jones 2014, Jakes et al. 2018*).

The lessons we will learn from the species can also directly and/or indirectly conserve many other species that make up the ecological community of its habitat that must navigate habitat loss and fragmentation across these open landscapes.

Big game migration corridors and winter range have received national attention with the U.S. Secretary of the Interior's Secretarial Order (SO) 3362. This order directs bureaus within the Department of the Interior to conserve big game migration corridors and winter range for mule deer, pronghorn, and elk. To assist with implementation of SO 3362, Montana Fish, Wildlife & Parks has identified priority areas in the state and the Canadian Border to Musselshell Plains Priority

Area includes part of Valley County.

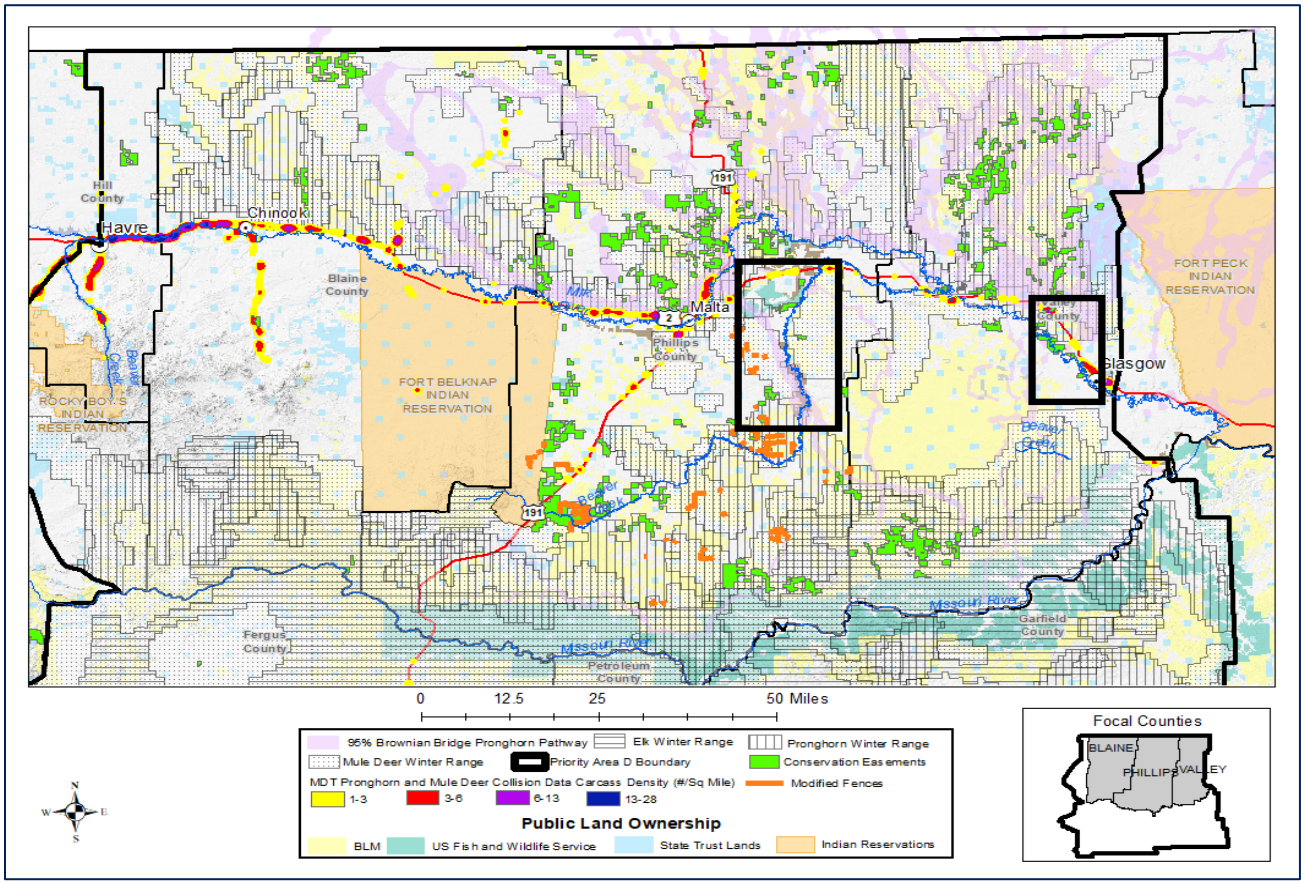

FIGURE 8 MONTANA FWP WILDLIFE PRIORITY AREAS IN VALLEY COUNTY

Grassland habitat in north Valley County is critical to the Sprague's pipit (*Anthus spragueii*) and several other grassland birds. Peregrine falcons are known to occur only as migrants.

