Agenda

Minnetonka Park Board

Wednesday, October 11, 2023 at 6:30 p.m.

Minnetonka Community Center - Minnehaha Room

1. Call to Order
2. Roll Call

_____Student Member	_____David Ingraham
_____Korey Beyersdorf	_____Ben Jacobs
_____Ella DiLorenzo	_____Katie Semersky
_____Anne Hanley	_____Chris Walick

3. Reports from Staff
4. Approval of Minutes
   A) August 2, 2023
5. Citizens wishing to discuss items not on the agenda
6. Special Matters
7. Business Items
   A) Cullen Nature Preserve Habitat Management Plan
8. Park Board Member Reports
9. Information Items
10. Upcoming Park Board Agenda Items
11. Adjournment

Board Vision:

An inclusive city with outstanding parks and recreational opportunities within a healthy and biodiverse natural environment.

Board Mission:

To proactively advise the city council, in ways that will:

- Conserve & enhance Minnetonka's natural environment
- Promote quality and inclusive recreation opportunities, natural amenities and facilities to meet the needs of all
- Provide a forum for public engagement regarding parks, trails, athletic facilities and natural resources
- Adhere to the goals and strategies of the Natural Resources Master Plan and the Parks, Open Space, and Trails Plan

Minutes
Minnetonka Park Board
Wednesday, August 2, 2023

1. Call to Order

2. Roll Call

Park board members present: Korey Beyersdorf, David Ingraham, Ben Jacobs, Katie Semersky, Isabelle Stroh and Chris Walick. Excused: Ella DiLorenzo and Anne Hanley.

Staff members in attendance: Kathy Kline, Matt Kumka and Sara Woeste.

Chair Walick called the meeting to order at 6:30 p.m.

3. Reports from Staff

Assistant Recreation Director Sara Woeste thanked Stroh for being a student member on the park board. She was a non-voting member but she has been very vital in a lot of their discussions. She hoped it was a good experience for her and wished her luck at college.

Stroh responded that it has been amazing.

4. Approval of Minutes

Jacobs moved, Ingraham seconded a motion to approve the meeting minutes of June 7, 2023 as submitted. All voted "yes." Motion carried.

5. Citizens wishing to discuss items not on the agenda

There were none.

6. Special Matters

There were none.

7. Business Items

A. Purgatory Park Master Plan Update

Park and Trail Project Manager Matt Kumka gave the report.

Walick liked the eclectic way community member's feedback is being gathered. He liked the pop-up idea because you get to talk to people who may not come to more structured events. He questioned if staff will continue doing the pop-up idea at different times and on different days so they get different samples.

Kumka replied that they will continue doing the pop-up idea but they are going to try and do it at different times knowing that people have a routine when it comes to the park and

they don't want them to miss out. They will mix it up and have a variety of times like on weekends, weekdays, evenings, etc.

Ingraham asked how many online survey responses there were.

Kumka didn't have the latest number but it was well over 150 last time he checked.

Semersky asked what they should expect at the end of this like the framework of it.

Kumka explained that they are hoping to get a to-do list out of it; these are things that folks generally think would improve the park user's experience. Some things they could get information about are: parking issues, whether or not there is enough parking, whether or not there are enough trails or if the signage is outdated. There is a myriad of things and the idea is to help staff prioritize items they need to tackle in the future. The resident feedback also provides evidence related to those particular concerns.

Ingraham asked if dogs, off-leashed dogs and dog parks have been a major area of interest so far in the responses.

Kumka said he has heard the most comments related to that particular feature of the park. The one finding so far is that people love Purgatory Park and they are very passionate about it.

8. Park Board Member Reports

Walick commented that we were glad to have Stroh on the park board. She had a lot of enthusiasm and energy, great ideas and engaged in the conversation. Second, he went to Night to Unite last night and everyone had fun in his neighborhood. A lot of people showed up and the Minnetonka Police stopped by.

Ingraham went to Summer Fest with his family and he complimented staff on a great job under interesting conditions. Everyone seemed to be having a great time and the weather pretty much cooperated. Second, he was at the new play area in Meadow Park and it is was really nice and the synthetic ground was really good. He was curious if there has been any manufacturer's feedback on the navy blue synthetic ground. He went on a hot sunny day and put his hand down and it was significantly hotter than the asphalt. If kid's had their shoes off it would've been challenging.

Woeste replied that she didn't know the answer to that but she would pass that feedback on. She asked if it was hotter than the asphalt or the concrete.

Ingraham answered hotter than the asphalt. He walked his dog through the parking lot on the asphalt and his dog was fine but when it stepped on the blue synthetic ground it yelped and jumped off. Ingraham put his hand down to feel it and it was really hot. He was just thinking about kids being on it.

Stroh thanked everyone and said it has been amazing being on the park board. She loved getting to know all of them and it has been an awesome experience. She hopes the next student member has as much fun as she did.

Woeste added that she doesn't anticipate having another student member probably until after the first of the year. That's when they go through the interview and application process.

9. Information Items

Summer Fest

Woeste gave the report.

Jacobs asked if it was canceled last year.

Woeste replied that it happened in 2022 but it was canceled in 2021.

Glen Lake Skate Park Improvements

Kumka gave the report.

10. Upcoming Park Board Agenda Items

Woeste gave the report.

Semersky asked what topics were going to be on the September agenda with council.

Woeste answered that mountain bike metrics would be on it. They will likely have more details on the master plan and perhaps something else.

Ingraham thought the council pushed their discussion out into the fall about dogs, off-leashed dogs and the ordinances. He couldn't remember if that was going to be discussed at the joint meeting or at a separate session.

Woeste said it will be part of the discussion with the Purgatory Master Plan. This is kind of the beginning of the dog discussion. No decisions will be made at the joint meeting but there will be a presentation on what they've heard so far and where they are in the process.

11. Adjournment

Jacobs moved, Beyersdorf seconded to adjourn the meeting at 6:48 p.m. All voted "yes." Motion carried.

Respectfully submitted,

Kathy Kline

Kathy Kline
Recreation Administrative Coordinator

Minnetonka Park Board Item 7A
Meeting of October 11, 2023

Subject:	Habitat Management Plan for Cullen Nature Preserve
Park Board related goal:	To conserve natural resources and open space
Park Board related objective:	Continue to review and comment on the implementation of the natural resources stewardship program as guided by the Natural Resources Management Plan
Brief Description:	Review Habitat Management Plan and Minnesota Land Trust Conservation Easement agreement update

Background:
In 2015, the City of Minnetonka acquired the 30-acre tract of land located at 2510 and 2620 Oakland Road in Minnetonka, Minnesota from the Estate of Ann Cullen Smith. The Property, which is also referred to as the "Cullen Nature Preserve", is encumbered by a conservation easement in favor of the Minnesota Land Trust, recorded on June 28, 2004. Since that time, the city has undertaken significant efforts to restore native habitat with approval of the Trust, in collaboration with the nonprofit organization Friends of Cullen Nature Preserve and Bird Sanctuary (FCNP). The FCNP is a 501(c)(3) non-profit organization incorporated under the laws of the State of Minnesota. The purpose of the organization is to preserve and restore the natural resources of the Cullen Nature Preserve.

The original conservation easement recorded in 2004 did not include a habitat management plan as an attachment to the easement agreement. Since that time, the Minnesota Land Trust began requiring habitat management plans to be created in association with conservation easements in order to coordinate restoration, conservation, and required site inspections. Hennepin County staff contacted the city and offered assistance in the creation of a habitat management plan for Cullen Nature Preserve in partnership with the Minnesota Land Trust, at no cost to the city. Staff from the city, Hennepin County, Minnesota Land Trust, and FCNP worked with a consultant hired by the county (Friends of the Mississippi River) to create the habitat management plan.

Summary:
The habitat management plan for Cullen Nature Preserve is designed to provide guidance towards restoration goals in the future. Original restoration goals for the site and significant on-going restoration accomplishments have been incorporated into the habitat management plan, including target plant community mapping, woody species removal, weed management, and native seed installation. The document also includes summaries of plant species inventories that have been performed by the FCNP and will help showcase ecological diversity improvements in the coming years.

The habitat management plan will be finalized with the Minnesota Land Trust in the coming months, and will need to be approved by the Minnetonka City Council as an amendment to the original agreement. Thus, city staff are looking for feedback and

requesting a recommendation from the Park Board to send the habitat management plan to the city council for approval.

Recommendation Action:

Receive presentation and provide recommendation of approval of the Cullen Nature Preserve habitat management plan to the city council

Attachment

Draft Cullen Nature Preserve Habitat Management Plan

HENNEPIN COUNTY
MINNESOTA

Habitat Management Plan

Cullen Nature Preserve

2023 – Prepared by Hennepin County and Friends of the Mississippi River

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About the Authors

Kristine Maurer – Conservation and Natural Resource Ecologist (Hennepin County)

Kristine is a Senior Natural Resource and Conservation Ecologist at Hennepin County and manager of the Hennepin County Habitat Conservation Program. She also facilitates restoration efforts, strategic planning, and helping landowners meet their conservation goals through a variety of programs. Kristine holds master's degrees in Natural Resource Ecology and Environmental Science from Iowa State University and a Biology degree from the University of St. Thomas. Kristine has written numerous management plans for park districts, the MN DNR, the MN Land Trust, and watershed districts, and has worked in the natural resource field for 10 years.

Laura Domyancich-Lee

Laura is an Ecologist at Friends of the Mississippi River. She manages several types of projects including habitat management planning, natural community surveys, and restoration implementation. She holds a bachelor's degree in Ecosystem Restoration from the University of Wisconsin – Stevens Point. Laura has written several management plans for public partners and has worked in the natural resource field for 20 years.

Julia Leone, PhD

Julia is a Pollinator Biologist at Friends of the Mississippi River. She leads long-term pollinator monitoring and research efforts and manages several restoration projects at sites within the Mississippi River corridor. Julia holds a PhD in Conservation Biology with a minor in Entomology from the University of Minnesota and a Bachelor of Liberal Arts degree from St. John's College in Maryland. Julia has developed management recommendations for pubic and private landowners and has worked in the entomology and natural resources fields for 10 years.

Leah Weston

Leah is an Ecologist at Friends of the Mississippi River. She conducts vegetation surveys, writes management plans and recommendations, and manages several restoration projects within the Mississippi River corridor in the Twin Cities. Leah holds a master's degree in Evolution, Ecology and Organismal Biology from The Ohio State University and a Botany degree from the University of Wisconsin – Madison. Leah has written management plans for private landowners and has worked in the natural resource field for 5 years.

Landowner, Easement Holder, & Funding

Owner – City of Minnetonka

The City of Minnetonka purchased the property from Ann Cullen Smith in 2004. A Conservation Easement was established with the Minnesota Land Trust upon purchase. The property is protected forever through the easement agreement and the City's desire to preserve high quality habitat and natural areas within the property for future generations.

Easement Holder – Minnesota Land Trust

The mission of the Minnesota Land Trust is to protect and restore Minnesota's most vital natural lands in order to provide wildlife habitat, clean water, outdoor experiences and scenic beauty for generations to come. The Minnesota Land Trust is a 501(c)(3) public charity as defined in Sections 501(c)(3) and 509(a) of the Internal Revenue Code and an organization qualified to hold conservation easements under Minnesota law and Section170(h) of the Internal Revenue Code and related regulations, possessing the commitment to protect the conservation purpose of this conservation easement and the resources to enforce the restrictions.

Funding Agent – Outdoor Heritage Fund

Funding for the development of this Habitat Management Plan was provided by the State of Minnesota's Outdoor Heritage Fund, as recommended by the Lessard-Sams Outdoor Heritage Council. Specifically, the Habitat Management Plan was funded through the Hennepin County Habitat Conservation Program Phase 1 program (grant #145662) from the Minnesota Department of Natural Resources ("DNR") to the Minnesota Land Trust. The purpose of this grant is to acquire permanent conservation easements and to restore and enhance habitats in Hennepin County.

Preface

The Protected Property has many intrinsic natural resource values that are worth protecting and was placed into a Conservation Easement with the Minnesota Land Trust in 2004.

Long-term protection of a Protected Property's Conservation Values can be heightened through regular, prescribed habitat management activities over time. As a condition of the Conservation Easement, a Habitat Management Plan ("HMP") is developed to provide recommendations on how to maintain the Conservation Values of the Protected Property. Specifically, the HMP guides the ecological preservation, restoration, and enhancement of water features and plant and animal communities within the Protected Property. By detailing the history, ecological context, characterization, and potential management actions, this HMP provides an outline for maintaining and improving the integrity of the Protected Property that is ecologically appropriate and consistent with both the terms of the Easement and your desires as the Owner.

The first section of this document outlines the significance and ecological context of the Protected Property. The second section of the HMP identifies the Conservation Values, Priority Issues, and associated Management Objectives.

The third section of the HMP identifies discrete Management Units within the Protected Property. Management Unit boundaries are defined by natural barriers and breaks in the landscape (e.g., streams, ridges, slopes, plant community transitions, etc.) as well as existing and desired future conditions. Management Units are a functional designation to help more easily execute management of plant communities within each Management Unit. This section will describe measurable goals for each Management Unit and outline a suite of management actions and options associated with achieving the desired future conditions.

Additionally, management priorities have been identified for each Management Unit. Management priorities highlight the most urgent management needs within each Unit. The Management Units, plant communities, and management priorities are described in detail throughout this HMP.

Several appendices follow the main body of the HMP. These sections offer detailed information and site context that will provide interesting insights for the landowner and necessary background for land managers and restoration specialists. Appendices include information pertaining to local, state, and federal approval and permitting requirements, the historical and ecological context, description of landscape level threats, general non-native species guidelines and information, wildlife habitat, and native plant community condition criteria.

If you, as the easement landowner, wish to undertake any habitat management or restoration activities on the Protected Property, a detailed action plan ("Action Plan") will typically be required. Action plans are in addition to this document and must be submitted to the Land Trust for approval prior to commencement of any desired activities. These Action Plans provide specific,

more detailed information related to the proposed activity, including course of action (site prep and implementation, seed mixes

and sources, etc.), schedule (timeline and specific timing of actions), and measurable outcomes (goals and how the outcomes will be monitored). In general, all but small-scale activities on the Protected Property require an approved detailed Action Plan. The MN Land Trust encourages all landowners to review their conservation easements and habitat management plans before engaging in any management activity.

Image 1: Oak Savanna habitat overlooking wetland complex (Photo: Leah Weston; FMR)

Executive Summary

The following executive summary outlines the Conservation Values, Priority Issues, and Priority Features objectives and goals for the property. The following few pages are a quick guide to the most important threats and management actions.

Conservation Values

Conservation Values are the key (priority) ecological and socioeconomic attributes (features or functions) of the Protected Property. The Protected Property contains areas of good to fair wetland and lakeshore communities and supports a variety of plants and animals. The Conservation Values of the Easement include:

A. The open and natural features of the property provide outstanding scenic views prominently visible from Interstate 494, Oakland Road, and Stone Road.
B. The Protected Property contains wetlands and mature forest providing habitat for a variety of plants and animals.
C. The undeveloped and relatively undisturbed natural areas provide important open space that adds to the natural character of the City of Minnetonka as advocated by the City.
D. Future use of the Protected Property as a publicly accessible natural and scenic park would provide important opportunities for nature observation, study, and reflection.

Priority Issues

Priority Issues are concerns that pose the greatest risk or threats to the preservation of the Conservation Values. Priority Issues for the Protected Property include:

1. Presence of woody non-native species including common buckthorn and black locust throughout the woodland and savanna.
2. Presence of non-native and invasive herbaceous species throughout the property including garlic mustard, reed canary grass, Canada thistle, and bull thistle.
3. Presence of non-native herbaceous species in the buffer and wetland, which include reed canary grass, non-native *Phragmites*, and narrow-leaf cattail.
4. Absence, suppression, and poor regeneration of native species within native plant communities, restored areas, and altered landcover types.
5. Ongoing erosion of gullies and impacts to the wetland resulting from off-site drainage.

Priority Features & Management Objectives

Priority Features are not all the features on the property, but rather they are key components that require management attention and specific objectives (e.g., ecological process, native plant community, rare features, and public access and use) to sustain Conservation Values and build resiliency in the face of Priority Issues. This HMP will focus on four Priority Features that relate to identified Conservation Values for the Protected Property.

PRIORITY FEATURE 1: MANAGEMENT AND ENHANCEMENT OF THE OAK SAVANNA

The property contains an area that was historically an oak savanna and was previously overcome by woody encroachment. Oak savanna is a rare habitat in Minnesota due to conversion to agriculture and fire suppression. Restoration efforts to return this area to the oak savanna have already begun. The savanna currently supports songbirds, a range of mammal species, and pollinators, but has the potential to support more diversity within these groups. Priority Management Objectives include:

1) Removal and management of noxious weeds and other non-native species within the savanna, including common buckthorn, black locust, reed canary grass, and garlic mustard.
2) Enhancement of habitat throughout the savanna through native planting, seeding, and re-introduction of prescribed fire.

Primary goals include reducing non-native plant cover, increasing native vegetation cover, diversity, and habitat structure, re-introduction of a disturbance regime, and increasing habitat for rare features like Species of Greatest Conservation Need (SGCN).

PRIORITY FEATURE 2: MANAGEMENT AND ENHANCEMENT OF OAK WOODLAND AND MESIC HARDWOOD FOREST AREAS

Multiple areas of the property contain degraded woodlands and forests overcome by non-native and invasive species. Mature tree canopy and pockets of native herbaceous ground cover demonstrate the ability of the seed bank to regenerate forest and woodland with effective management strategies to reduce non-native cover. Primary Management Objectives include:

1) Removal and management of noxious weeds and other non-native species within the oak woodland and mesic oak forest, including common buckthorn, black locust, and garlic mustard.
2) Enhancement of habitat throughout the woodland through native planting and seeding.

Primary goals include reducing non-native plant cover, increasing native vegetation cover, diversity, and habitat structure, screening neighboring residential properties, and increasing habitat for rare features like Species of Greatest Conservation Need (SGCN).

PRIORITY FEATURE 3: MANAGEMENT AND ENHANCEMENT OF WETLAND BUFFER AND WETLAND COMPLEX

A large portion of the Protected Property consists of a degraded wetland and wetland buffer. Despite a constant influx of non-native species, nutrients, and road salt runoff via proximity to major roads and surrounding development, pockets of native species diversity persist along the wetland edge. This complex currently provides habitat for birds, frogs, and dragonflies. Primary Management Objectives include:

1) Removal and management of noxious weeds and non-native species within the buffer and wetland edge, including reed canary grass and non-native *Phragmites*.
2) Enhancement of habitat throughout the buffer by reestablishing some shrub cover as well as native seeding and planting.
3) Reduction of erosion and increased nutrient capture by establishing continuous native herbaceous groundcover within the wetland buffer.

