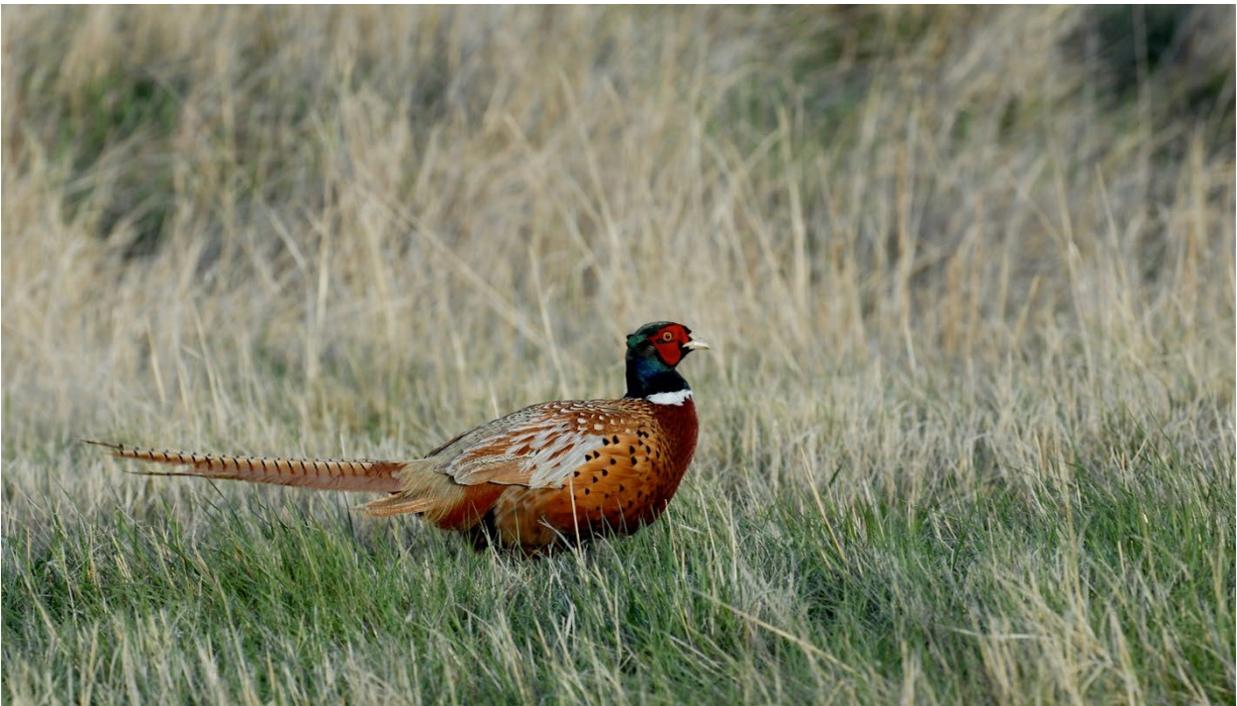


# Sheridan County Crop to Perennial Vegetation Targeted Implementation Plan

USDA NRCS PLENTYWOOD FIELD OFFICE

## Table of Contents

Cropland to Perennial Vegetation Plan.....	2
Problem Statement.....	2
Project Location .....	3
Goals and Objectives.....	3
Alternatives and Actions .....	4
Desired Outcomes.....	5
Partners.....	5
Implementation .....	6
Ranking.....	10
TIP Ranking Questions .....	10



*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 (Sheridan County Long Range Plan, page 37). The resource concerns selected to be addressed through the TIP are shown in Table 1.

Table 1. Priority Resource Concern

INEFFICIENT ENERGY USE
<ul style="list-style-type: none"><li>• <b>Energy Efficiency of Farming/Ranching Practices and Field Operations</b></li></ul>

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 farm economically. These types of fields occur throughout all of Sheridan County. As equipment gets larger, 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.

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. 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. 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 habitat for pollinators and beneficial insects and year-round habitat for wildlife.

## Project Location

The Target Area lies along the southern portion of Sheridan County, Figure 1. It encompasses 227,926 acres. Approximately 123,444 acres within the Target Area are annually cultivated crop fields that have the potential to be converted to perennial vegetation under the TIP. Last year, in 2022, we implemented this TIP in the western portion of Sheridan County, Figure 2, and in the first year, we contracted over 850 acres.

## 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.

<b>Energy Savings Example</b>		
<b><i>Converting Small Areas of Cropland to Perennials</i></b>		
<b>Operations &amp; Fertilizer</b>	<b>System - Gallons Diesel/Acre</b>	
	No-Till Spring Wheat/Lentil	Perennial Hay
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
<b>Total</b>	<b>15.5</b>	<b>1.3</b>
<b>500 Acres Converted</b>	<b>7750</b>	<b>650</b>
<b>Dollars Saved (Based on \$5.00 Dyed Fuel)</b>	<b>\$38,750</b>	<b>\$3,250</b>

## Alternatives and Actions

### Alternative 1

The first alternative considered was seeding a perennial mixture immediately following an annual crop harvest, using either Conservation Cover, Forage and Biomass Planting, or the Range Planting practice.

