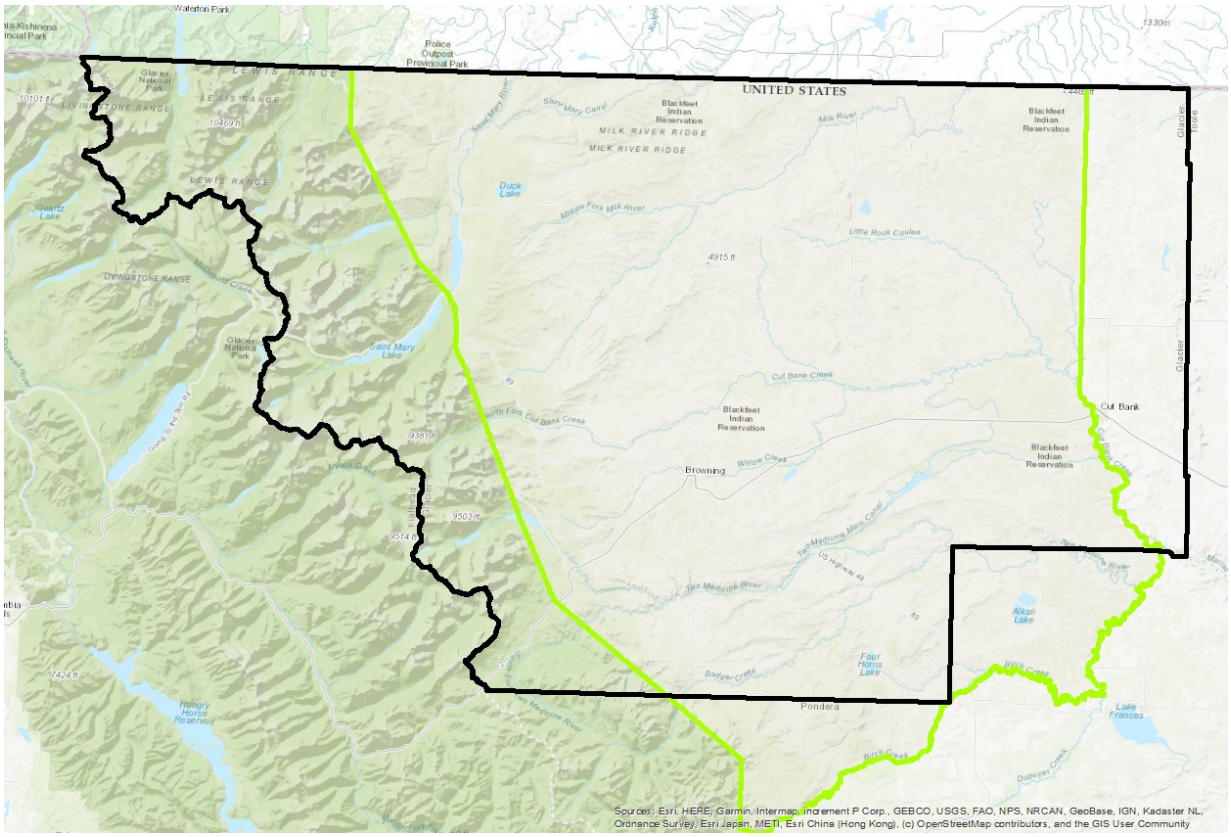

Long Range Plan

GLACIER COUNTY

2019-2024

Cut Bank NRCS Office and Browning NRCS Tribal Service Center

I. INTRODUCTION

Vision: Improve the natural resources on private and tribal lands through focused collaboration.

Mission: Work with partner organizations and agricultural operators to identify and focus efforts to address the highest need and economically feasible resource concerns.

Purpose: Provide a framework for NRCS staff, partners, and clients to collaborate efforts to implement conservation by focusing on an identified resource concern in a small geographic area.

Partners:

- Natural Resources Conservation Service (NRCS)
- Pondera County Conservation District (PCCD)
- Glacier County Conservation District (GCCD)
- Toole County Conservation District (TCCD)
- Blackfeet Natural Resources Conservation District (BNRCD)
- Fish Wildlife and Parks
- U.S. Fish Wildlife Service
- Pheasants Forever
- MT Department of Natural Resources and Conservation (DNRC)
- Blackfeet Tribe
- Bureau of Indian Affairs (BIA) Browning
- County Commissioners Glacier County
- Marias River Watershed Group
- Rocky Mountain Front Weed Roundtable
- Glacier National Park

Long Range Plan is designed to cover the next 5 years. However, the long-range plan is a living document that can be changed or updated as necessary. The LRP will be reviewed by the local conservation district as needed.