The primary goals will be to improve water quality, reduce run-off and surrounding development impacts, increase native vegetation cover, diversity, and habitat structure, and increase habitat for rare features like Species of Greatest Conservation Need (SGCN).

PRIORITY FEATURE 4: RESTORATION OF FORMER HOME SITE

This Protected Property was previously a home site and contained a driveway, tennis court, house, and garden. Although the structures were removed, remnants of this former land use remain. Some of these remnants make management of other native plant communities a challenge, including large stretches of asphalt and compacted grade in the tennis area. Removing remnants and integrating the homesite seamlessly into the restoration is important to providing long-term habitat benefits. Primary Management Objectives include:

1) Removal of man-made remnants, including asphalt and gravel.
2) Incorporate soil decompaction best management practices enough to support native species establishment.
3) Removal and management of noxious weeds and non-native species, including common buckthorn, black locust, garlic mustard, and garden plants that remain as remnants of former landscaping.
4) Enhancement of habitat throughout the unit by native seeding and planting.

The primary goals will be to minimize the home site footprint and seamlessly integrate this area into surrounding management units. Over time, this area will aesthetically blend into more natural areas of the Protected Property as well as increase native vegetation cover, diversity, and habitat structure, and increase habitat for rare features like Species of Greatest Conservation Need (SGCN).

Image 2: Showy orchis (*Galearis spectabilis*) in Oak Woodland (Photo: Leah Weston; FMR)

The table below summarizes the plant communities and land cover associated with each Management Unit including a condition grade and the acres of each community or land cover type.

Table A1: Plant communities and land cover within each Management Unit. Grades Described in detail in Appendix G. NPC = Native Plant Community as defined by the MN Department of Natural Resources.

MANAGEMENT UNIT	CURRENT PLANT COMMUNITIES	ACRES (rounded to nearest tenth)	CURRENT GRADE*	DESIRED FUTURE CONDITION
MU 1: Oak Savanna *Priority Feature 1*	Oak Savanna (UPs14)	8.9	C	• Toward a B quality oak savanna plant community with reduced cover of non-native/invasive species and increased cover of native grasses, forbs, and oak trees. • Target communities to consider = UPs14 or UPs24 depending on soil conditions.
	Prairie (UPs13)	0.2	C	
	Former home site	0.6	C	
MU 2: Mesic Hardwood Forest *Priority Feature 2*	Mesic Hardwood Forest (MHs38)	0.7	C	• Toward a B quality mesic hardwood forest with reduced cover of non-native/invasive species and increased cover of native forbs, shrubs, and trees. • Target communities to consider = MHs38 or MHs39 depending on adaptive management outcomes.
	Oak Woodland (FDs37)	1.2	C	
	Driveway Remnant	0.2	NA	

MANAGEMENT UNIT	CURRENT PLANT COMMUNITIES	ACRES (rounded to nearest tenth)	CURRENT GRADE*	DESIRED FUTURE CONDITION
MU 3: Oak Woodland Priority Feature 2	Mesic Hardwood Forest (MHs38)	1.5	B/C	• Toward a B quality mesic woodland with reduced cover of non-native/invasive species and increased cover of native forbs, shrubs, and trees. • Target communities to consider = FDs37, FDs27, or MHs38 depending on adaptive management outcomes.
	Oak Woodland (FDs37)	3.7	C	
	Oak Woodland (FDs37)	1.8 (main island)	C	
	Oak Woodland (FDs37)	0.3 (island outside of easement)	C	
	Tennis Court Remnant	0.3	D	
MU 4: Wetland Complex *Priority Feature 3*	Wet Prairie	0.3	C	• Erosion is managed. • Toward a B quality wetland/prairie complex. • Target communities to consider = UPs23, WPs54b, and WMn82. • Work with neighbors, MN DNR, BWSR, watershed district, and USACE to consider larger hydrologic and vegetative restoration.
	Buffer	2.8	D	
	Freshwater emergent wetland	8.2	D	• Toward increasing pockets of native diversity along the wetland edge. • Target communities to consider = MRn83 or WMn82. • Work with neighbors, MN DNR, BWSR, watershed district, and USACE to consider larger vegetative restoration.
MU 5: Prairie *Priority Feature 4*	Restored Prairie	0.4	C	• Toward a B quality dry/mesic prairie. • Target communities to consider = UPs13 or UPs23, depending on soil moisture conditions.
MU 6: Vernal Pool *Priority Feature 2*	Vernal Pool	0.03	C	• Toward a vernal pool that provides diverse habitat options for flora and fauna. • Target communities to consider = MHs49

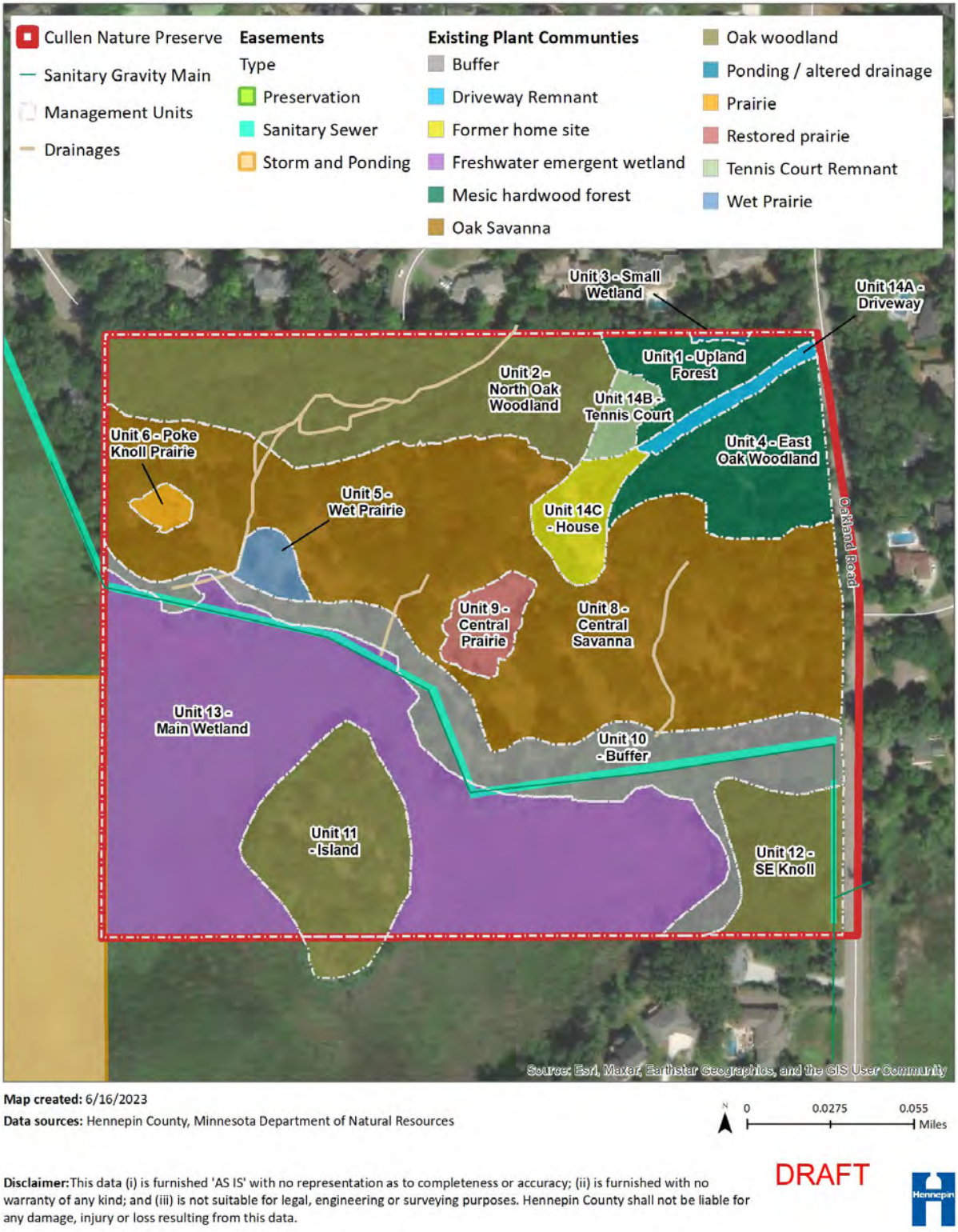

Figure 1: Management units and existing community types

Site Significance

The following section provides an overview of the Protected Property significance as it relates to its location, ecological context and characteristics, and land cover. More details on the following topics are provided in Appendix D, E and H.

Conservation Values

Conservation Values are the key (priority) ecological and socioeconomic attributes (features or functions) of the Protected Property. The Protected Property contains areas of good to fair wetland and lakeshore communities and supports a variety of plants and animals. The Conservation Values of the Easement include:

A. The open and natural features of the property provide outstanding scenic views prominently visible from Interstate 494, Oakland Road, and Stone Road.
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C. The undeveloped and relatively undisturbed natural areas provide important open space that adds to the natural character of the City of Minnetonka as advocated by the City.
D. Future use of the Protected Property as a publicly accessible natural and scenic park would provide important opportunities for nature observation, study, and reflection.

Site Context

LOCATION

The Protected Property is approximately 31 acres in size and is in the City of Minnetonka, Hennepin County, MN (Section 7, Township 118N, Range 24W). Parcels within the Protected Property are identified as PIDs 1011722310001 and 1011722310002. Adjacent land cover includes partially wooded residential lots to the northeast, north, west, and southwest, and a wetland to the south and southeast. Oakland Road runs along the eastern edge of the property. Interstate 494 is located approximately 800 feet from the western property line.

RELATIONSHIP TO CONSERVATION LANDS

The Protected Property adds to a complex of protected public and private conservation lands that provide wildlife habitat, water quality, and scenic open space. The Protected Property is directly adjacent to the City of Minnetonka's Meadow Park, which provides continuity of upland and wetland habitat. Additionally, it is within a 1-mile radius of Minnehaha Creek and Mooney Park. The Protected Property adds large tracts of oak savanna and wetland to the Hennepin County Habitat Conservation Program, as well as to the Land Trust's Twin Cities Metro Priority Conservation Program Area.

ECOLOGICAL CHARACTERISTICS

- Based on the MN Ecological Classification System, the Protected Property is found within the Big Woods Subsection of the Minnesota & Northeast Iowa Morainal Section of the Eastern Broadleaf Forest Province.
- The Protected Property lies in the Platteville and Glenwood Formations. Surficial geology of the area consists of Villard till along the slope and uplands as well as fine-grained lake sediment in the wetland and buffer.
- The Protected Property is in an area associated with the Late Wisconsin Glaciation which delivered calcareous till deposits and resulted in the formation of rolling hills and closed depressions.
- The Protected Property is situated on a south-facing slope. The topography ranges from 932 to 990 feet above sea level (Figure 28), with the highest points in the northeast corner of the Protected property sloping downward to the south and west.
- Soils within the site are primarily classified as moderately well-drained loam in the upland and along slopes with organic, poorly drained, mucky soils in the wetland and depressional areas.
- Historical mapping data indicate Oak Openings and Barrens (oak savanna) was likely the predominate plant community in this area prior to European colonization. Primary disturbances of this system include fires which are frequent enough to prevent fire-prone trees and shrubs from dominating, but where the frequency is low enough to allow trees to reach maturity.
- The Protected Property contains Type 1 (Seasonally Flooded Basin/Floodplain Forest) and Type 3 (Shallow Marsh) wetlands according to National Wetlands Inventory classification system.

Rare Features

The following Species of Greatest Conservation Need (SGCN) and other rare species have potential to utilize the property now and/or in response to improved habitat conditions through the management actions recommended in this plan.

Table 1: Possible rare and SGCN species

ANIMAL NAME	SEEN DURING SITE VISIT (Y/N)	GENERAL HABITAT NOTES
Year-Round		
Least Weasel	N	Fields, prairies, farms, wetlands. Use old chipmunk burrows and hollow logs and under rock piles. Spends most time on the ground and eats voles and mice. Territory is about 2 acres.
Prairie Vole	N	Prairies, meadows, and dry grasslands. Eats insects, seeds, and plants. Creates and maintains burrows and extensive surface runway systems. Reproduction levels are closely related to moisture availability and decline in droughts.

ANIMAL NAME	SEEN DURING SITE VISIT (Y/N)	GENERAL HABITAT NOTES
Short-eared Owl	N	Open low vegetation such as prairie and grassland, prefers areas with nearby woodlots and edges and shrub thickets. Nest on ground amid grasses and build nets in a scraped-out bowl in ground lined with feathers and grasses
Blanding's Turtle	N	Open areas near shallow water, mud bottoms, and aquatic vegetation are preferred. Hibernate on pond and marsh bottoms. Eat crayfish, frogs, snails, fish, insects, and occasionally berries. Emerge from hibernation in April and nest in early June. Hatchlings leave nests in September. Territory is about 1mi in diameter.
Gopher Snake	N	Prairies, old fields, oak savannas, and sandy habitats with burrowing rodents. Hibernates in mammal burrows. Emerge in late April-May and mate in May. Eggs are deposited in June or July and hatch within 56-100 days. Home ranges are up to 18 acres and use up to 500 acres. Eat small mammals.
Eastern Hog-nosed Snake	N	Floodplains, open woodlands, forest edges, and grassland. Need sandy or loamy soils. Active y end of April and mating occurs through May. Eggs are laid May-July and hatch 50-65 days later. Prey includes small mammals and other snakes.
Smooth Green Snake	N	Prairies, meadows, and forest edges. Hibernate below the frost line in the ground. Some use abandoned ant mounds. Active beginning in April and mate in May-August. Nesting occurs July-August and hatching August-September. Prey includes invertebrates and is very vulnerable to pesticides. Bask in trees and shrubs primarily crawls and hides in vegetation and underground.
Rusty-Patch Bumblebee	N	Forest and prairie. Nests underground often in deserted animal burrows. *Likes Impatiens, Lonicera, Monarda, Prunus, Solidago, Aesculus, Dalea* flowers
American Bumblebee	N	Open fields and prairies. Nest on ground surface among long grasses. Likes *Cirsium, Cornus, Dalea, Echniacea, Helianthus, Liatris, Trifolium* flowers
Yellow-banded Bumblebee	N	Wooded areas and wetlands. Nests underground. Prefers *Ribes, Monarda, Rosa, Rubus, Spirea, Taraxacum, Crocus, and Eupatorium.*
Russet-tipped Clubtail	N	Streams and lakes. Typically mate in trees and bushes, lay eggs over water.
Blue-eyed Darner	N	Open lakes and ponds and shorelines with moderate vegetation. Eggs are laid in emergent vegetation, floating leaves, and floating logs above waterline.
Crimson-ringed Whiteface	N	Low clearings near lakes and ponds, perch on vegetation and floating plants. Eggs laid in water.
Migration Only (Spring, and Fall; Temporary)		
LeConte's Sparrow	N	Marshy wet meadows with dense grasses and sedges
Loggerhead Shrike	N	Open areas with short vegetation, well-spaced shrubs, low trees, and thorny vegetation. Will utilize agricultural fields, and riparian areas and places with fences and utility lines. Eat insects, amphibians, reptiles, and small mammals.

ANIMAL NAME	SEEN DURING SITE VISIT (Y/N)	GENERAL HABITAT NOTES
Common Merganser	N	Large lakes are preferred. Eat mostly fish.
Common Loon	N	Large Lakes with coves and islands, clear water, and abundant small fish.
Black Crowned Night Heron	N	Wetlands, lakes, and ponds with aquatic vegetation and terrestrial cover. Eat insects and small animals.
American White Pelican	N	Forage in shallow waters and mainly eat small fish and minnows.
Horned Grebe	N	Small shallow ponds with emergent vegetation. Eat small fish, frogs, and tadpoles, and crustaceans.
Eared Grebe	N	Lakes and ponds that lack fish. Mainly eat invertebrates.
Lesser scaup	N	Seek out lakes and ponds during migration. Mainly forage aquatic insects and aquatic plants and seeds.
Breeding Season (Summer resident)		
Hoary Bat	N	Deciduous and coniferous forest. Solitary bat that will hang out in leaves of trees and hang from one foot. Eats insects, especially moths.
Little Brown Bat	N	Form large maternity colonies in tree cavities, attics, and bat houses, Males will often roost under tree bark or in hollows of dead trees. Eats insects and forage over bodies of water and woodland margins.
Eastern Red Bat	N	Deciduous and lowland forest. Forage near fields and wetlands and primarily eat moths. They are solitary and roost in trees, changing roost location every few days. Hang from one foot among tree leaves on south-side of trees.
Big Brown Bat	N	Deciduous forest. Maternity colonies roost under bark of trees and in small tree cavities in addition to buildings, and bat houses. Eats insects and many agricultural pests.
Red-shouldered hawk	N	Bottomland and hardwood forests and oak woodlands with an open subcanopy. Eat small animals such a snakes and amphibians. Nest in broadleaved trees near water and often reuse past nesting sites
Common Night Hawk	N	Rural and urban habitats including clearings, prairies, and grasslands. Eat mostly flying insects. Nest on unsheltered round but may be near vegetation clumps boulders or logs.
Northern Harrier	N	Wetland and grassland and woodland complexes. Breed in marshes and meadows. Hunt amphibians, mammals, reptiles, and birds. Nest on the ground in dense clumps of vegetation such as willows, grasses, sedges, reeds, bulrushes, and cattails.

ANIMAL NAME	SEEN DURING SITE VISIT (Y/N)	GENERAL HABITAT NOTES
American Kestrel	N	Open areas with short vegetation and sparse trees with cavities for nesting; mowing and grazing can be helpful to improve habitat conditions for Kestrels. They eat insects and small animals. Nest in existing cavities.
Purple Martin	Y	Forage over open fields and wet meadows and breed along forest edges. Use dead snags and old woodpecker holes to nest in. However now, they primarily utilize nesting boxes. They eat flying insects.
Northern Rough-winged Swallow	N	Forage over open water and above fields. Eat flying insects and nest in burrows created by other animals. Also nest in crevices and often in small groups.
Western Meadowlark	N	Open Grasslands, prairies, meadows, avoid shrubby and wooded edges. Eats seeds and insects. Grain in important during winter and early spring. Nest on the ground in small depression shielded by vegetation.
Grasshopper Sparrow	N	Grasslands, prairies, and hayfields with little shrub cover and some bare ground. Eat grasshoppers and other insects, and nest on the ground at base of grass clumps within larger dense stand of tall grasses or sedges.
Sedge Wren	N	Wet meadows, hayfields, tallgrass prairie, shallow marsh margins with dense sedges and grasses and shrubs. Eat spiders and insects, foraging in low vegetation and on the ground. Nests are sometimes on the ground or up to 40 inches off the ground in dense sedges.
Brown Thrasher	N	Deciduous forest edges, thickets, and hedgerows. Often found in places with cottonwood, willow, dogwood, American plum, and hawthorn. Eat mostly insects in addition to some fruits (elderberries, hackberries, pokeberries, Virginia creeper, sumac, raspberry, currant, grape, strawberry), and seeds. Feed on the ground and nest in low tree or thorny shrub, sometimes on the ground.
Virginia Rail	N	Shallow marshes with 40-70% cover of cattails and rushes, areas with less than 6inches of standing water and muddy bottoms. Nest in cattails and bulrushes and build nests on top of floating mats or just above water edge.
Bobolink	Y	Large mixed grass fields, such as legumes and dandelions, Nest in tallgrass and mixed prairies. Primarily eats seeds and insects. Mainly forage during the day. Nest on wet soils near bases of large non-woody plants such as meadow rue, golden Alexanders, or clovers.
Least Bittern	N	Marshes with reeds and cattails, open water, and woody vegetation. Prefer tall and dense vegetation.
American Bittern	N	Marshes with tall vegetation, typically shallower and less densely vegetated than desired by least bittern.
Trumpeter Swan	Y	Shallow Lakes and ponds with abundant aquatic plants, 100 yards of open water, beaver or muskrat dens or small islands to nest on. Seek out deeper waters prior to migration.