### Alternative 2 – Preferred

The selected alternative consists of planting a cover crop the year after an annual crop, and then seeding the perennial vegetation immediately after that fall or the following spring. Cover crops improve water filtration, reduce weed pressure, increase soil organic matter, and act as biological primer for the soil. Seeding cover crops the year after an annual crop provides a good transition to perennial vegetation.

This TIP will give producers and the NRCS the opportunity to improve soil health and benefit wildlife. Alternatives used to treat the resource concern will be limited to the practices in Table 2.

Table 2. Conservation Practices

EQUIP PRACTICE	CODE	PAYMENT RATE *based on 2022 rates
Conservation Cover	327	\$134.99 per acre
Cover Crop	340	\$63.61 per acre
Forage and Biomass Planting	512	\$66.75 per acre
Range Planting	550	\$83.88 per acre

### Alternative 3 – No Action

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.

### Desired Outcome

The desired outcome is 1,200 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, which amounts to over an estimated 16,000 gallons of fuel saved. We will be converting non-productive, inefficient, or difficult to access areas to perennial grass 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 microorganisms.

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 health:

- 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

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 other producers about the TIP and to locate project sites.

The Nine Steps of Conservation Planning<sup>1</sup> 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.

Conservation Plans will include:

- Planting the cropland to perennial grass mixes through practice 327, 512 or 550.
- Some contracts will also utilize cover crops and pollinator habitat plantings where feasible and needed.

Conservation contracts will be no longer than two years. The average total contract amount will be \$134.99 per acre. Our goal for the first sign-up is 700 acres; NRCS financial assistance required would be \$95,000 in year one.

EQIP Funds				
Fiscal Year	Contracts (no.)	Acres Treated (total)	Average Expected Cost per Contract	Total
2023	10	700	\$9,500	\$95,000
2024	6	500	\$9,500	\$67,500

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](https://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/people/outreach/slbfr/?cid=nrcsdev11_001040)

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<sup>1</sup> 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](https://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/programs/financial/eqip/?cid=nrcs144p2_015695)

