2022

Sheridan County
Crop to Perennial Vegetation
Targeted Implementation Plan

USDA NRCS PLENTYWOOD FIELD OFFICE

Table of Contents

Montana NRCS photo

Cropland to Perennial Vegetation Plan

The overall goals of this Targeted Implementation Plan (TIP) are to establish perennial grass mixes in unproductive or inefficient areas of annual cropping systems. This will restore marginally productive croplands back to grasslands and will improve the management of working lands for agricultural production while minimizing impacts to natural resources.

Problems with marginal or low-producing cropland and degraded wildlife habitat were identified at our Local Work Group meeting as priority resource concerns. The resource concerns selected to be addressed through the TIP are shown in Table 1.

Table 1. Priority Resource Concern

ENERGY	**Energy Efficiency of Farming/Ranching Practices and Field Operations**

Other potential resource concerns that may be addressed include plant productivity, water quality degradation due to excess nutrients and sediments in surface water, wind and water soil erosion, soil organic matter depletion, and terrestrial habitat for wildlife.

Problem Statement

The size of farm equipment continues to increase as the industry attempts to maximize efficiency in crop production. Equipment has outgrown the ability to farm on every acre; some fields are now just too small and some areas in larger fields are too oddly shaped to economically crop. These types of fields occur throughout all of Sheridan County, and continue to occur as agricultural equipment gets bigger. As equipment gets large, efficiency drops on small and odd-shaped fields. There is a need, and much interest in converting small, odd-shaped, or even larger marginal annual cropland areas into perennial cover in Sheridan County (Sheridan County Long Range Plan, p. 37).

Resource concerns on small, odd-shaped, or marginal crop fields:

- Energy efficiency of farming practices and field operations – small or oddly-shaped fields are subject to operational overlap, where equipment such as sprayers and seeders make multiple trips across the fields or subfields. Agricultural overlap is highly inefficient because of the extra fuel needed to go over the acreage again and the amount of seed and fertilizer put down. In marginal cropland, the amount of energy put into the cropland compared to the yield returned is too high to justify continually cropping.
- Plant productivity & health and plant structure & composition are affected when plant communities have insufficient composition and structure to achieve desired ecological functions and management objectives. Specifically, thin stands in marginal crop areas are more susceptible to damage from pest pressure including that from plant pests and noxious weeds, diseases, soil borne pathogens and nematodes.
- Thin crop stands are susceptible to loss of nutrients and pesticides, which are transported off-site to surface water.

- Soil erosion is accelerated in areas where the crop is too thin to protect the soil from the wind or raindrop impact. Topsoil is lost and sediment is transported to surface water when the crop is not robust enough to provide adequate protection from erosion.
- Soil organic matter depletion continues on unproductive fields that are farmed year after year.
- Annual crop land does not provide winter cover for wildlife.

There is a need, and much interest in converting small, odd-shaped, or marginal annual cropland to perennial cover in Sheridan County. Many conservation benefits will be realized by converting these marginal areas to perennial cover. Increased efficiency of farming operations will be attained when odd-shaped areas and subfields are planted to perennial cover, resulting in more regularly shaped crop fields that are compatible with the use of GPS guidance systems and contemporary farm equipment. Perennial vegetation will eliminate the need for fertilizer and pesticide in the treated areas, reducing both the cost of operation and the risk of nutrient and pesticide transport to surface water and non-target areas. Soil erosion is expected to be reduced to nearly none on the treated areas due to the protection provided by the perennial cover. Perennial vegetation will provide year-round habitat for wildlife, pollinators, and beneficial insects.

Project Location

The Target Area lies along the western side of Sheridan County— see Figure 1. It encompasses 165,297 acres. Approximately 73,297 acres within the Target Area are annually cultivated crop fields that have the potential to be converted to perennial vegetation under the TIP.

Objectives

Our objective is to assist producers to convert unproductive annual cropland into perennial vegetation which can be used sustainably for haying and/or grazing while supporting wildlife habitat. Once these acres are planted and the potential benefit is realized, it is unlikely that they will be converted back into an annual cropping system. Through this TIP, the outcome will be perennial vegetation maintained for many years past the actual contract length. Benefits include:

- Optimizing field designs that will maximize the advantages of GPS guidance systems.
- Energy will be conserved by eliminating machinery operations on non-profitable acres and doubling up on fertilizer, seed, chemicals, and compaction (see Energy Savings below).
- The need for nutrients and chemical inputs will decrease when converted to perennial vegetation since annual crops require significant inputs.
- Nutrient and sediment runoff will decrease. Perennial plantings in areas along water features will act as a buffer to keep runoff out of aquatic habitat.
- Soil erosion will be reduced when land is planted to a perennial crop.
- Perennial crop systems can reduce carbon emissions and facilitate soil storing carbon.
- Terrestrial habitat areas and the diversity of species (plants and animals) will benefit from year-long cover.