ANIMAL NAME	SEEN DURING SITE VISIT (Y/N)	GENERAL HABITAT NOTES
Non-breeding Season (Winter-only residents)		
Belted Kingfisher	N	Lakes and ponds with earthen banks for nesting. Need perches to hunt from. Mostly eat small fish but will also eat crustaceans, insects, amphibians, young birds, small mammals, and berries
American Black Duck	N	Freshwater wetlands and shallow lakes with reeds and sedges, lined with woods and shrubs. Eat mostly plants including seeds and tubers and during breeding consume aquatic insects. Nest on the ground on wooded or grassy islands, uplands next to water features and create small basin they fill with leaf litter. Sometimes nest in trees.

Bolded species have been observed within the Protected Property.

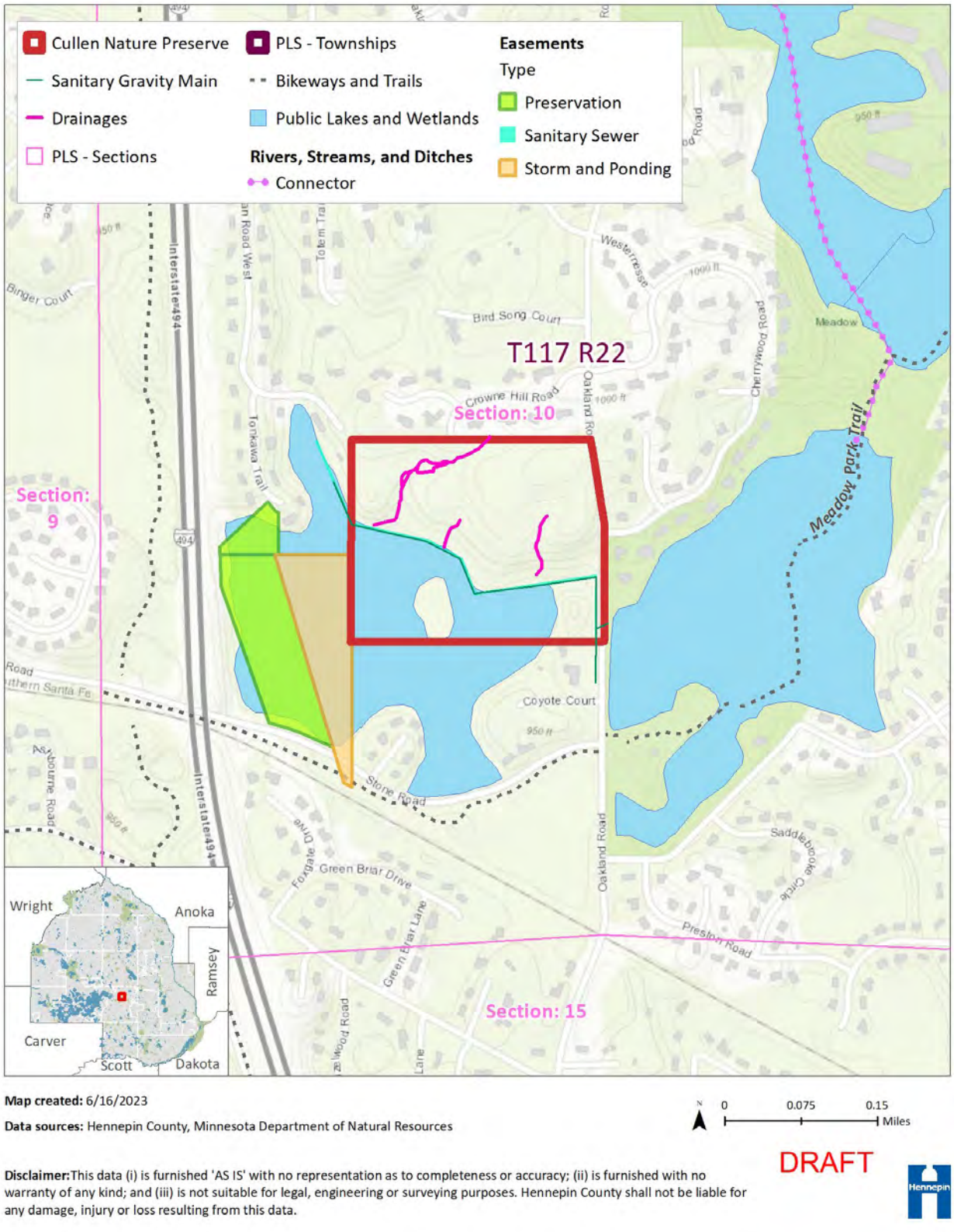


Figure 2: Location

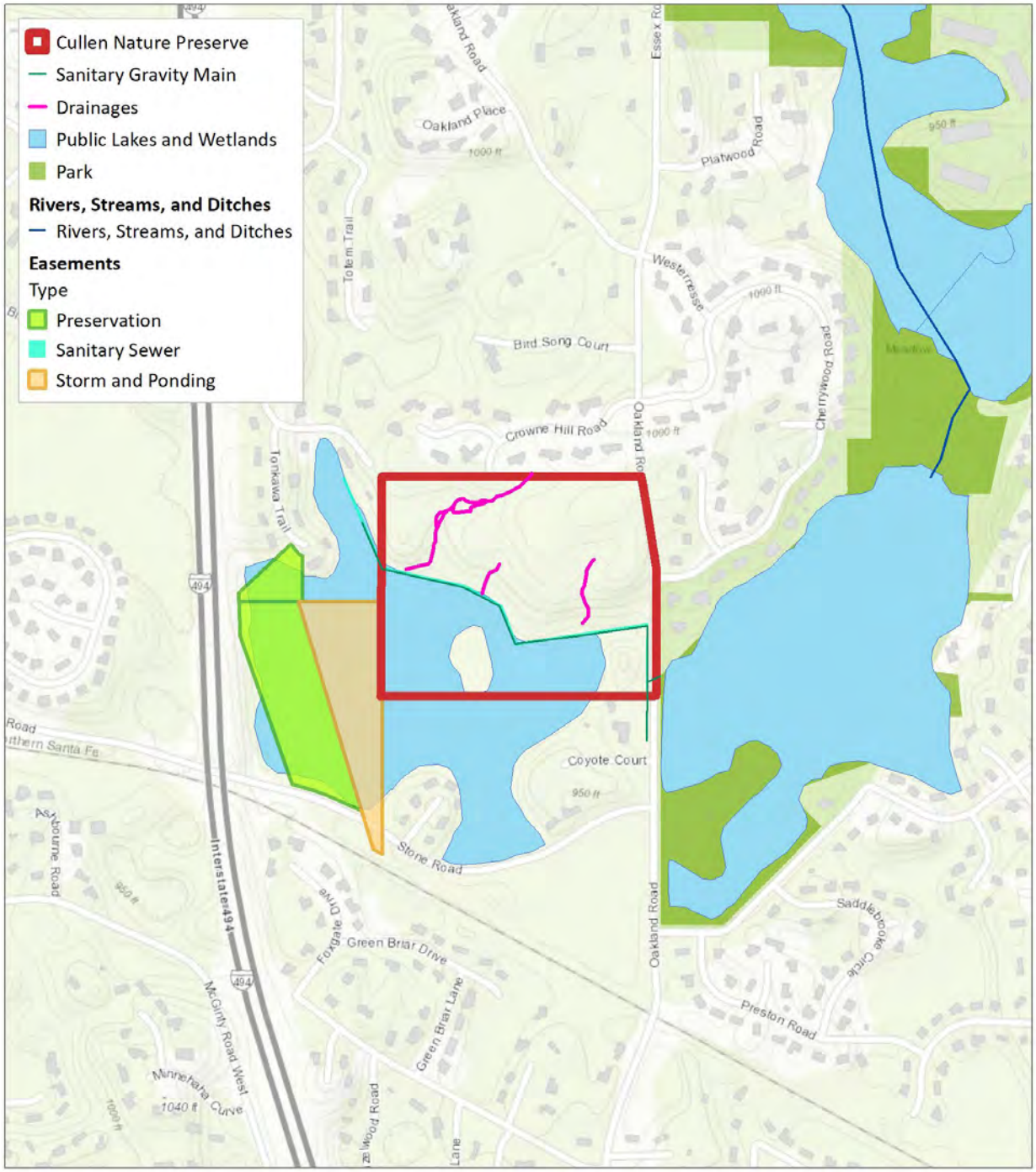


Figure 3: Site context

PROTECTED PROPERTY RECENT LAND USE & CURRENT LAND COVER

The Protected Property currently includes valuable woodland, savanna, vernal pools, and wetland resources. Land use includes ongoing restoration, nature observation, and low-impact recreation.

There are no formal trails on the Protected Property. A partially paved driveway exists leading to an open area where a home site once stood. The upland area is forested. There are three drainage ways conveying water from the adjacent development to the north down the slope into the wetland. The slope is currently an oak savanna. A water and sewer easement exists at the base of the slope within the buffer of the wetland. A forested upland island is partially located within the wetland.

More detail about each Management Unit and their current land cover types and plant communities are provided in the following sections and Appendix G: Community Condition Guidelines.

Image 3: Early spring views through the Oak Savanna (Photo: Leah Weston; FMR)

Priority Issues

Priority Issues are concerns that pose the greatest risk or threats to the preservation of the Conservation Values. Priority Issues for the Protected Property include:

1. Presence of woody non-native species, including common buckthorn and black locust throughout the woodland and savanna.
2. Presence of non-native and invasive herbaceous species throughout the property, including garlic mustard, reed canary grass, Canada thistle, and bull thistle.
3. Presence of non-native herbaceous species in the buffer and wetland, including reed canary grass, non-native *Phragmites*, and narrow-leaf cattail.
4. Absence, suppression, and poor regeneration of native species within native plant communities, restored areas, and altered landcover types.
5. Ongoing erosion of gullies and impacts to the wetland resulting from off-site drainage.

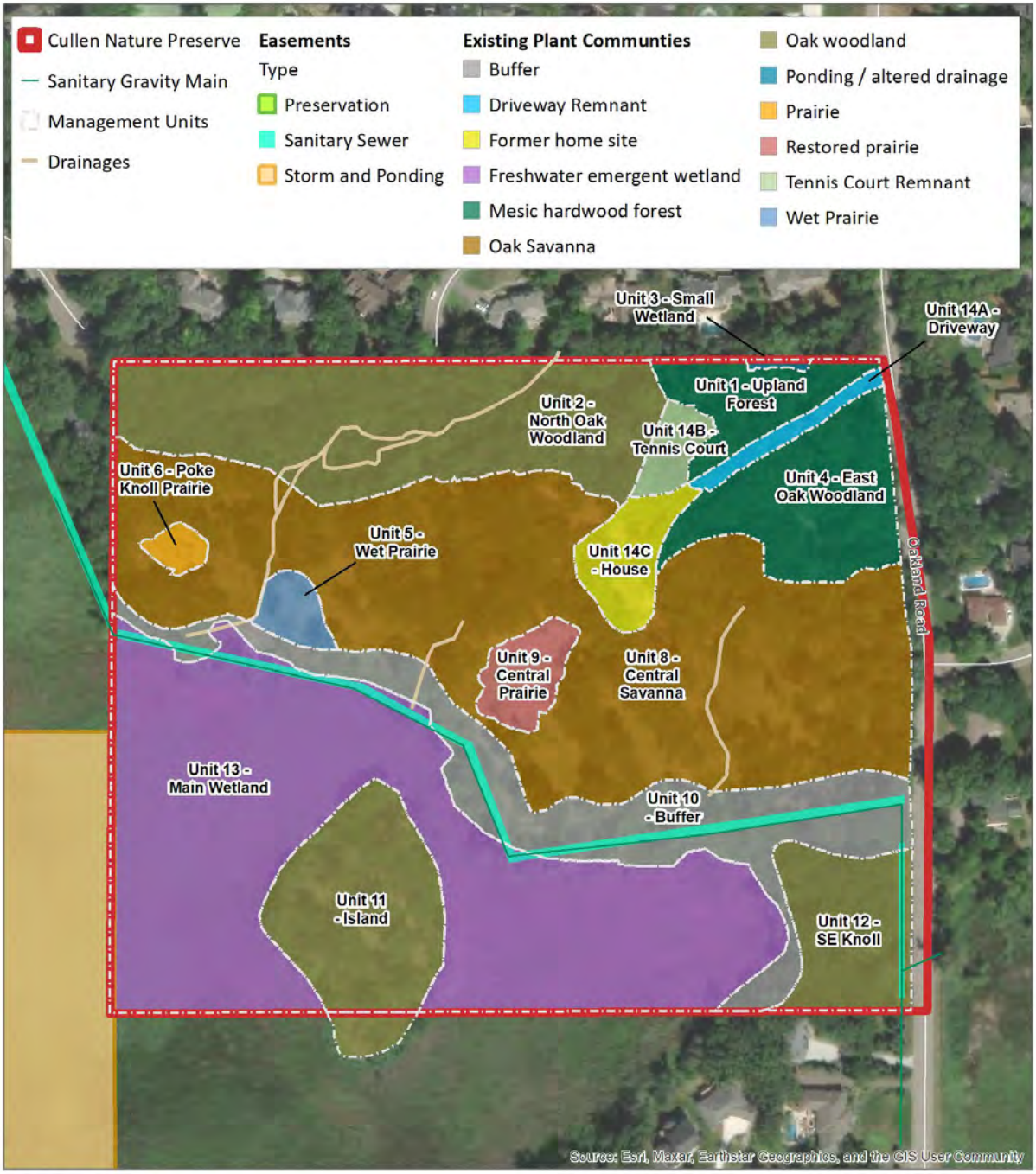
Management Units and Associated Actions

Management Units Overview

The Protected Property contains six management units (MUs). The following section lays out a description of each management unit, the plant communities or land cover types, and possible management strategies. This section also contains representative photos of the various plant communities within each Management Unit, and Figures 4 and 5 are maps of existing and desired community conditions.

Native Plant Community conditions (grade) are identified for each intact community and are ranked from A (excellent) to D (poor). B and C correspond to good and fair conditions, respectively. Guidelines for ranking consider abundance of non-native species, diversity and health of native species, level of disturbance and degradation, and impacts or alterations to water features. Condition ranks are only assigned to native plant communities classified according to DNR guidelines; other plant communities are considered land cover types and are not assigned condition ranks.

Although management action is not a requirement of the easement, this Protected Property is in Hennepin County and is consequently facing many threats and pressures related to non-native species, pests, habitat loss and fragmentation, development pressure, and climate change. These threats are meaningful even if non-native species are absent from plant communities, management units, or the entire property. As a result, taking no action will ultimately result in degradation of the systems.



Map created: 6/16/2023

Data sources: Hennepin County, Minnesota Department of Natural Resources

N 0 0.0275 0.055 Miles

DRAFT

Disclaimer: This data (i) is furnished 'AS IS' with no representation as to completeness or accuracy; (ii) is furnished with no warranty of any kind; and (iii) is not suitable for legal, engineering or surveying purposes. Hennepin County shall not be liable for any damage, injury or loss resulting from this data.

Figure 4: Existing plant communities

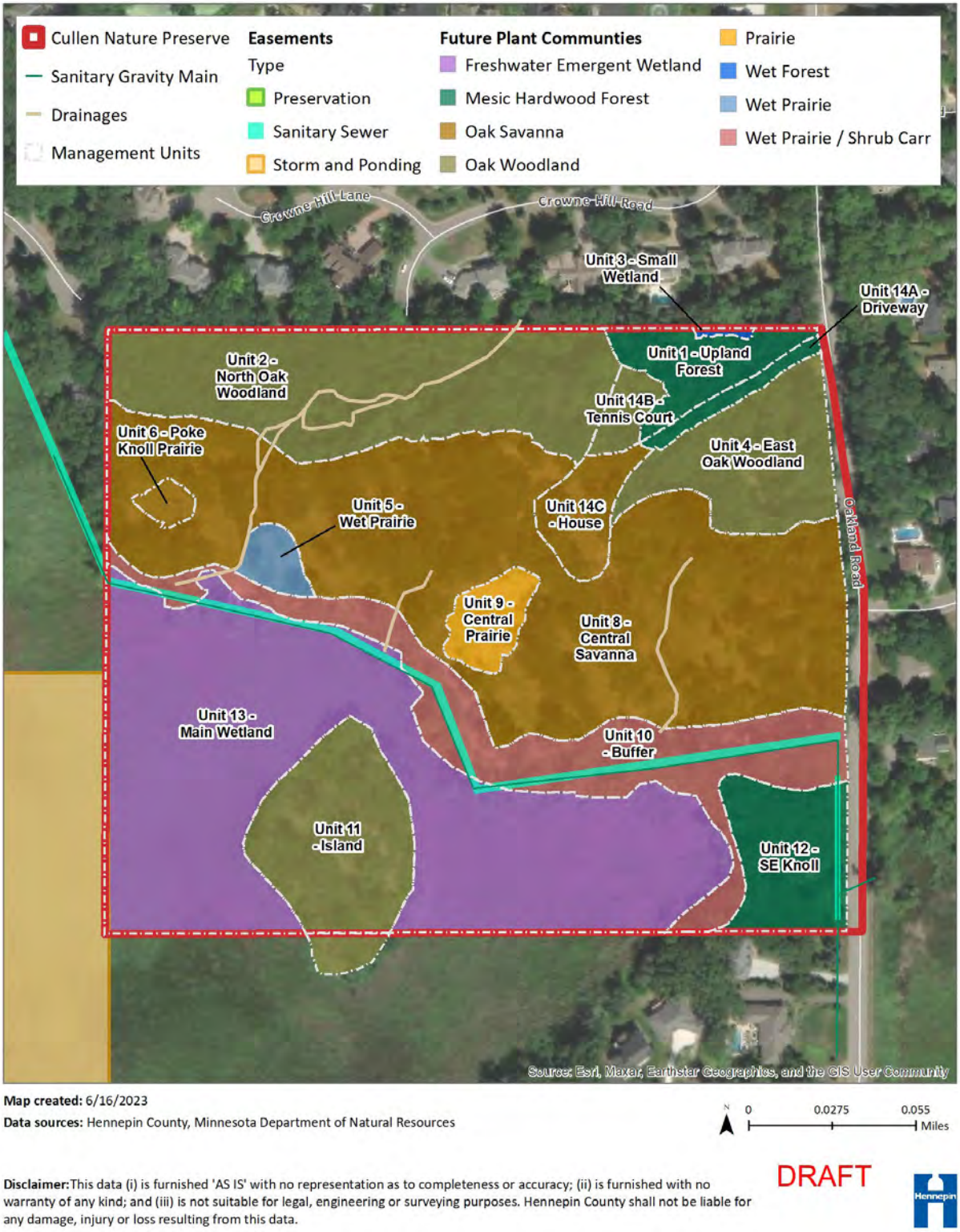


Figure 5: Desired future plant communities

Table 2 below summarizes the plant communities and land cover associated with each Management Unit including a description of the community or land cover condition and accompanying grade and the acres of each community or land cover type.

