

MARSHALL COUNTY 23G – HABITAT EASEMENT

Current Landowner:

Arlyne Johnson and Michael Hedemark
Rollis Township Section 17
Township 157, Range 40, part of E½ of Section 17
described in Exhibit "A" of 23G
Marshall County, MN



Prepared By :

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MARSHALL 23G - OVERVIEW

The protected property was placed into a conservation easement with Ducks Unlimited in 2023. The Restoration Plan outlines property overviews, history, ecological information, restoration needs and suggested timeframes.

Resource Values:

- The relatively natural character of the property provides significant habitat for a variety plants and wildlife, including native plant communities and potential habitat for species of plants and animals that are listed as Species of Greatest Conservation Need as well as pollinators and beneficial insects.
- The conservation value of the property is enhanced by the U.S. Fish and Wildlife Service's Agassiz National Wildlife Refuge a ½ mile to the west.

To enhance the resource value of the protected property, a set of restoration needs have been identified. These needs were identified based on a review of ecological information including pre-settlement vegetation, historic land cover and use, soils, topography, hydrology, and sites visits during summer and fall of 2023.

The results of the site visits found that the property contains a mix of quality native plant communities and wildlife habitat because of native seedings as well as “go-back,” areas with minimal past land use and disturbance, and the current landowner's stewardship.

Some of the primary threats to resource value are the lack of natural disturbances, in particular fire, invasive woody species, and hydrological impacts from field ditching.