II. NATURAL RESOURCES INVENTORY

Soils

Specific Soils information can be obtained from two published soil surveys: The soil survey of Glacier county area and part of Pondera County and the soil survey of Choteau-Conrad Area; Parts of Teton and Pondera Counties.

The Eastern part of Glacier County is a complex of rolling, hilly, and nearly level plains. The southern part is plains intercepted by the steep valley wall of Cut Bank Creek, Birch Creek, and Two Medicine River, all of which have their headwaters on the high mountain slopes that form the western boundary of the soil survey area. Westward from the plains along the Canadian

border, the topography is broken by high plateaus dissected by the headwater streams of the Milk River. The elevation of the eastern plains' ranges from about 3,600 to 4,400 feet, of the western foothills from 4,400 feet to about 5,500 feet, and of the mountain foot slopes from 5,500 feet to more than 8,000 feet. Soils can be broken into two categories: Dominantly deep, well-drained and somewhat excessively drained, undulating to very steep soils on mountain and adjacent upland. The second is dominantly deep to shallow, well drained to excessively drained, nearly level to very steep soils on upland.

A significant percentage of soils in the area formed in glacial till or in glacial outwash materials. Some soils formed in alluvium derived from mixed sources, and other soil formed in material that weathered from limestone, mudstone, sandstone, shale, or siltstone.

Soils are highly susceptible to wind erosion. Water erosion can be a concern on cropland. However, most farming practices limit water erosion to some sheet and rill erosion and occasionally gully erosion resulting from an unusually high precipitation or most of the cropland allows for adequate residue levels to control excessive wind erosion. However, conventional tillage systems do exist from which wind and water erosion issues can appear.

Soil salinity continues to be a resource concern throughout cropland and can be seen in some native rangeland due to the nature of the soil type present. Soil salinity was first addressed by the Bullhead Salinity Control Association and is now a priority for the MT Salinity Control Association located in Conrad, MT. Saline or sodic soils form when water moves through the soil profile, picking up salts and moving them through the ground water until they surface along lower elevations on the landscape. As the water evaporates the salts are left on the soil surface. This results in a less productive soil.

Soils with a low pH have also been found in eastern Pondera County. It is anticipated that this change in pH is due to historical crop fallow rotations combined with commercial fertilizer, herbicide and long-term no till practice use over the last 30 years.

Glacier County has pursued soil health related practices which include diversifying crop rotations, adding cover crops as a tool, and monitoring soil health through soil biology sampling and monitoring. Soil health sampling in general shows low soil health scores resulting from the Haney Soil Test when compared to range or pasture samples.

Soil health and sustainability for future generations is a concern for a large percentage of the operators. Soil health concerns are specific to soil acidity, soil salinity, field gully erosion, and wind erosion. Soil health also includes the five principles of soil health: species diversity, living roots in the soil as long as possible, cover on the soil surface, reduced tillage and integrating livestock.

Water

The mean annual precipitation ranges from 10-20 inches, elevation ranges from 3000 to 6000 feet, and the growing season is 60 to 110 days. Watersheds included are Two Medicine

Watershed, St. Mary Watershed, Milk River Watershed, Cut Bank/Willow Creek Watershed, Birch Creek Watershed and the Marias River Watershed.

Water quality is a concern for human, livestock, and wildlife consumption. Water quality monitoring by individual producers is done to track salts in the water for safe levels when consumed by livestock. Surface water quality is directly affected by run-off events resulting from spring snow melt and high precipitation events typically occurring April through June.

Water quantity is a concern for the Blackfeet Tribe, and the Blackfeet Bureau of Indian Affairs (BIA), and local producers. The Blackfeet water compact has been settled which has directly affected the local producers, BIA, and the Blackfeet Tribe. Irrigation efficiency improvement and maintaining irrigation delivery infrastructure is a crucial part of addressing water quantity for all parties. These concerns lead to a need to line delivery canals, convert ditch to pipe, update or replace irrigation delivery infrastructure, and install irrigation automation systems for monitoring and management.