Table 2: Plant communities and land cover within each Management Unit

MANAGEMENT UNIT	CURRENT PLANT COMMUNITIES	ACRES (rounded to nearest tenth)	CURRENT CONDITION DESCRIPTION	CURRENT GRADE*	DESIRED FUTURE CONDITION
MU 1: Oak Savanna *Priority Feature 1*	Oak Savanna (UPs14)	8.9	This community is currently undergoing restoration. Once dominated by non-native shrubs, the area now contains native herbaceous groundcover and scattered native trees.	C	Toward a B quality oak savanna plant community with reduced cover of non-native/invasive species and increased cover of native grasses, forbs, and oak trees. Target communities to consider = UPs14 or UPs24 depending on soil conditions.
	Prairie (UPs13)	0.2	This community is currently undergoing restoration. Once dominated by non-native shrubs, the area now contains remnant native herbaceous groundcover.	C	
	Former home site	0.6	This community consists of native trees, as well as native, non-native, horticultural, and invasive shrubs and groundcover.	C	
MU 2: Mesic Hardwood Forest *Priority Feature 2*	Mesic Hardwood Forest (MHs38)	0.7	This area contains forest in fair condition. Native plants exist in the tree canopy, shrub, and groundcover layers. Non-native shrubs persist.	C	Toward a B quality mesic hardwood forest with reduced cover of non-native/invasive species and increased cover of native forbs, shrubs, and trees. Target communities to consider = MHs38 or MHs39 depending on adaptive management outcomes.
	Oak Woodland (FDs37)	1.2	This area contains forest in fair condition. Native plants exist in the tree canopy, shrub, and groundcover layers. Non-native shrubs persist.	C	
	Driveway Remnant	0.2	This area consists of native and non-native plants growing through remnant cracks in asphalt and gravel from the former home site driveway.	NA	

MANAGEMENT UNIT	CURRENT PLANT COMMUNITIES	ACRES (rounded to nearest tenth)	CURRENT CONDITION DESCRIPTION	CURRENT GRADE*	DESIRED FUTURE CONDITION
MU 3: Oak Woodland Priority Feature 2	Mesic Hardwood Forest (MHs38)	1.5	This native plant community is in good to fair condition. Native plants exist in the tree canopy, shrub, and groundcover layers. Non-native shrubs persist.	B/C	Toward a B quality mesic grassland or savanna community. Target communities to consider = FDs37, FDs27, or MHs38 depending on adaptive management outcomes.
	Oak Woodland (FDs37)	3.7	This native plant community is dominated by non-native and invasive species in the shrub and canopy layers. The ground layer and tree canopy contain some native plants.	C	
	Oak Woodland (FDs37)	1.8 (main island)	This plant community has recently undergone extensive invasive species management. Native species dominate the herbaceous and tree canopy layers.	C	
	Oak Woodland (FDs37)	0.3 (island outside of easement)	This plant community has recently undergone extensive invasive species management. Native species dominate the herbaceous and tree canopy layers.	C	
	Tennis Court Remnant	0.3	This community consists of bare soil, non-native shrubs, and native pioneer tree species around the perimeter. Soil is heavily altered due to construction of a tennis court.	D	
MU 4: Wetland Complex *Priority Feature 3*	Wet Prairie	0.3	This community consists of native and non-native herbaceous vegetation and downed woody debris.	C	Erosion is managed. Toward a B quality wetland/prairie complex. Target communities to consider = UPs23, WPs54b, and WMn82. Work with neighbors, MN DNR, BWSR, watershed district, and USACE to consider larger hydrologic and vegetative restoration.
	Buffer	2.8	This community consists of non-native and invasive cool season grasses and small areas of higher native sedge diversity. There are native and non-native shrubs and trees present.	D	

MANAGEMENT UNIT	CURRENT PLANT COMMUNITIES	ACRES (rounded to nearest tenth)	CURRENT CONDITION DESCRIPTION	CURRENT GRADE*	DESIRED FUTURE CONDITION
MU 4: Wetland Complex *Priority Feature 3*	Freshwater emergent wetland	8.2	This community is dominated by non-native and invasive grass species. Waterfowl do utilize the area.	D	Toward increasing pockets of native diversity along the wetland edge. Target communities to consider = MRn83 or WMn82. Work with neighbors, MN DNR, BWSR, watershed district, and USACE to consider larger vegetative restoration.
MU 5: Prairie *Priority Feature 4*	Restored Prairie	0.4	This community consists of native understory and savanna species, non-native cool season grasses and non-native invasive shrubs.	C	Toward a B quality dry/mesic prairie. Target communities to consider = UPs13 or UPs23, depending on soil moisture conditions.
MU 6: Vernal Pool *Priority Feature 2*	Vernal Pool	0.03	This area consists of native sedges and non-native grasses and shrubs. Native shrubs and trees surround the border of the seasonal high water mark.	C	Toward a vernal pool that provides diverse habitat options for flora and fauna. Target communities to consider = MHs49

*Community grading criteria is more specifically outlined in Appendix G.

MANAGEMENT UNIT 1: OAK SAVANNA

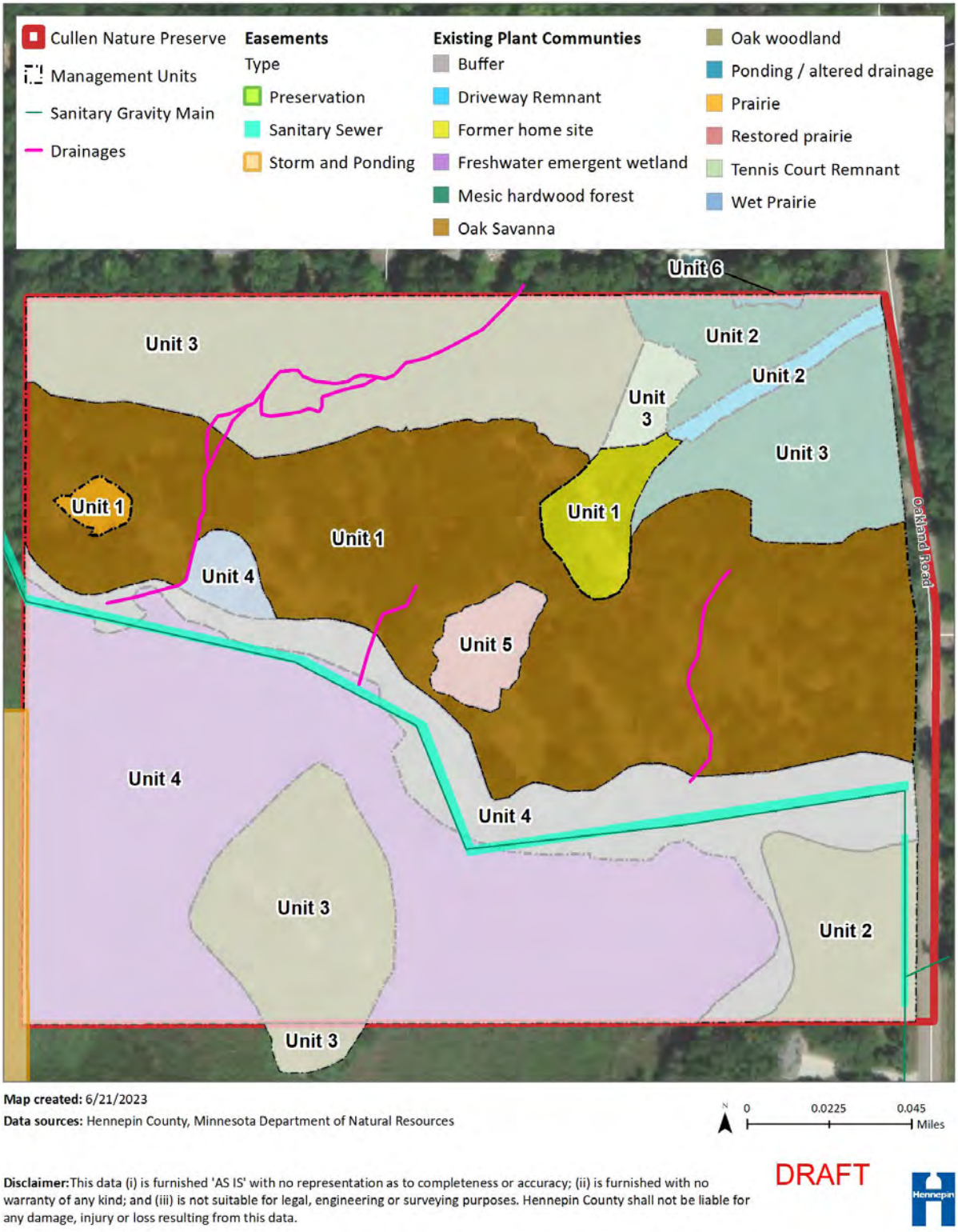


Figure 6: MU1 Existing plant communities

Management Unit 1 (MU1) consists of one plant community in various stages of restoration. This unit is located along the south facing slope and extends from the eastern property edge to the western property edge. The oak savanna comprises 31% of the total site with the oak woodland and wetland buffer forming its north and south boundaries. Previously, this area was trending toward oak forest and several understory forest species were established in the area. Currently, this area is undergoing active restoration to oak savanna. The canopy is nearly entirely mature oak trees. There are pockets of problematic invasive species established in this unit, including a large patch of black locust that has been undergoing active management with very limited success, buckthorn resprouts, and isolated pockets of reed canary grass. The MU contains two oak openings, or areas where oak canopy cover is not present, one atop the western knoll and another where the home once stood.

COMMON AND NOTABLE PLANT SPECIES OBSERVED IN MU1:

TREES	SHRUBS	HERBACEOUS PLANTS
• *Bur Oak* • *White Oak* • *Red Oak* • *Ironwood*	• ***Common buckthorn*** • *Quaking Aspen*	• ***Canada thistle*** • ***Reed canary grass*** • *Nodding trillium* • *Jack in the Pulpit* • *Early Meadow Rue* • *Canada goldenrod* • ***Mullein*** • *Common milkweed* • *Poke milkweed* • *Common woodland sedge* • *Eastern star sedge*

BOLDED: Non-native and/or non-native species

MANAGEMENT OBJECTIVES AND GOALS

OBJECTIVE 1: Remove and manage non-native, noxious weeds, and aggressive plant species.

Primary Goals:

- Reduce cover of non-native woody species through mechanical and chemical removal methods.
- Reduce cover of herbaceous non-native species and noxious weeds through mechanical and chemical removal methods.
- Reintroduce and mimic natural disturbances to control non-native species and noxious weeds.

OBJECTIVE 2: Enhance habitat through native planting and seeding and adaptive management.

Primary Goals:

- Increase native vegetation cover, diversity, and habitat structure.
- Increase habitat suitability of savanna and oak opening areas for Species of Greatest Conservation Need (SGCN) and other wildlife such as Short-eared owl, Gopher Snake, Eastern Hog-nosed Snake, Rusty-Patch Bumblebee, and American Bumblebee.

DESIRED FUTURE CONDITION

A reasonable trajectory for the communities in MU1 is a B quality oak savanna plant community with reduced cover of non-native species and increased cover of native trees, grasses, and savanna

understory species. Target communities to consider include Southern Dry Savanna (UPs14) or Southern Mesic Savanna (UPs24) depending on soil type, soil moisture, aspect, and hydrology. Drier areas with more open canopy cover could be considered as Southern Dry Prairie (UPs13) pockets or oak openings depending on management outcomes and climate trajectories.

Additionally, steps should be taken to establish deep-rooted grass and forb cover near drainageways through the MU to mitigate erosion impacts resulting from stormwater runoff. Non-vegetative interventions such as check dams could also be used to slow water flow. This is especially pertinent to the westernmost drainage way as this area has the most significant erosion. The City of Minnetonka prepared a Stream and Stabilization Assessment in 2021 (see Attachment), which should be referenced in conjunction with this management plan for additional erosion control strategies.

Finally, planting design should consider remnant soil impacts from the home site including existing soil compaction and buried house remnants. Large tree plantings atop the footprint of the house should be avoided as the chance for unearthing construction materials is high, but smaller plantings and seeding to help recover the area is okay. Establishment of understory grasses and forbs is desired in this area. Oak trees can be planted surrounding the building footprint to increase canopy cover.

General guidelines for desired vegetation composition include:

- Patchy to continuous ground cover (25-100%) of plants such as little bluestem, porcupine grass, side oats grama, Pennsylvania sedge, big bluestem, Indian grass, golden alexanders, health aster, prairie clovers, smooth blue aster, rough blazing star, Virginia ground cherry, gray goldenrod, white sage, hoary frostweed, and starry false Solomon's seal.
- Sparse to patchy shrub layer (5-50%) of plants such as leadplant, prairie rose, chokecherry, and American hazelnut.
- Scattered canopy cover (approximately 10%) of predominantly bur oak, with minimal white or northern pin oak. Individual or small clumps of trees scattered throughout.

Image 4: Animal den in Oak Savanna (Photo: Leah Weston; FMR)

MANAGEMENT ACTIONS

The following section summarizes the various actions that will support the Management Objectives for Management Unit 1. The table below identifies the likely trajectory of the habitats and the effort associated with various actions. The paragraphs below provide a text summary, and more detail of what activities will help support the Easement Values and Priority Features.

Table 3: Management Unit 1 Potential Management Actions.

Bolded items are considered priority and addressed in further detail in Table 11 of the Recommended Actions section

MANAGEMENT EFFORT	MANAGEMENT ACTIONS	RISKS & LIKELY TRAJECTORY	PROJECTED GRADE
None	No management actions.	Risks include reversion to oak woodland or mesic forest. Condition will decline over time.	C
Low	**Monitor to assess management action and spread of non-native species.**	**No/low risk.** **Condition will be maintained or improve. Issues will be identified before they become more costly. Effectiveness of management actions can be evaluated and inform future actions.**	**C**
Medium	Restore oak regeneration by strategically planting trees or acorns.	Risks include establishing too much canopy cover for savanna target community. Condition will ensure regeneration as existing mature oak trees decline.	B
High	**Remove herbaceous non-native/non-native species using chemical and mechanical management techniques.**	**Risks include impacting existing native species via chemical drift.** **Condition will improve via reduction in non-native plant cover.**	**B/C**
High	**Restore native vegetation following management of non-native species such as seeding savanna mixture and strategically planting oaks.** **Reintroduce prescribed fire.**	**Risks include reinfestation and poor success of restoration efforts.** **Condition likely to improve as native plant cover helps to prevent reinfestation of non-native plants.**	**B**

Continuing to manage non-native and invasive species is the top priority for this unit. Initial clearing of common buckthorn and other woody plants has already begun, and it is critical to continue these efforts and reestablish native ground cover to protect the current investment. If no action is taken, the unit will revert to at best, oak woodland and at worst, an invasive species-dominated forest.

Woody management has already revealed a robust seed bank consisting of remnant savanna species including poke milkweed and typical woodland species such as wild leek. Additional seeding to establish grass cover may be necessary, but efforts to maintain and increase native understory diversity should be undertaken. This includes seeding, planting, and reintroduction of a disturbance regime including prescribed fire.

This unit may benefit from jumpstarting oak regeneration by strategic planting of young oak trees or mass planting oak acorns from nearby sites. Extensive shrub and understory clearing can influence existing oak trees over time. Existing tree canopy should be monitored for decline, and planting efforts should be taken if canopy cover dips below 20%. Leaving downed trees and standing snags (dead

trees) is beneficial to wildlife and is an important part of savanna aging. Standing snags create hollow areas for bird nests, perches that are not interrupted by leaf cover, and hiding places for small animals.