MARSHALL 23G - OVERVIEW

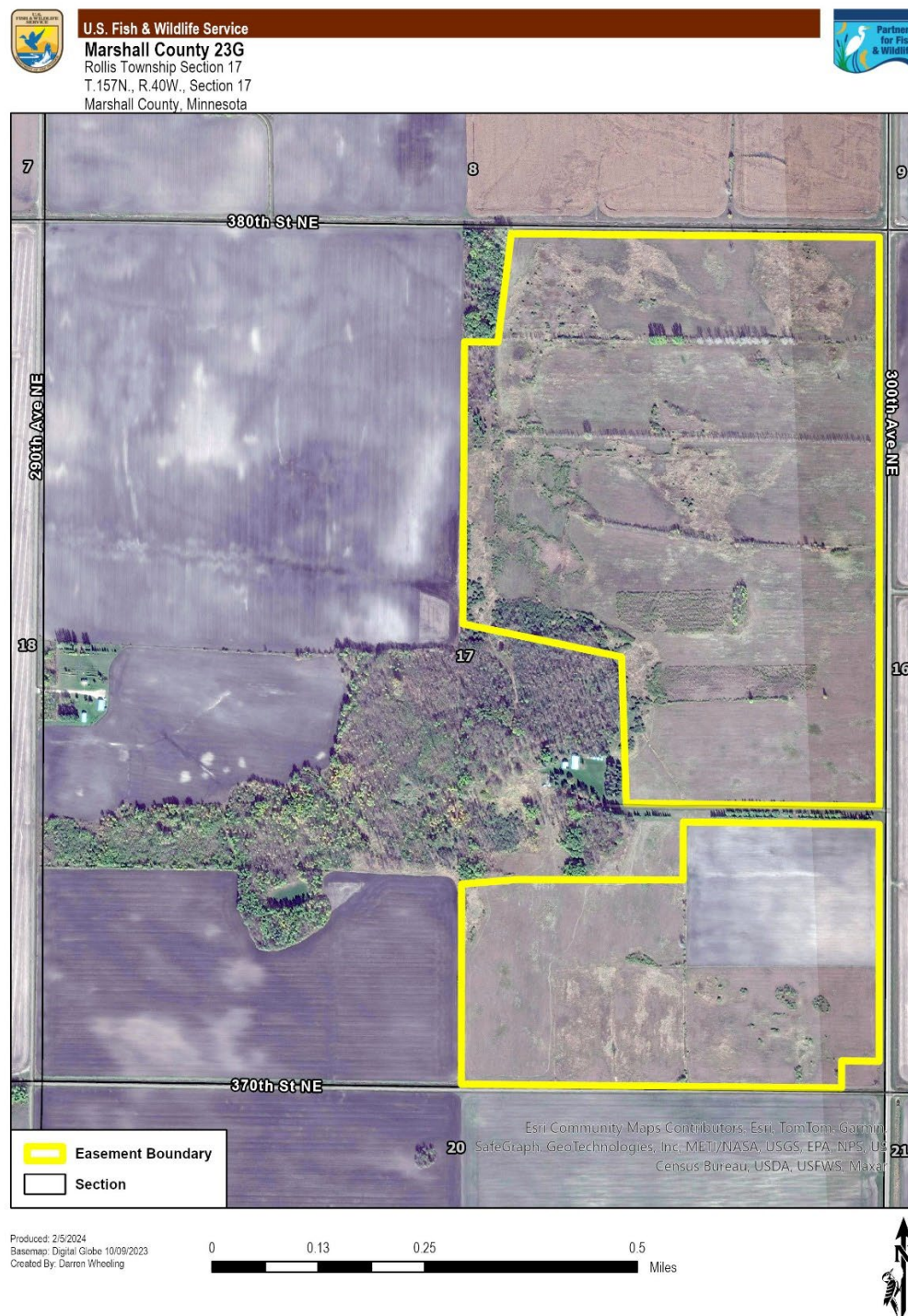


Figure 1. 2023 Aerial Photography

MARSHALL 23G - HISTORY

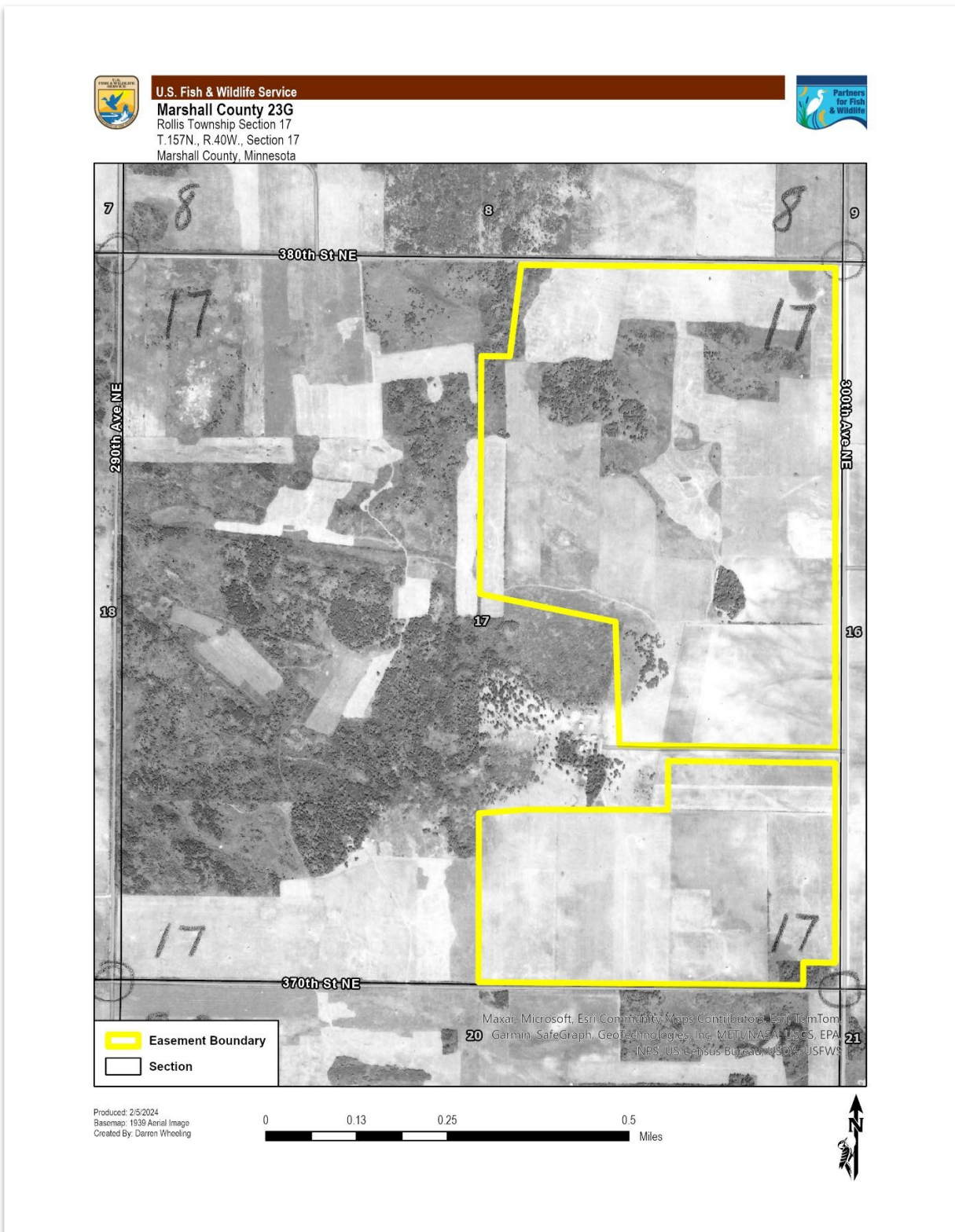


Figure 2. 1939 Aerial Photography



Figure 3. 1954 Aerial Photography

MARSHALL 23G - HISTORY



Figure 4. 1966 Aerial Photography

MARSHALL 23G - HISTORY

Land History

Written by Arlyne Johnson and Mike Hedemark (June 2024)

Following the 1862 Dakota wars, the Chippewa Red Lake and Pembina Bands signed a treaty in 1863 ceding their lands within Marshall County to the US government. The first European immigrants began arriving in the Gatzke area of Marshall County in 1897. The Southeast (SE) Quarter of Section 17 of Rollis Township was granted by the United States General Land Office on behalf of the president, Theodore Roosevelt, to Cordelia Marsh in March 1906. In 1909 Cordelia and Orson Marsh sold one acre in the southeast corner of the SE Quarter to the Rollis Presbyterian Church to use for a cemetery. They later sold the SE Quarter (minus the one acre cemetery) to George Leslie in 1911. Arthur and Amanda Johnson purchased the SE Quarter from Leslie in 1948. At that time, most of the SE Quarter was made up of many small fields except for the oak woodlot where the Leslie building site was located. Arthur and Amanda occupied the building site on the SE Quarter from 1948 to 1992. The Northeast (NE) Quarter of Section 17 of Rollis Township was originally granted to William and Emily Lowell, who sold the property to Albert and Helen Forder in 1908. The Johnsons purchased the Northeast Quarter of Section 17 from Peter Frank Czeh in 1955, which at that time consisted of a small building site amidst a patchwork of woods, pasture and small grain fields.