# Sheridan County TIP 2023

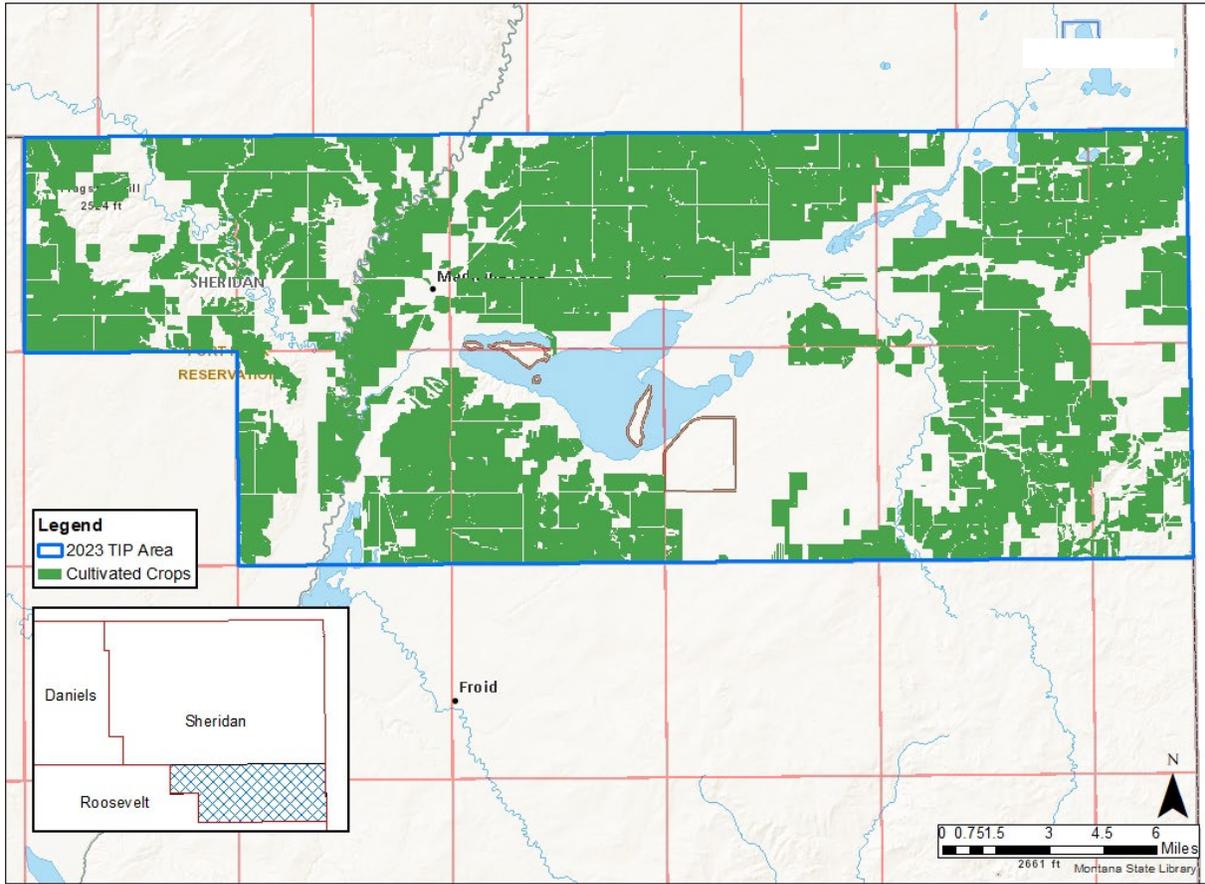


Figure 1. Sheridan County 2023 TIP Project Area

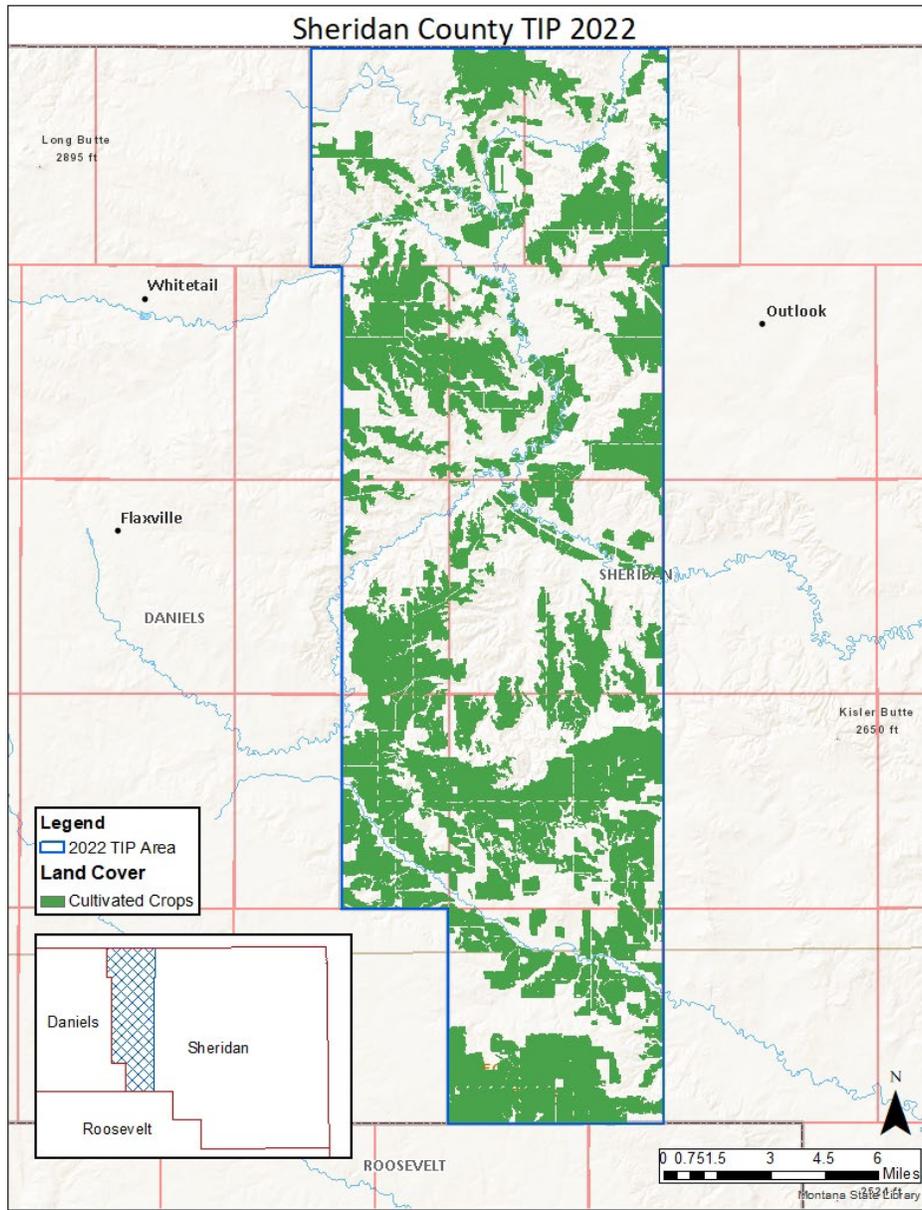


Figure 2. Sheridan County 2022 TIP Project Area

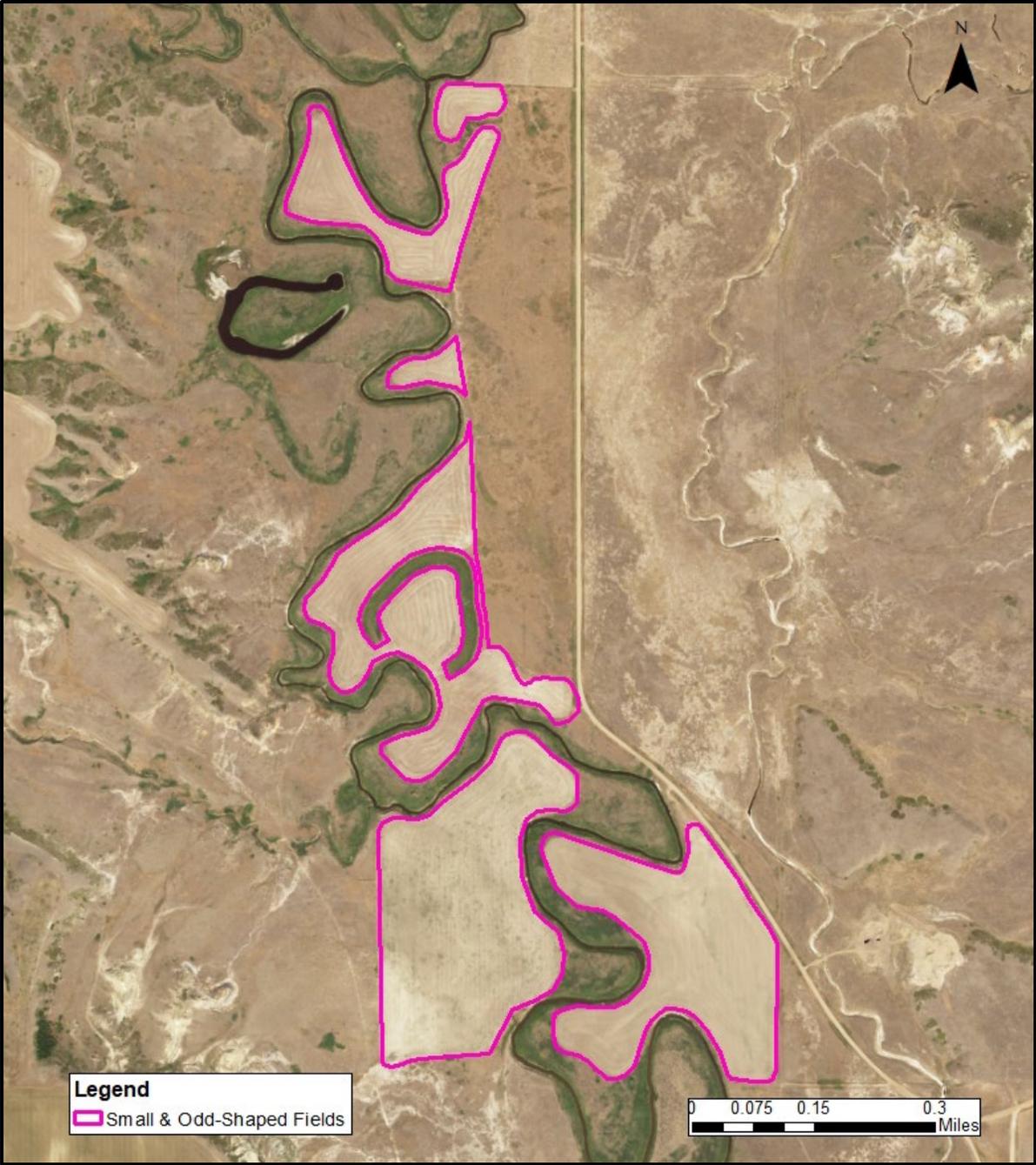


Figure 3. Sheridan County 2023 TIP Small & Odd-Shaped Field Example

## Ranking

### TIP Ranking Questions

1	Select one of the following: Will the seed mix include...	Points
	Only introduced species?	
	A mix of introduced and native species?	
	Only native species?	
2	Select one of the following: Will the seed mix include...	
	Less than 5 species?	
	More than 5 species?	
3	Select one of the following: Will the seed mix include...	
	0 forb species?	
	1 forb species?	
	2 forb species?	
	3 forb species?	
4	Select one of the following: Application includes...	
	No cover crops?	
	Cover crops?	