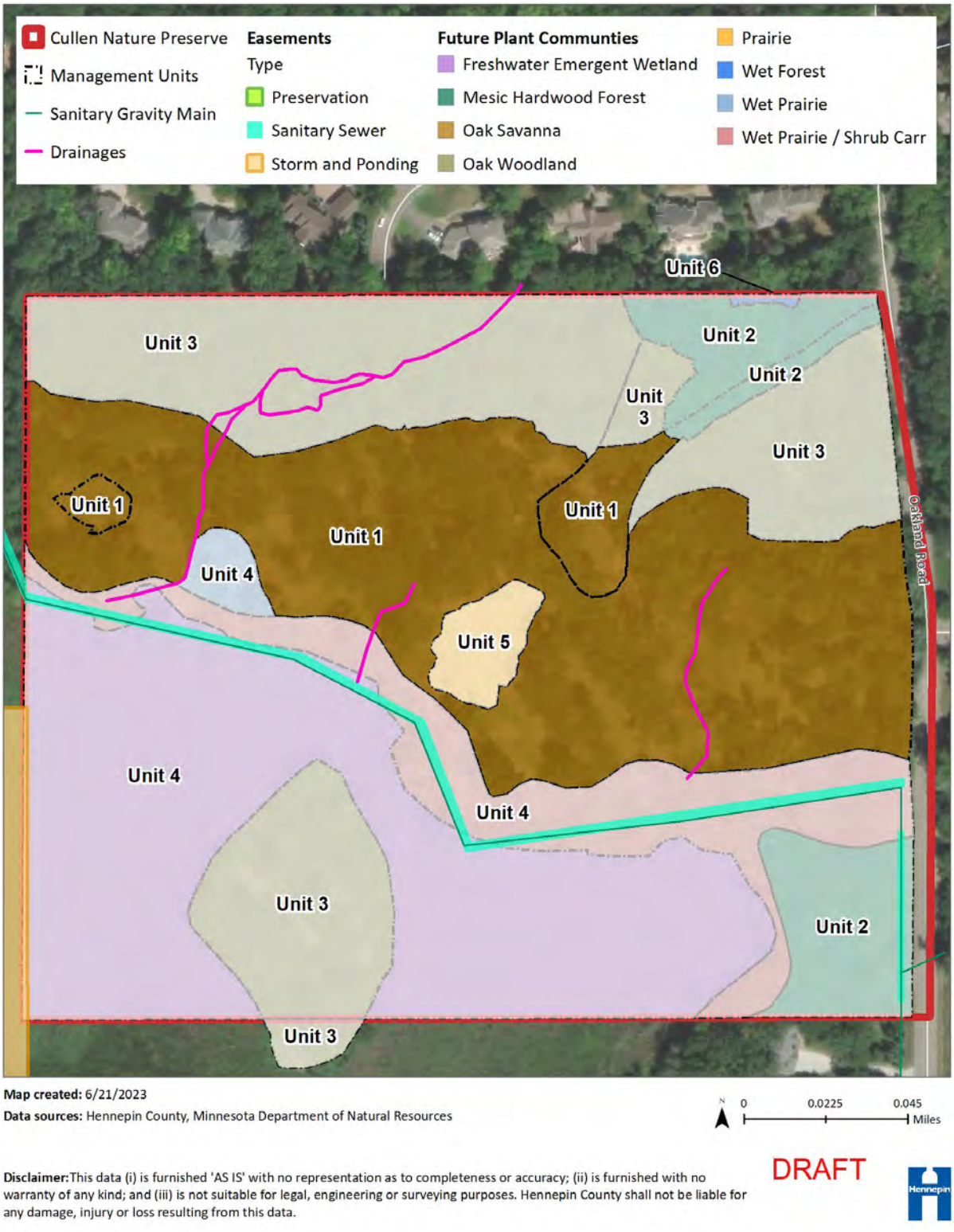


Figure 7: MU1 Future plant communities

MANAGEMENT UNIT 2: MESIC HARDWOOD FOREST

Figure 8: MU2 Existing plant communities

Management Unit 2 (MU2) consists of mesic hardwood forest located in the northeast corner and the southeast corner of the Protected Property. The existing plant communities have mature tree cover, spring ephemerals, and several age classes of woody plants. Although it was likely an oak woodland historically, the current condition is hardwood forest. In the northeast section, there is heavier buckthorn sapling coverage and less diverse ground cover moving from east to west through the unit. Oak wilt and emerald ash borer damage is present throughout the unit. Some portions of the northeast section were historically the driveway to the home site and contain remnants of asphalt and tree species more typical of a residential landscape rather than a mesic hardwood forest. The southeast section exists along a steep knoll. Both sections are directly adjacent to homes where screening is a priority to prevent encroachment and shade views of the Protected Property.

COMMON AND NOTABLE PLANT SPECIES OBSERVED:

TREES	SHRUBS	GROUND COVER (WILDFLOWERS, GRASSES, SEDGES, FERNS, VINES)
• *Basswood* • *Bur oak* • *Black cherry* • *Ironwood* • *Green ash* • *Silver maple* • *Boxelder*	• *Common buckthorn*	• *Wild geranium* • *Jack in the Pulpit* • *Virginia waterleaf* • *Canada mayflower* • *False Solomon's seal* • ***Garlic mustard*** • *Pennsylvania sedge* • *Common wood sedge* • *Violets*

BOLDED: Non-native and/or non-native species

MANAGEMENT OBJECTIVES AND GOALS

OBJECTIVE 1: Remove and manage non-native, noxious weeds, and aggressive plant species.

Primary Goals:

- Reduce cover of non-native woody species through mechanical and chemical removal methods.
- Reduce cover of herbaceous non-native species and noxious weeds through mechanical and chemical removal methods.
- Minimize impacts to existing herbaceous native plant community.

OBJECTIVE 2: Enhance habitat through native planting and seeding and adaptive management.

Primary Goals:

- Increase native vegetation cover, diversity, and habitat structure.
- Increase habitat suitability of forest areas for Species of Greatest Conservation Need (SGCN) and other wildlife such as Rusty-Patch Bumblebee, Yellow-banded Bumblebee, Eastern Red Bat, Red-shouldered hawk, and Brown Thrasher.

DESIRED FUTURE CONDITION

A reasonable trajectory for the communities in MU2 is to work towards a B quality mesic hardwood plant community with reduced cover of non-native/invasive species and increased cover of native trees, shrubs, and woodland understory species. Target communities to consider include several mesic hardwood systems such as Southern Mesic Oak-Basswood Forest (MHs38) or Southern Mesic Maple-Basswood Forest (MHs39).

General guidelines for desired vegetation composition include:

- Patchy to continuous ground cover (25-100%) of plants such as zig-zag goldenrod, large-flowered bellwort, Virginia waterleaf, Clayton's sweet cicely, Virginia creeper, bloodroot, common enchanter's nightshade, early meadow-rue, wild sarsaparilla, Pennsylvania sedge, honewort, yellow violet, wild leek, blue cohosh, cut-leaved toothwort, dutchman's breeches, blue phlox, Virginia spring beauty, white bear sedge, cleavers, wood nettle, tall coneflower.
- Variable shrub cover of species such as chokecherry, gooseberry, basswood, sugar maple, hackberry, ironwood, elms, and bitternut hickory.
- Interrupted to continuous canopy cover of species such as basswood, sugar maple, bur oak, white oak, American elm, hackberry, black walnut, black cherry, and bitternut hickory.

Image 5: Mesic Hardwood Forest community in early Summer (Photo: Leah Weston; FMR)

MANAGEMENT ACTIONS

The following section summarizes the various actions that will support the Management Objectives for Management Unit 2. The table below identifies the likely trajectory of the habitats and the effort associated with various actions. The paragraphs below provide a text summary, and more detail of which activities will help support the Easement Values and Priority Features.

Table 4: Management Unit 2 Potential Management Actions.

Bolded items are considered priority and addressed in further detail in Table 11 of the Recommended Actions section.

MANAGEMENT EFFORT	MANAGEMENT ACTIONS	RISKS & LIKELY TRAJECTORY	PROJECTED GRADE
None	No management actions.	Non-native vegetation may spread and become denser, making future removal more difficult and further suppress native vegetation. Non-native vegetation will encroach on other areas of the Protected Property. Condition will remain the same or worsen.	C
Low	**Monitor to assess management action.**	**No/low risk.** **Condition will be maintained or improve. Issues will be identified before they become more costly. Effectiveness of management actions can be evaluated and inform future actions.**	**C**
Medium	Removal of non-native herbaceous species through mechanical and chemical means.	Risks include unintentional targeting of native species with chemical overspray. Condition will improve via reduction of non-native plant cover	B
Medium	**Planting native shrubs**	**Risks include soil disturbance, potential loss of investment if shrubs are lost due to browse or drought, and accidental invasive species reintroduction** **Condition will improve early season nectar availability for pollinators and forest structure and screening**	**B**
High	**Removal of non-native and invasive woody species through mechanical and chemical means.**	**Risks include unintentional targeting of native species with chemical overspray and damage via mechanical removal.** **Condition will improve via reduction of non-native plant cover**	**B**
High	Removal of existing asphalt.	Risks include unintentional root damage to adjacent large trees. Condition will improve soil health, increase infiltration, allow for introduction of native species and reduce human disturbance by shrinking the laydown area.	B

Restoration of Management Unit 2 will require woody non-native vegetation management followed by herbaceous non-native vegetation management. Common buckthorn is pervasive within MU2 and is a priority to manage to preserve the native woodland diversity present within the unit. Cutting and treating stumps with herbicide is the best way to minimize chemical drift and avoid unnecessary impacts to the existing native plant community. After initial clearing of buckthorn, garlic mustard may

increase in abundance. Given its current level of establishment, mechanical removal by hand-pulling or mowing second-year garlic mustard plants is recommended. If populations grow in size to mass monocultures, chemical removal may be considered.

Concurrently with common buckthorn removal, removal of asphalt along the historical driveway should be considered. This large disturbance may result in the need for reforestation or planting efforts after removal, so timing is critical. Care should be taken to preserve existing large trees along the driveway. If full removal is not possible, partial removal in addition to strategic planting to mask remaining asphalt is an option. Species tolerant of soil compaction such as nodding wild onion, ostrich fern, bee balm, little bluestem, bush honeysuckle, and New England aster should be considered.

After initial management of non-native and invasive species, reestablishment of a native shrub layer is recommended. Mass planting of bare root shrubs within the understory will provide diversity and forest structure while ensuring some survival in light of anticipated deer browse. Increased density of planting should be prioritized in areas adjacent to residential properties to create a visual screen.

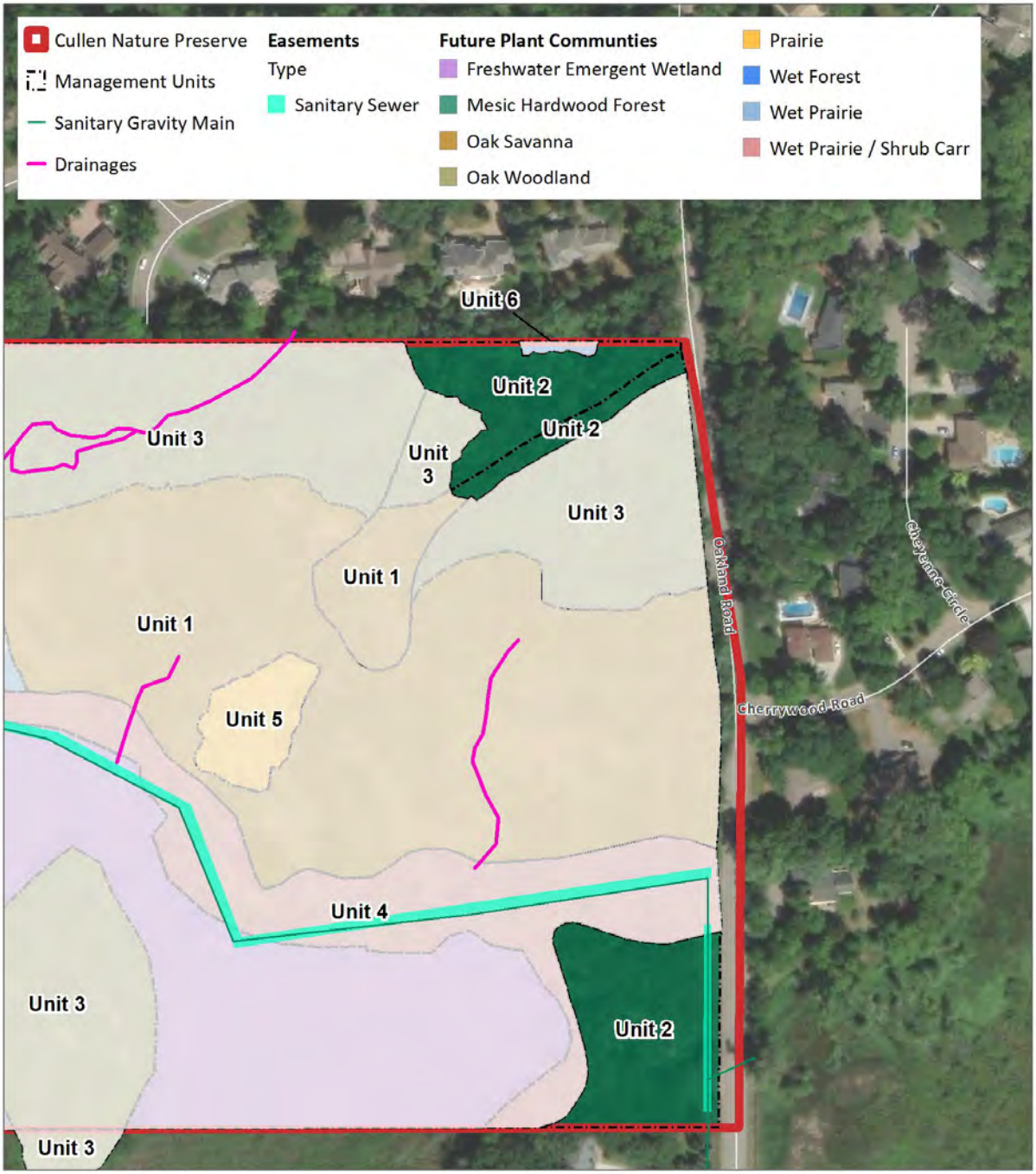


Figure 9: MU2 Future plant communities

MANAGEMENT UNIT 3: OAK WOODLAND

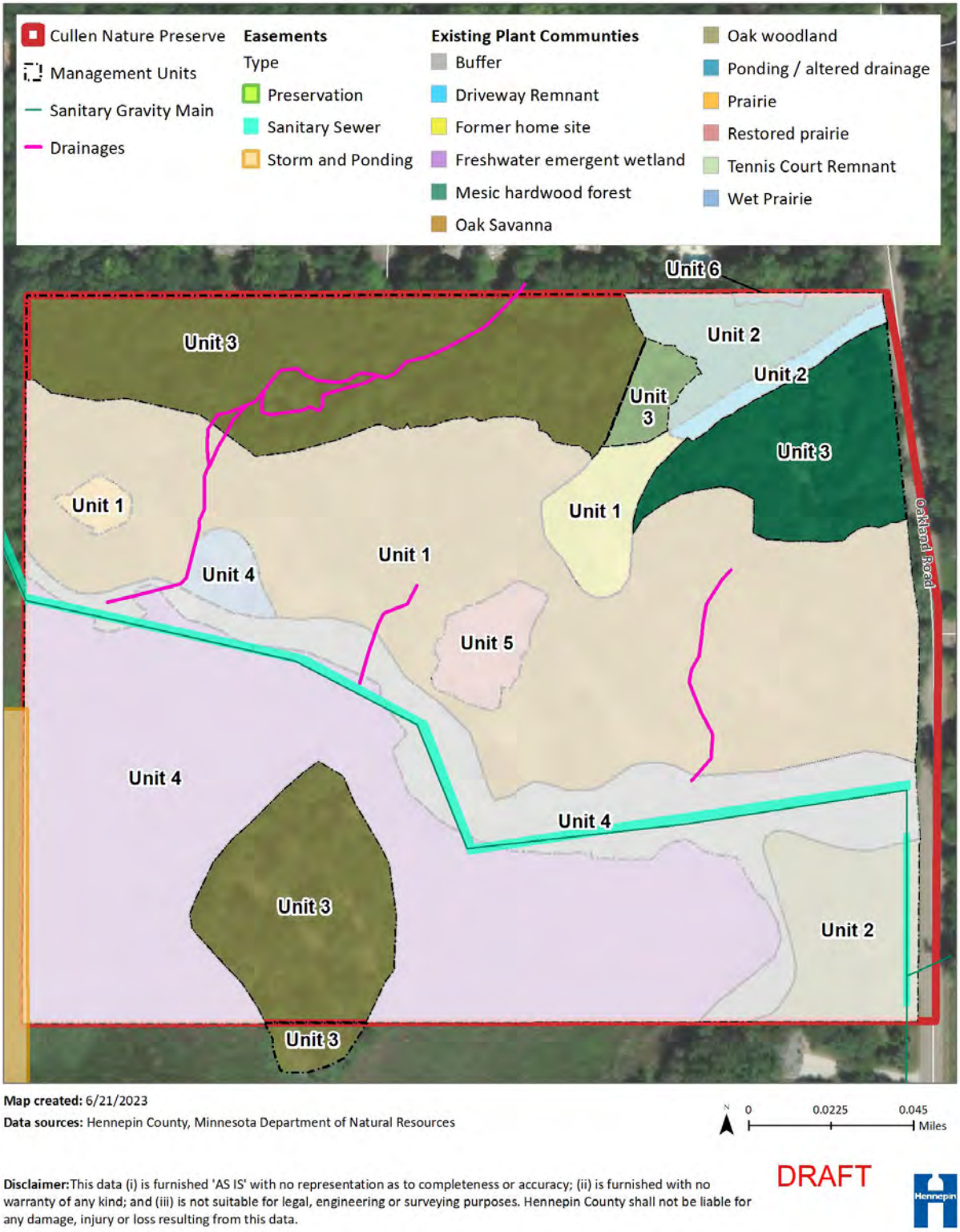


Figure 10: MU3 Existing plant community

Management Unit 3 (MU3) consists of areas that are currently oak woodland, mesic hardwood forest, and a degraded tennis court. The unit is located predominantly along the north and east property boundaries, with a small section located in the south on the upland island within the southern wetland. Each area exists in a slightly different current state. In the north, the unit is currently an oak woodland overrun by common buckthorn. The impact of common buckthorn paired with the presence of invasive earthworms, which rapidly breakdown leaf litter on the soil surface, contribute to the lack of native diversity in the understory and shrub layer. Additionally, significant erosion due to exposed soil exists along drainageways throughout the unit. Green ash trees in the canopy are affected by EAB, and red oak trees are suffering from oak wilt. The eastern area south of the driveway is similarly affected by buckthorn but maintains more diversity than the north section with bur oak and white oak as the dominant tree species. This forested area is trending toward mesic hardwood forest based on spring ephemerals and understory species present. However, because of its proximity to the savanna currently undergoing restoration, it makes ecological and practical sense to open this up to cover typical of oak woodland. On the island, the transition to oak woodland has already begun. It was recently forestry mowed, and this practice opened the canopy and reduced woody invasive species cover.

Image 6: Common buckthorn management within Oak Woodland (Photo: Leah Weston; FMR)

COMMON AND NOTABLE PLANT SPECIES OBSERVED:

TREES	SHRUBS	GROUND COVER (WILDFLOWERS, GRASSES, SEDGES, FERNS, VINES)
• *Boxelder* • *Green ash* • *Ironwood* • *Black cherry* • *White Oak* • *Bur Oak* • *Red Oak* *Basswood* • *American elm* • *Sugar maple*	• ***Common buckthorn*** • ***Black locust***	• ***Garlic mustard*** • *Wild geranium* • *False Solomon's seal* • *Virginia waterleaf* • *Pennsylvania sedge* • *Fragrant bedstraw* • *Virginia stickseed* • *Jack in the pulpit* • ***Burdock*** • ***Canada thistle*** • *Wood sorrel*

BOLDED: Non-native and/or non-native species

MANAGEMENT OBJECTIVES

OBJECTIVE 1: Remove and manage non-native, noxious weeds, and aggressive plant species.

Primary Goals:

- Reduce cover of non-native woody species through mechanical and chemical removal methods.
- Reduce cover of herbaceous non-native species and noxious weeds through mechanical and chemical removal methods.
- Minimize impacts to existing herbaceous native plant community.