- In some areas, soil salinity can be addressed by planting salt-tolerant perennial species.
- Areas with excess soil moisture will have permanent cover instead of having cover only when it is dry enough to seed an annual crop.
- Better defined crop edges will help to prevent invasion of Canada thistle and other noxious weeds.

Energy Savings Example
Converting Small Areas of Cropland to Perennials

Operations & Fertilizer	No-Till Spring Wheat/Lentil System (Gallons of Diesel/Acre)	Perennial Hay System (Gallons of Diesel/Acre)
Field Operations (WEPS comparison)	2.6	1.3
Urea fertilizer- 100 lb/ac @ 0.129 gal/lb N diesel fuel equivalent (Iowa State Extension)	12.9	0
Total	**15.5**	**1.3**
500 Acres Converted	**7750**	**650**
Dollars Saved (Based on $2.50 Dyed Fuel)	**$19,375**	**$1,625**

Alternatives and Actions

If no action is taken, unprofitable and soil degrading practices will dominate the affected acres. Degraded plant condition will continue to negatively affect the quality of wildlife habitat. Energy consumption will continue at the current rate.

This TIP will give producers and the NRCS the opportunity to improve soil health and benefit wildlife. Alternatives used to treat the resource concerns will be limited to the practices listed below.

Table2: Conservation Practices

EQIP PRACTICE	CODE	PAYMENT RATE *based on 2021 rates
Conservation Cover	327	$119.73
Cover Crop	340	$63.07
Forage and Biomass Planting	512	$61.78
Range Planting	550	$80.32

Desired Outcome

The desired outcome is 1500 acres transitioned to perennial cover, which will be accomplished through conservation plans. We will measure our progress by calculating fuel reduction. We are predicting a 90% fuel reduction by switching to perennial vegetation. We will be converting non-productive, inefficient, or difficult to access areas to perennial grass production or wildlife habitat to promote healthier soils, decrease nutrient and sediment loss, decrease energy use and expenses, and increase habitat for wildlife, pollinators, beneficial insects and soil micro fauna.

The Sheridan County Local Working Group identified soil health on cropland as one of the top priority resource concerns in the county (Sheridan County LPR, page 36). The desired outcome of improved soil health on cropland will be accomplished by the benefits of perennial cover which align with the principles of soil heath:

- Living roots in the soil for the entire growing season and beyond
- Soil armor or cover will protect the soil year round by controlling wind and water erosion, reducing soil water evaporation rates, maintaining a more moderate range of soil temperatures, suppressing weeds and providing a protective habitat for the soil food web's surface dwellers (BCCD, 2017)
- Diversity of plant community
- Minimal (or no) soil disturbance

Partners

Our partners will include Pheasants Forever, Montana Fish Wildlife & Parks, Sheridan County Conservation District, and United States Fish & Wildlife Service. These partners will provide outreach and help us expand our network with producers to increase participation in the TIP area. Pheasants Forever will assist us after the seeding is established in monitoring the success of the stand and help us determine what seedings are creating greater quality habitat for wildlife, as well as setting up and conducting wildlife surveys. Montana Fish Wildlife & Parks can provide additional financial resources to the producers if they are willing to provide game bird hunting opportunities. The Sheridan County Conservation District will assist us in advertising our TIP project.

Implementation

Conservation Plans will include:

- Planting the cropland to perennial grass mixes through practice 327 at a cost of $119.73 per acre. 512 or 550 could also be used instead of 327.
- Some contracts will also utilize cover crops and pollinator habitat plantings where feasible and needed.

The average total contract amount will be $119.73 per acre. Our goal for the first sign-up is 800 acres.

The Nine Steps of Conservation Planning[1] will be followed as we complete inventories and prepare conservation plans for each project. Technical assistance will be provided during daily activities and supported by our partners. Ranking will prioritize the applications that contain the greatest benefit to the resources. NRCS financial assistance required would be $174,580 in year one.

EQIP Funds

Fiscal Year	Contracts (no.)	Acres Treated (total)	Average Expected Cost per Contract	Total
2022	4	800	$43,645	$174,580
2023	10	500	$6,200	$62,000
2024	3	200	$4,000	$12,000

*In the first year (2022), we have multiple, willing, participants that intend to seed back larger, marginal acreages. In the following years, we anticipate smaller, inefficient areas.

Conservation plans and contracts will be no longer than two years. A probable scenario would be one year of a cover crop, Practice 340, to improve soil health, followed by Practice 327, 512, or 550 in the fall or the spring after to establish perennial vegetation.