The Johnsons initially grazed a small herd of approximately 12 head of dairy cattle in the oak woodlot around the building site and planted small grains (oats, wheat, barley) and alfalfa on the farm fields. In response to the Soil Bank Act of 1956, the Johnsons enrolled the fields in the Soil Bank Program for several years beginning in the late 1950's until 1965. In the 1960s, Arthur and Amanda transitioned from dairy to a small beef cow/calf operation of approximately 50 cows with calves that were sold each fall. Cattle were mostly pastured in woodlot around the building site and in the wet meadow along the western boundary of the north quarter of the farm. In response to changes in federal agricultural policy in the early 1970's, and the rise of agribusiness, the Johnsons further opened up the north quarter for farming by clearing most of the remaining woods and ditches were dug to improve the drainage of both quarters. Crop production continued to be a rotation of small grains, alfalfa, with an occasional field of flax.

In 1979, Arlyne Johnson (Arthur and Amanda's daughter) and her husband, Mike Hedemark, purchased the north quarter and took over management of the farm. In 1980, Arlyne and Mike received support from the Soil and Water Conservation District (SWCD) to plant east/west windrows of green ash and hybrid popple trees dividing the north quarter into roughly four 40-acre fields. The SWCD also provided support to plant a border of honeysuckle, Arbor pear and Russian olive trees along the west end of the farm fields on the north quarter as well as a two windrows of hybrid popple, white spruce and green ash on the south side of the driveway on the south quarter. Mike and Arlyne continued to produce small grains and alfalfa on the farm until 1985. The beef cattle herd was sold in 1983.

In 1986, the farm fields were rented out to neighbors who continued to plant small grains and alfalfa on the property until the late 1990s. In 1999, Mike and Arlyne enrolled 136 acres of the north quarter of the farm in a 15-year contract with the Conservation Reserve Program (CRP), which included plugging ditches and seeding farm fields to noninvasive perennial grasses. Likewise, they enrolled the south quarter of the farm into a 15-year CRP contract in 2000. They re-enrolled both quarters in the CRP in 2014 and 2015 and reseeded the fields to native grasses and forbs. In line with Arlyne and Mike's desire to conserve the farm's native grasslands, wetlands and wildlife in perpetuity, Mike and Arlyne placed a wildlife habitat easement on this 270-acre property with Ducks Unlimited in 2023.

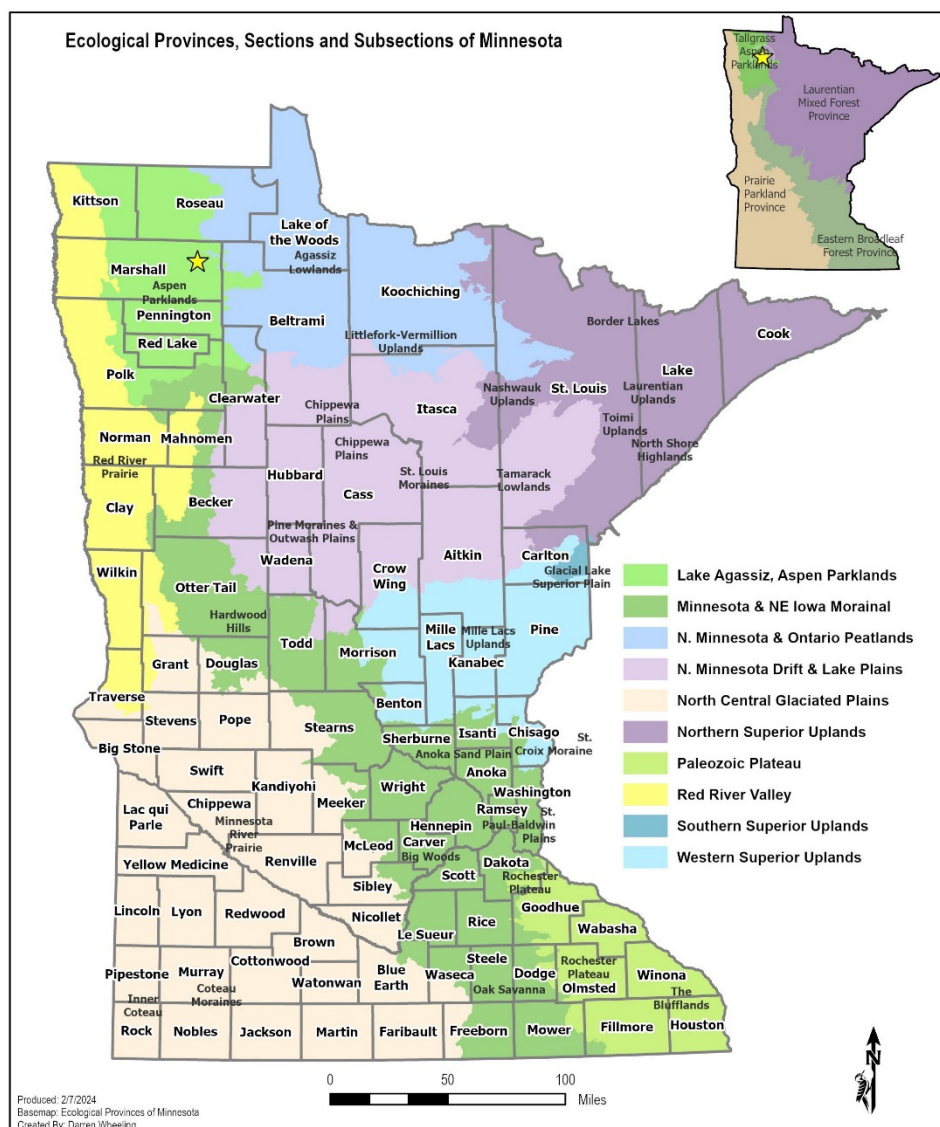
MARSHALL COUNTY 23G - ECOLOGICAL SETTING