OBJECTIVE 2: Enhance habitat through native planting and seeding and adaptive management.

Primary Goals:

- Increase native vegetation cover, diversity, and habitat structure.
- Introduce and/or mimic natural disturbances (e.g., prescribed burns)
- Increase habitat suitability of forest areas for Species of Greatest Conservation Need (SGCN) and other wildlife such as Eastern Hog-nosed Snake, Rusty-Patch Bumblebee, Yellow-banded Bumblebee, and Red-shouldered hawk.

DESIRED FUTURE CONDITION

The desired future condition for Management Unit 3 is toward an oak woodland community of B quality with reduced non-native and invasive coverage. Potential community trajectories include Southern Dry-Mesic Oak (Maple) Woodland (FDs37), Southern Dry-Mesic Pine-Oak woodland (FDs27), and/or Southern Mesic Oak-Basswood Forest (MHs38) if unable to utilize prescribed fire.

Although portions of this unit are trending toward mesic hardwood forest, it makes ecological and practical sense for this area to be maintained as an oak woodland. Oak woodland acts as a transitional community between oak savanna to the south and mesic hardwood forest, typically located on north facing slopes. Prescribed fire is an important management tool in oak savanna, and the adjacency of this unit to oak savanna will allow prescribed fire to creep in along the woodland floor if adequate fuels are present. The addition of this habitat type allows for increased community diversity at the Protected Property.

General guidelines for desired vegetation composition include:

- Patchy to continuous ground cover (25 – 100%) of forbs and sedges including pointed=leaved tick trefoil, clayton's sweet cicely, hog peanut, northern bedstraw, white snakeroot, Canada mayflower, wild geranium, Pennsylvania sedge, Dewey's sedge, and starry sedge.
- Patchy to continuous shrub cover (25-100%) of black cherry, red maple, chokecherry, American hazelnut, gray dogwood, prickly ash, and Virginia creeper.
- Interrupted to continuous canopy cover (50-100%) of bur oak, northern pin oak, northern red oak, white oak, red maple, black cherry, quaking aspen, basswood, and white pine.

MANAGEMENT ACTIONS

The following section summarizes the various actions that will support the Management Objectives for Management Unit 3. The table below identifies the likely trajectory of the habitats and the effort associated with various actions. The paragraphs below provide a text summary, and more detail of what activities will help support the Easement Values and Priority Features.

Image 7: Erosion along drainageway cutting through Oak Woodland (Photo: Leah Weston; FMR)

Table 5: Management Unit 3 Potential Management Actions.

Bolded items are considered priority and addressed in further detail in Table 11 of the Recommended Actions section.

MANAGEMENT EFFORT	MANAGEMENT ACTIONS	RISKS & LIKELY TRAJECTORY	PROJECTED GRADE
None	No management actions.	Non-native vegetation may spread and become denser, making future removal more difficult. Non-native vegetation will encroach on other areas of the Protected Property. Condition will remain the same or worsen.	C
Low	**Monitor to assess management action.**	**No/low risk.** **Condition will be maintained or improve. Issues will be identified before they become more costly. Effectiveness of management actions can be evaluated and inform future actions.**	**C**
Medium	**Planting native shrub buffer along northern property boundary**	**Risks include shrub failure if invasive species are not managed prior to planting or if new plantings are not maintained.** **Condition will improve via reduced encroachment and establishment of native shrub layer.**	**C**
High	Mechanical removal of native trees to thin tree canopy.	Risks include over thinning and alteration of woodland structural diversity. Condition will improve via increased light availability to the soil surface, allowing native grasses and forbs to flourish.	B
High	**Stabilize soils along drainageways by establishing deep-rooted native plants**	**Risks include failure of establishment and seed wash out.** **Condition will improve via establishment of deep roots which hold onto soil and are resistant to future erosion.**	**B**
High	**Use chemical treatments to reduce non-native plans and noxious weeds.** **Reintroduce disturbances through prescribed burns.** **Native plant seeding and planting.**	**Risks include unintentional targeting of native species.** **Condition will improve via establishment of native plant dominance.**	**B**

Restoration of Management Unit 3 will require woody non-native vegetation management followed by herbaceous non-native vegetation management. Common buckthorn is pervasive within MU3 and is a priority to manage given the diversity of native woodland understory biodiversity present within the

unit. Cutting and treating stumps with herbicide is the best way to minimize chemical drift and avoid unnecessary impacts to the existing native plant community. If future funding precludes the use of contracted labor for cutting and treating buckthorn, the Friends of Cullen may consider "critical period cutting" of buckthorn whereby the canopy of larger buckthorn is removed followed by 3-4 successive removals of resprouts from the high-stumped trunk. This method of progressive exhaustion of stored resources kills the plant over the course of 2-3 growing seasons. After initial clearing of buckthorn, garlic mustard may increase in abundance. Given its current level of establishment, mechanical removal of garlic mustard plants is recommended. If populations grow to mass monocultures, chemical removal may be considered.

After initial management of non-native and invasive species, re-establishment of a native understory and shrub layer is recommended. The understory should be seeded with a shade-tolerant diverse mix of native grasses and forbs that can provide pollinator resources and allow the unit to carry prescribed fire. Specifically, fast-growing native species such as switchgrass, Virginia wild rye, fowl bluegrass, and fowl manna grass should be planted along the drainageways to help minimize erosion. Mass planting of bare root shrubs within the understory will provide diversity and forest structure while ensuring some survival in light of anticipated deer browse. Increased density of shrub planting should be prioritized in areas adjacent to residential properties to create a visual screen and discourage encroachment.

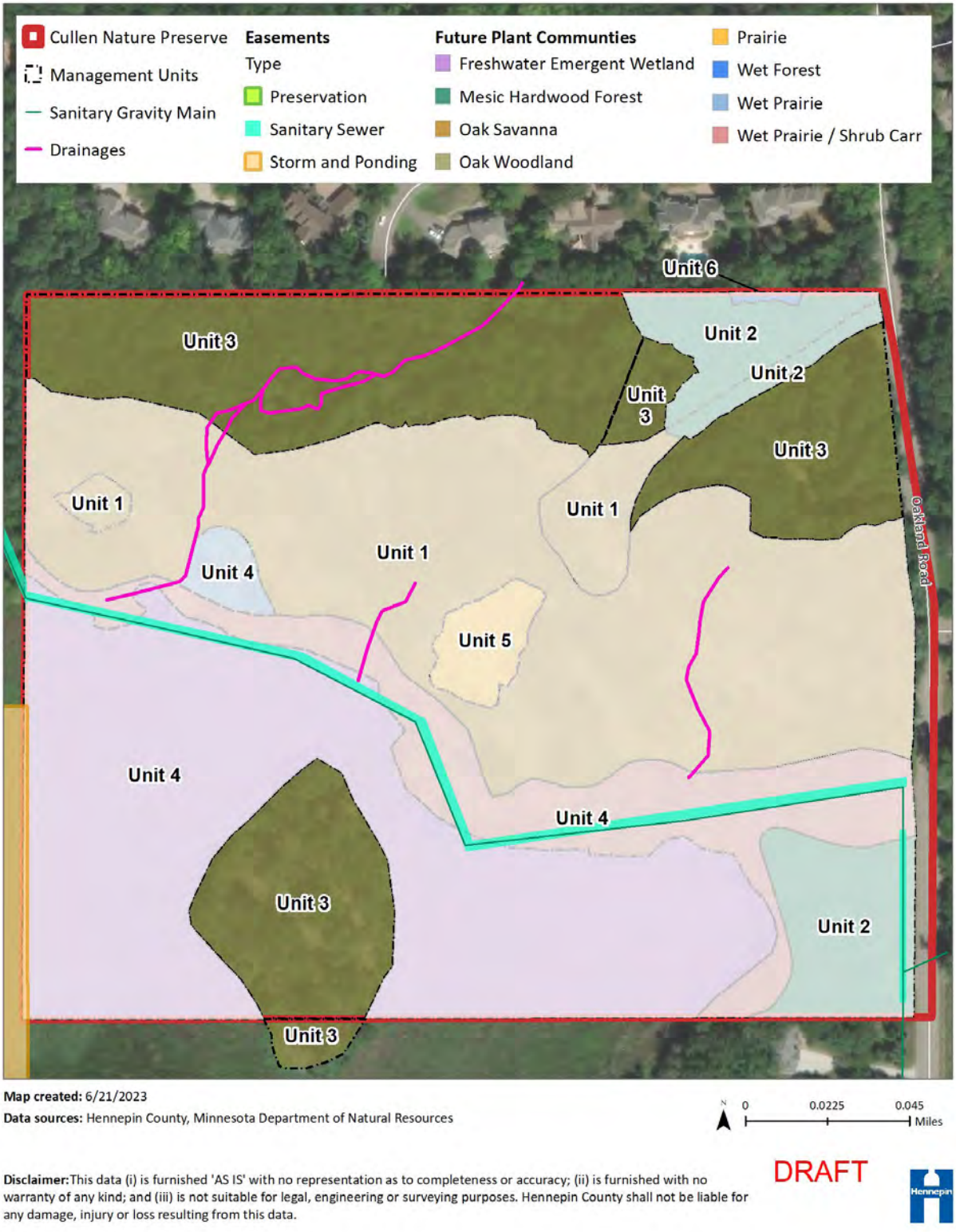


Figure 11: MU3 Future plant community

MANAGEMENT UNIT 4: WETLAND COMPLEX

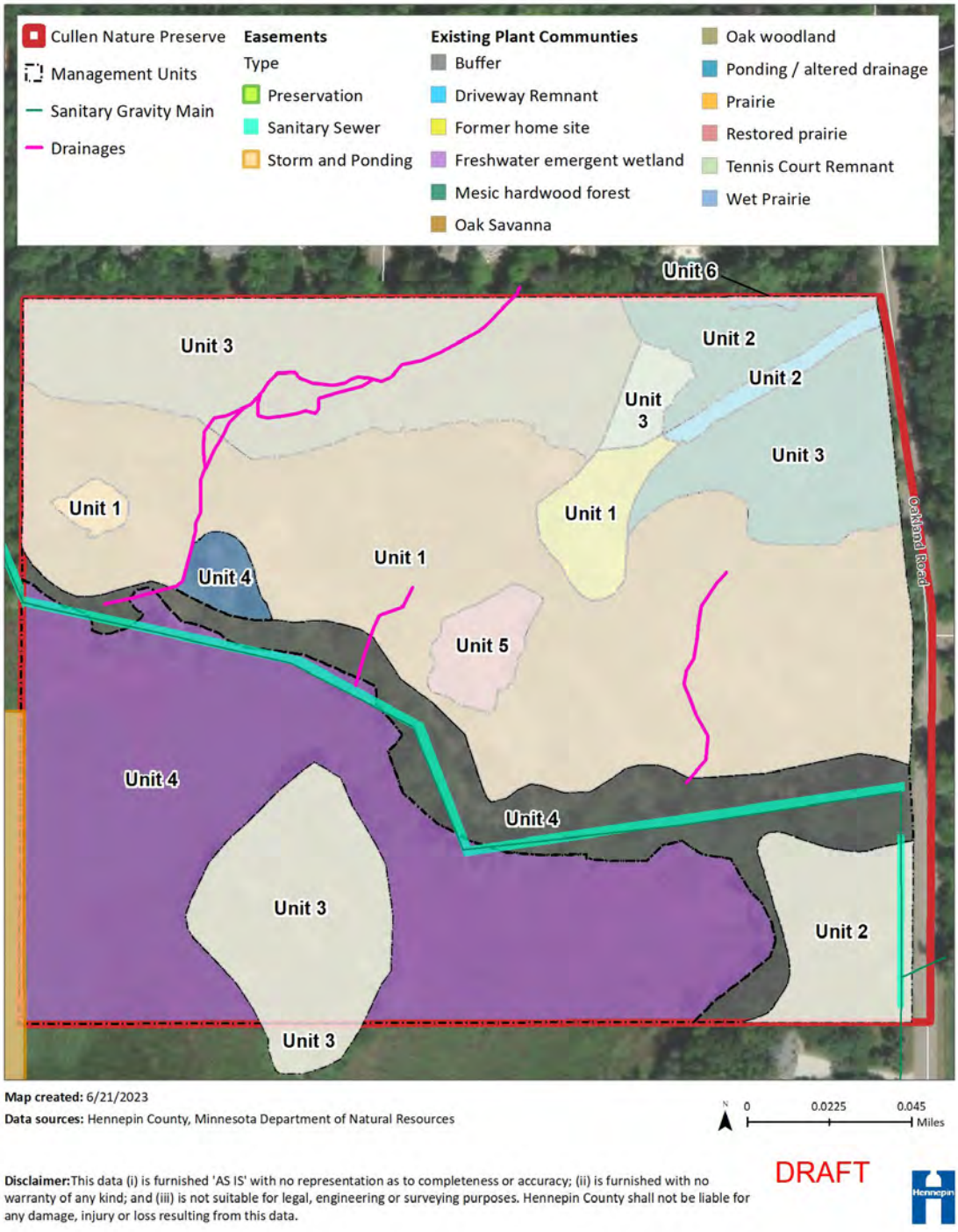


Figure 12: MU4 Existing plant communities

Management Unit 4 (MU4) contains three plant communities, which include wet/mesic prairie, degraded mesic buffer, and freshwater emergent wetland. The unit is in the southern third of the Protected Property, and the wetland continues outside of property boundaries and into City of Minnetonka-owned property. A sanitary and storm sewer line and associated utility easement runs west to east through the degraded mesic buffer. Presently, the unit is dominated by non-native and invasive species including garlic mustard, reed canary grass, narrow-leaved cattail, and phragmites. Recent tree clearing within the buffer and wet/mesic prairie have created large areas without ground cover that are susceptible to erosion. There are pockets along the wetland edge that have maintained native sedge diversity.

COMMON AND NOTABLE PLANT SPECIES OBSERVED:

TREES	SHRUBS	GROUND COVER (WILDFLOWERS, GRASSES, SEDGES, FERNS, VINES)
• *Cottonwood* • *Green ash* • *Hackberry* • *Trembling aspen* • *Willow*	• ***Common buckthorn***	• *Marsh marigold* • *Rosy sedge* • *Awl-fruited sedge* • ***Reed canary grass*** • ***American common reed*** • ***European common reed*** • ***Narrow leaved cattail*** • ***Hybrid cattail*** • *Figwort* • *Nodding trillium* • ***Garlic mustard***

BOLDED: Non-native and/or non-native species

Image 8: Wetland complex in spring (Photo: Leah Weston; FMR)

MANAGEMENT OBJECTIVES

OBJECTIVE 1: Restore wet/mesic prairie within the grassland complex

Primary Goals:

- Reduce non-native plants, noxious weeds, and aggressive species such as reed canary grass, Canada thistle, burdock, and garlic mustard.
- Increase native vegetation cover and diversity.
- Improve soil health and ecological function, minimizing erosion in the process.
- Introduce and/or mimic natural disturbances (e.g., prescribed burns).
- Improve habitat structure and suitability for wildlife and SGCN such as Loggerhead Shrike, Northern Harrier, and Sedge Wren.

OBJECTIVE 2: Reduce and manage non-native, noxious weeds, and aggressive plant species along the wetland edge.

Primary Goals:

- Reduce cover of herbaceous non-native species and noxious weeds through mechanical and chemical removal methods, particularly prioritizing areas adjacent to native existing native plant diversity.
- Minimize impacts to existing herbaceous native plant community.

OBJECTIVE 3: Enhance habitat through native planting, seeding and adaptive management along the wetland edge.

Primary Goals:

- Increase native vegetation cover, diversity, and habitat structure.
- Introduce and/or mimic natural disturbances (e.g., prescribed burns)
- Increase habitat suitability of forest areas for Species of Greatest Conservation Need (SGCN) and other wildlife such as Blanding's Turtle, Loggerhead Shrike, Northern Harrier, Virginia Rail, and Least Bittern.

DESIRED FUTURE CONDITION

A reasonable trajectory for the majority of Management Unit 4 is toward a restored mesic/wet prairie or shrub/carr system with higher native plant diversity. While the current level of wetland invasive species present poses a challenge for restoration and management, potential community trajectories include Southern Mesic Prairie (UPs23), Southern Wet Prairie (WPs54b), and/or Northern Wet Meadow/Carr (WMn82).

General guidelines for desired vegetation composition include:

- Continuous ground cover of grasses, sedges, and forbs such as prairie cordgrass, big bluestem, Indian grass, switch grass, blue joint, lake sedge, slough sedge, woolgrass, bristly sedge, woolly sedge, swamp milkweed, Nuttall's sunflower, giant goldenrod, tall meadow-rue, eastern panicled aster, great blazing star, clasping dogbane, Virginia mountain mint, and golden alexanders.
- Sparse cover of shrubs such as pussy willow, slender willow, and red-osier dogwood.

A reasonable trajectory for the emergent wetland is toward Northern Wet Meadow/Carr (WMn82), and/or Northern Mixed Cattail Marsh (MRn83).

General guidelines for desired vegetation composition include:

- Continuous ground and emergent cover of grasses and forbs such as soft stem bulrush, rice cut grass, broad-leaved arrowhead, water smartweed, bur reeds, bluejoint grass, lake sedge, beaked sedge, tufted loosestrife, great water dock, northern bugleweed, northern marsh fern, downy willow herb, prairie cord grass, big bluestem, switchgrass, wooly sedge, and Virginia mountain mint.
- Sparse cover of shrubs such as pussy willow, slender willow, and red-osier dogwood.

MANAGEMENT ACTIONS

The following section summarizes the various actions that will support the Management Objectives for Management Unit 4. The table below identifies the likely trajectory of the habitats and the effort associated with various actions. The paragraphs below provide a text summary, and more detail of what activities will help support the Easement Values and Priority Features.

Table 6: Management Unit 4 Potential Management Actions.

Bolded items are considered priority and addressed in further detail in Table 11 of the Recommended Actions section.

MANAGEMENT EFFORT	MANAGEMENT ACTIONS	RISKS & LIKELY TRAJECTORY	PROJECTED GRADE
None	No management actions.	Non-native vegetation will continue to be dominant within the unit.	D
Moderate	**Remove non-native/non-native herbaceous vegetation through:** • **Herbicide application*** • **Mechanical methods**	**Risks include recolonization and inadvertent spreading.** **Condition will improve via reduction in non-native plant cover.**	**C**
High	**Seed and plant a high diversity of native plants with variable bloom times.**	**Risks include failure to establish.** **Condition will improve increased native plant diversity, improved wildlife habitat, and better resilience to invasion.**	**B/C**
High	Mow / Hay at variable intervals and scales to prevent woody encroachment and create structural diversity. Reintroduce fire through prescribed burns.	No/low risk to condition. Condition will be maintained and improved by removing woody species, encouraging native prairie species, and providing structural habitat diversity.	B

***A water-safe herbicide must be used when working in/near the wetland.**

Restoration of Management Unit 4 will require intensive non-native vegetation management. Reed canary grass and narrow-leaved cattail are the predominant non-native species with MU4 and can be notoriously challenging to manage. Efforts should be prioritized on managing reed canary grass

because most areas with reed canary grass lie within the easement and are within the scope of this habitat management plan. Chemical, mechanical, and biological methods could be used to restore a more diverse native plant community across MU4.