The headwaters of the Upper Missouri River basin originate along the Rocky Mountain Front. The watershed contains wetlands, lakes, riparian and river floodplain ecosystems. Groundwater is tapped by wells for drinking water, oil and gas drilling operations, and for limited irrigation purposes. Groundwater surfaces as springs and feeds numerous prairie pot-hole type wetlands along the Rocky Mountain Front. Due to geomorphology in the western half of the counties, development of wells for drinking or stock water is limited and may not be feasible in some locations. This results in the need to pipe water long distances from reliable sources such as ponds or lakes or high producing wells to areas with limited water supply.

Air and Energy

Air quality historically has not been an issue. Wind speeds can be 35-80 MPH throughout the year. Resulting in a very clean atmosphere. The Blackfeet Agriculture Resource Management Plan (ARMP) has identified air quality as an area that needs further monitoring and analysis.

Energy production has been addressed by the installation of wind farms primarily in Glacier County and neighboring Toole County. Additional locations for wind energy are under investigation while solar energy production has been used on a small scale. Solar energy has been used for pumping stock water and electric fences. Very few homes or farmsteads utilize solar energy.

Energy reduction resulting from the utilization of gravity fed water systems for stock water and irrigation purposes has been and will continue to be a need for agriculture producers.

Glacier County produces oil and natural gas. Oil is trucked to refineries in Great Falls and Billings, MT. Natural gas is piped to Northwest Energy's pumping stations to be added to the US and Canada supply lines.

Plants

Native rangeland plants, introduced forage species, and crops are grown throughout the area. Native and introduced plant health is altered because of "over grazing" or grazing for long periods of time during the growing season, and lack of stock water to distribute animals to areas of high production and low utilization. Improved management on native rangeland would require infrastructure improvements such as stock water, fencing, herding, and improve grazing management.

Typical perennial crops grown are Alfalfa or Sainfoin for seed or hay production. Annual crops are winter wheat, spring wheat, barley, peas, lentils, camelina, canola, and some flax. Producers are venturing out into alternative crops such as hemp and quinoa. Typically crop rotations are in a crop fallow type rotation utilizing hoe drills or disk drills to seed directly into stubble. Chemical fallow practices are utilized during the fallow period for most of the operations. Organic crop production involves a very small number of agriculture producers in the area. These operations have an increased tillage rate with no chemical application. Crop rotations would benefit from increased plant diversity, annual cropping, and improved soil health. The climate is the number one limiting factor in making drastic changes to the traditional crop fallow system.

Animals/Wildlife

Livestock and wildlife coexist in the area. Grizzly Bears, Gray Wolf, Lynx, Bull Trout, Eagles, migratory birds, and pollinators are among other species that inhabit the area. Most livestock producers are typically cow/calf operations. Commercial and registered cattle herds are abundant with a few sheep producers. Large confinement facilities in the area house milk cows, pigs, chickens and turkeys.

III. CONSERVATION ACTIVITY ANALYSIS

Existing Assessments

- Water Resources Survey Glacier County, September 1969
- Water Resources Survey Pondera County, June 1964
- Dupuyer Creek Riparian Assessment 1997
- Bullhead Water Quality Project 1991-1997
- Lower Birch Creek Watershed Areawide Plan, Updated 2000
- Blackfeet Nation Agriculture Resource Management Plan (ARMP) 2019 DRAFT

IV. PRIORITIZATION OF NATURAL RESOURCE PROBLEMS AND DESIRED OUTCOMES

Local Working Group established priorities in Spring of 2019. These are listed in order of priority.