The Ecological Landcover Classification System developed by the Minnesota Department of Natural Resources (MN DNR) is a useful tool for understanding how the protected property fits into the surrounding region and broader landscape. The Protected Property is in Marshall County, Minnesota in the Tallgrass Aspen Parklands Province (TAP) (Figure 5).

The TAP covers a small part of northwestern Minnesota and extends northwest into Manitoba, Saskatchewan, and Alberta where it is recognized as the Boreal Plains Ecozone. In Minnesota, the province forms a transition, or ecotone, between the semi-arid prairie landscape to the west and semi-humid mixed conifer-deciduous forests to the east. The TAP has only one section, the Lake Agassiz Aspen Parklands (LAP) which represents one landform, the basin of Glacial Lake Agassiz.

Glaciers advanced and retreated many times across nearly all of Minnesota between about 75,000 and 11,000 years ago. About 13,000 years ago, as the climate warmed and glaciers retreated, Glacial Lake Agassiz formed from glacial meltwater. Ultimately, this lake covered an enormous area across western Minnesota and eastern North Dakota, Manitoba, Ontario, and Saskatchewan. About 9,000 years ago, the lake drained from this area in northwestern Minnesota, leaving behind a rocky, flat plain. As the lake drained, beach ridges of gravel and sand formed along the shoreline, marking successively lower lake levels. After the lake drained, deposits of peat formed from vegetation and alluvium along rivers.

Figure 5. Ecological Provinces, Sections, and Subsections



MARSHALL COUNTY 23G - ECOLOGICAL SETTING

Pre-settlement vegetation in the uplands could be classified as a mosaic of prairies, brushland, fire-dependent woodlands and forests. In the lowlands, wet prairie, meadows, conifer bogs, and swamps covered the landscape. Years ago, wildfire kept the aspen and other woody species from encroaching while allowing prairie grasses to flourish. Fire suppression has also allowed oak openings and brush prairie to develop into woodlands.

Figure 6. Marschner Pre-settlement Vegetation



MARSHALL COUNTY 23G - ECOLOGICAL SETTING

The property is in the Red River of the North watershed more specifically, the Thief River Subwatershed. This subwatershed is approximately 1,090 square miles. The Thief River Subwatershed has an extensive system of ditches created in the early 1900's across the Red River Valley and parts of the TAP to promote drainage for agricultural production. The level topography of the region, along with changes in land use patterns such as wetland removal and the conversion of tallgrass prairie to agriculture, leads to frequent flooding and contributes to sediment and pollutant loading to surface waters. Predominant land uses are row crops (36%), wetlands (44.9%), grass/pasture/hay (7.8%), forests (6.7%) and residential/ commercial development (2.8%), open water (1.7%) and the remaining is barren/mining land.

The TAP Province is cold and dry. Annual precipitation is about 20-22 inches, with a small portion coming as snow, and evapotranspiration is greater than precipitation. Low precipitation, little spring infiltration due to frozen ground, and strong, desiccating winds from the Great Plains historically promoted spring fire that caused severe stress on shrubs and woodland communities. Extreme low temperatures of -40°F to -45°F exceed the physiological tolerances of some woody species.

Regarding future climate conditions, trends indicate warmer winters and nights and even larger rainfalls, along with the likelihood of increased summer heat and the potential for longer dry spells. These changes, along with agricultural expansion, increased demands on groundwater resources, and altered hydrology, could result in further loss and degradation of native plant communities. These communities, with higher biological diversity and connectivity, are expected to be better able to respond to these predicted changes than lower diversity, fragmented communities.

MARSHALL COUNTY 23G - WILDLIFE

Minnesota provides habitat for hundreds of species of wildlife, some of which are common and many of which are rare due to loss or degradation of vegetation types on which they depend. The goals of this section are to identify which wildlife species may be present based on existing vegetation types on the protected property, and which wildlife species are likely to respond favorably to habitat management.

Key Wildlife Species

The MN DNR maintains a list of Species of Greatest Conservation Need (SGCN), which includes all species with Endangered, Threatened, or Special Concern status at the state level, as well as species without status but warranting inclusion on the list due to declining population trend. All SGCN are associated with one or more vegetation types, and within each vegetation type, can be associated with vegetation features, such as vegetation height, presence or absence of water or water depth, and total area of the vegetation type.

