



MEMORANDUM

Comfort Lake-Forest Lake Watershed District

Date: June 29, 2026
To: CLFLWD Board of Managers
From: Mike Kinney, District Administrator
Subject: Bone Lake South Nature Area Management Plan Update



Background/Discussion:

District Staff and engineers are currently working on the management and restoration plan for the Bone Lake South Nature Area (BLSNA). The plan will cover the day-to-day operations and management of the Nature area as well as a detailed five-year restoration plan for the entire property – including both wetland and upland habitats. The following is the requested update on this process.

The property was purchased in December 2025 using grant funds from the Lessard-Sams Outdoor Heritage Fund. The 25-year vision statement for the Lessard-Sams Outdoor Heritage Council states that "Investments from the LSOHC... are made with primary consideration given to maintaining habitat and diversity, which provides the foundation for improved fish, game, and wildlife habitat; long-term ecosystem integrity; and public access for hunting, fishing, and other wildlife-oriented recreation." According to the OHF grant requirements, "land acquired with Outdoor Heritage Funds must be open to public hunting and fishing during the open season in accordance with the state constitution" (www.legacy.mn.gov/outdoor-heritage-fund).

As the OHF is a competitive grant, the CLFLWD's BLSNA grant applications materials were aligned with this vision of the Council and requirements of the grant and indicated that the CLFLWD would open the property to hunting and fishing in accordance with local regulations. Staff feel that this was a key element in being awarded funding from the OHF for the acquisition of the property. City of Scandia regulations allow hunting if no firearms are discharged within 500 ft of any structure (home or building). The majority of the 238-acre property is greater than 500 ft from any building or any adjacent property (except those homes along 228th St N and Bone Lake).

The current draft management plan allows year-round non-motorized use of the BLSNA from dawn to dusk. Hunting and fishing would be allowed in accordance with local regulations. On-leash pets would also be allowed. Prescribed burns and conservation grazing are two management tools suggested for establishing and maintaining native vegetation. No overnight camping, fires, or firewood gathering would be permitted and the nature area would have a pack in/pack out trash guideline as no garbage service would be provided at the sole access point along 228th St North – across from Mallard Dr North.



MEMORANDUM

Comfort Lake-Forest Lake Watershed District

Staff hope to have a final draft management and restoration plan for Board consideration by late summer. This draft would be based on staff and EOR recommendations but could be edited further based on manager feedback.

Attached to this memo is an example management plan for a property located in Otter Tail County. The plan contains many of the elements that the BLSNA management and restoration plan will encompass. Staff used this plan, as well as several others, as a template for the BLSNA management plan currently being drafted.

Attached:

Example Habitat Management Plan

Habitat Management Plan Tamarack Lake (REDACTED)

Otter Tail County

Prepared for:

The REDACTED Family

Prepared by:

Nick Bancks, Kanati Land Management

June 2022

Funding for this plan was provided by Minnesota's Outdoor Heritage Fund as recommended by the Lessard-Sams Outdoor Heritage Council



Thank you to the REDACTED Family, for your protection and stewardship



“When we enter the landscape to learn something, we are obligated...to pay attention rather than constantly to pose questions...to stay in one place, to make of that one, long observation a fully dilated experience...we will always be rewarded if we give the land credit for more than we imagine, and if we imagine it as being more complex even than language.
In these ways we begin to find a home, to sense how to fit a place.”

—*Barry Lopez*

Executive Summary

The Protected Property was placed into a Conservation Easement with the Minnesota Land Trust in 2023. As a condition of the Conservation Easement, habitat management on the Protected Property may occur in accordance with a habitat management plan approved by the Land Trust. A Habitat Management Plan (HMP) is developed to provide recommendations on how to maintain the Conservation Values of the Protected Property, as set forth in the Conservation Easement. The HMP provides recommendations to guide the ecological restoration or enhancement of associated wildlife habitat. Implementation of these recommendations *is not required* by the Conservation Easement terms. **However, a separate detailed action plan that has been approved by the Land Trust will be required if the REDACTED Family seek to implement any of the recommended activities.**

This HMP (the “Plan”) has identified a set of management objectives that provide measurable outcomes and expectations (i.e. desired conditions) that maintain the Conservation Values of the Protected Property. These management objectives and the corresponding management recommendations were developed in consultation with the REDACTED Family and are consistent with the Conservation Easement. Objectives and recommendations are more fully described, along with a suggested timeline, in the *Management of the Protected Property* section and **Appendix A** of this Plan.

Habitat Management Plan Goals & Timeline

- Goal 1: Management and suppression of non-native invasive species (ongoing)
- Goal 2: Enhancement of Mesic Prairie to promote biological diversity and provide wildlife habitat for grassland bird species and pollinators (2023 & 2024)
- Goal 3: Restoration of the Gravel Pit area to provide wildlife habitat and connectivity

All goals and recommendations detailed herein take into account the requirements of the Wetland Habitat and Protection Program - Phase 5 grant funding the development of this Plan. Specifically, the plan design and recommendations are consistent with the highest quality conservation and ecological goals for the site. Current and historic land cover, soils, geology, topography, and other relevant factors that provide the best chance for long-term success and durability of the management objectives and recommendations were considered and incorporated into plan design. Additional management requirements stipulated by the Wetland Habitat and Protection Program - Phase 5 grant and Outdoor Heritage Fund are identified and detailed in **Appendix A** of this Plan.

This Plan has identified management units, which are based on the mapped NPCs and land cover types. For each unit, there is a description of the current conditions and desired conditions, along with management options for achieving the desired conditions. Additionally, management priorities have been identified. Management on the Protected Property should be directed first to these areas in order to prevent any further habitat degradation. The management units and management priorities are mapped on **Figure 1**, and described in detail throughout this Plan.

The management priorities for the Protected Property are identified on **Figure 1** and include:

1. Management of non-native invasive species, with primary focus directed towards eradication of crown vetch and suppression of invasive cattail, buckthorn and thistle present on portions of the Protected Property.

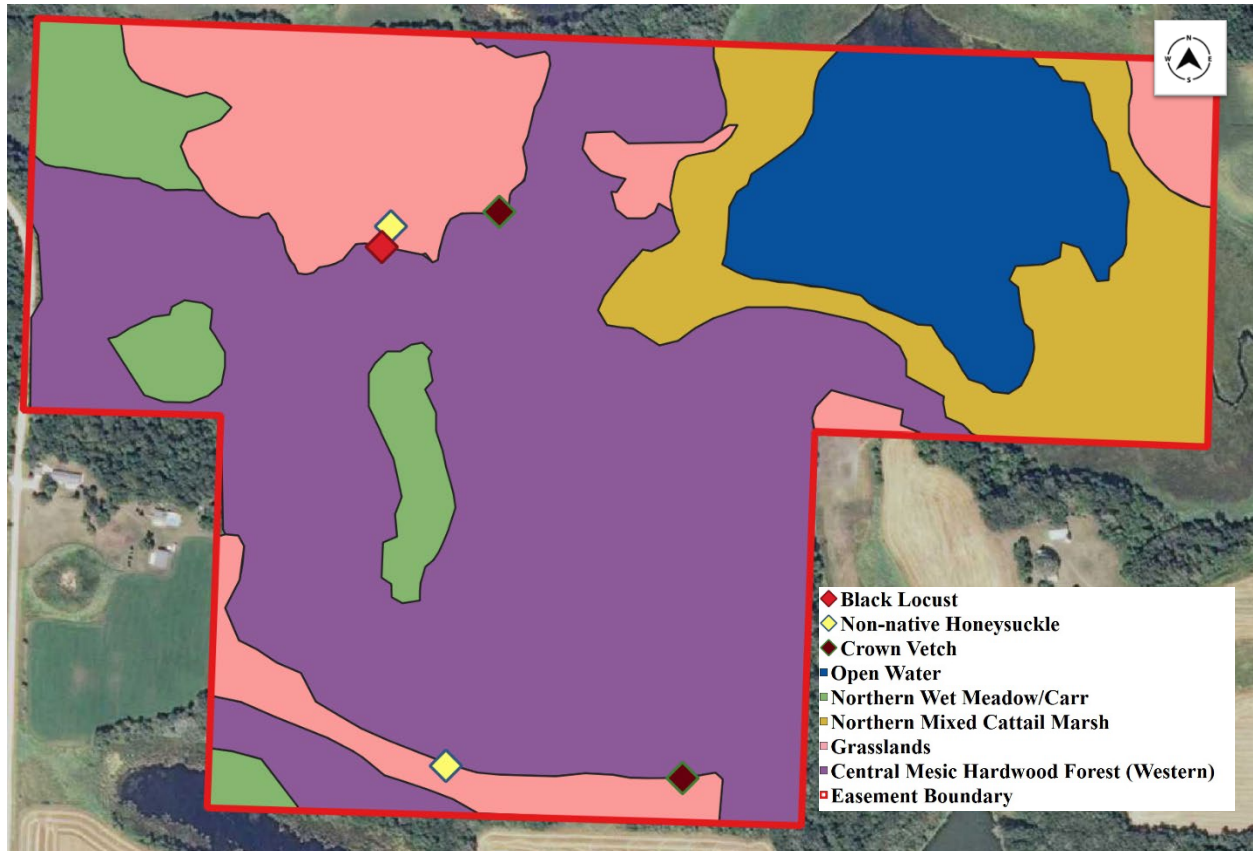


Figure 1. Protected Property Land Cover and Priority Management Areas

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Introduction

The Minnesota Land Trust (“Land Trust”) provides Habitat Management Plans (the Management Plan”) for Owners whose properties are newly protected through a conservation easement (“Easement”) held by the organization. As an Owner of such a property (the “Protected Property”) this Plan provides recommendations to guide the ecological restoration or enhancement of associated wildlife habitat on your land.

Easements detail the negotiated terms agreed upon by the Land Trust and the Owner to protect the Conservation Values (described below) of the Protected Property. Easements, however, do not often require you, as an Owner, to conduct habitat management activities on your property (although in some instances such requirements are put forth). However, long-term protection of a Protected Property’s Conservation Values can be heightened through regular, prescribed habitat management activities over time. This Plan provides you with the guidance to manage these habitats in a manner that is ecologically appropriate, consistent with the terms of the Easement and any requirements of the associated funding source, and meets your desires as the Owner.

Since an Easement is the over-arching legal document that provides for the long-term protection of a property, any recommended action put forth in this Plan should consider protection and maintenance of the Protected Property’s Conservation Values in accordance with the terms of the Easement.

This Plan also intersects with the Baseline Documentation Report (“Baseline”), which augments your Easement and provides complete documentation of both the Conservation Values and condition of the Protected Property at the time the easement was executed. The Baseline provides a benchmark against which the ecological impact of any prescribed management activity may be measured over time.

This Plan also addresses additional requirements put forth by the funding source for all easements acquired with financial support from the Outdoor Heritage Fund (OHF), and as stipulated in the Land Trust’s grant agreement with the Minnesota DNR (grant number 182829) for its OHF Wetland Habitat and Protection Program - Phase 5 grant. The purpose of the grant is to acquire permanent conservation easements and to restore and enhance prairie, wetland, and other habitat on permanently protected conservation easements in high-priority wetland habitat complexes in the prairie and forest/prairie transition regions.

This Plan is intended to be the basis for a working partnership between the Owner and the Land Trust. If you, as an Owner, wish to undertake any habitat management or restoration activity on the Protected Property as laid out in the Plan, you will be required to provide a detailed action plan (“Action Plan”) to the Land Trust for approval prior to commencement of any desired activities. Action Plans are intended to provide more specific, detailed, descriptive information related to the proposed activity, including course of action, schedule, and management objectives. In general, all but small-scale activities on the Protected Property require an approved detailed Action Plan that builds from this Plan, in accordance with sections 3 and 7.6 of your Easement.