Grassland Bird Species of Concern

Several species of grassland birds are Montana species of concern in Daniels County. Vickery et al. explain the recent decline of grassland birds and probable causes of their decline in Grassland Birds: An Overview of Threats and Recommended Management Strategies.

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

Shortgrass prairies evolved under intense grazing by prairie dogs and bison. Consequently, the shortgrass prairie bird fauna evolved to select a variety of different site characteristics, created within landscapes receiving grazing pressure ranging from light to severe. Unfortunately, current range management practices strive to graze rangelands uniformly. These practices remove or inhibit heterogeneous grazing impacts across landscapes, and do not favor the specific habitat requirements of many species.

For example, Mountain Plovers require heavily grazed sites for breeding, but Lark Buntings prefer denser vegetation. Thus, moderate grazing everywhere is unlikely to result in suitable habitat for either species. In many locales, insufficient grazing has led to the invasion of grasslands by shrubs and forbs. Rather than opposing grazing as a management tool in all grasslands, conservation groups should encourage grazing that imitates natural conditions as closely as possible." (Vickery, 2000).

 **Baird's Sparrow** (*Centronyx bairdii*)	Prefers to nest in native prairie; requires a relatively complex plant structure including areas of light to no grazing. Feeds on seeds, insects and spiders. Migrates from winter habitat in Mexico to the grasslands of the northern plains in Montana, North Dakota and Canada. Loss of native prairie habitat due to agricultural conversion and loss of winter habitat due to overgrazing are thought to be causes of population decline (MNHP, 2019).
 **McCown's Longspur** *(Rhynchophanes mccownii)*	Prefers semi-arid shortgrass steppe, open with sparse vegetation. Migrates in large flocks between breeding ground in the Canadian Prairie Provinces and northwestern Great Plains and wintering grounds in the southwestern US and northern Mexico. Decreasing range-wide abundance can be attributed to conversion of short-grass prairie to agriculture and urban development (MNHP, 2019).

 **Chestnut-collared Longspur** *(Calcareous ornatus)*	Prefers open, sparse vegetation in native pastures with short-to-medium grasses that have been recently disturbed (grazed, mowed or burned). Summer diet includes insects, especially grasshoppers, caterpillars and spiders, and seeds. In the winter it eats seeds from grain, sunflowers and grasses. Winter habitat is the grasslands of the southwestern U.S. and north-central Mexico. Breeding grounds are grasslands in Montana and North Dakota and southern Canada. Conversion of native prairie to agriculture and urban development has eliminated the Chestnut-collared Longspur from much of its historical breeding range (MNHP, 2019).
Sprague's Pipit *(Anthus spragueii)* 	Do not nest in cropland and are uncommon or absent in non-native grasslands. They tolerate some grazing of this habitat but do not nest where it is overgrazed. Prefer scattered shrubs and relatively little bare ground. Summer diet is mostly insects and other arthropods, with some seeds. Little is known about the winter ecology and diet of Sprague's Pipit. Breeds in the north-central United States in Minnesota, Montana, North Dakota and South Dakota as well as south- central Canada. Wintering occurs in the southern US. Conversion from prairie to cropland and pasture along with excessive grazing are identified as the cause of this species' decline (MNHP, 2019).
 **Long-billed Curlew** *(Numenius americanus)*	Breeds in areas with sparse, short grasses, including shortgrass and mixed-grass prairies and agricultural fields. Outside of the breeding season it is found in wetlands, tidal estuaries, mudflats and beaches. Degradation or loss of grassland breeding habitat to agricultural and residential development is the greatest threat to the Long-billed Curlew. Additionally, other human disturbances such as off-road vehicle travel and agricultural practices such as chaining or dragging to remove sagebrush can destroy nests if done in the spring (MNHP, 2019).

Animal Species of Concern

Montana Natural Heritage Program (MTNHP) describes 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 MTNHP Animal Species of Concern Report last updated on October 31, 2019 lists 75 animal species for Valley County. These are listed in Appendix B. Endangered and threatened species identified by the USFWS which occur or may occur within the county include pallid sturgeon, interior least tern, whooping crane, piping plover, northern long-eared bat and the red knot.

Listed Threatened or Endangered Species

Pallid Sturgeon (*Scaphirhynchus albus*)–Endangered

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

The pallid sturgeon is one of the rarest fishes in North America and found only in portions of the Missouri and Mississippi River basins; 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. Any NRCS undertaking that impacts the Milk Riverbank below the ordinary high-water mark will require a consultation with the Corp of Engineers as well as a consultation with USFWS.

Whooping Crane (Grus americana)–Endangered

Whooping cranes are the world's rarest crane and the tallest birds in North America. Adult height is about five feet, wingspan can be up to seven- and one-half feet. Average adult weight is about fifteen pounds.