Glacier County and the Blackfeet Reservation

1. Range Health
    - Range and Pastureland: Grazing management as it relates to the utilization of native rangeland has been described as over grazed in areas were water is reliable and in areas along the Rocky Mountain Front that are easily accessible by livestock. The direct causes are related to water distribution and infrastructure that results in limited management possibilities. Water distribution can be improved through development of off-site stock water. However, due to the geology of the Rocky Mountain Front, water wells are not necessarily a feasible alternative. Groundwater may not be present, water volume produced does not support the number of animals utilizing the forage, or water is too deep to be economical. Group water developed with storage systems that can be gravity fed to multiple pastures and producers are needed in areas where drilling wells is not feasible.
    - Fencing and stock water systems are tools to improve livestock management. Improved livestock management can lead to improved species composition, plant health, and soil health.
2. Noxious weeds continue to be an issue across the area as more noxious weeds are reported and larger infestations are found. Education, outreach, and coordination to feasibly address this issue continues to be a challenge.
    - Biological control and chemical application are the two-primary means of control. Livestock management is a secondary means of control especially as it relates to the spread of noxious weed seeds.
3. Soil Health
    - Soil Acidity has been identified as a concern in Glacier County as producers are concerned with lower than normal Ph levels. Increasing organic matter (OM) levels maybe one way to buffer the soil along with changing crop management practices.
    - Soil salinity/sodicity has been addressed in Glacier County for over 30 years. As farms change ownership and new operators begin farming, acres seeded to permanent vegetation are being returned to crop rotations. Education and outreach on how to manage and control saline/sodic issues continues to be an issue. Finding economically viable solutions to address recharge areas is a concern and a hurdle to seeding cropland to perennial vegetation.
    - Implementing additional soil health management practices can be costly. Adopting new practices to diversify plant species, keep a living root in the soil year around, keeping residue on the soil surface, reducing tillage, and integrating livestock are challenges facing producers.
4. CRP acres are expiring from the program and producers are faced with the decision to crop, hay, or graze the acres. Grazing infrastructure does not exist in many of these areas. However, if fences and water could be developed it would keep sensitive soil types and possibly soil salinity recharge areas in permanent vegetation.
5. Irrigation water quality and quantity is a concern when irrigation water is pumped from a stream or river or delivered from a canal system. Improvements may include canal lining, ditch or canal delivery to buried pipe, and automation technology to monitor and manage

the irrigation water. Improving irrigation system infrastructure continues to be a feasible alternative for producers and irrigators.

6. Herbicide resistant weeds have been found throughout the county as more and more Kochia plants are tested and found to be Glyphosate resistant. Alternatives in herbicide and cropping management are needed to reduce the use of restricted use herbicides that are potentially harmful to humans or the environment. Education is an important component to changing farming traditions in the Golden Triangle.

V. POTENTIAL TARGET IMPLEMENTATION PLANS (TIP) AND INVESTMENT PORTFOLIOS

Glacier/Blackfeet: Two-Medicine Noxious Weed Buster: The project area will assess sections of the Two-Medicine River corridor starting with the upper end of the watershed and working downstream to target Knapweed and Leafy Spurge with biological controls and spot spraying along two-tracks and farm trails. The purpose is to assist landowners and operators through education, outreach, and coordinated efforts to feasible address Knapweed and Leafy Surge along the Two Medicine River.

Blackfeet: Four Horns Lake Irrigation Improvement: Potential project would be with the Blackfeet Tribe and Bureau of Indian Affairs to address irrigation water efficiency as prioritized by the Blackfeet tribe in conjunction with the Blackfeet Water Compact. The purpose of the project will be to establish infrastructure to deliver water to historically irrigable lands with cost effective and efficient irrigation systems or improve existing irrigation systems.

Glacier Irrigation Improvement: Potential projects exist between neighboring operators serviced by the BIA canal system to convert irrigation delivery system ditches to pipe to reduce water losses to evaporation and seepage. This should eliminate soil erosion in some locations. As the Blackfeet Tribe prioritizes the use of their water compact and available resources, additional projects may arise. This includes converting flood to sprinkler irrigation, updating and improving delivery system infrastructure.

Soil Health improvements related to intensive grazing management. To implement livestock integration to improve soil health, innovative producers are interested in high intensity short duration grazing practices. Infrastructure and education are needed to accomplish improvements to cropland, pasture, and rangeland. The project purpose is to find a group of innovative livestock producers who want to use short duration high intensity management to improve soil health through management and monitoring.

Soil health improvements on cropland would target producers who are committed to implementing the principles of soil health on cropland and interested in education and demonstration. The purpose of the project would be to implement the key components of adding diversity to the crop rotation, keeping a living root in the soil as often as possible, keeping the soil covered, reducing tillage, and integrating livestock.