Conservation Values and Management Goals & Objectives

- Goal 1: Management and suppression of non-native invasive species (ongoing)
 - Objective 1: Removal of non-native honeysuckle and crown vetch present on Property
 - Objective 2: Suppression of reed canary grass (RCG), thistle, invasive cattail, and common buckthorn infestations present on Property
- Goal 2: Enhancement of Mesic Prairie to promote biological diversity and provide wildlife habitat for grassland bird species and pollinators (2023 & 2024)
 - Objective 3: Implement disturbance to encourage native tallgrass prairie species and maintain open character
- Goal 3: Restoration of the Gravel Pit area to provide wildlife habitat and connectivity
 - Objective 4: Restore the former gravel pit area to a mesic/xeric upland prairie or savanna community with enhancement of adjacent wetlands to provide additional areas of habitat and improve connectivity with adjacent federal lands

Protected Property Description

The Protected Property has been in ownership by the REDACTED family since 1972 when the REDACTED family patriarch, John REDACTED purchased the property.

Much of the Protected Property is grassland, which is concentrated in the eastern half extending from the property interior to its southern border. Much of these grassland areas were once grazed, with limited areas of tillage, but have been retired from grazing activities since the 1970s, while the tillable portions were planted to several different tree species through the Conservation Reserve Program (CRP) during the 1990s and 2000s. Portions of the grasslands are dominated by cool season, non-native grasses, however natives are present throughout. Apart from several vegetated trails that are part of a larger network of trails on the Protected Property and several hunting stands there are no improvements within these grassland areas.

Interspersed throughout the grasslands, and Protected Property as a whole, are pockets of upland woodlands, areas of open water, and wetlands. The upland woodlands comprise hardwood species, though there are small areas of conifers near the south boundary and southwest corners that were also planted as part of a past CRP practice which has since expired. These pockets of woodlands tend to be more prevalent near the western and southern boundaries of the Protected Property, though there is a prominent woodland pocket nestled in the property interior. The wooded portions of the Protected Property were enrolled in the Sustainable Forestry Incentive Act, but the Woodland Stewardship Plan associated with enrollment in SFIA was not accessible for use in consultation towards this Plan.

There numerous wetlands, ranging in size and type, scattered across the Protected Property. Several of the wetlands were deepened by dredging, or bermed to increase holding capacity and duration, during the 1970s. Many of the wetlands are shallow or deep marshes, or wet meadow. These water-filled basins, with a mix of open water and emergent and submergent vegetation,

provide food and resting areas for migratory birds and many species of wildlife.¹ The wetlands on the Protected Property are already encumbered with a separate perpetual easement that prevents draining, filling, leveling, or burning of the wetland areas, however other uses such as farming, grazing and haying are allowed during dry conditions. The Easement held by the Land Trust will also cover these wetlands and place additional restrictions on use.

The condition of the wetlands, upland woodlands and grasslands are largely of good quality, though there are portions of each system that have been degraded by non-native, invasive species. In particular, areas of the wetlands have pervasive infestations of reed canary grass (*Phalaris arundicia*) and narrow leaf cattail (*Typha augustifolia*). As noted above, both smooth brome and Kentucky bluegrass are present throughout the Protected Property's grasslands, but there are also limited amounts of other invasives, including: crown vetch (*Securigera varia*), black locust (*Robinia pseudoacacia*), sweet clover (*Melilotus spp.*) and Tartarian honeysuckle (*Lonicera tatarica*). Common buckthorn (*Rhamus cathartica*) and non-native honeysuckle are pervasive across portions of the property woodlands. A more detailed description, along with a condition assessment, of each natural system present on the Protected Property is provided in the *Land Cover and Native Plant Communities* section of this Plan.

Historically, the Protected Property was part of the larger Martin Family farm, and portions of the forest, woodlands, and wetlands were grazed or hayed. Remnant fencing is still present in areas as part of that legacy land use. The grassland areas were cultivated, hayed and grazed, though grazing has not occurred on the Protected Property since the mid-1970s, and farming stopped in the early 1990s. As evidenced by historical aerials much of the interior woodland appears to have been in grassland cover or presenting much more open canopy conditions during periods between the 1930s and 1960s (Figure 2a & 2b). These areas have since “mesophied” with canopy conditions closed in present day. Also notable in the historical aerials is the larger extent of the Protected Property that was hayed and grazed under the open conditions. Past and current land uses, in conjunction with historical conditions and presettlement patterns of vegetation will be considered in the context of preserving the Conservation Values of the Protected Property, while also incorporating the REDACTED family's management goals in the *Management Objectives & Recommended Activities* section. A culvert and road (190th Street) have altered the hydrology of the adjacent wetlands, including some on the Protected Property.

Approximately 19 acres of the Protected Property were impacted by mining for sand and gravel as part of an aggregate operation from 1997 up until approximately 2019. Located in its northeastern corner this area is also the highest portion of the Protected Property. Recommendations for restoration of this area will be provided in the *Management Objectives and Recommended Activities* section of this Plan.

¹ MN DNR. (2022). *Wetlands*. Online. www.dnr.state.mn.us/wetlands/index. Accessed April 20, 2022.

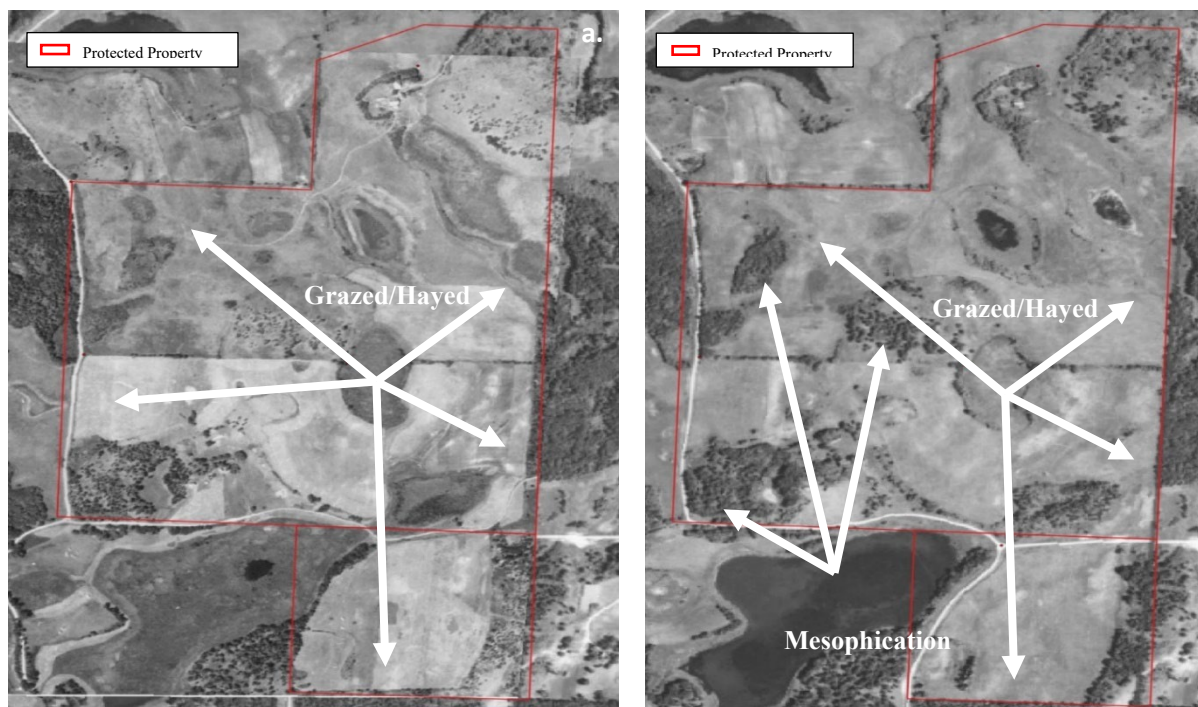


Figure 2. a) 1938 aerial b) 1963 aerial

Land Cover and Native Plant Communities

Historic Context

Understanding historic factors and forces that helped form present day conditions is crucial when developing management objectives and prescriptions. Soils, geology, topography, climate, and other relevant factors that provide the best chance for long-term success towards achieving management goals for the Protected Property are considered both here and in following sections of the Plan.

The Protected Property is located within the Hardwood Hills Ecological Subsection of the Eastern Broadleaf Forest Province as it crosses Minnesota. This area is an “ecotone”, or place of transition between two regional systems (forest and prairie). Landforms, topography, and soils here were influenced by glacial activity as recent as 9,000 years ago as the Des Moines lobe of the Wisconsin glaciation wasted and receded from the landscape leaving behind moraines, outwash plains, and calcareous, loamy sediment.

Vegetation responded to drastic changes in climate following the recession of glaciers from the area. Initially, until roughly 8,500 years ago the region surrounding the Protected Property was covered by spruce forest, which transitioned to more temperate forest and prairie as the climate warmed.² As the climate continued to oscillate between warm/dry and cool/humid areas of forest transitioned to prairie and then back to forest, causing the forest/prairie boundary to dramatically

² Amundson, Donna C. *Forest changes in Minnesota at the end of the Pleistocene*. Ecological Monographs. March 1979. Volume 49:1, pp. 1-16.

shift in relatively short periods of geologic time.³ The current vegetation of the region that still exists includes a mixture of wetland species with areas of forest and grasslands, though much of the landscape has been converted to agriculture. This mosaic is evident where rolling, hardwood woodlands is interspersed with wetlands, open grassland, and open water across the Protected Property.

Prior to European settlement the vegetation on the Protected Property was most likely a mix of “Oak openings and barrens” and “Prairie”. This was indicative of a fire-maintained mosaic of prairie, sedge meadow, dense shrub thickets and scrub forest, and other woody plants.⁴ These vegetative communities were dependent upon a natural disturbance regimen largely maintained by frequency of fire, which played a regenerative role by top-killing plants and initiating vegetative recovery through resprouting. Historically, low-intensity surface fires occurred on a very short rotation of just 10 years within the region, whereas catastrophic stand-replacing fires occurred roughly every 100 years. These fires enhanced vegetation reproduction by exposing mineral soil corollary increasing light and heat conditions on the ground, triggered seed dispersal and germination, and facilitated nutrient cycling and availability.⁵

Plant communities in this region are extremely dynamic in their response to the disturbance mechanisms of fire and climate, though as fire has become less prevalent on the landscape some areas have increasingly succeeded to more mesic communities. As climate continues to trend towards warmer and wetter weather patterns vegetative communities will respond and modify.

Current Land Cover

The current land cover of the Protected Property includes Native Plant Communities and human-altered land cover types. The Minnesota Department of Natural Resources (DNR) developed the Native Plant Community (NPC) Classification system to, among other things, improve vegetation management and survey natural areas for biodiversity conservation. NPCs are generally defined by the vegetation that is present and have similar soil properties (texture, moisture, and nutrients), topography, and natural disturbance regimes (e.g. fires, windthrow, or drought). Vegetation in an NPC occurs in layers, (referred to as structure), frequency and percentage of cover. Because NPCs are classified by the DNR with specific assemblages of plants, they can be used to set targets for habitat goals and measure progress toward reaching those goals. NPCs are generally intact, relatively high-quality habitats, dominated by native

³ McAndrews, John H. *Postglacial history of prairie, savanna, and forest in northwestern Minnesota*. Memoirs of the Torrey Botanical Club. Vol. 22:2, pp. 1-72.

⁴ From *Natural Vegetation of Minnesota at the Time of the Public Land Survey 1847-1907* published by the Natural Heritage Program, MN DNR, 1988.

⁵ Minnesota Department of Natural Resources (2005). *Field Guide to the Native Plant Communities of Minnesota: The Eastern Broadleaf Forest Province*. Ecological Land Classification Program, Minnesota County Biological Survey, and Natural Heritage and Nongame Research Program. MNDNR St. Paul, MN.

species; they have not been greatly altered by human activities. Alternatively, vegetated areas where native species have been largely replaced by non-native or invasive species, and the overall structure of the community has been altered (e.g. following agriculture or non-sustainable logging) are referred to in this management plan as land cover types.