Once found throughout North America, the last wild flock of whooping cranes had been reduced to fewer than 20 birds by the 1940's due to habitat loss and hunting. Intensive conservation efforts and international cooperation between Canada and the United States rescued the species from extinction, but they remain extremely rare.

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

Interior Least Tern (Sterna antillarum athalassos)–Endangered

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

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

Piping Plover (Charadrius melodus)–Threatened

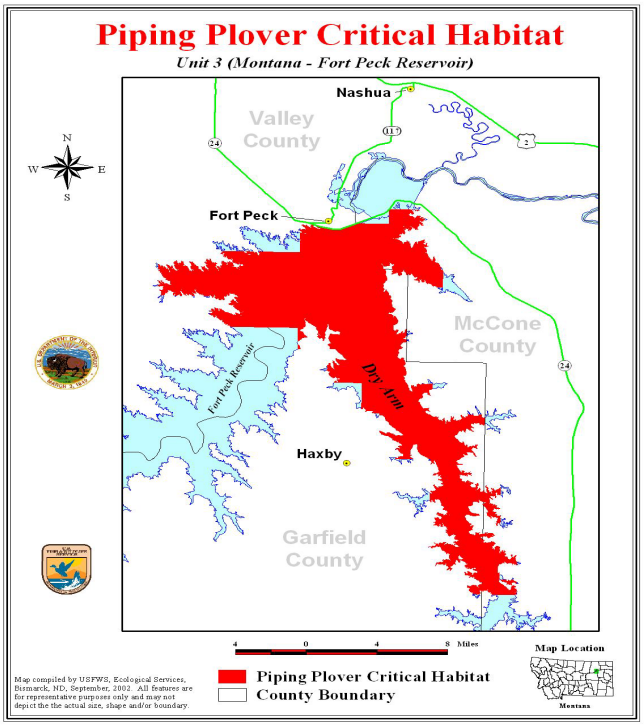

FIGURE 9 PIPING PLOVER CRITICAL HABITAT

Piping plover populations are 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 Rivers. Dam construction, water diversion and water withdrawals change river flow and drastically reduce the amount of available nesting habitat. Human activity has increased predation which decreases nest success and chick survival. USFWS Range map of breeding and wintering habitat shows piping plovers use the northeast area of the county for breeding habitat. Piping plovers are dependent on gravel bars for nesting and are concentrated in the northeastern portion of the county. Figure10 Critical habitat (CH) has been designated by USFWS for piping plover. CH in Valley County is shoreline at Fort Peck Reservoir (USFWS Piping Plover Critical Habitat Unit 3 (Montana - Fort Peck Reservoir). See https://www.fws.gov/mountain-prairie/es/pipingPlover.php.

Northern Long-Eared Bat (Myotis septentrionalis)–Threatened

In Montana, this species is known to occupy specific habitat within a limited range along the Missouri and Yellowstone river drainages near the North Dakota border. These bats are found in or near riparian habitat dominated by cottonwood trees. They emerge to feed at dusk using echolocation to hunt a variety of insects.

Long-eared bat populations in the eastern U.S. have suffered tremendous losses due to white-nose syndrome (WNS). Regional extinction has occurred in some locations. WNS is caused by the fungus *Pseudogymnoascus destructans* which attacks the bare skin of bats while they are hibernating. As the fungus grows, it instigates changes in bats' behavior causing them to become active during hibernation, using up the stored fat that they need to survive the winter. WNS continues to spread rapidly across the United States and Canada, mostly through bat-to-bat contact. According to the WNS Response Team, there were no reported occurrences of the disease in bats in Montana as of August 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.

Red Knot (Calidris canutus rufa)–Threatened

The red knot is a medium-sized, bulky sandpiper about 23-25 cm in total length (Baker et al. 2013). The red knot's distinctive reddish plumage makes it easily recognizable during the breeding season. The red knot differs from dowitchers (Limnodromus spp.) in its shorter bill, paler crown, and whitish rump barred with grey. It may also be confused with Dunlins (Calidris alpina), which are smaller than red knots and have proportionately longer bills with a down-curve at the tip (Baker et al. 2013). Rarely observed at Montana wetlands during migration in May or July through October (Montana Natural Heritage Program Point Observation Database 2016).

The USFWS listed the rufa red knot (*C. canutus rufa*) as threatened in 2015 due to loss of breeding and nonbreeding habitat, disruption of natural predator cycles on breeding grounds, reduced prey availability throughout the nonbreeding range, and increasing frequency and severity of mismatches in the timing of the birds' annual migratory cycle relative to favorable food and weather conditions (*Federal Register 79(238):73706-73748*).

Valley County also provides habitat for significant populations of elk, deer, cougars, burrowing owl, northern leopard frogs, and many upland game birds. In southern Valley County, complexes of black-tailed prairie dog (*Cynomys ludovicianus*) towns are common.