Reed canary grass can be managed by close repeated mowing 3 times a year, chemical control with grass-specific herbicide in the late fall when other native plants are dormant, tiling the root system every 2-3 weeks throughout the growing season, and/or establishing a shaded shrub canopy can be effective at reducing abundance. Scraping of the top 8-12 inches of topsoil (full removal of rhizomes is required) can be effective to eliminate the seedbank and reduce populations more thoroughly.

In conjunction with reed canary grass management, hybrid and/or narrow-leaf cattail and non-native Phragmites should be targeted. These two wetland invasive species have related native counterparts and care should be taken to positively identify them before management is undertaken. Identification and management resources are located in Appendix B.

Additionally, garlic mustard, burdock and Canada thistle are all threats to the restoration of native plant communities within MU4. Garlic mustard should be spot sprayed or hand pulled so as not to disturb adjacent native plants. Burdock can be hand dug or flower heads can be removed before seeding to reduce the population. Canada thistle management should be a combination of mowing/weed whipping to reduce energy stores in the roots and targeted herbicide application in the fall.

After non-native and invasive species reduction, this unit should be seeded with a diverse native seed mix that can handle fluctuating water levels and provides floral abundance throughout the entire growing season. The MN Board of Water and Soil Resource (BWSR) created a native seed mix designed for interim seeding while continuing chemical reed canary grass management. This could be a good option for the site. Additionally, in areas where reed canary grass is a monoculture, shrubs such as pussy willow, slender willow, and red osier dogwood can be planted to introduce shade and structural diversity to those areas. Reed canary grass is less tolerant of shade and over time, shade establishment could be an effective, multipurpose management strategy.

Specific effort should be made to establish robust groundcover at the outlet of the drainage way. This area has experienced erosion over time due to stormwater runoff, sandy soils, and loss of understory vegetation. A simple and low-input practice to slow water is to place downed logs perpendicular to the drainages at locations where water can be diverted across the slope. Wildlife-safe erosion control mat may be needed when establishing native grasses and forbs. These practices may need to be supplemented by more intensive methods such as regrading, installing check dams, and diverting flows

Image 9: Existing erosion along drainageway through wetland complex (Photo: Leah Weston; FMR)

upstream of the slope. The City of Minnetonka prepared a Stream and Stabilization Assessment in 2021 (see Attachment), which should be referenced in conjunction with this management plan for additional erosion control strategies.

Placing logs and rocks inside the wetland edge provides loafing sites for frogs, toads, turtles, and snakes. Adding brush creates habitats for amphibians and invertebrates. Installing a wood duck house or other birdhouses in or around the wetland may be considered if they can be adequately maintained.

The wetland complex extends beyond the Protected Property onto adjacent parcels so any methods to manage narrow-leaved cattails or nonnative phragmites within the wetland would need coordination with neighbors as well as the USACE, MN DNR, MN Board of Water and Soil Resources, and local jurisdictions such as watershed and/or cities. Additionally, any herbicides used in this Management Unit must be approved for use near water.

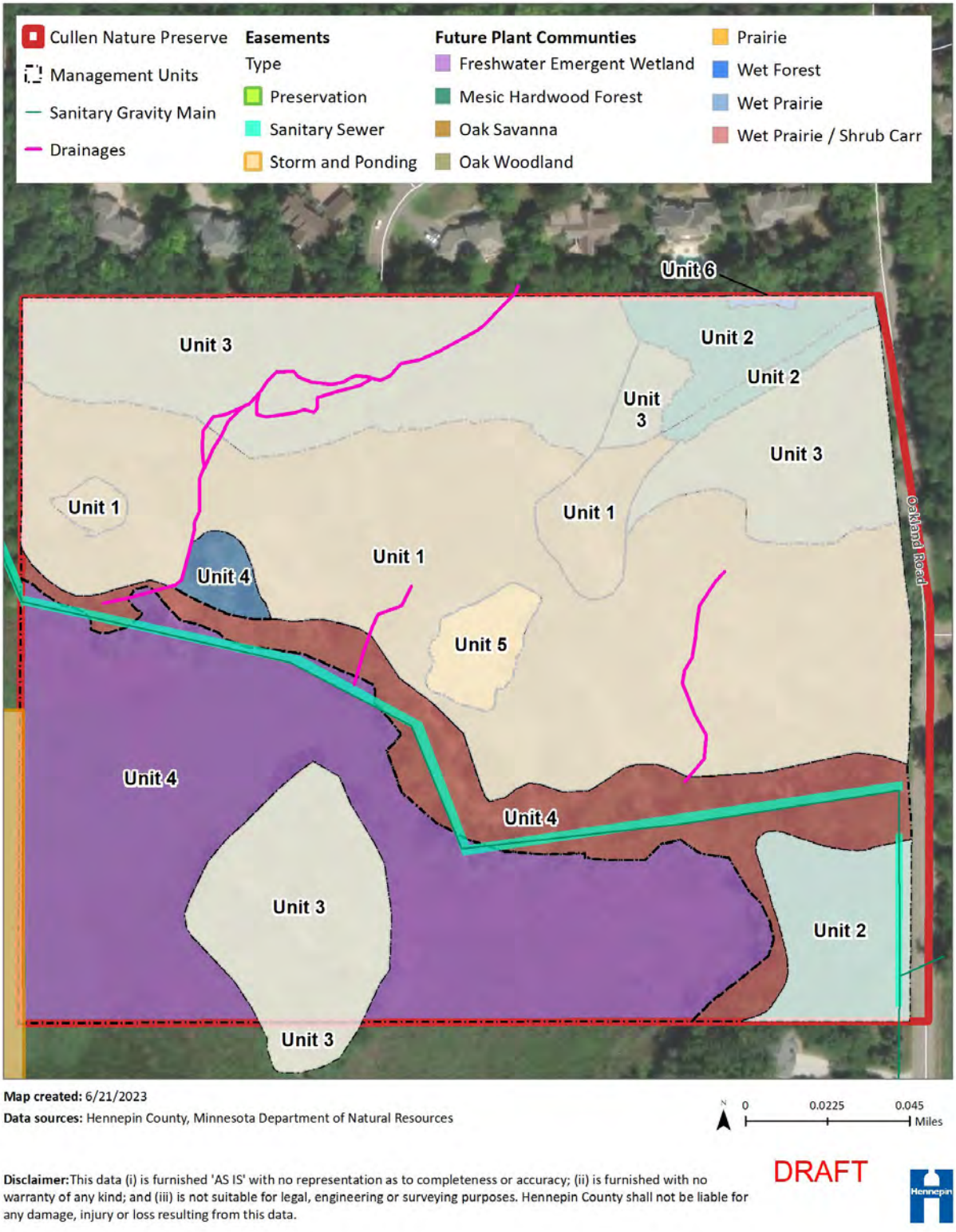


Figure 13: MU4 Future plant communities

MANAGEMENT UNIT 5: PRAIRIE

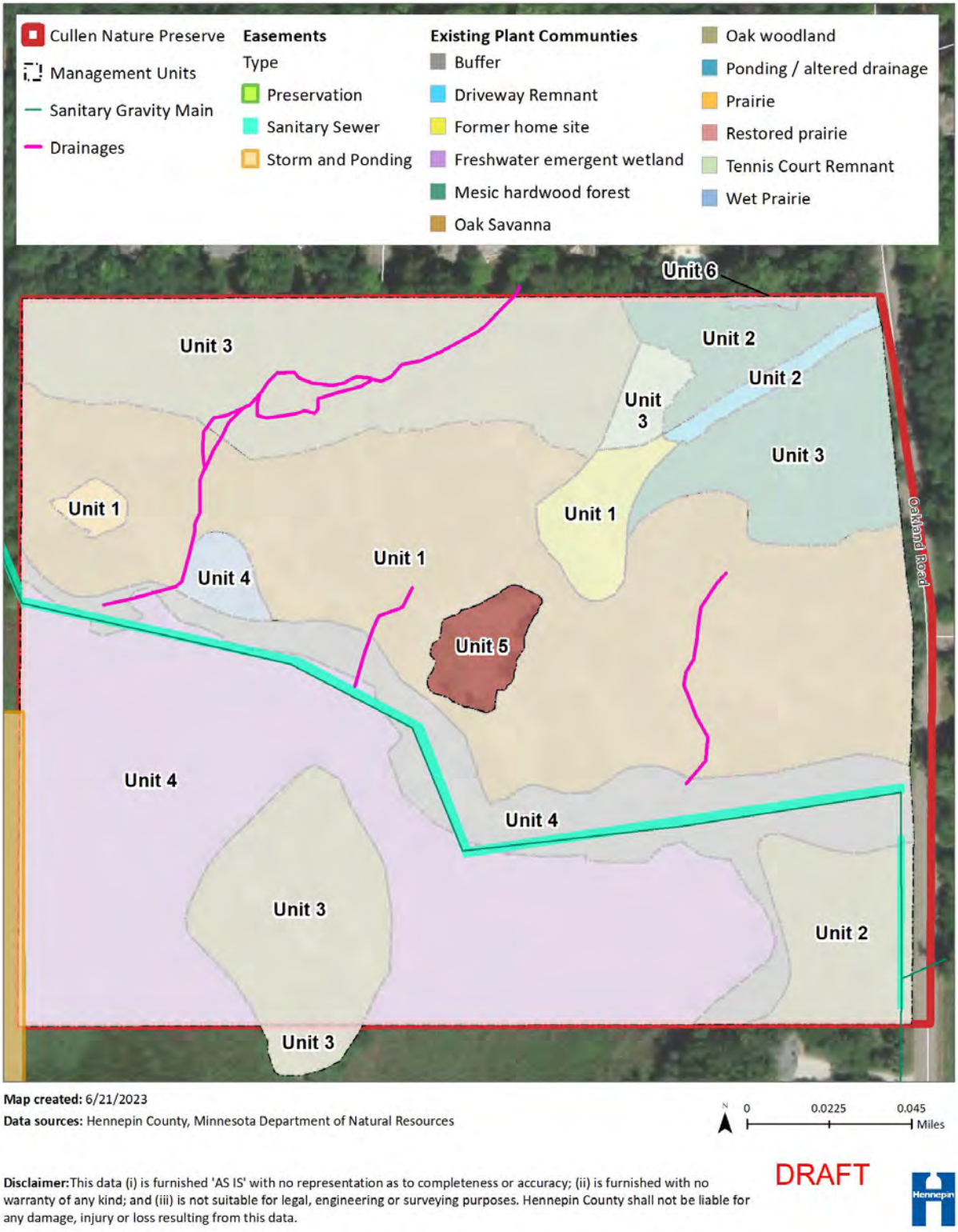


Figure 14: MU5 Existing plant communities

Management Unit 5 (MU5) is situated on a south-facing slope surrounded by oak savanna. This area was previously the garden adjacent to the house and does not contain any mature trees. Approximately half of this unit is steeply sloped, and half exists on a shallower slope. The ground cover is a matrix of remnant woodland/forest understory species and newly released savanna species emerging from the seed bank. Large patches of wood slash mulch are present due to recent tree clearing. There is a large patch of black locust in the northern third of the unit that has been previously chemically treated.

COMMON AND NOTABLE PLANT SPECIES OBSERVED:

TREES	SHRUBS	GROUND COVER (WILDFLOWERS, GRASSES, SEDGES, FERNS, VINES)
	• ***Common buckthorn*** • ***Black locust***	• *Jack in the pulpit* • *Roadside agrimony* • *American hog peanut* • *Common woodland sedge* • *Short-beak sedge* • *Eastern star sedge* • *Field thistle* • ***Quackgrass*** • *False Solomon's seal* • *Bee balm* • ***Reed canary grass*** • ***Kentucky bluegrass*** • *Canada goldenrod* • *Early meadow rue*

BOLDED: Non-native and/or non-native species

Image 10: Prairie along south-facing slope (Photo: Leah Weston; FMR)

MANAGEMENT OBJECTIVES

OBJECTIVE 1: Remove and manage non-native, noxious weeds, and aggressive plant species.

Primary Goals:

- Reduce cover of non-native woody species through mechanical and chemical removal methods.
- Reduce cover of herbaceous non-native species and noxious weeds through mechanical and chemical removal methods.
- Minimize impacts to existing herbaceous native plant community.

OBJECTIVE 2: Enhance habitat through native planting, seeding and adaptive management.

Primary Goals:

- Increase native vegetation cover, diversity, and habitat structure.
- Introduce and/or mimic natural disturbances (e.g., prescribed burns)
- Increase habitat suitability of forest areas for Species of Greatest Conservation Need (SGCN) and other wildlife such as Prairie Vole, Short-eared Owl, Gopher Snake, Smooth Green Snake, Rusty-Patch Bumblebee, American Bumblebee, and Grasshopper Sparrow.

DESIRED FUTURE CONDITION

The desired future condition for Management Unit 5 is toward a prairie community of B quality with reduced non-native and invasive coverage. Potential community trajectories include Southern Dry prairie (UPs13) or Southern Mesic Prairie (UPs23), depending on soil moisture availability.

General guidelines for desired vegetation composition include:

- Patchy to continuous grass cover (50-100%) of grasses including little bluestem, side-oats grama, prairie dropseed, porcupine grass, plains muhly, June grass, hairy grama, big bluestem, and Indian grass.
- Sparse to patchy forb cover (5-50%) including gray goldenrod, silky aster, aromatic aster, dotted blazing star, hairy golden aster, pasqueflower, harebell, false boneset, flowering spurge, narrow-leaved purple coneflower, purple prairie clover, health aster, stiff goldenrod, rough blazing star, stiff sunflower, green milkweed, silky prairie clover, rattlesnake master, and compass plant.
- Sparse shrub cover (<5%) comprised of leadplant, prairie rose, sage wormwood, and smooth sumac.

MANAGEMENT ACTIONS

The following section summarizes the various actions that will support the Management Objectives for Management Unit 5. The table below identifies the likely trajectory of the habitats and the effort associated with various actions. The paragraphs below provide a text summary, and more detail of what activities will help support the Easement Values and Priority Features.

Table 7: Management Unit 5 Potential Management Actions.

Bolded items are considered priority and addressed in further detail in Table 11 of the Recommended Actions section.

MANAGEMENT EFFORT	MANAGEMENT ACTIONS	RISKS & LIKELY TRAJECTORY	PROJECTED GRADE
None	No management actions.	Unit may be re-colonized by non-native vegetation	N/A
Low	**Monitor to assess management action and spread of non-native species.**	**No/low risk.** **Condition will be maintained or improve. Issues will be identified before they become more costly. Effectiveness of management actions can be evaluated and inform future actions.**	**C**
Moderate	**Remove herbaceous and woody non-native/invasive species using chemical and mechanical management techniques.**	**Risks include impacting existing native species via chemical drift.** **Condition will improve via reduction in non-native plant cover.**	**B/C**
Moderate	**Inter-seed with a diverse seed mix including early blooming forbs and short grasses.**	**Risks include failure to establish.** **Condition will improve increased native plant diversity, improved wildlife habitat, and better resilience to invasion.**	**B**
High	**Reintroduce prescribed fire.**	**Risks include exposing soil, leading to higher erosion potential.** **Condition likely to improve as fire disturbance negatively impacts non-native/invasive species and positively impacts native species.**	**B**

Ongoing management will require reduction of non-native and invasive shrubs including common buckthorn and black locust. These populations should be monitored to assess whether management actions are working. As there is a diverse native seed bank, care should be taken to spot-spray or stump-treat individuals with herbicide, rather than broadcast spraying where possible. Additionally, the management of non-native cool season grasses including Kentucky bluegrass and quack grass should take place in the early spring or late fall, when other native species are dormant. Sections can be spot-sprayed with a grass-specific herbicide.

Depending on monitoring data, inter-seeding additional prairie species may be necessary to increase diversity and provide floral resources for pollinators during spring, summer, and fall. Monitoring efforts should focus on species present as well as individual species' cover. Members of the Friends of Cullen Nature Preserve are equipped with knowledge and resources to develop a monitoring scheme, and native plant communities are becoming established. Where holes in ecological niches are identified, seed may be inter-seeded in late fall or snow-seeded during winter to allow for the freeze-thaw cycle to work seed into the soil.