Native Plant Communities/Land Cover on the Protected Property

Kanati conducted field surveys in May and July 2022 to map NPCs and land cover types on the Protected Property following the DNR *Field Guide to Native Plant Communities of Minnesota: The Eastern Broadleaf Forest Province*. As a result of past land uses, the species composition and structure of some of the plant communities are altered and are not necessarily representative of intact NPCs. In those areas classifying communities to specific NPC types was not possible. Based on the field survey, aerial photo interpretation, and review of existing NPC and historical vegetation records (e.g. bearing tree data and DNR analysis of Public Land Survey notes and landscape patterns) Kanati mapped four NPCs, and three other land cover types across the Protected Property (**Figure 4, Table 1**). The DNR uses Condition Ranks to describe the overall condition of NPCs; Condition Ranks are not applicable to other land cover types. Condition Ranks reflect the degree of ecological integrity of a specific occurrence of an NPC. Condition Ranks are assigned by considering species composition, vegetation structure, ecological processes and functions, level of human disturbance, presence of exotic species, and other factors. Condition Ranks are assigned on a scale of A to D. At the time this HMP was developed, condition ranking guidelines for some of the NPCs on the Protected Property were in draft by the DNR. Kanati determined the current Condition Rank for each NPC (**Table 1**) based on available ranking guidelines.



Figure 3. Open grown bur oak on Protected Property.

Management of the Protected Property

Management Units

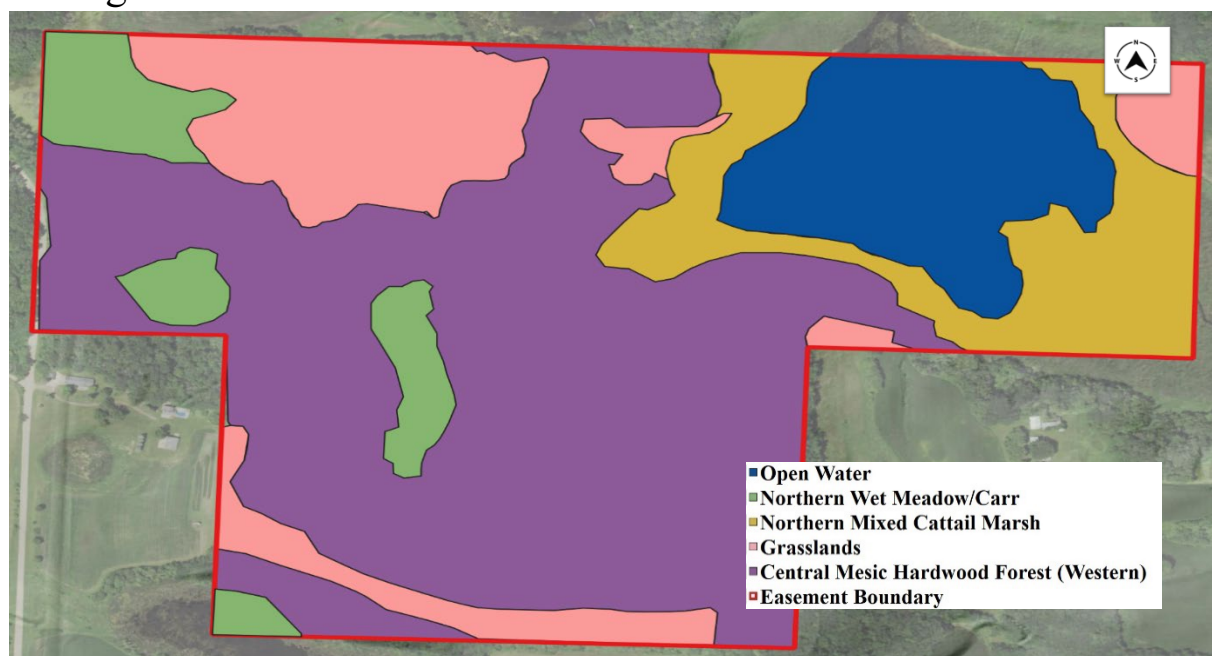


Figure 4. Native Plant Communities and Land Cover delineated on the Protected Property.

Ecological System/Land Cover	Native Plant Community Class & Type	Native Plant Community Type Code	Size (ac.)	Condition Ranking	S-Rank ⁶
Wet Meadow/Carr	Sedge Meadow	WMn82b		CD	S4
Open Rich Peatland	Graminoid – Sphagnum Rich Fen (Basin)	OPn92b		AB	S4
Fire Dependent Forest/Woodland	Pin Oak – Bur Oak Woodland	FDs37b		C	S3
Upland Prairie	Mesic Prairie (Southern)	UPs23a		CD	S2
Open Water	N/A	N/A		N/A	N/A
Wildlife Food Plots	N/A	N/A		N/A	N/A
Tree Plantings	N/A	N/A		N/A	N/A
Gravel Pit Area	N/A	N/A		N/A	N/A

Table 1. NPCs and Land Cover within the Protected Property.

⁶ The DNR assigns a state conservation rank (S-rank) to each Native Plant Community (NPC). The S-rank reflects the risk of elimination of the NPC within Minnesota. S-ranks range from S1 to S5, with S1 indicating the NPC is critically imperiled, and S5 indicating it is secure/common/abundant.

Sedge Meadow (WMn82b)



Figure 5. Sedge Meadow Management Unit.

General Description and Current Conditions

Located in the areas where the topographical relief is depressed, the Sedge Meadow community covers portions of the Protected Property concentrated in the northwest corner, extending to its interior. Generally, Sedge Meadow occurs in depressional areas, or along drainageways; soils are extremely organic, composed of decomposed plants (sapric) and typically inundated with enough water to prevent tree and dense shrub establishment, though water level fluctuation is common. Wet meadow communities can succeed into wet forest communities if hydrological changes result in the lowering of the local water table, which would allow for an increase in shrub dominance, followed by tree establishment

Tussock sedge (*Carex stricta*) is the dominant native ground cover across much of the Sedge Meadow NPC on the Protected Property. Lesser duckweed (*Lemna minor*) and water smartweed (*Polygonum amphibium*) are also present in significant number. Shrub and tree cover are absent, likely due to the amount of standing water present preventing their establishment. There is a significant amount of invasive hybrid cattail (*Typha x glauca*) across portions of the Sedge Meadow communities present, however it is still regulated to areas where open, standing water is present and sedges cannot fully establish and dominate. Non-native, invasive reed canary grass (RCG) is present across various portions of the Sedge Meadow, typically intermixed with natives at the transitional fringe from wetland to upland, and nearing establishment as a dense monoculture stand. Management of these areas are discussed in greater detail in the *Management Objectives and Activities* section of this Plan.



Figure 6. Example of sedge meadow community present on Protected Property. Sedge, boneset, blue vervain, green bulrush prominent in middle of photo.

Desired Future Conditions for Sedge Meadow

The current condition ranking for this NPC is “C” given the presence and prevalence of invasive species, and limited native species diversity. Suppression of existing invasive species and maintenance of the composition and structure of the Sedge Meadow present on the Protected Property is the desired future condition for this NPC. Maintenance of the Sedge Meadow community with continue to provide habitat for wildlife, including wetland bird species like the American bittern, aquatic invertebrates such as dragonfly and damselfly, and a host of amphibian species. Increases in sedge meadow native species abundance and diversity through decreases in invasive species presence will have beneficial impacts on nesting habitat for a variety of duck species.

Detailed information about the Sedge Meadow community can be found at: https://files.dnr.state.mn.us/natural_resources/npc/wet_meadow_carr/wmn82.pdf.



Figure 7. View of young arrowhead and lesser duckweed plants within Sedge Meadow community.

Management Effort	Management Options	Management Activities	Trajectory	Projected Condition Ranking
None	Passive; allow for natural succession to occur	None	Condition will eventually degrade over time given abundance of cattails across portions of community. Decrease in native species diversity and abundance.	<C
Low	Monitoring and management for invasive species (RCG)	• Suppressing existing infestations. • Monitoring for new infestations; spot treat where necessary	Condition will remain stable. Suppression of invasives will lessen negative impacts to native species diversity and abundance and limit spread to other areas of NPC.	C
High	Enhancement; removal of hybrid cattails & RCG across portions of NPC	• Removal of RCG and cattail monocultures • Supplemental planting in treated areas (see Appendix C for suggested species)	Condition will improve. Suppression of RCG, augmented by supplemental plantings of native species will increase diversity and abundance across NPC.	B

Table 2. Management options for Sedge Meadow. Current Condition Rank is C.

Graminoid – Sphagnum Rich Fen (Basin) [OPn92b]

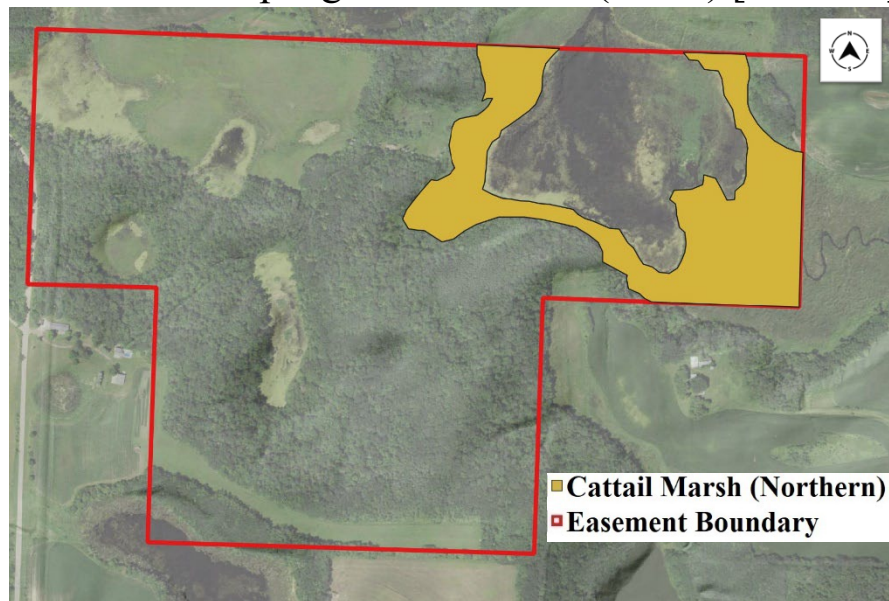


Figure 8. Graminoid – Sphagnum Rich Fen (Basin) Management Unit.

General Description and Current Conditions

This NPC is present in the littoral zone (transitional area between upland and open water) adjacent to the open water on the Protected Property. This community is located in the Protected

Property's northeastern corner, with a significant portion extending from the eastern border to the interior. The Pomme de Terre River runs through an area of this NPC near the eastern boundary of the Protected Property. A dock and associated floating boardwalk are present in the western portion of the NPC. Generally, Northern Mixed Cattail Marsh occurs in shallow basins and depressions along the shores of lands, ponds and river backwaters, such as present conditions created by the Pelican River adjacent to the Protected Property. This NPC develops in the persistent standing water, with soils consisting of well-decomposed peat or floating mats of peat. Sustained fluctuations in water level can transition the community to shallow aquatic or wet meadow community types, depending on the gradient.

Cattails (*Typha spp.*) are the dominant ground cover across much of the Northern Mixed Cattail Marsh NPC on the Protected Property. The cattails are a mix of the native broad-leaved cattail (*Typha latifolia*), the invasive, non-native cattail hybrid cattail (*T. x glauca*). Lesser-duckweed (*Lemna minor*) lake sedge (*Carex stricta*), common reed grass (*Phragmites australis*) and Touch-me-not (*Impatiens spp.*) are also present in limited number. A shrub layer is absent. From analysis of historical aerial photography the extent of the community has largely remained stable over the past 30 years, though further back in time the NPC appeared to extend farther into what is presently open water. There are areas where open, standing water is present, often intermixed between dense monoculture stands of *Typha*. Invasive hybrid cattail is present as dense stands across several areas of the marsh. Management of these areas are discussed in greater detail in the *Management Objectives and Activities* section of this Plan.