Game species in Minnesota include large game (white-tailed deer, elk, moose, bear), small game (eastern cottontail, snowshoe hare, white-tailed jackrabbit, squirrel, numerous furbearers), game birds (American woodcock, common snipe, mourning dove, ring-necked pheasant, prairie chicken, ruffed grouse, sharp-tailed grouse, wild turkey), and waterfowl (ducks, geese, cranes). The following game species occur or may occur on the site based on current vegetation types: deer, eastern cottontail, squirrel (American red squirrel, eastern gray squirrel and fox squirrel), American woodcock, common snipe, mourning dove, sharp-tailed grouse, ruffed grouse, sandhill cranes and other waterfowl.

Several non-game bird species of greatest conservation need (SGCN) have been recorded on the site (See Figure 7).

Within Minnesota, there are over 500 species of bees, 150 species of butterflies, 1,000 species of moths, and numerous other species of beetles, flies, and ants. These insects are not only essential as pollinators for food crops and wild plants, but also serve as natural enemies for pests of cultivated plants. Insects are a critical portion of many wildlife species' diets such as bluebirds, flycatchers, nighthawks, and frogs.

Recently, there has been a decline in insect species, including pollinators (both native and introduced honeybees), beneficial insects, butterflies, and moths. Some of the causes for these declines include loss of habitat, limited diversity, and lack of abundant floral resources (nectar and pollen), and pesticides. The neonicotinoid class of pesticides is thought to be especially damaging.

Many native insects feed only on native plants and in some cases only one species of plant. Therefore, supporting healthy insect populations will require protecting and restoring diverse native plant communities. Restoration and enhancement of prairie, including reducing woody species to promote native grasses and forbs will benefit native pollinators and other insects.

MARSHALL COUNTY 23G - WILDLIFE

Figure 7. Known SGCN species occurring on site.

Bird Species in Greatest Conservation Need (SGCN)* known to occur on the site		
*Source: Minnesota Wildlife Action Plan 2015-2025		
Common name	Scientific name	State status**
Le Conte's sparrow	<i>Ammodramus leconteii</i>	NL
Eastern whip-poor-will	<i>Antrostomus vociferus</i>	NL
Veery	<i>Catharus fuscescens</i>	NL
Northern harrier	<i>Circus cyaneus</i>	NL
Sedge wren	<i>Cistothorus platensis</i>	NL
Black-billed cuckoo	<i>Coccyzus erythrophthalmus</i>	NL
Olive-sided flycatcher	<i>Contopus cooperi</i>	NL
Bobolink	<i>Dolichonyx oryzivorus</i>	NL
American kestrel	<i>Falco sparverius</i>	NL
Purple finch	<i>Haemorhous purpureus</i>	NL
Wood thrush	<i>Hylocichla mustelina</i>	NL
Loggerhead shrike	<i>Lanius ludovicianus</i>	NL
Franklin's gull	<i>Leucophaeus pipixcan</i>	SPC
Marbled godwit	<i>Limosa fedoa</i>	SPC
Red-headed woodpecker	<i>Melanerpes erythrocephalus</i>	NL
Black-crowned night heron	<i>Nycticorax nycticorax</i>	NL
Eastern towhee	<i>Pipilo erythrophthalmus</i>	NL
Dickcissel	<i>Spiza americana</i>	NL
Eastern meadowlark	<i>Sturnella magna</i>	NL
Brown thrasher	<i>Toxostoma rufum</i>	NL
Sharp-tailed grouse	<i>Tympanuchus phasianellus</i>	NL

** NL = Non-listed species; SPC = Species of special concern

All state-listed species and federally listed species that occur in Minnesota are automatically SGCN. Additional non-listed species are SGCN based on specific criteria and expert opinion. The purpose of the SGCN list is to prioritize species and habitats on which to target conservation strategies and actions that are defined in Minnesota's 2015–25 Wildlife Action Plan.

MARSHALL COUNTY 23G – RESTORATION

As described in the preceding section, the easement has quality native plant communities and wetlands, many of them with open ditches and expected sediment loading. This section of the Restoration Plan provides recommendations for protecting and improving the resource value of these habitat types. Actual implementation timeframes may vary based on local site conditions, contractor availability or other circumstances.