The Field Office has been working with several producers who are willing to participate in the TIP. Outreach will be done in the Target Area to inform participants and potential participants about the TIP and to locate project sites. The ranking process will order the applications based on environmental benefit values.

The Plentywood Field Office has a great deal of experience in successfully implementing the prescribed conservation practices. We will evaluate and monitor sites annually to determine success of perennial vegetation and adjust mixes, planting timing and techniques according to our findings. NRCS and partners will meet with participants for site visits.

There are Historically Underserved funding scenarios available for all the above-mentioned practices for qualified applicants. Information about the definitions of Historically Underserved categories, qualification criteria and The Financially Limited Farmer/Rancher self-determination tool are available from the NRCS at https://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/people/outreach/slbfr/?cid=nrcsdev11_001040

[1] The NRCS Nine Step Conservation Planning Process is fully explained on our website at https://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/programs/financial/eqip/?cid=nrcs144p2_015695

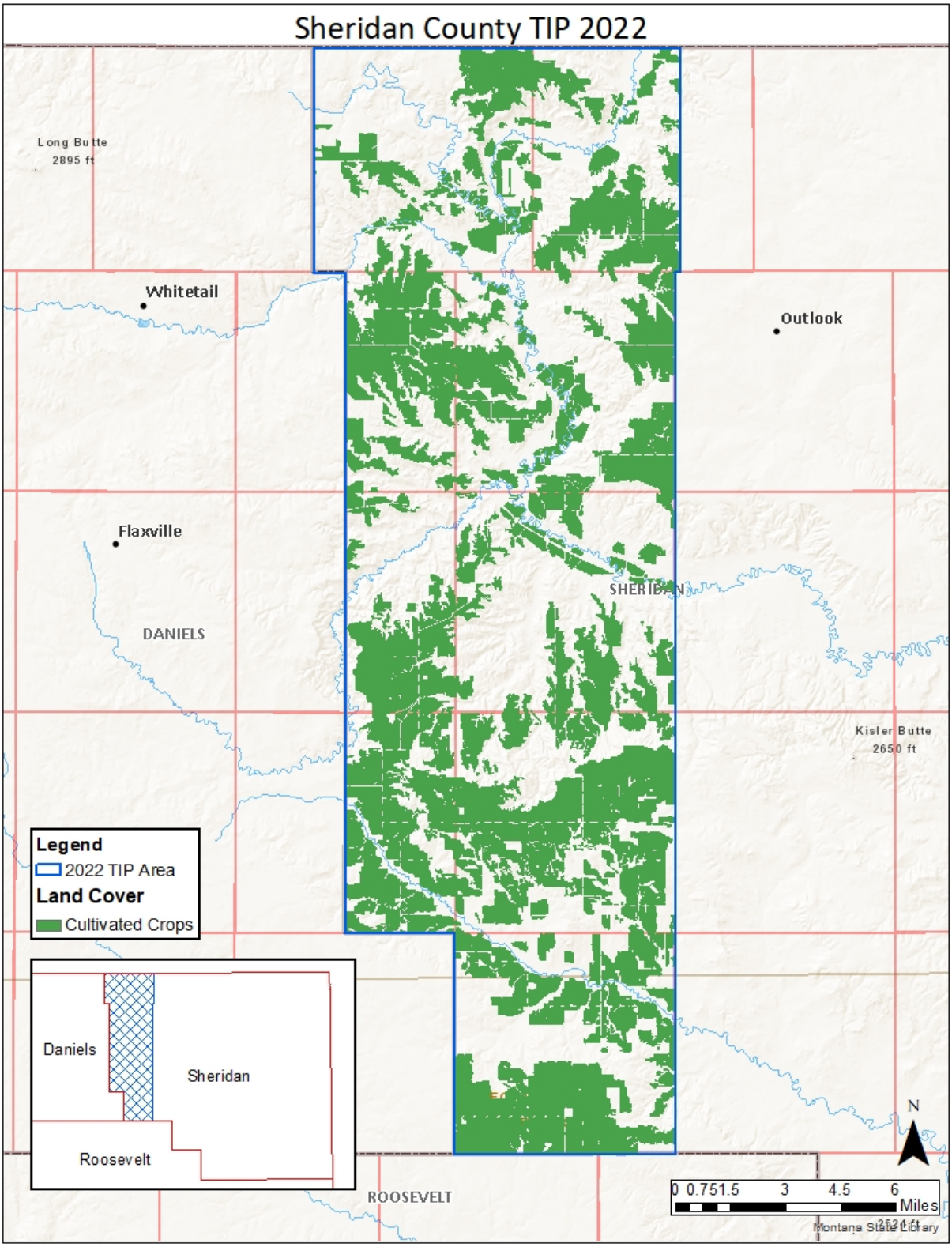

Figure 1. Sheridan County 2022 TIP Fields and Area

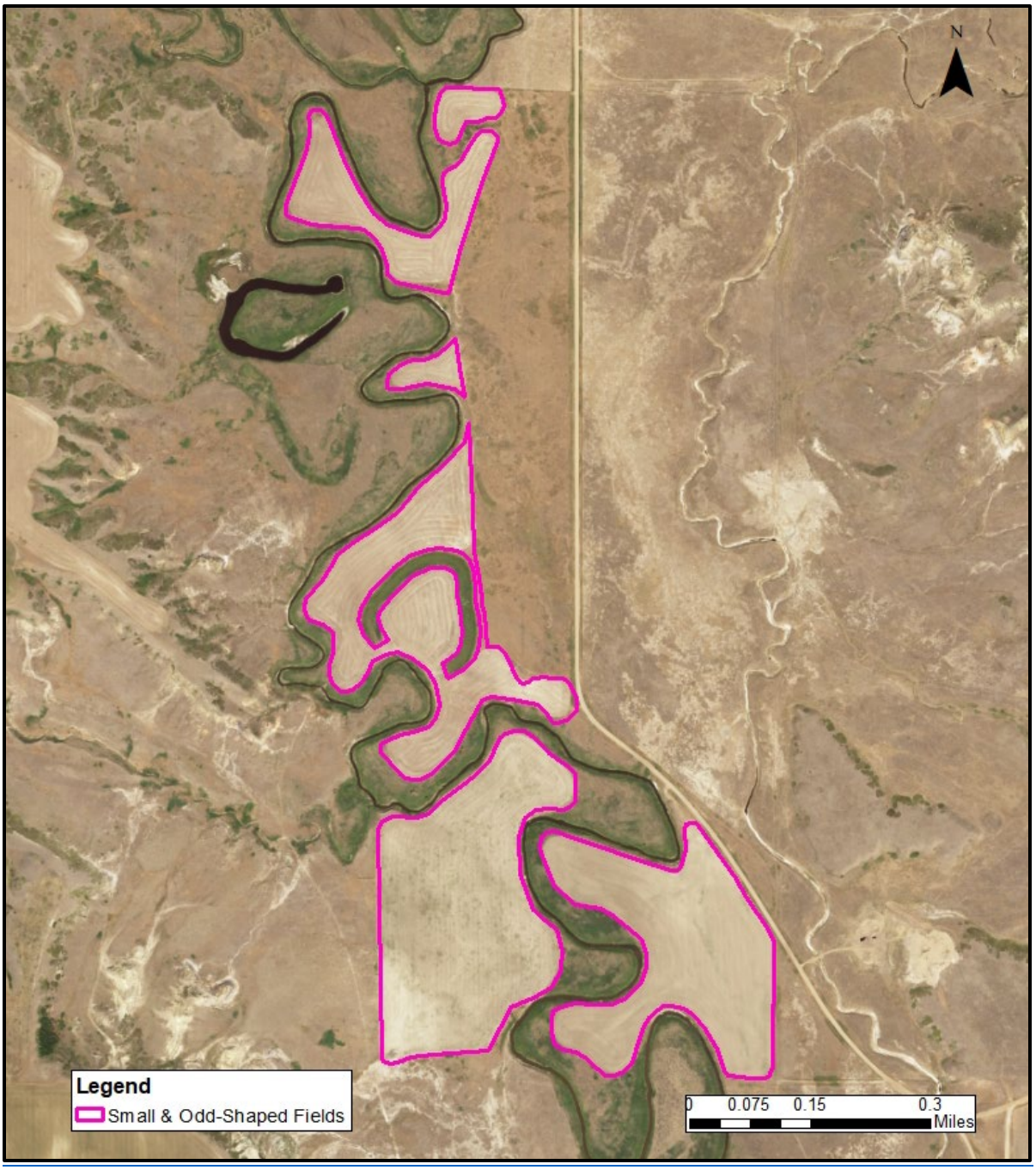

Figure 2. Sheridan County 2022 TIP Small & Odd-Shaped Field Example

Ranking

TIP Ranking Questions

1. Select one of the following. Will the seed mix include…
    a. Only introduced species?
    b. A mix of introduced and native species?
    c. Only native species?
2. Select one of the following. Will the seed mix include…
    a. Less than 5 species?
    b. More than 5 species?
3. Select one of the following. Will the seed mix include…
    a. 0 forb species?
    b. 1 forb species?
    c. 2 forb species?
    d. 3 forb species?
4. Select one of the following.
    a. Planned land use for converted acres is haying.
    b. Planned land use for converted acres is grazing.
    c. Planned land use for converted acres is wildlife.