Figure 9. Characteristic floating mat of sphagnum moss with marsh cinquefoil, fen wiregrass, arrowhead, northern white violet, and other native plant species present in fen community.

Desired Future Conditions for Graminoid – Sphagnum Rich Fen (Basin)

The current condition ranking for this NPC is “AB” given the limited presence and frequency of invasive species and diversity of native species. Suppression of existing invasive species, and maintenance with potential enhancement of the composition and structure of the Northern Mixed Cattail Marsh present on the Protected Property is the desired future condition for this NPC.

Detailed information about the Graminoid – Sphagnum Rich Fen (Basin) community can be found at: https://files.dnr.state.mn.us/natural_resources/npc/open_rich_peatland/opn92.pdf.

Management Effort	Management Options	Management Activities	Trajectory	Projected Condition Ranking
None	Passive; allow for natural succession to occur	None	Condition will eventually degrade over time given abundance of invasive cattails across portions of community. Continued decrease in native species diversity and abundance.	Extirpated
Medium	Monitoring and management for invasive species (hybrid cattail)	• Suppressing existing infestations. • Monitoring for new infestations; spot treat where necessary	Condition will remain stable. Suppression of invasives will lessen negative impacts to native species diversity and abundance and limit spread to other areas of NPC.	C
High	Enhancement; removal of cattails across portions of NPC	• Removal of cattail monocultures • Supplemental planting in treated areas	Condition will improve. Suppression of invasives, augmented by supplemental plantings of native species will increase diversity and abundance across NPC.	BC

Table 3. Management options for Graminoid – Sphagnum Rich Fen (Basin). Current Condition Rank is C.

Pin Oak – Bur Oak Forest (FDs37b)

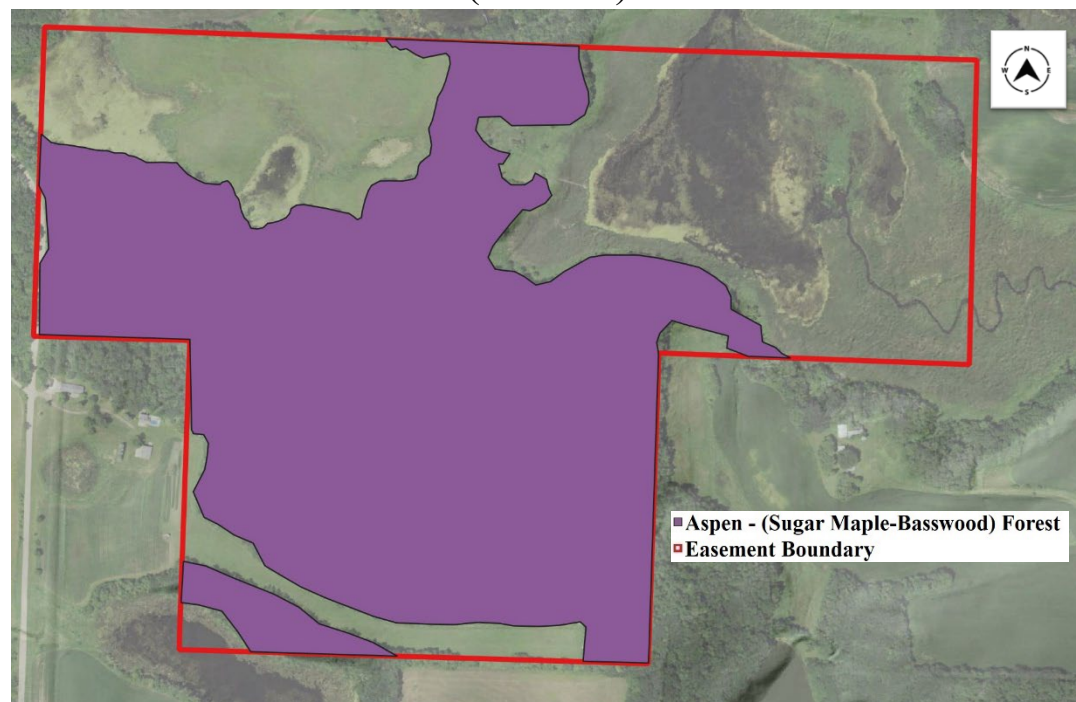


Figure 10. Pin Oak – Bur Oak Forest Management Unit.

General Description and Current Conditions

This is largest NPC present on the Protected Property. Located in the areas where the topographical relief is variable and rolling, the Aspen – (Sugar Maple-Basswood) Forest community covers portions of the Protected Property from its western boundary, extending to across the interior, to its eastern boundary. Generally, MHc37 communities are found on areas with variable relief (e.g. stagnation moraines) that have calcareous, loamy soils. Historical disturbance typically consisted of maintenance events (surface fires, selective windthrow, natural senescence, disease or defoliation) rather than catastrophic stand-replacing events. There are several areas of past logging across the NPC, ranging from a quarter acre to several acres in size, but the canopy has since closed. Also noticeable is the amount of deadfall present in various stages of decomposition on the forest floor.



Figure 11. View of Bur Oak – Pin Oak Forest community on Protected Property.

The ground layer contains characteristic species, including wild ginger (*Asarum canadense*), bloodroot (*Sanguinaria canadensis*), early meadow-rue (*Thalictrum dioicum*), Clayton's sweet cicely (*Osmorhiza claytonii*), sweet-scented bedstraw (*Galium triflorum*), and Pennsylvania sedge (*Carex pennsylvanica*). Sparse to patchy in cover, green ash (*Fraxinus pennsylvanica*) and ironwood (*Ostrya virginiana*) saplings are most prevalent, with lesser amounts of prickly ash (*Zanthoxylum Americanum*) present in the shrub layer.

Ironwood is prominent in the subcanopy, while bur oak (*Quercus macrocarpa*), basswood (*Tilia americana*) and big-tooth aspen (*Populus grandidentata*), with limited amounts of quaking aspen (*Populus tremuloides*), paper birch (*Betula papyrifera*), green ash and American elm (*Ulmus americana*) are present in the canopy. There are significant amounts of mature canopy trees present, with several bigtooth aspen exceeding 20" diameter at breast height (DBH) and bur oak exceeding 24" DBH. Noticeably absent is the presence of any sugar maple in the subcanopy/canopy layer and any advance oak regeneration in the layers below the canopy, whereas instead there is an increased prevalence of ironwood. In general, the forest is well into a mature growth stage (55 – 135 years old) with portions that have recently entered the front end of their natural rotational cycle. Common buckthorn is found across various portions of the forest, typically in seedling/sapling growth form, though there are some areas of dense infestation-these areas are typically closer to the forest fringe with adjacent grasslands or wetlands. Management of these areas are discussed in greater detail in the *Management Objectives and Activities* section of this Plan.



Figure 12. Left-hand photo displays characteristic species of FDs37 community on Protected Property including early meadow rue, Pennsylvania sedge, common enchanter's nightshade, and poison ivy. Right-hand photo displays more characteristic species, including Penn sedge, Clayton's sweet cicely, and nightshade.

Desired Future Conditions for FDs37b

The current condition ranking for this NPC is “BC” given the presence and frequency of invasive species, and human-induced degradation (logging). Maintenance of the composition and structure of the Aspen – (Sugar Maple-Basswood) Forest present on the Protected Property is the desired future condition for this NPC. A wide variety of wildlife benefit from the existing tract of intact forest—many species, such as red-shouldered hawk, need substantial habitat (40 acres or more) to meet their needs (food, cover, breeding & nesting/bedding) The amount of deadfall and standing dead snags in the NPC provide vital nutrient cycling as well as habitat for a wide variety of species, including cavity nesting avian species such as piliated woodpecker and wood duck.

- Allow for natural disturbance cycle to play out across the community. Alternatively, mimicking disturbance events through selective harvest or prescribed burn across portions of the forest is possible to create large gap or small gaps and maintain the community mosaic and varied age class. Gap-size is dependent on desired species and specific management objectives set forth in a detailed action plan approved by the Land Trust.
- Suppression and reduction of non-native, invasive species (common buckthorn) to maintain native species composition in forest understory

Detailed information about the Pin Oak – Bur Oak Forest community can be found at: https://files.dnr.state.mn.us/natural_resources/npc/mesic_hardwood/mhc37.pdf

Management Effort	Management Options	Management Activities	Trajectory	Projected Condition Ranking
None	No active management: allow for natural succession to occur	None	The condition of the forest community may remain stable for some time but given the presence and location of invasive species, coupled with absence of historical natural disturbance (i.e. surface fire) eventually the composition and structure will degrade and diminish in function and diversity. • Increase in common buckthorn • Decline in oak, coinciding with increase in American elm, and basswood in canopy; ironwood will continue to increase in coverage of understory	C
Medium	Suppression and monitoring for invasive species	• Management of existing invasives to suppress and limit expansion • Monitoring for invasives encroaching from neighboring properties; spot treat where necessary • Ensuring all equipment and gear is free of plant material prior to entry into area for recreational uses or habitat management to ensure no introduction of invasives	Stable. The community will continue to transition to mature growth stage with characteristic species composition and structure.	BC
High	Prescribed burning to maintain mixed forest composition	• Initiate a prescribed burn throughout the Aspen – (Sugar Maple-Basswood) Forest to mimic the stand maintenance of a mild surface fire which would create large-gap habitat for fire-resistant trees. • Protect emerging seedlings from herbivory until they reach appropriate size to survive.	Improved condition; enhancement of forest community with increased compositional diversity and heterogeneity of structure throughout. Maintenance of bur oak & paper birch as component of forest across different growth stages. Stimulated suckering of aspen. Decrease in fire-sensitive trees, like ironwood, elm, basswood.	B

Table 4. Management options for Pin Oak – Bur Oak Forest. Current Condition rank is BC.

Mesic Prairie (Southern) [UPs23a]

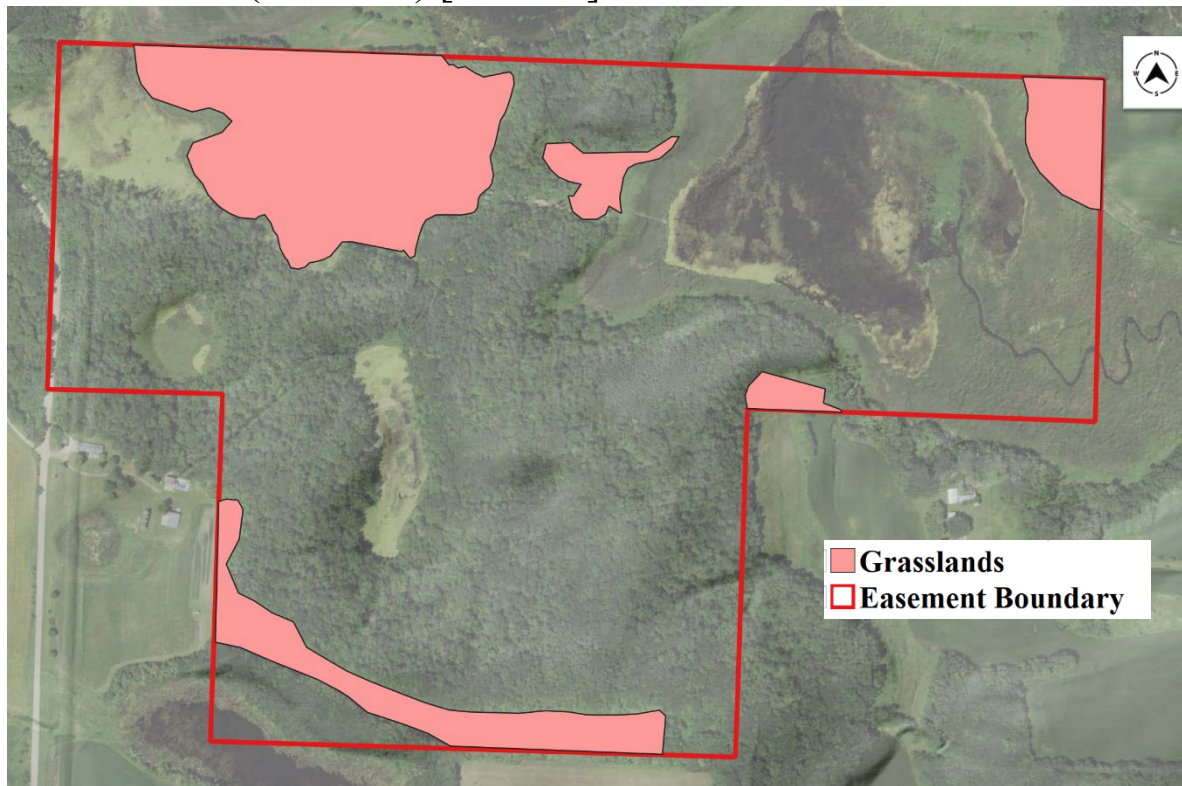


Figure 13. Mesic Prairie (Southern) Management Unit.