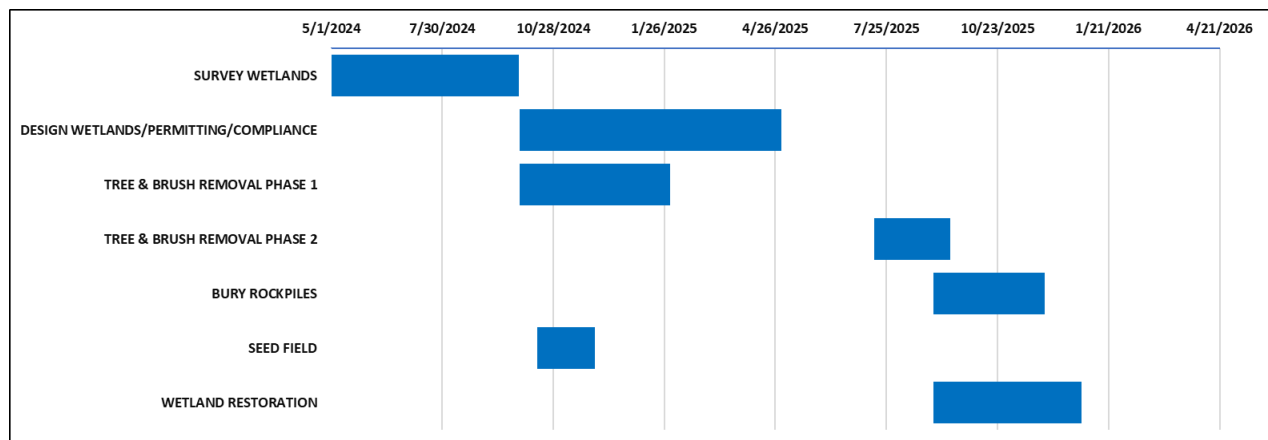
Other considerations should include rights retained by the landowner to hunt, graze livestock, hay (within season) and recreate on all the property within the habitat easement. To avoid any misunderstanding, communication of intended use and coordination of the land use practices between the landowner and the easement holder is important. The landowner is encouraged to share their intended land use practices with the easement holder contact person. This may include making a phone call, sending a text, or ideally providing a brief written document describing what practices will be done and when. These intentions might include plans for such activities as trail making, the location of sites for hunting stands, intentions to allow commercial hunting, pasture/fencing designs for grazing and livestock, livestock rotation schedules, etc. Obviously plans can change due to weather conditions, markets, or other external factors. Therefore, the landowner and the easement holder should keep each other informed and provide adequate notice before initiating a land use activity.

Objective 1: Wetland restoration and/or enhancement including ditch fills/plugs, sediment removal, or a combination. Burying rock piles should occur when equipment is onsite for wetland work.

Objective 2: The field (~24 acres) is seeded to high diversity native plant mix composed of high forb:grass ratio and high species richness.

Objective 3: Mechanical/chemical/browsing treatment of widespread woody species encroaching wetland fringe, ditches, and grassland areas. Oak trees are preserved.

Figure 8. Tentative Restoration Schedule



MARSHALL COUNTY 23G – RESTORATION

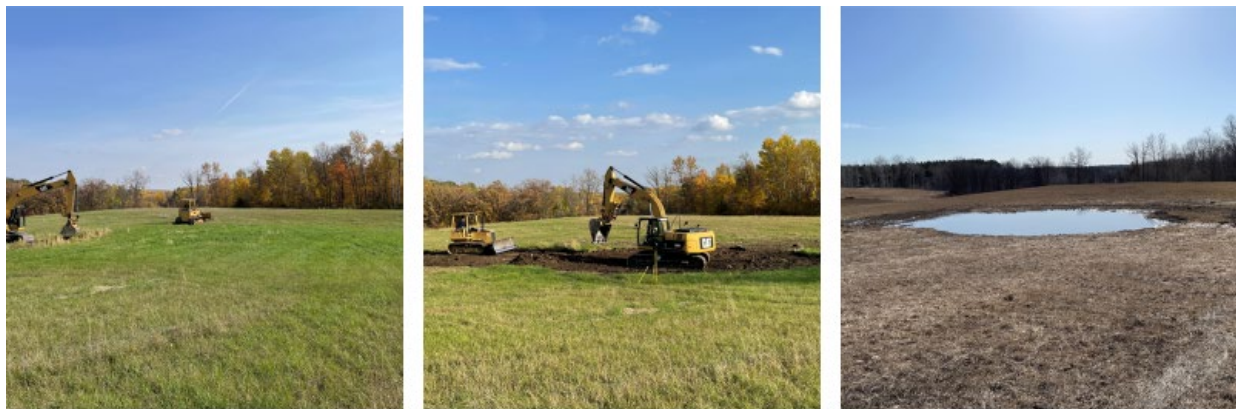
WETLAND RESTORATION AND ENHANCEMENT

Due to the relatively flat nature of the land, extensive survey work will need to be completed to determine restoration needs and potential and to ensure offsite impacts are avoided. Ducks Unlimited will be the surveying and design lead with the USFWS and landowner assisting as needed. Surveying should begin as soon as site conditions allow and should continue until complete.

Wetland restoration needs can be highly variable, but all the basins will have some level of heavy equipment dirt work needed in the form of ditch fills, ditch plugs (earthen dikes), and sediment scrape-outs. Restoring the natural hydrology is the primary goal for depressional wetlands, generally by removing and abandoning the current site's artificial drainage. Outlets will need to handle regular, continuing ground water inflow as well as sporadic flow from large surface runoff events. In restoring hydrology to drained surface water depressional wetlands, the goal should be to remove and abandon any drainage out of the wetland and seal breaches through the wetland substrate. This may include completely filling in the drainage ditches that penetrate the confining layer at the base of the wetland. Care must be taken to avoid backing water off-site or off-easement. Designs should maximize restoration potential but will not impact neighbors or off-easement areas and infrastructure.

Existing rockpiles can attract ground nesting predators, so during the wetland restoration and enhancement phase, rock piles will be buried outside of basins while considering minimal impacts to the site.