Bison as "domestic livestock" have been re-introduced to the plains and have grazed within the wildlife refuge in a limited fashion, though their leases are mostly on adjacent lands and additional requests have been made to provide what some term the "big open"

where bison would roam free through Valley County and surrounding areas into Canada (*mtnhp.org*).

SECTION III CONSERVATION ACTIVITY ANALYSIS

In the past 18 years, NRCS has made over $11 million in incentive payments through the Conservation Stewardship Program (CSP) and Environmental Quality Incentives Programs (EQIP) in Valley County. These payments have resulted in the substantial conservation benefits on over 314,000 acres of range, crop, and pasture lands. Including: 38 miles of cross fencing, 5,102 acres of range and pasture seeding, 18,000 acres of irrigation improvements and 70 miles of stock water pipeline installed. These stock water and cross fencing projects led to the improved grazing management on approximately 95,000 acres.

Remaining Needs

Grasses commonly are planted as a permanent forage for livestock production, cover type for wildlife habitat and conservation practices for soil protection, providing a major staple in the diets of domestic and wild herbivores, habitat structure for many wildlife species and ground cover to stabilize soils.

In Valley County, dry pastures are typically crested wheatgrass or smooth brome which in many cases are expired Conservation Reserve Program seedings from the 1980's. Lack of species diversity is resulting in very short seasons of use (early spring / late fall) leading to increased mid-season pressure on native range. These tame pastures are often used as winter feeding areas and turn out pastures which results in high levels of manure accumulation and bare ground.

Cropland needs include irrigation system and delivery improvements, cropping system diversity, nutrient and pest management, and soil quality improvement.

The resource issues on irrigated cropland result from inefficient use of water in both conveyance and on farm use. Use of wheel line and flood irrigation leads to nutrient leaching below the rooting depth and dewatering of perennial streams. The main crops grown under irrigation are alfalfa hay, spring wheat, barley (hay), and corn with very little crop diversity outside of these main crops. This leads to

increased disease and pest pressure. Lack of crop diversity also has resulted in increased weed pressure, requiring the use of more tillage, leading to greater soil erosion.

Dry cropland in the county is typically in a wheat-fallow rotation (both spring and winter wheat) with some spring barley and dry peas in rotation. Much of the acreage is chemical fallowed with a mulch till prior to seeding. This leads to a window of increased soil erosion via wind and decreased soil quality (soil health) resulting in decreased soil organic matter and reduced water holding capacity and infiltration rates. The lack of crop diversity on dryland has also led to increased weed and pest pressure.

Connectivity, conversion and impediments are concerns for wildlife.

SECTION IV NATURAL RESOURCE ISSUES AND DESIRED OUTCOMES

Invasive Species and Use

What is the severity of the problem?

Nearly every rangeland owner in Valley County has varying degrees of sustainability issues. Noxious weed invasion (including annual grasses), lack of upland water developments & fencing are just a few of the contributing factors associated with soil quality degradation and low plant productivity.

Who is willing to help with this resource concern?

Consistent partners in cooperation with the NRCS on the rangeland concern are USFWS-Partners, Valley County Weed Department, and Ranchers Stewardship Alliance. This is an issue that is a high priority because the consequences of taking no action include, upland wildlife habitat degradation and loss of critical range due in part to continued loss of native plant diversity, forage loss for livestock and wildlife, and increased soil erosion, interrupted hydrologic cycle, and reduced economic viability of agricultural operations.

Resource Trends

This problem continues despite practices used to enhance rangeland function. These activities include **fencing in both ripa**rian areas and uplands, herbaceous weed management, stock water improvements and prescribed grazing. Although noxious weed

infestations have been expanding in the area for decades, there has been a significant increase in the past 30 years, according to residents and historic aerial imagery. The recent increases may be due to fire suppression, improper grazing, climate change, and increased pathways for dispersal and conveyance of plant seeds. Federal land managers require stricter standards to be followed,

especially along riparian corridors potentially resulting in shorter grazing seasons on some allotments,

which in turn will lead to increased grazing days on private lands. This increased grazing duration coupled with noxious weeds, and annual grass species are all leading to a declining resource trend.

Over the past several years we have seen a dramatic increase in invasive grasses across the region. Interestingly, the invaders originate from Eurasia, where a more stable climate and diffuse form of grazing has been in place for thousands of years. These species exploit the early spring and late fall ("green up") periods when modern grazing is often deferred. Species include not only aggressive, invasive annual grasses such as cheatgrass and Japanese/field brome but also cool-season perennial grasses including crested wheatgrass), smooth brome and Kentucky bluegrass.