General Description and Current Conditions

Located in the far northwest and northeast corners and along the southern boundary of the Protected Property, this land cover type consists of grasslands that once served as cultivated land, hay ground and pasture during previous ownership. The area is generally rolling, though there is a level portion in the southeast location of the land cover type.

The land cover species composition is a mix of native species and non-native, cool season grasses, a legacy of the area's past use. Portions of the grasslands in the northwest corner and along the southern boundary were restored under past USFWS wetland project and CRP conservation practice planting, in these area native species are most prevalent and tend to be dominant. However, Kentucky bluegrass (*Poa pratensis*) and smooth brome are pervasive, with other non-native invasives present but more sporadic in number, including crown vetch (*Securigera varia*), wormwood (*Artemisia absinthium*), Tartarian honeysuckle (*Lonicera tatarica*), and black locust (*Robinia pseudoacacia*). Native species including golden Alexanders (*Zizia aurea*), wild bergamont (*Monarda fistulosa*), yarrow (*Achillea millefolium*), blue flax (*Linum lewisii*), black-eyed Susan (*Rudbeckia hirta*), switchgrass (*Panicum virgatum*), sedge (*Carex spp.*), Canada goldenrod (*Solidago canadensis*), and smooth sumac (*Rhus glabra*) are also present. Along the southern extent of the land cover type green ash has volunteered in significant density; this portion is also where non-native, cool season grasses are most prevalent.



Figure 14. Native forbs and grasses prevalent on display across northwest portion of Mesic Prairie, with some woody encroachment.

Desired Future Conditions for Mesic Prairie (Southern)

Maintenance of Grassland cover type composition and structure on the Protected Property is the desired future condition for this land cover type. This cover type provides habitat for grassland wildlife species or other wildlife that utilize grasslands as part of their life cycle (e.g. nesting habitat for waterfowl) and is a vital component of the habitat mosaic present on the Protected Property.

- Suppression and eradication of non-native invasive species to maintain native species composition and community integrity
- Enhancement of Grasslands areas dominated by non-native cool-season grasses to increase in frequency and diversity of forb & graminoid components
- Implementation of disturbance regime (e.g. through prescribed burning, or mowing) to maintain processes necessary for Grassland community to thrive



Figure 15. Left-hand photo displays wild bergamot, yarrow, heath aster, slender wheatgrass, side-oats grama in Mesic Prairie on Protected Property, while right-hand photo displays lead plant present.

Detailed information about the Mesic Prairie community can be found at:
https://files.dnr.state.mn.us/natural_resources/npc/mesic_hardwood/mhc37.pdf

Management Effort	Management Options	Management Activities	Trajectory
None	No active management: allow for natural succession to occur	None	Succession to environment with more woody species present, potentially transitioning to completely new community influenced by surrounding NPCs and seed sources. Non-native cool season grasses and woody vegetation will become dominant.
Low	Monitoring and management for invasive species	Monitoring for new infestations; target and treat species that can aggressively take over areas (black locust, honeysuckle, and crown vetch), spot treat where necessary.	Condition will remain stable. Monitoring for and management of invasives will lessen negative impacts to land cover species diversity & abundance and limit spread to other areas of Protected Property.
Medium	Mowing/Haying or Rx Fire	- Institute regime where entire grassland is disturbed at regular intervals, w/ different portions disturbed separately, on rotating basis to facilitate a range of habitat structures (height of plants) to create diversity. - To extent possible avoid mowing during nesting period of May – July, or only mow a portion, leaving one-third to half of the important habitat unmown.	Maintenance of current condition and open character, with potential for diminished non-native cool season grass populations.
High	Enhancement of grasslands with native tallgrass prairie species	- Interseeding of area with native seed mix - Suppression of weed growth post-seeding, if necessary - Maintaining disturbance regime that rotates through different portions of the enhanced grasslands at different seasons (spring or fall), with entire area disturbed within 5-year cycle	Land cover will be enhanced with native tallgrass prairie species that eventually will need to be maintained by regular disturbance regime; enhancement and regular disturbance will increase compositional diversity and heterogeneity of structure throughout.

Table 5. Management options for Mesic Prairie (Southern).



Figure 16. White prairie clover on Protected Property.

Open Water Area



Figure 17. Open Water Area Management Unit.

General Description and Current Conditions

One area consisting of shallow open water is present on the Protected Property. This open water cover type is located near the northeast property corner with much of its surface area on the Protected Property, though a small portion extends to land adjacent to the north. The Pomme de Terre River flows through this area, entering from the southeast and exiting at a northern outlet. Emergent, floating, or submergent aquatic vegetation was present across much of the open water cover type; what was observable consisted of lesser-duckweed, bulrush (*Scirpoides holoschoenus*), coontail (*Ceratophyllum demersum*) and sedge species (*Carex spp.*) in transitional areas.

Under the National Wetland Inventory this area is classified as a Lacustrine wetland system while the DNR has designated this as a Shallow Lake (lakes that are 50 acres or greater in size and have a maximum depth of 15 feet or less). Due to their value for wildlife, many of these wetlands are specially designated and managed under the DNR's Shallow Lakes Program. Lacustrine wetlands encompass most wetlands referred to as shallow ponds or shallow open water under other classification systems. They are often found within shallow lake basins adjacent to large open water basins, though they may be isolated in the landscape as in the case of marshes and ponds in the Hardwood Hills ecological subsection where the Protected Property is located.

Desired Future Conditions for Open Water Areas

Maintenance of the composition and structure; avoiding any detrimental alterations to the adjacent cover types on the Protected Property which drain to the Open Water area so as not to negatively alter hydrology and function is the desired future condition for this cover type. This

cover type provides excellent fish habitat (both spawning areas and nesting cover) while attracting marsh birds and provides food for waterfowl.



Figure 18. View of Open Water Area on Protected Property.

Management Effort	Management Options	Management Activities	Trajectory
None	Passive management; no action taken	None	Land cover will remain stable, subject to fluctuations in precipitation and climate, and adjacent land uses
Low	Maintenance of natural vegetated buffers	Maintaining existing surrounding natural vegetation as buffer and filter	Land cover will remain stable, subject to fluctuations in precipitation and climate
Medium	Monitoring and management for invasive species	Monitoring for new infestations; because this area is a public water wetland a permit may be necessary to treat any invasive species infestation-consult with local DNR hydrologist before undertaking any management effort	Condition will remain stable. Monitoring for and management of invasives will lessen negative impacts to species diversity & abundance and limit spread to downstream areas.

Table 6. Management options for Open Water Area.

Tree Plantings

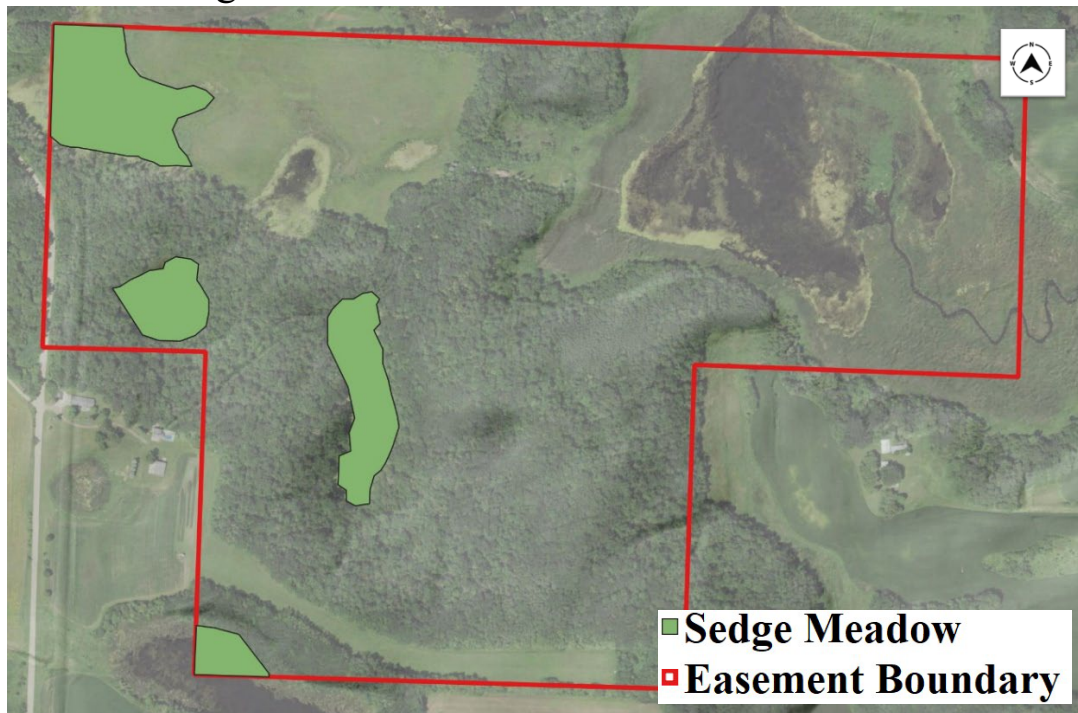


Figure 19. Tree Planting Management Unit.

General Description and Current Conditions

This land cover type consists of one area on each Easement Property that was densely planted with several different species of conifer trees during the 1990s and 2010s. The larger of these conifer plantings is located near the western boundary of the Westby Easement; this area was planted with Black Hills spruce (*Picea glauca* var. *densata*) as part of a CRP planting. The other smaller and older portion of the Conifer Planting is located at the southwestern corner of the Westby 2 property and consists of red pine (*Pinus resinosa*). Across all areas of the Conifer Plantation the understory is generally free and clear of any other vegetation and the ground layer is primarily smooth brome and Kentucky bluegrass.

Desired Future Conditions for Tree Plantings

Maintenance of the current condition and structure of the Conifer Plantings is the desired future condition for this land cover type.

- Maintaining the plantings by monitoring for non-native invasive species, disease and pest outbreak
- Consider alternative plantings and restoration of the Westby 2 Conifer Planting portion in conjunction with enhancement of the adjacent Grasslands cover type

Management Effort	Management Options	Management Activities	Trajectory
None	Passive; allow for natural succession to occur	None	Condition will remain stable but plantings will be susceptible to increased mortality if disease or pest outbreak occurs
Low	Monitoring	- Monitoring for disease & pest outbreaks - Focus management on preventing spread to other trees within the plantings.	Condition will remain stable throughout natural lifespan of spruce.
Medium	Thinning & tree planting	- Selective and repeated thinning of plantation - Replacement planting of more appropriate native hardwood tree and shrub species on Westby 2 property	Condition will be improved. Eventual transition to land cover type resembling mesic hardwood community which was historically present nearby. Ecological complexity will increase; Species diversity and abundance will be enhanced and provide wildlife habitat benefits. Resiliency of cover type to disease and insect pest outbreaks will increase.
High	Restoration of Conifer Planting to native tallgrass prairie	- Site preparation for seed bed - Seeding of area with native seed mix - Suppression of weed growth post-seeding with potential supplemental seeding, if necessary Eventual maintenance of restored areas by disturbance mechanisms of fire, grazing, mowing/haying or combination thereof	Land cover will be reconstructed to native tallgrass prairie that eventually will need to be maintained by regular disturbance regime. Increase in compositional diversity and heterogeneity of structure throughout and resiliency of cover type/landscape.