Figure 9. Progression of Wetland Restoration

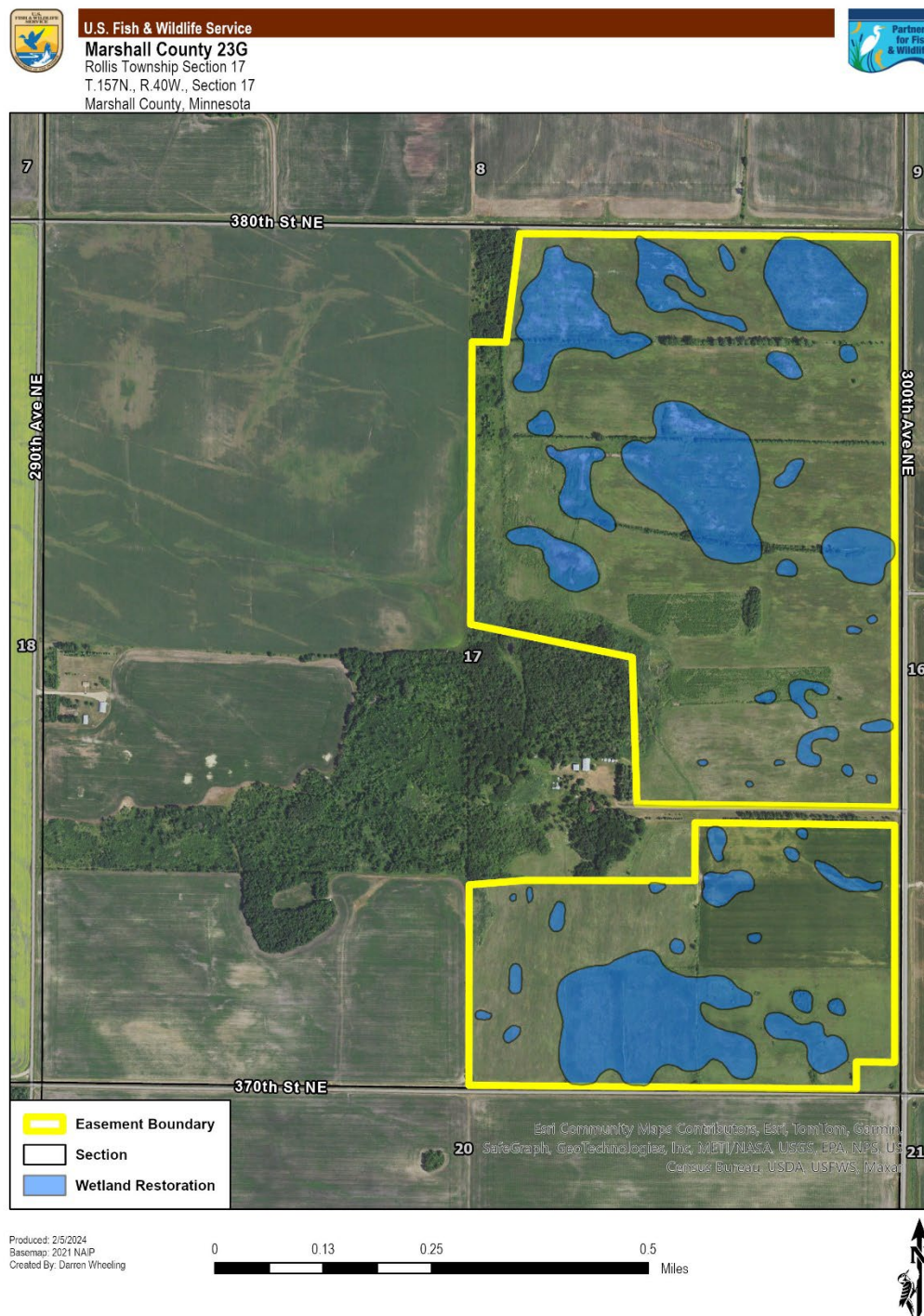


Wetland Restoration

- Wetland surveyed and elevation set
- Restoration designed and advertised for bids
- Local contractors hired to perform work
- Wetland becomes available for livestock and wildlife uses

MARSHALL COUNTY 23G – RESTORATION

Figure 10. Wetland Restoration or Enhancement Areas



MARSHALL COUNTY 23G – RESTORATION

SEEDING

A roughly 24-acre field remains in crop production with plans to reseed the area to a high diversity, high forb:grass ratio. The field should be planted to soybeans in 2024 to ensure weed species are controlled and to provide a smooth and firm seedbed. Following soybean harvest, the ground must not be tilled or otherwise disturbed. Use of neonicotinoid class of insecticides such as clothianidin, imidacloprid, and thiamethoxam are prohibited.

Seeding will take place in the late fall or early winter during periods of freezing nights and above freezing days also referred to as frost-seeding or dormant seeding. Actual planting dates will vary depending on site conditions and forecasted weather. If possible, timing the seeding before a snowfall will help prevent loss of seed consumed by wildlife during the winter months.

Seed establishment should be expected to take at least 3 to 5 years. The first years after being in crop rotation usually begin with flushes of “weedy” species. Chemical and mechanical treatment during the early establishment should be avoided to prevent harming the young native plants. Native plants typically spend the first years growing below ground through their extensive root systems. The following years, grasses and early establishing forbs begin to compete with “weedy” species. After year 5, the seeding should show “balancing” with more forbs beginning to flower throughout the growing season and grasses are established throughout the field.