The Conservation Reserve Program (CRP) is the largest private land conservation program in the U.S., having established millions of acres of permanent cover on marginal cropland in the northern Great Plains. With decreasing acreage caps and payment rates, however, enrollment has been in decline. Montana and North Dakota together lost nearly four million acres of CRP between 2007 and 2016 (USDA 2016). Losses are expected to continue in Montana, with another 1.4 million acres expiring by 2030 (USDA 2016). A significant proportion occurs in northeast Valley. The most common barrier for landowners transitioning expiring CRP or other reclaimed cropland into grazing land is the upfront cost associated with the necessary livestock management infrastructure. It is common for former crop fields to be without fences or water sources and installing infrastructure to allow livestock use can run into the tens of thousands of dollars. This is often cost-prohibitive to landowners.

North valley rangelands are important breeding habitats for many imperiled grassland species endemics to the Great Plains. Few areas in the state contain such extensive blocks of intact grasslands. Expired CRP, especially where the system could be extended to adjoining range land would provide access to aftermath grazing in the fall to take pressure off of the native range. The use of expired CRP would also allow for a change of season of use and will provide the continuity in the landscape. These opportunities would lessen the likelihood of conversion.

What are the goals?

Stop expansion of degradation on range and crop

Reduce the extent of the rangeland sustainability problems

To make measurable impact on grazing lands in the county between 25 - 50 percent of the acreage needs to be treated. This would mean 175,000 - 350,000 acres would need to be treated for proper use, invasive species, and soil quality degradation. To ccomplish this, we would need to do outreach & education, herbaceous weed control, along with facilitating practices such as range planting, fencing and water developments.

How much funding is required?

To fund the improved management and facilitating practices on 175,000 to 350,000 acres approximately

$10 - $30 million will be needed to cover the cost of outreach, cost-share assistance programs, and technical assistance.

Prioritization of Natural Resource Problems and Desired Outcomes

In 2019 the LWG identified and prioritized the natural resource concerns in Valley County by county wide issues. The six natural resource concerns identified as the top priorities in the county are listed in Table 4.

TABLE 4 RESOURCE CONCERNS IN VALLEY COUNTY

RESOURCE CONCERN	DESCRIPTION
Soil Quality Degradation-Rangeland, Cropland	Lack of organic matter, microbial activity and low productivity
Insufficient Water – Inefficient use of irrigation water	Inadequate irrigation infrastructure and delivery systems within the Milk River Watershed .
Degraded Plant Condition-Undesirable plant productivity and health	Plant productivity, vigor and/or quality negatively impacts other resources or does not meet yield potential due to improper fertility, management or plants not adapted to site. This includes addressing pollinators and beneficial
Inadequate Habitat For Fish And Wildlife – Habitat degradation	Quantity, quality or connectivity of food, cover, space, shelter and/or water is inadequate to meet requirements of identified fish, wildlife or invertebrate species.
Livestock Production Limitation – Inadequate water	Off-site transport of sediment from sheet, rill, gully, and wind erosion into surface water that threatens to degrade surface water quality and limit use for intended purposes.
Degraded Plant Condition – Excessive plant pressure	Invasive and noxious weed pressure on range, pasture, crop and associated agricultural lands.

Invasive Species-Noxious Weeds

Identified as a resource concern in Valley County due to the rate at which the problem grows and the negative economic impact, degradation of ecosystem function and wildlife habitats, and the risk of crossing thresholds. Invasive species will continue to spread rapidly if nothing is done to slow their impact. At this point they are found throughout all watersheds in the county. It is recommended that the goal for this LRP as just being able to contain the weeds. This means that acres of weeds may not be reduced, but the expectation to simply stop increasing acres of weeds is a significant goal.

Water Quantity/Quality-Inadequate structure

Irrigation is an integral part of the agricultural operations and the economic sustainability of Valley County.

There has been an extensive backwater channel created upstream of the larger dams (Vandalia and Dodson). This backwater has tended to widen the river channel and, in some cases, caused sections of active bank erosion.

Irrigation return flows show various degrees of turbidity, some clearer and others more turbid than the Milk River. Some irrigation return flow discharges may be contributing elevated levels of salinity, nutrients, and sediment to the Milk River.

Irrigation lateral seepage and tail water have saturated some riverbanks causing them to slough.

There is a relatively high density of animal facilities located within the Milk River floodplain. Some of these facilities are situated immediately adjacent to the Milk River and may be contributing elevated levels of nutrients to the river during run-off events.

Several towns have discharge outlets into the river from waste treatment lagoons, stormwater, and roads. Many of these discharge sources may be periodically contributing high levels of pollutants (nutrients, petrochemical, and sediment) to the river. And, on farm infrastructure is inadequate on multiple operations to irrigate efficiently and effectively.