Table 7. Management options for Tree Plantings.



Figure 20. Black walnut planting on Protected Property.

Existing Land Use

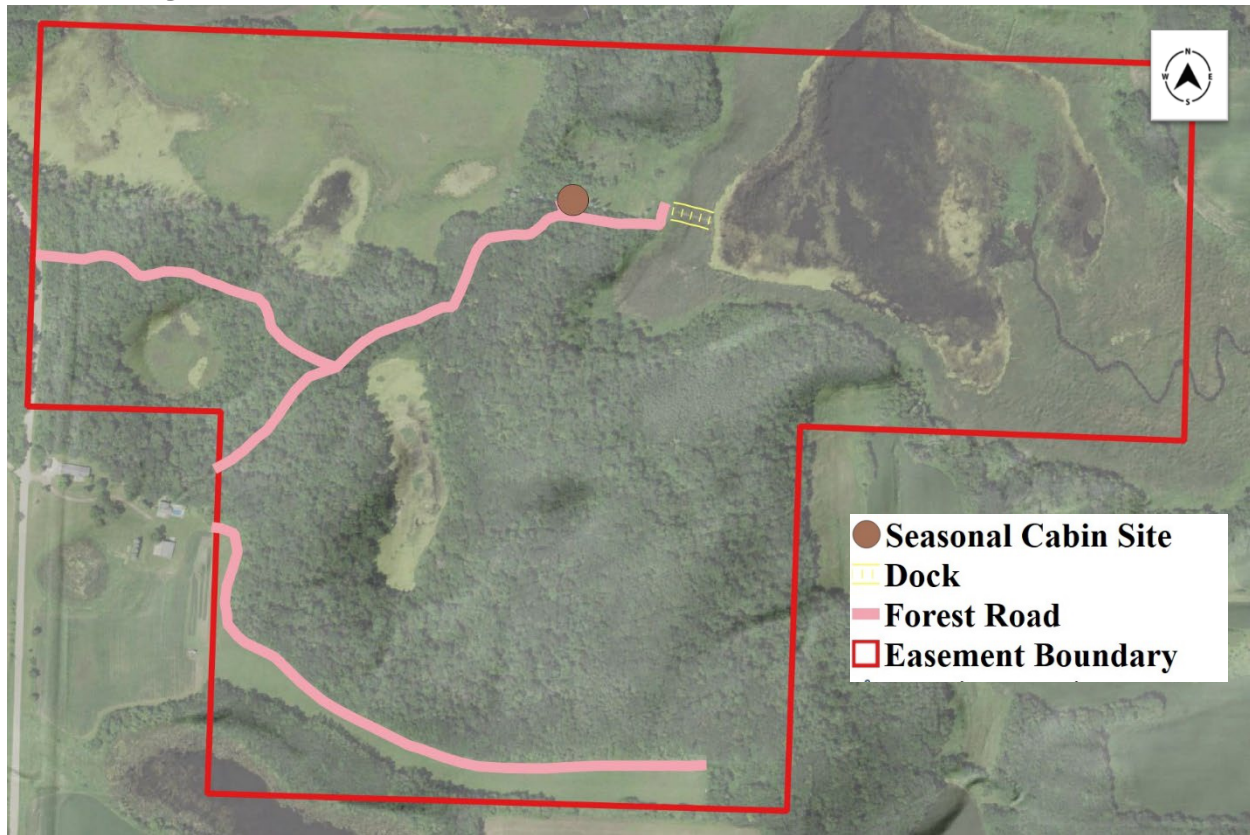


Figure 21. Structure and Improvement Locations on Protected Property.

Trails

A trail system is present on the Protected Property; the system consists of several two-track forest roads and associated spurs. These improvements are minimal but do offer the landowners opportunities to access outlying areas of the Protected Property. The trail system poses no substantial risk to habitat; fragmentation, if any, is minimal and there are no signs of historical or present erosion. Some sections of the trails are used more extensively than others. The main trail from Dalton Road leading to the seasonal cabin near the interior is the most used but does not display any signs of erosion. All sections of the trail system are unimproved, two-track or grass-covered, and do not exceed 12' in width. The trail system is useful both from a recreational standpoint, but also for management purposes.

Management Considerations for the Trails

The existing trail system is well established but is posing no obvious ecological threats to the land or water. Trails less than 20 feet wide do not reduce overall forest growth as the canopy closes over them. Any new roads or trails must receive approval from the Land Trust prior to establishment as stipulated in section 2.8 and 7.6 of the Conservation Easement. If more trails are developed follow Best Management Practices for trail establishment and maintenance (keeping the following suggestions in mind for future reference).

- Close any trails that are redundant to reduce disturbance. If negative impacts to the forest or wetlands becomes apparent, limit access to favorite viewpoints, or wildlife viewing areas via dead end spur trails that lead off the main trail.
- An early sign of erosion is when the trail is comprised of small stones rather than vegetation. This is an indication that the soil particles are being washed away. Erosion will progress with larger stones taking the place of smaller stones and sand. Rivulets appear and can lead to gully formation. If signs of erosion present themselves again on any trail, but particularly the more used steep trails leading from high points along the western boundary, there are several erosion control practices that can be implemented. The following link outlines some simple erosion control practices that could be implemented on the Protected Property if the need arises: [Best Management Practices for Trail Construction & Maintenance](#). In situations where erosion cannot be abated then a trail may have to be reconstructed to go along the sideslope (sidehill) rather than with the slope directly up the hill. Although this means a longer trail, it also results in a more stable trail.
- Continue to avoid the small wetlands near the interior as user impact can damage sensitive species, soil properties, and local hydrology.
- When clearing trails of fallen trees and branches cut woody debris into small pieces for easier removal and to lessen the impact of any machines necessary to transport the wood. Consider distributing woody debris over the ground to speed decomposition and provide nutrients back into the forest system.
- Consider replacing the existing boardwalk with a floating boardwalk that will not disturb the marsh bottom and allows for movement of water.
- Avoid using materials that contain contaminants and could pose environmental concerns, such as paints and stains, or pressure-treated lumber which typically contains metals (e.g. chromium, copper, arsenic) or creosote to mitigate breakdown in an aquatic environment.
- Maintain a small footprint as is feasible to utilize the boardwalk to minimize any potential negative “shade out” effects to aquatic vegetation.

Structures/Utilities

There is a dilapidated weigh station shed and associated concrete pads near the entrance to the gravel pit. Electric had been run to this area at one time though it did not appear to be currently functional. Scattered throughout the Protected Property are elevated hunting stands, typically constructed from metal framing and wood. A corrugated metal culvert runs under 190th Street and outlets into the Sedge Meadow community on the north side of the road.

Wildlife Food Plots

There are 4 small wildlife food plots scattered across the Protected Property. These food plots are generally located within clearings of the Bur Oak-Pin Oak forest community, or the margins of the Mesic Prairie areas. The most recent food crop planted were a mix of clover-these areas will continue to be maintained as a food plots in their current locations and configurations, consistent with the terms of the Conservation Easement. The location of the food plots are depicted in Figure 22 on the following page.

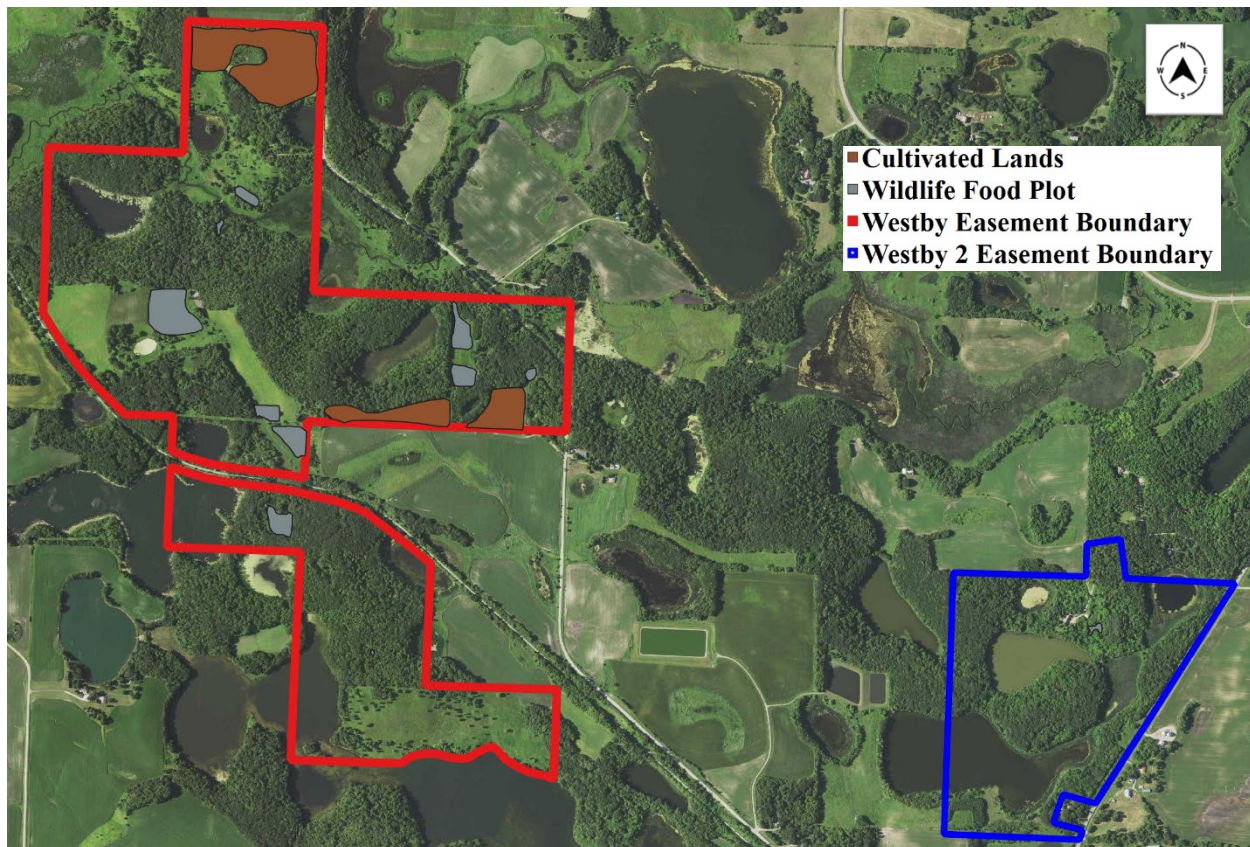


Figure 22. Wildlife Food Plot Locations on Protected Property

Management Considerations for the Wildlife Food Plots

- **Shape & Configuration:** small plots designed in the shape of an hourglass or boomerang for bowhunting deer help to direct movement and increase chance for a close shot.
- **Crop selection & rotation:** rotating food plot crop species on a regular basis not only can help reduce pathogens, but also help manage nutrient availability and site productivity. Another strategy is to allow plots to remain fallow for one to two years, especially when managing annual plots. Fallow plots should not be viewed as wasted space. Early successional plants growing in fallow plots can provide nutritious forage, seed, soft mast and valuable cover for songbirds, game bird broods and fawns. However, monitoring of the site for invasive species should occur on annual basis, especially if the food plot is left fallow for one or several seasons.
- **Site preparation, fertilizer & weed/pest management:** no-till drilling to seed food plots is beneficial in several ways for both habitat and financial considerations. Tillage (i.e. disturbance) of the surface is avoided, reducing the potential for erosion, weed growth or invasive species colonization. This also allows for organic matter to be retained on site, which helps with nutrient release and moisture retention, both of which can increase yield while reducing inputs and cost. When applying pesticides remember to follow all label directions and avoid negative impacts to pollinators and adjacent plant communities by

applying herbicides during periods of relative inactivity (early morning and later evening), during calm conditions to avoid drift. Spot treat wherever possible.