Figure 11. Field to be Seeded



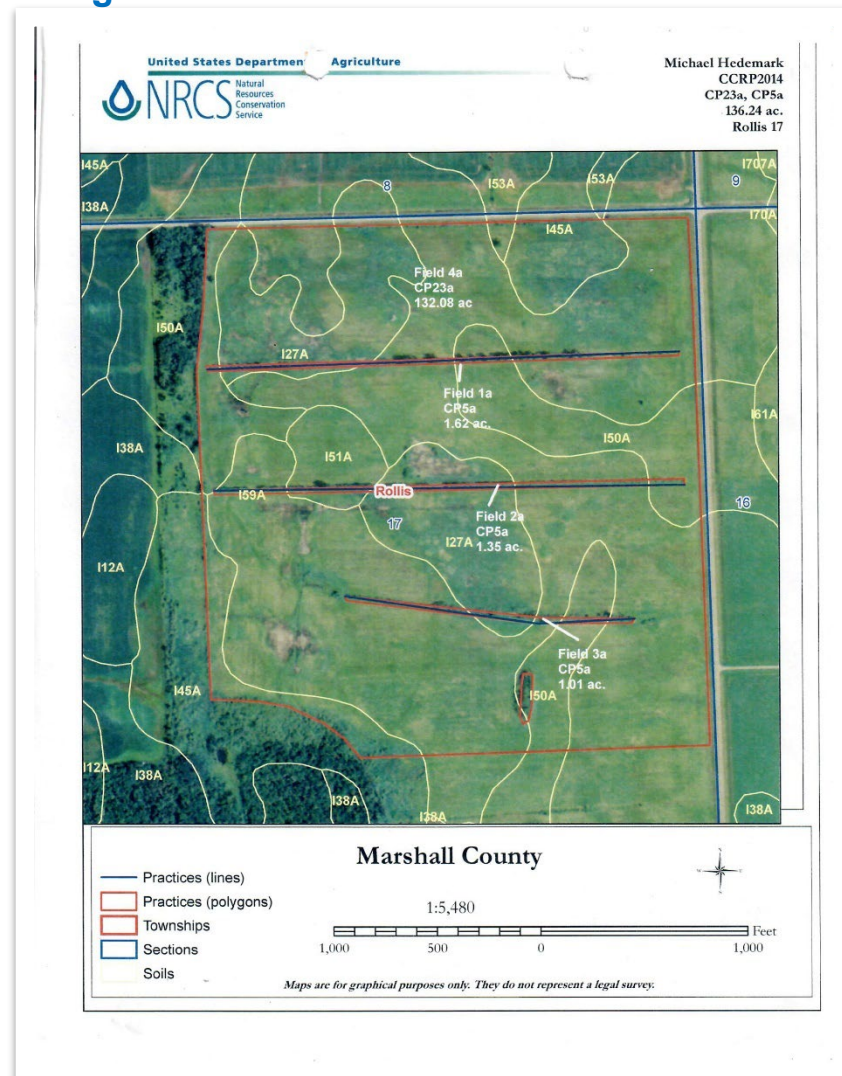
MARSHALL COUNTY 23G – RESTORATION

TREE AND BRUSH REMOVAL

One of the greatest threats to the prairie plant communities and wildlife habitat is the absence of disturbance to reduce woody cover. However, given the importance of acorns as a food resource, protecting and fostering oak trees to ensure a future supply for wildlife while also ensuring seeds for oak regeneration will be beneficial. Scattered mature stands of willow, popple and planted rows of green ash will be cut to reduce edge and predator perches and add value to grasslands for a variety of local and migratory wildlife.

The property currently has 2 existing Conservation Reserve Program contracts with one expiring 09/30/2024 (Figure 12) and the other expiring in 09/30/2026 (Figure 13). The “volunteer” trees may be cut at any time during the CRP contract; however, the green ash rows must be left until the contract expires at the end of September 2024. At the end of the contract, the tree rows will be removed.

Figure 12. North CRP Field



MARSHALL COUNTY 23G – RESTORATION

Figure 13. South CRP Field



Scattered stands of willows and other softwood species have progressively invaded prairie plant communities including wetland fringe and field ditches throughout the easement. Once volunteer trees and brush become more established, control and removal become much more difficult and expensive. Seedlings and trees under 2 inches in diameter can be controlled by fire, mechanical, and chemical means. Trees larger than 3 inches in diameter can be removed by chemical or mechanical means. Anything 4 inches and larger, mechanical removal becomes the most viable option but can be the most time consuming and expensive. Willow stands and young trees typically need multiple treatments and a combination of chemical and mechanical control to have any success in reducing stem density.

“Phase 1” will include the initial mowing of the smaller diameter (<4 inches) brush and trees and larger trees (>4 inches) will be sheared and stump treated. The following year, “Phase 2,” will include a foliar herbicide treatment to resprouts, followed by a second mowing. Reducing or eliminating stands would aid in the wetland restorations by removing biomass in areas where dirt work will be needed. Targeted areas can be seen in Figure 14. Longer term management of trees and brush can be accomplished through haying, intermittent mechanical control and livestock grazing/browsing.

MARSHALL COUNTY 23G – RESTORATION

Figure 14. Woody Tree and Brush Removal Areas