There have been numerous meander cut-offs creating isolated oxbows that commonly serve as important wetland habitat for waterfowl and wildlife. Backwater reaches behind the major irrigation dams on the Milk River have created large wetland areas for waterfowl: Vandalia and Dodson Dams. And, Native fish (Paddlefish, Blue Sucker, etc.) migration is restricted to the lower 110 miles of the Milk River from the Missouri River to Vandalia Dam.

Planning considerations include establishing and/or maintaining a vegetative buffer along the river, multi- landowner cost-effective management practices to reduce active bank erosion and sediment in the water.

Improve on-farm irrigation efficiencies, ditch lining or irrigation pipelines would reduce ditch seepage and would be cost effective. Most importantly, take a proactive, voluntary approach to initiate demonstration projects with some willing landowners would be a good way to get started.

Rangeland Resource Concerns

- Range and Crop-Soil Quality Degradation
- Range, Crop and Marginal Land-Degraded Plant Condition
- Livestock water

Rangelands and pasturelands provide a wide range of ecosystem services such as food and fiber, carbon storage, recreation, open space, and water supply. In Valley County, soil quality degradation, lack of organic matter, plant diversity and production and livestock water were identified as a priority by the LWG due to the loss of grazing for livestock, loss of income to landowners, and loss of habitat for wildlife.

Offsite water is lacking on much of the rangeland in the county. Historically ranches relied on perennial flowing streams and upland springs for year-round sources of livestock water. Over the past few decades upland springs have begun to fail (especially during drought years) forcing livestock to concentrate along riparian corridors. Reliable water sources in the uplands are needed to facilitate grazing systems and reduce summer grazing reliance on sensitive areas (riparian / wetland communities).

There are primary differences between managing soil health in croplands and rangelands that must be considered. Factors such as, intensive crop management vs extensive rangeland management, annual plants in cropland vs. perennial plants in rangelands, and varying climates, vegetation and organisms are just some of the differences that must be considered when addressing the improvement of grasslands. Compared to other ecosystems, the soil health of grasslands has received little attention in the scientific literature despite the global vastness of these land types.

Currently, rangeland and pastureland health protocols are not considered a comprehensive tool for evaluating soils, as this framework is focused largely on physical characteristics which are only one aspect of soil health. Planning considerations need to identify “usable science,” to understand the drivers of resiliency, especially in response to stress, quantify the economics of soils health, cost of recovery over time and quantify site potential.

Inadequate Habitat for Wildlife

The increasing demand for renewable and non-renewable energy resources is resulting in continued development, resulting in habitat loss, fragmentation, direct and indirect disturbance. The intentional removal or treatment of sagebrush contributes to habitat loss and fragmentation, and structures which support range management activities can have both positive and negative impacts on habitats, depending on their location and use.

Agricultural conversion is typically defined as the conversion of sagebrush habitats to tilled agricultural crops or re-seeded exotic grass pastures, resulting in habitat loss and fragmentation. Agricultural conversion can also be the conversion of conservation (CRP SAFE) when such lands are providing important habitat components for wildlife. This type of conversion could be detrimental to wildlife species in areas where the animals depend on these interim successional habitats.

Planning considerations include the continuance and expansion of incentive programs that encourage the maintenance of sagebrush habitats. To develop criteria for working land easement programs which stop negative habitat impacts and promote the quality and quantity wildlife habitat. Similarly, if lands that provide seasonal habitats for wildlife are taken out of a voluntary program, such as CRP or SAFE, precautions should be taken to ensure withdrawal of the lands minimize the risk of direct take or degradation. The contiguous landscape will provide not only a conduit for migratory animals but will also provide home for multiple sagebrush steppe dependent wildlife and working family ranches.

The Natural Resources Conservation Service Glasgow Field Office would like to say thank you to the community, partners and leadership for their contribution to the development of this plan.

APPENDIX A

A1 April 2019 VCCD Board Meeting Minutes

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REGULAR MONTHLY BOARD MEETING

April 10, 2019 at 1 p.m.

USDA Service Center Conference Room

Gene Granada, Chairman	Jeff Pattison, Vice Chair	Jody Mason, Treasurer
Ron Garwood	Ron Stoneberg	Hanna Redfield
Lih•An Yang, Administrator		John Bach

Gene called the meeting to order at 1:02 p.m. John Fahlgren (VC commissioner), Doris Ozark and Keegan Morehouse (Two Rivers Economic Growth), Tracy Cumber, (NRCS) and Lisa Koski (Chamber of Commerce) were also present.

Hanna arrived at 1:55 p.m. as she had a prior appointment.

310 APPLICATION

NorVal--Jeff and John will try to visit Bear Creek on Friday, April 12. Gene emphasized that all board members need to vote on a decision.

Nemont-Nemont submitted applications on March 26 for boring fiber optic cables underneath eight stream crossings south of Nashua, including one under the Milk River and three under the Missouri River. Ron G. made a motion to approve the applications. John seconded. Motion carried.