- Restoration: If the existing food plots are ever retired from use consider restoring these areas to native vegetation. Strategic native species selection as part of any restoration can replace these artificial food sources with native plants which also provide food and cover for wildlife species. A suggested list of native species that are also great as a perennial wildlife food source is provided in **Appendix C**.



Figure 23. Wildlife food plot present on Protected Property. Thistle is prominent across all four wildlife food plots.

Hunting

The increase in deer population in the last 50 years has altered plant community structure, and composition. Unpalatable species such as ironwood have increased while oak species have decreased. Overall deer density in this area is very good. Populations goals have not yet been updated by the MN DNR, however the goal for this Deer Permit Area (from 2020 goal setting) was to reduce the deer herd from the 2020 level by 25%; area managers are recommending another 3-deer limit season to aggressively reduce population size. There are several hunting stands present across the Protected Property and it is understood that one of the uses of the Property is for recreational purposes. Continued management and reduction of the local deer population present on the Protected Property will help to mitigate herbivory and subsequent tree mortality, while supporting regeneration for oak species.

Gravel Pit Area

Located in the northeast corner of the Protected Property is an area roughly the size of 19 acres that served as a sand and gravel pit during the 1990s up until 2019. Though surface mining activities have since ceased several stockpiles of sand and pea-sized aggregate, ranging from 30 to several hundred cubic yards in size, remain distributed across the Gravel Pit area. Invasives species and early successional tree species (green ash, eastern cottonwood, quaking aspen) are widespread through the area. The local hydrology has been altered and appears to have also affected the adjacent wetland as evidenced by analysis of historical aerals and present conditions

on site. While sand and gravel mining may disrupt wildlife habitats during active operations, reclamation offers the chance to create new and sometimes better habitats for some species.

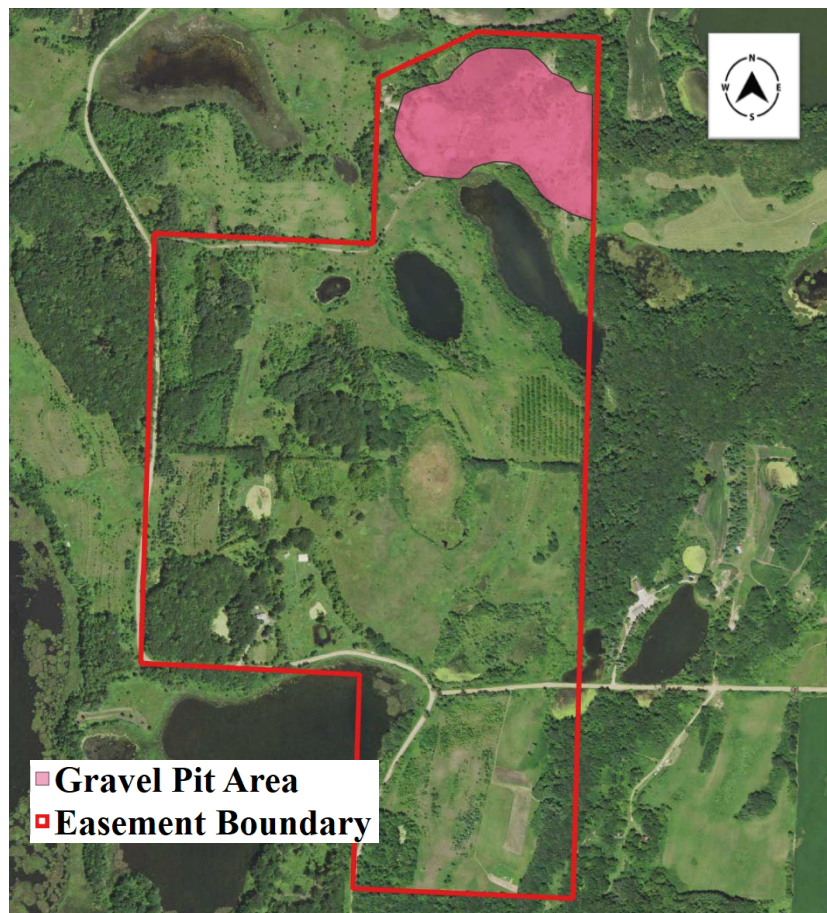


Figure 24. Location of Gravel Pit Area on Protected Property.

Management Priorities

Specific management goals and the corresponding management priorities, objectives and activities were developed in consultation with the REDACTED Family, in conjunction with consideration of historical conditions, a site assessment that took place in June 2022, and the Conservation Easement. The management priorities focus on invasive species management. Invasive species management is targeted to those areas with larger areas of infestation to limit spread, or to smaller, origin areas to eradicate source plants and prevent spread. Under this Plan their management is addressed as a standalone priority, however management as part of a recommended enhancement of the Grasslands land cover type to promote a more diverse assemblage of native species would also make sense.

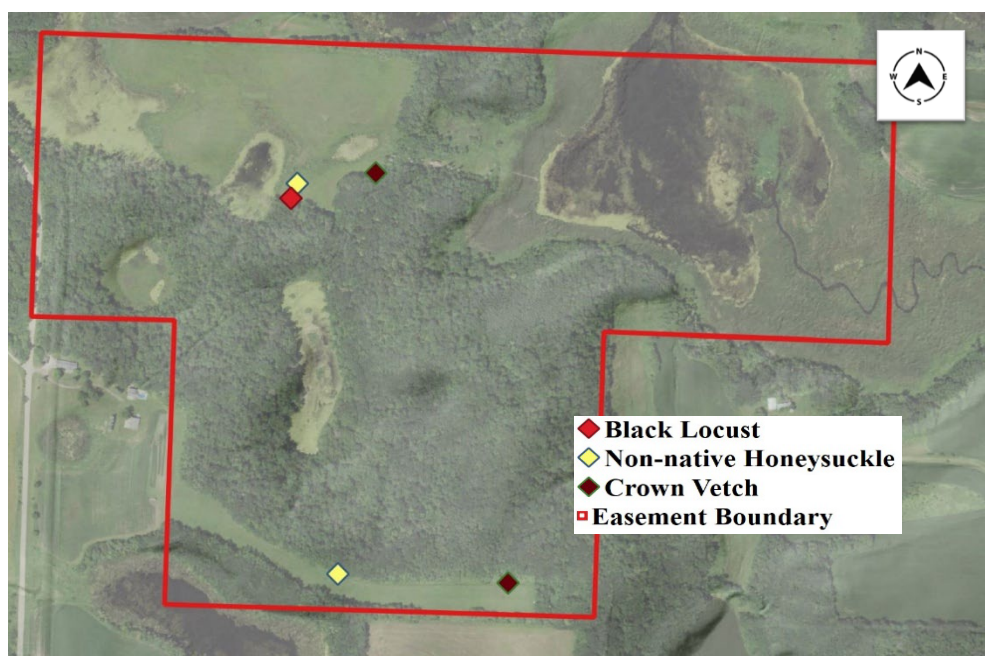


Figure 25. Management Priorities for Protected Property.

Management Priority	Recommended Management Options
Management and suppression of invasive species, including eradication of infestations of crown vetch and Tartarian honeysuckle present on portions of the Protected Property.	• Mechanical/chemical treatment of existing infestations • Monitoring for new infestations; spot treat where necessary

Table 8. Priority Management Areas and Recommendations.

Management Objectives & Recommended Activities

For each goal, objectives and actions provide specific, time-dependent targets which will help achieve habitat management goals. Objectives and actions need to be feasible given available resources and should be revised as necessary. For the REDACTED Family it is also worth knowing that the objectives of this plan do not need to be implemented all at one time, nor is implementation *required* by the Conservation Easement terms. **However, a separate detailed**

action plan approved by the Land Trust will be required if you seek to implement any of the recommended activities. While some objectives would work well in concert with one another the timelines can be modified or delayed to meet limitations imposed by resources or other external factors such as weather. An area and suggested timeline (**Appendix A**) for completion is assigned to each objective and action so progress can be measured. Monitoring and adaptive management are important to assess outcomes and effectiveness of management activities.

Goal 1: Management and suppression of non-native invasive species.

Management Objective	Recommended Management Activities & Considerations
Removal of honeysuckle and crown vetch present on Property	• Stump cut and chemical treatment of honeysuckle (due to ability to resprout and spread when stimulated by mechanical treatment alone) • Mowing crown vetch can be effective to slow the spread if done on schedule to prevent seed formation, and for successive years. For complete eradication, mowing will need to be performed in conjunction with another control method, like herbicide application (e.g. spot-spraying with foliar treatment) • Herbicide treatment should be applied to target species only to minimize impact to non-target plants, pollinators, and other wildlife. All herbicide application shall follow appropriate herbicide label directions.
Suppression of reed canary grass (RCG), invasive cattail, thistle, cool season exotic grasses, and common buckthorn infestations present on Property to limit spread and increase in abundance	• Identify and treat prioritized invasive species; type of treatment (mechanical, chemical, biological) should take into consideration abundance of species, its life cycle, effectiveness of method as demonstrated by research and practice, and potential negative impacts or collateral damage to wildlife and native plant communities • If utilizing herbicide as a treatment target all actively growing invasives and spot treat where possible. Due to presence of wetlands, treat areas with herbicide rated for aquatic application to avoid adverse impacts to amphibians and other aquatic life on site. All herbicide application shall follow appropriate herbicide label directions. Avoid application if wind speeds exceed 10 mph and time application to early morning or evening when pollinators are least active. Timing and method of application should always be considered to reduce impacts to native plants and animals. • Federal, state and local permits may be required when performing restoration work in wetlands or along waterways. Contact your local DNR office or county zoning administrator before initiating management work. • It is easy to spread invasive seeds, rhizomes or other plant parts to new locations. Be sure to clean equipment, clothes, and footwear before leaving a site.

Table 9. Management Goal 1 Objectives and Activities Recommendations.

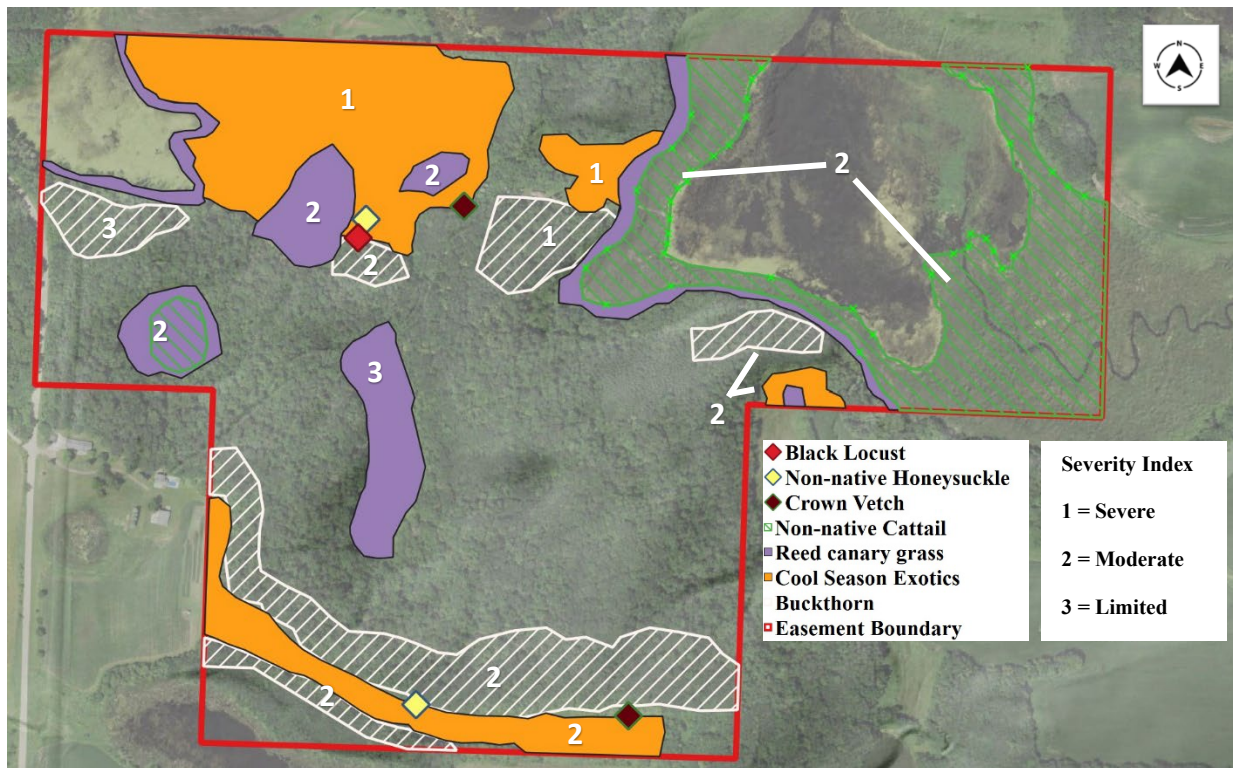


Figure 26. Invasive Species Location and Severity on Protected Property.

Monitor and Control Invasive Species

Invasive species were found on the Protected Property across the NPCs and land cover types. RCG was present in limited frequency in transitional areas of the forest and grasslands to wetlands, with concentrations approaching a monoculture in the transitional areas from prairie to wetland. Non-native narrow leaf cattail was also observed in dense concentrations across transitional areas of the Sedge Meadow and Open Water Area communities. In the Mesic Prairie cool season exotic grasses (Kentucky bluegrass, smooth brome, timothy, orchard grass) were pervasive, forming dense sod mats of ground cover in certain areas. Also present in the Mesic Prairie, but more sporadic in number, were thistle, non-native honeysuckle and crown vetch. In the Gravel Pit Area there are numerous invasives including sweet clover, mullein, and spotted knapweed. The wildlife food plots were almost entirely taken over by thistle. Ongoing monitoring for future infestations is critical to limit expansion and simple measures to prevent introduction to new areas can be implemented.

In some instances, the intentional use of an herbicide is necessary to control and suppress shrub and tree species. When using an herbicide make sure to follow all label directions. Specifically, it is recommended to follow pollinator best management practices though utilization of pollinator-friendly pest control by scouting and monitoring pest populations, applying herbicides only when necessary and at times when pollinators are less active (early morning/evening, or when temperatures are below 55°F), chose herbicides with low toxicity to pollinators whenever possible, and prevent drift during application and spot spray when practicable. For more detailed descriptions of pollinator best management practices consult the Minnesota Department of Agriculture and DNR-developed BMPs in **Appendix A**.

Some simple measures to ensure you do not inadvertently track invasive species seeds or propagules onto the Protected Property include:

- Clean boots with a brush before entering the property and inspecting any belongings, equipment, and pets to remove mud or plant debris and dispose of it in the trash.
- Use only firewood harvested from the property.

Unfortunately, there are many more invasive terrestrial and aquatic species that harm the natural ecosystems of Minnesota. If any plant or animal looks unfamiliar try and identify it or ask for help to identify it and report any infestation. To learn more about invasive species, how to control them, and who to report any sightings go to this link:

<https://www.dnr.state.mn.us/invasives/index.html>

Additional information about target invasive species, including plant species descriptions and control methods, can also be found in **Appendix B**. Additionally, the Minnesota Department of Agriculture maintains a list of noxious weeds (invasive species), with descriptions and control options (see the link below):

Minnesota Noxious Weed List

<https://www.mda.state.mn.us/plants-insects/minnesota-noxious-weed-list>

Record Keeping

Maintain records of all invasive species management activities, such as type of control, when treatments were applied, and to what species. Additionally, monitoring a site after control is important for determining effectiveness of treatments, as well as needs for follow-up treatments. Specifically, document percent cover or abundance of invasive species before and after control. Monitor the site at least one time per year for new invasions.

Goal 2: Enhancement of Mesic Prairie to promote biological diversity and provide wildlife habitat for grassland bird species and pollinators.

Management Objective	Recommended Management Activities & Considerations
Implement disturbance regime to encourage native tallgrass prairie species, maintain open character, and set back cool season, non-native grasses	• Maintaining disturbance regime that rotates through different portions of the Mesic Prairie at different seasons (spring or fall), with entire area disturbed within 5-year cycle • Alteration and rotation of disturbance type (Rx fire, grazing, mowing/haying) as part regime will help to promote species diversity and heterogeneity

Table 10. Management Goal 2 Objectives and Activities Recommendations.



Figure 27. Woody encroachment of sumac into prairie.

Goal 3: Restoration of the Gravel Pit Area to provide wildlife habitat and connectivity

Management Objective	Recommended Management Activities & Considerations
Restore the former gravel pit area to a mesic/xeric upland prairie or savanna community with enhancement of adjacent wetlands to provide additional areas of habitat and improve connectivity with adjacent federal lands	• Development of restoration plan and targets for the site • Clearing, stripping, grading of site prior to establishing vegetation • Establish vegetation consistent with restoration plan. Make sure to select species appropriate for site and intended target plant community. Often reapplication of topsoil is necessary following planting, especially with coarse-textured, droughty soils • Monitor and manage for non-native, exotic species to ensure native species can thrive and are not displaced

Table 11. Management Goal 3 Objectives and Activities Recommendations.

Appendix A: Suggested Management Activity Timeline, Management Resources and Contacts

Management Objectives Suggested Timeline

Activity	2023				2024				2025				2026				2027				2028				2029			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Reed Canary Grass Management																												
Herbicide Application			X				X				X				X													
Mowing (if feasible)	X					X																						
Crown Vetch Removal																												
Mowing (if feasible)	X					X				X																		
Herbicide Application	X					X				X																		
Common Buckthorn Management																												
Cut & Stem/Stump Herbicide Application	X			X	X			X	X			X	X															
Hybrid Cattail Management																												
Mowing (if feasible)	X					X				X																		
Herbicide Application (alternative to mowing)			X				X				X																	
Honeysuckle & Black Locust Removal																												
Cut & Herbicide Application	X			X																								
Grassland Enhancement																												
Site Prep	X	X																										
Interseeding				X																								
Mowing (weed suppression)						X	X			X	X																	
Burn														X												X		

Management Resources

- MN Board of Water and Soil Resources (BWSR) - [Native Vegetation Establishment and Enhancement Guidelines](#)
- Advancing Ecological Restoration Practice in Minnesota - [pdf file](#)
- Implementing Planning Guidance For Determining Best Practices For Restoring Minnesota Ecosystems - [MS Excel file](#)
- Minnesota Department of Agriculture - [Pollinator Best Management Practices](#)
- MN DNR – [Pollinator Best Management Practices & Restoration Guidelines](#)

A copy of the Tamarack Lake (REDACTED) Conservation Easement is on file with the Land Trust and can be provided upon request.

Project Contacts

Minnesota Land Trust Bev Rinke, Project Manager 651-917-9590 brinke@mnland.org	Kanati Land Management Nick Bancks 651-621-0789 nick@kanatiland.com
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Appendix B: Invasive Species Information

- **Reed canary grass**



Above: Dense reed canary stand (monoculture) that prevents any native species growth. Right: Reed canary seed head and growth surrounding wetland.



[Reed canary grass management guide](#): Good summary document from Wisconsin Wetlands Working Group, funded by the EPA. Describes different management techniques and strategies, as well as providing plant lists for restoration

[Reed canary grass control](#): management techniques from MN Board of Soil and Water Resources

- **Non-native cattail**



[Invasive plant profile: cattail](#) – Summary document from Wisconsin Wetland Association which provides good overview

[Narrow-leaf cattail](#) – Brief overview from U of M extension office

[Invasive Species Control Information: Cattail](#) – Very specific management techniques and strategies provided by MN Board of Soil and Water Resources

Photo: hybrid invasive cattail

- **Smooth brome**



Photo: field of smooth brome with seed head on display

[Smooth brome management](#) – From Nebraska Pheasants Forever, good summary document presenting multiple management options and strategies for smooth brome.

[Smooth brome grass: Control in CRP fields](#) – From the NRCS this is a good resource for an overview of smooth brome and its management

- **Kentucky bluegrass**

[Kentucky bluegrass in prairies](#) – good overview from The Nature Conservancy ecologist Chris Helzer describing management techniques, as well as how to gauge and assess outcomes of management activities

- **Common buckthorn**



Photo: buckthorn saplings in forest understory on Property

[Controlling buckthorn: the who, what, where, when and how](#) – from the U of M extension office, good summary resource for buckthorn management, including cost estimates.

- **Black locust**



Left: Black locust bush with seed pod. Right: Compound leaf and thorns on black locust

[Black locust brush management](#) – Factsheet from NRCS, provides good overview of management considerations and techniques

[Black locust](#) – overview from MN Department of Agriculture

[Black locust](#) – overview from MN DNR

- **Crown vetch**



Above: Flower head and compound leaf.

[Crown vetch](#) – great overview from the MN DNR, complete with identification and management recommendations

Appendix C: Native Species List for Replanting

Native shrub & fruiting tree species list⁷

- Chokecherry (*Prunus virginiana*)
- American hazelnut (*Corylus americana*)
- Gray dogwood (*Cornus racemose*)
- Juneberries (*Amelanchier spp.*)
- Nannyberry (*Viburnum lentago*)
- Beaked hazelnut (*Corylus cornuta*)
- Downy arrowwood (*Viburnum rafinesquianum*)
- Highbush cranberry (*Viburnum trilobum*)

Species list for RCG replacement area⁸

Common Name	Latin Name	Common Name	Latin Name
Wood reed	<i>Cinna arundinacea</i>	Tall sunflower	<i>Helianthus giganteus</i>
Drooping wood reed	<i>Cinna latifolia</i>	Cow parsnip	<i>Heracleum maximum</i>
Coastal barnyardgrass	<i>Echinochloa muricata</i>	Giant St.John's wort	<i>Hypericum pyramidatum</i>
American barnyardgrass	<i>Echinochloa walteri</i>	Monkey flower	<i>Mimulus ringens</i>
Canada wild rye	<i>Elymus canadensis</i>	Bergamot	<i>Monarda fistulosa</i>
Riparian wild rye	<i>Elymus riparius</i>	Ditch stonecrop	<i>Penthorum sedoides</i>
Virginia wild rye	<i>Elymus virginicus</i>	Yellow coneflower	<i>Ratibida pinnata</i>
Wild timothy	<i>Muhlenbergia racemosa</i>	Black-eyed Susan	<i>Rudbeckia hirta</i>
Switch grass	<i>Panicum virgatum</i>	Wild golden glow	<i>Rudbeckia laciniata</i>
Fowl meadow-grass	<i>Poa palustris</i>	Brown-eyed Susan	<i>Rudbeckia triloba</i>
Prairie cord grass	<i>Spartina pectinata</i>	Cup plant	<i>Silphium perfoliatum</i>
Bebb's oval sedge	<i>Carex bebbii</i>	Giant goldenrod	<i>Solidago gigantea</i>
Fringed sedge	<i>Carex crinita</i>	Ironweed	<i>Vernonia fasciculata</i>
Emory's sedge	<i>Carex emoryi</i>	Marsh aster	<i>Aster lanceolatus</i>
Beaked sedge	<i>Carex rostrata</i>	New England aster	<i>Aster novae-angliae</i>
Brown fox sedge	<i>Carex vulpinoidea</i>	Nodding bur marigold	<i>Bidens cernuus</i>
Clasping dogbane	<i>Apocynum sibiricum</i>	Common beggars-ticks	<i>Bidens frondosa</i>
Swamp milkweed	<i>Asclepias incarnata</i>	Sweet Indian plantain	<i>Hasteola suaveolens</i>
Shiny-leaved aster	<i>Aster firmus</i>	Grass-leaved goldenrod	<i>Euthamia graminifolia</i>

⁷ Species recommendations based upon site conditions (soils, moisture, light) and perceived ecological system and native plant community

⁸ Species recommendations based upon site conditions (soils, moisture, light), successional type (early/mid/late), and phenology