MINUTES

Jeff made a motion to approve the March 15, 2019 minutes. Ron S. seconded. Motion carried.

TREASURERS' REPORT, BILLS

Board members signed the claim checks. The March bank statement was reconciled.

Jeff made a motion to approve the March financial report. Ron G. second ed. Motion carried.

Ron S. made a motion to donate $25 to MT Biocontrol Project.

Jody seconded. Motion carried. Admin Grant-Uh-An presented

the FY 2020 admin grant application for the board to review.

Jody made a motion to accept and approve the application. Ron S. seconded. Motion carried.

CORRESPONDENCE

Lih-An passed around a survey for board members to choose which workshop topics and tours they are interested in having for the 2019 MACD convention.

OLD BUSINESS

Bison ordinance-Ron S. presented a draft amendment to the bison ordinance. Gene asked everyone to review and have feedback ready for the next meeting. Jeff would like to convene a meeting with MT Bison Association, Dept. of Livestock, and the county attorney after the legislative session is over.

Local working group-NRCS held a local working group meeting on April 8, the first step in developing a county long range plan. Seventeen people attended, including Ron S.,

Jody and Lih-An. The top four resource concerns that were identified were 1) Quantity and quality of livestock water; 2) idled grazing land leading to undesirable plant health and wildlife habitat; 3) lack of plant diversity on rangelands; 4) irrigation infrastructure and inefficiency.

June soil health workshop-Uh-An passed around a brief bio of Nicole Masters, the speaker of the workshop. Gene signed the mini-education grant application for DNRC. The max.$500 award can help pay for facility rental, advertising, and travel.

Private funding-Uh-An read an email from Ruby Valley CD, which stated that most of their fundraising comes from the annual banquet, which helps pay for the banquet. Some residents also donate funds to the CD for specific projects that benefit their land. Ron S. suggested that we can do projects such as water sampling and composting manure to increase revenue. Jeff made a motion to apply for an official letter from IRS, regarding contribution to government entity being tax-deductible under section 170(c)(l). John seconded. Motion carried.

Area 1 meeting-The board will host the meeting in Glasgow. Lih-An will check on pricing options from different venues.

Tree plot-According to Gene, the Neubauer tree farm won't be able to use the Canadian red cherry. Any digging and transplanting should be done in the next 10 days before trees break out of dormancy. Gene suggested having FFA kids pull up the remaining stakes then donating trees for them to sell as fundraiser. Jeff will talk to Patti. John mentioned that the city of Fort Peck might want some as well. Jeff made a motion to let board members take some trees if they have a need, and leftover trees go to FFA as donation. John seconded. Motion carried.

NEW BUSINESS

Doris Ozark, Lisa Koski and Keegan Morehouse are here to discuss making the Valley County vs APR brochure. They will

gather numbers for various economic contributions made by Valley County residents vs. ARP. John F. emphasized we clarify the basis of acreage comparison and stay consistent with Petroleum and Phillips Counties' format. Doris proposed producing a draft around June 1. The board would like to have the brochure available for the Missouri River Rendezvous and the Area 1 meeting.

Valley County Planning Board-John Fahlgren requested that the district appoint a supervisor to advise on the county resource plan. Jeff made a motion to appoint Sierra Stoneberg to Valley County Planning Board. Ron S. seconded. Motion carried.

Old equipment-Gene would like to clear out old equipment by selling the tractor and tiller, and trading in no-till drill and aerator together for a bigger drill. He'll talk to Glasgow Equipment Rental about possibly buying the district's equipment.

Arbor Day-Jody and Hanna will bring trees to Opheim students for Arbor Day. Jody encourages all board members to visit their schools as well.

Hanna was sworn in for another term as Urban Supervisor of

Opheim . Her term will end on April 2022. Meeting was

adjourned at 3:20 p.m. Next meeting: Wednesday, May 8 at 1

p.m. Respectfully submitted,

Lih-An Yang
District Administrator

A2 Valley County Local Working Group for Long Range Planning

The local community and partners were asked - What natural resource concerns do they see, what matters most to them and what issues do they identify as high priority?

The meeting was held on April 8, 2019. Flyers, mailings, survey, news and radio announcements brought 17 people to the meeting and an additional 14 surveys were returned from those who could not attend.

The priorities are listed below and the highest priorities at this time are bolded.

Soil

- **Soil Health on Rangeland**

  How to measure? How to monitor?

- Excessive Bank Erosion

  Lack of vegetation and frequent flooding have caused vertical banks

- **Soil Health on Cropland**

  Soil erosion, soil armor

  Marginal land, Idle land

  Unproductive cropland that should not have converted and the difficulty in returning them back to grass

  Effects on wildlife

Water

- **Irrigation Infrastructure**

  On farm inlets and outlets are inadequate

  St Mary's diversion needs repair/replacement and threatens the integrity of the Milk River

  Timing of water delivered does not correspond to the time needed

- Water cycle on Rangeland

  Erosion, lack of vegetated cover and low infiltration

- Lack of Livestock Water on range and crop lands

Humans

- **Grazing Management**

Willingness of people willing to rotate or implement a contingency plan during a drought

Plants

- **Noxious and Invasive weed control on grazing lands public and private**

  Canada thistle, Bindweed, Hawksbeard, Leafy spurge, Cheatgrass and Japanese brome

- Plant composition and diversity on rangeland
- Undesirable plant productivity
- Lack of infrastructure to support grazing
- Grazing lands

  Idle (marginal) or un grazed land is not good for wildlife

Animals

- **Insufficient water for livestock on grazing lands (expired CRP and Marginal (idle))**
- Permanent fences are not wildlife friendly

APPENDIX B Animal Species of Concern

Species	Scientific Name	Common Name	Habitat
Mammals	Corynorhinus townsendii	Townsend's Big-eared Bat	Caves in forested habitats
	Cynomys ludovicianus	Black-tailed Prairie Dog	Grasslands
	Lasiurus borealis	Eastern Red Bat	Riparian forest
	Lasiurus cinereus	Hoary Bat	Riparian and forest
	Mustela nigripes	Black-footed Ferret	Grasslands
	Myotis lucifugus	Little Brown Myotis	Generalist
	Myotis septentrionalis	Northern Myotis	Riparian and mixed forest
	Sorex hoyi	Pygmy Shrew	Open conifer forest, grasslands, and shrublands, often near water
	Sorex merriami	Merriam's Shrew	Sagebrush grassland
	Sorex preblei	Preble's Shrew	Sagebrush grassland
	Vulpes velox	Swift Fox	Grasslands
Birds	Ammospiza nelsoni	Nelson's Sparrow	Prairie wetland
	Anthus spragueii	Sprague's Pipit	Grasslands
	Aquila chrysaetos	Golden Eagle	Grasslands
	Ardea herodias	Great Blue Heron	Riparian forest
	Athene cunicularia	Burrowing Owl	Grasslands
	Botaurus lentiginosus	American Bittern	Wetlands
	Buteo regalis	Ferruginous Hawk	Sagebrush grassland
	Calcarius ornatus	Chestnut-collared Longspur	Grasslands
	Centrocercus urophasianus	Greater Sage-Grouse	Sagebrush
	Centronyx bairdii	Baird's Sparrow	Grasslands
	Charadrius melodus	Piping Plover	Prairie lakes and river shorelines
	Charadrius montanus	Mountain Plover	Grasslands
	Coccyzus erythropthalmus	Black-billed Cuckoo	Riparian forest
	Dolichonyx oryzivorus	Bobolink	Moist grasslands
	Hydroprogne caspia	Caspian Tern	Large rivers, lakes
	Lanius ludovicianus	Loggerhead Shrike	Shrubland
	Melanerpes erythrocephalus	Red-headed Woodpecker	Riparian forest
	Numenius americanus	Long-billed Curlew	Grasslands
	Oreoscoptes montanus	Sage Thrasher	Sagebrush
	Pipilo chlorurus	Green-tailed Towhee	Shrub woodland
	Rhynchophanes mccownii	McCown's Longspur	Grasslands
	Spizella breweri	Brewer's Sparrow	Sagebrush
	Sterna hirundo	Common Tern	Large rivers, lakes
	Sternula antillarum	Least Tern	Large prairie rivers
Reptiles	Heterodon nasicus	Plains Hog-nosed Snake	Friable soils
	Phrynosoma hernandesi	Greater Short-horned Lizard	Sandy / gravelly soils
Amphibians	Anaxyrus cognatus	Great Plains Toad	Wetlands, floodplain pools
Fish	Chrosomus eos	Northern Redbelly Dace	Small prairie rivers
	Chrosomus eos x Chrosomus neogaeus	Northern Redbelly X Finescale Dace	Small prairie streams

	Cycleptus elongatus	Blue Sucker	Large prairie rivers
	Etheostoma exile	Iowa Darter	Small prairie rivers
	Lepisosteus platostomus	Shortnose Gar	Large prairie rivers
	Macrhybopsis gelida	Sturgeon Chub	Large prairie rivers
	Macrhybopsis meeki	Sicklefin Chub	Large prairie rivers
	Margariscus nachtriebi	Northern Pearl Dace	Small prairie streams
	Polyodon spathula	Paddlefish	Large prairie rivers
	Sander canadensis	Sauger	Large prairie rivers
	Scaphirhynchus albus	Pallid Sturgeon	Large prairie rivers
Invertebrates	Polygonia progne	Gray Comma	Deciduous woodland, riparian woodland, aspen parkland

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