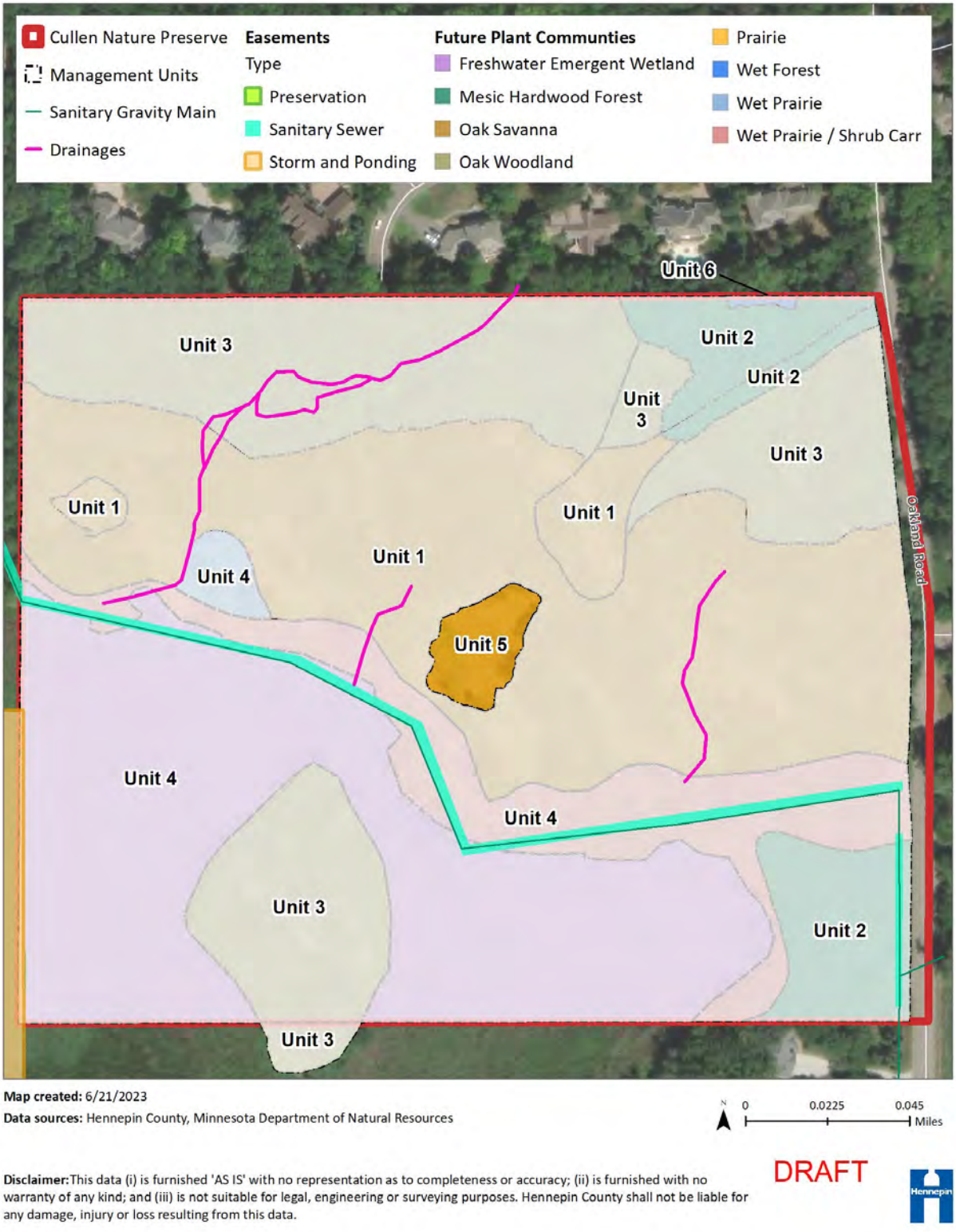


Figure 15: MU5 Future plant communities

MANAGEMENT UNIT 6: VERNAL POOL

Figure 16: MU6 Existing plant communities

Management Unit 6 (MU6) includes one small vernal pool located in the northeast corner of the Protected Property surrounded entirely by MU1. This area does not show up on the public waters inventory and was possibly formed in response to runoff from adjacent development. It is a shallow depression consisting of sedges and reed canary grass in the bottom surrounded by green ash and silver maple. All the ash trees are affected by EAB and are in decline.

COMMON AND NOTABLE PLANT SPECIES OBSERVED:

TREES	SHRUBS	GROUND COVER (WILDFLOWERS, GRASSES, SEDGES, FERNS, VINES)
• *Green ash* • *Boxelder* • *Ironwood* • *Silver maple*	• ***Amur maple*** • ***Common buckthorn***	• *Jack-in-the-pulpit* • *Lady fern* • *Hairy wood sedge* • *Common woodland sedge* • *Eastern star sedge* • *Enchanter's nightshade* • *Canada mayflower* • *False Solomon's seal* • ***Canada thistle*** • ***Reed canary grass*** • ***Creeping Charlie***

BOLDED: Non-native and/or non-native species

Image 11: Bristly Sedge (*Carex comosa*) in vernal pool (Photo: Leah Weston; FMR)

MANAGEMENT OBJECTIVES

OBJECTIVE 1: Remove and manage non-native, noxious weeds, and aggressive plant species.

Primary Goals:

- Reduce cover of non-native woody species through mechanical and chemical removal methods.
- Reduce cover of herbaceous non-native species and noxious weeds through mechanical and chemical removal methods.

OBJECTIVE 2: Enhance habitat through native planting and seeding and adaptive management.

Primary Goals:

- Increase native vegetation cover and diversity.
- Improve soil health and ecological function.
- Improve habitat structure and suitability for wildlife and SGCN such as Blanding's Turtle, Fairy Shrimp, and Blue-spotted Salamander.

DESIRED FUTURE CONDITION:

The desired future condition of Management Unit 6 is toward a B quality wet-mesic forest plant community through the reintroduction of native species diversity and non-native species management. Potential community trajectories include Southern Wet-Mesic Hardwood Forest (MHs49) and/or Southern Wet Ash Swamp (WFs57), although no ash will be present in the tree canopy moving forward.

General guidelines for desired vegetation composition include:

- Continuous ground cover of grasses and forbs such as white bear sedge, hairy-leaved sedge, false rue anemone, blue phlox, appendaged waterleaf, Virginia spring beauty, tall coneflower, white and yellow trout lilies, wild geranium, jack in the pulpit, and common enchanter's nightshade.
- Sparse to continuous shrub layer including chokecherry, Missouri gooseberry, basswood, sugar maple, hackberry, bitternut hickory, American elm, wild black currant, and nannyberry.
- Patchy canopy consisting of basswood, sugar maple, American elm, hackberry, and bur oak.

MANAGEMENT ACTIONS

The following section summarizes the various actions that will support the Management Objectives for Management Unit 6. The table below identifies the likely trajectory of the habitats and the effort associated with various actions. The paragraphs below provide a text summary, and more detail of what activities will help support the Easement Values and Priority Features.

Image 12: View of vernal pool in early spring (Photo: Leah Weston; FMR)

Table 8: Management Unit 6 Potential Management Actions.

Bolded items are considered priority and addressed in further detail in Table 11 of the Recommended Actions section.

MANAGEMENT EFFORT	MANAGEMENT ACTIONS	RISKS & LIKELY TRAJECTORY	PROJECTED GRADE
None	No management actions.	Risks include potential spread of non-native species into other communities within the Protected Property. Condition will be maintained or decline.	C
Low	**Monitor to assess management action and spread of non-native species and forest pests.**	**No/low risk.** **Condition will be maintained or improve. Issues will be identified before they become more costly. Effectiveness of management actions can be evaluated and inform future actions.**	**C**
Moderate	**Remove and treat non-native and non-native species from the unit using appropriate management techniques.**	**Risks include reinfestation.** **Condition will improve with reduced non-native/invasive cover.**	**B/C**
Moderate	**Increase native diversity through seeding and planting**	**Risks poor germination/establishment of native vegetation and reinfestation of non-native species.** **Trajectory is variable and may increase, remain the same, or decline.**	**B**

Vernal pools provide important habitat for invertebrate species that require wet areas in the spring during mating season. Small populations of reed canary grass have begun to establish in this area. Reed canary grass soaks up more water than native plants and can alter soil hydrology and outcompete other species if left unmanaged. Spot weed-whipping and targeted application of herbicide can reduce reed canary grass cover. Management should occur when vernal pool is not wet so as not to harm animals using it.

MU6 would benefit from introduced diversity to provide floral resources for insects and subsequently insects for frogs and other species. After reed canary grass and common buckthorn management, a wet shade sedge and forb seed mix can be planted to increase ground cover, floral resources and height diversity within the vernal pool.

Green ash affected by EAB should be left standing to provide habitat for bird species. Hazard trees hanging over the Protected Property line should be removed.

Figure 17: MU6 Future plant communities

Recommended Management Actions

Management actions are suggested based on the Conservation Values, Priority Issues, Management Objectives, plant community conditions, existing infrastructure, and goals. Table 9 identifies the suggested management actions to accomplish the primary goals of each Management Unit. Main steps, costs, and timing of each management action are also provided. Costs assume actions are implemented across the entire Management Unit, but the landowner may choose to implement all or a portion of an action. Monitoring is a critical action for all activities and is included in costs. Timing begins at the onset of each management action (for example, planting native vegetation might initiate three years following non-native management actions).

Table 9: Recommended Short-term (5 year) Schedule:

MANAGEMENT UNIT	PRIORITY MANAGEMENT ACTIONS – MAIN STEPS	PRIORITY	Potential Partnerships, Funding Sources, etc.	POTENTIAL TIMING					
				Year 1	Year 2	Year 3	Year 4	Year 5	On Going
Management Unit 1 **Oak Savanna** **(9.6 acres)**	Monitor to assess management action and spread of non-native species	Moderate	Hennepin County = Potential Habitat Conservation Program Partner project, technical assistance MLT = Potential Restoration Program project						X
	Treat woody and herbaceous non-native and noxious weed species with herbicide treatment during tails of the growing season (early spring and late fall).	High		X	X	X			
	Restore native vegetation through seeding and planting oak trees.	Moderate				X			
	Introduce prescribed fire to control woody encroachment once the herbaceous layer is established enough to carry fire. Protect newly planted trees from fire. Increase species diversity via seeding.	High		X				X	
Management Unit 2 **Mesic Hardwood Forest** **(2.1 acres)**	Monitor to assess management action and spread of non-native species	Moderate	Hennepin County = Potential Habitat Conservation Program Partner project, technical assistance, tree and shrub materials MLT = Potential Restoration Program project						X
	Treat woody and herbaceous non-native and noxious weed species with herbicide treatment during tails of the growing season (early spring and late fall).	Moderate			X	X	X		
	Seed with woodland seed mix and re-establish shrub layer with bare root native shrub planting after buckthorn removal.	Moderate – pending invasive species removal					X	X	
Management Unit 3 **Oak Woodland** **(7.5 acres)**	Monitor to assess management action and spread of non-native species	Moderate	Hennepin County = Potential Habitat Conservation Program Partner project, technical assistance, tree and shrub materials MLT = Potential Restoration Program project						X
	Treat woody and herbaceous non-native and noxious weed species with herbicide treatment during tails of the growing season (early spring and late fall). Follow up seed with a graminoid-dominant native seed mix to establish groundcover.	High		X	X				
	Planting native shrub buffer along northern property edge.	High – pending invasive species removal					X		
	Introduce prescribed fire to control woody encroachment	Moderate				X			
	Seed with woodland native seed mix after prescribed fire.	Moderate				X			

MANAGEMENT UNIT	PRIORITY MANAGEMENT ACTIONS – MAIN STEPS	PRIORITY	LANDOWNER & PARTNER RESPONSIBILITES & POTENTIAL FUNDING SOURCE	POTENTIAL TIMING					
				Year 1	Year 2	Year 3	Year 4	Year 5	On Going
Management Unit 4 Wetland Complex (11.2 acres)	Treat woody and herbaceous non-native and noxious weed species with a combination of mowing and herbicide treatment during tails of the growing season (early spring and late fall).	High	Hennepin County = Potential assistance with permitting MLT = Potential Restoration Program project CPL Grant with MCWD	X	X	X			
	Seed and plant a high diversity of native species with variable bloom times. Seed should be prioritized in areas with current diversity. Planting shrubs should be prioritized in areas of monoculture reed canary grass.				X	X			
Management Unit 5 Prairie (0.4 acres)	Monitor to assess management action and spread of non-native species	Moderate	Hennepin County = Potential Habitat Conservation Program Partner project MLT = Potential Restoration Program project						X
	Treat woody and herbaceous non-native and noxious weed species with herbicide treatment during tails of the growing season (early spring and late fall).	High		X	X				
	Introduce prescribed fire to control woody encroachment	Moderate					X		
	Seed a diverse seed mix including early blooming forbs and short grasses. Seeding can be inter-seeding, snow seeding, or seeding after a prescribed fire.	High			X		X		
Management Unit 6 Vernal Pool (0.03 acres)	Monitor to assess management action and spread of non-native species	Low	Hennepin County = Potential Habitat Conservation Program Partner project, Cost-Share project, or Natural Resources Grant project MLT = Potential Restoration Program project						X
	Treat woody and herbaceous non-native and noxious weed species with a combination of mowing and herbicide treatment during tails of the growing season (early spring and late fall).	Moderate				X	X		
	Increase species diversity by seeding and planting plugs.	Moderate					X	X	

Appendix A: Overview of MN Natural Resource Regulations and Permitting Considerations

Management activities are typically conducted in a manner to limit disruption to natural systems and wildlife. However, sometimes restoration and enhancement activities cause disturbance to existing water resources, wildlife, and plant communities. Before embarking on restoration and enhancement activities it is important to:

1) Contact the MLT.
2) **Prepare and submit an Action Plan to the MLT**. Hennepin County Staff can assist with developing an Action Plan.
3) Review and consider the various rules, laws, and agencies associated with natural resources in MN.

Below is an outline of regulations you should be familiar before conducting any changes or management to your easement.

Water Resource Regulations

Wetlands and waters within the Protected Property fall under the jurisdiction of several regulatory authorities including the US Army Corps of Engineers (USACE), MN DNR, and local government authorities. **Any activity that may directly or indirectly impact a water feature should be properly permitted through the correct regulatory authority. This includes dredging, filling, or any activity that could displace soil or sediment into water features.**

WETLANDS

Clean Water Act Section 404 regulates impacts to wetlands that are under federal jurisdiction. In Minnesota, it is administered by the St. Paul District of the U.S. Army Corps of Engineers . The Minnesota Pollution Control Agency certifies that permits issued meet state water quality requirements.

Wetland Conservation Act regulates wetlands in Minnesota that are not public waters. This program is administered by local governments with oversight by the Minnesota Board of Water and Soil Resources. According to the MN Wetland Conservation Act, wetlands may not typically be dredged, filled, or drained without a permit. In addition, vegetation alteration, even for the purpose of ecological restoration and non-indigenous plant management may require permitting.

PUBLIC WATERS

Public Waters Permit Program administered by the DNR, regulates activities in public waters, which includes most lakes, rivers, streams, and certain types of wetlands. State Shoreland Standards regulates activities within shoreland zones, rather than within the wetland itself. These standards only apply

where they have been adopted by local governments. Follow link below to read more about what activities require a DNR Permit. Hennepin County can also assist if you have any questions.

- **Do I need a DNR Public Water Permit?:** https://www.dnr.state.mn.us/permits/water/needpermit.html

NATIONAL POLLUTION DISCHARGE ELIMINATION SYSTEM

Activities for most construction projects are subject to the requirements of the National Pollution Discharge Elimination System (NPDES) general permit and must establish a Stormwater Pollution Prevention Plan (SWPPP) that explains how stormwater will be managed. Since the Protected Property is located within one mile of Impaired Waters and Special Waters, additional best management practices (BMPs) are required and should be included in SWPPP development. City and Watershed Stormwater regulations must also be followed.

Listed Species & Wildlife

The intent of Minnesota's Endangered Species Law is to retain or restore healthy populations of the state's endangered, threatened, and special concern plants and animals. A permit is required to take, pursue, capture, kill, dig up, dispose, destroy, purchase, import, possess, transport, or sell live or dead endangered or threatened plants or animals, including their parts or seeds. This can also include biological monitoring or research efforts that entail handling of wildlife. Permit issuance is discretionary and based on the DNR's assessment of all relevant information.

Historical Artifacts

Although review of archeological resources is not likely to be required for vegetation enhancement and restoration projects, Hennepin County encourages all landowners to consult with the State Historic and Preservation Office (SHPO) and appropriate Tribal Historic Preservation Office (THPPO) prior to any management or improvement actions. County staff are available to assist with this effort.

Link SHPO: https://mn.gov/admin/shpo/environmental-review/review/

Link to THPO: https://mn.gov/admin/shpo/about/thpo/

USE OF HERBICIDE AND FIRE FOR MANAGEMENT

If you plan to use herbicide or fire for management purposes, please contact staff at Hennepin County before commencing any activity.

Appendix B: Non-indigenous, Noxious Weed, and Undesirable Plant Management

Prevention and early detection are paramount in preventing the spread of additional non-indigenous species. Specific actions and practices that should be implemented on the Protected Property to prevent the spread and introduction of non-indigenous species include the following (MN DNR 2017b and 2017c):

1) Do not use or transport soil, gravel, mulch, wood, gravel, or hay that is not locally sourced and/or certified non-indigenous free.
2) Do not transport water, organisms, or plant material from infested waterbodies to the Protected Property.
3) Any equipment and tools used should be cleaned to avoid transfer of non-indigenous plant material to or from the Protected Property.
4) Non-indigenous plant material should be disposed of on site in a manner appropriate to the species to prevent spread to other locations. Please connect with the Hennepin County Agricultural inspector to discuss proper disposal of any noxious weeds.
    - Hennepin County Weed Inspector | Matt Stasica | 612-348-4659
    - If the plant material must be removed, transport the material in such a way that none will be lost on the way to the destination. Only certain yard waste sites will accept non-indigenous plant material, so be sure to call ahead before transporting.
5) Conduct regular inspections and mapping of invasions.
6) Populations of non-indigenous species and noxious weeds should be inventoried and delineated to help identify priority areas. Prioritize areas in early stages of invasion (work from least to most infested; high to low quality areas); working outwards to more degraded areas.
7) All herbicides should be used according to recommended guidelines and care should be taken to minimize impacts to non-target native and rare plant species on site.
8) Chemical and mechanical treatment of non-indigenous and nuisance plants should follow the guidelines identified by the MN DNR to reduce impacts to native plants and pollinators. For instance:
    - Herbicide treatment should be conducted in a targeted fashion to prevent incidental impacts to native plants and pollinators; spot spraying only the species identified for control.
    - Herbicide treatment should be done only in low wind conditions (below 10 mph) and in early morning when insects are less active.
    - Mowing should be done in a targeted fashion to limit impacts to native plants, birds, and pollinators. The MN DNR recommends that no more than one-third of a given

habitat type be mowed per year to provide refugia to wildlife, especially pollinators (MN DNR 2014).

9) Treated areas should be reseeded with native plants appropriate for each community or suitable cover crops. Seeds should be collected locally or sourced from a provider of locally collected seed that is willing to supply provenance data.

Primary Non-indigenous Plants at Protected Property

Common and Glossy Buckthorn and Tatarian Honeysuckle

There are two types of buckthorn species non-indigenous to Minnesota, which are currently or have the potential to be problematic within the Protected Property. Common and glossy buckthorn are shrubs native to Europe and imported to Minnesota via the nursery trade. Common buckthorn is highly aggressive and frequently invades a variety of habitats, most often upland forest. Glossy buckthorn is similarly non-indigenous and is more likely to invade wetland habitats.

Another non-indigenous woody species which is problematic in Minnesota and within the Protected Property is Tatarian honeysuckle. This species is also aggressive and invades woodland habitats. Both buckthorn and honeysuckle can form dense thickets which lack native plants, are poor wildlife habitat, and are nearly impenetrable for recreational use. Due to the attractive berries, populations of these species can spread quickly through animal distribution of seeds. Therefore, control of mature, fruit-producing individuals is critical to management.

The leaves, bark, and berries can help identify these species. When dormant, bark is distinctive. Common buckthorn can be distinguished from the related glossy buckthorn by woody thorns at the tip of the twig. Tatarian honeysuckle has a much lighter, tan bark and grows in more of a shrub form compared to the small tree form that buckthorn species take. Common native lookalikes of buckthorn include chokecherry and black cherry. There is also a native honeysuckle, northern bush honeysuckle, but it is much smaller in stature.

Additional information on common buckthorn and Tatarian honeysuckle can be found at the links below:

- https://www.minnesotawildflowers.info/tree/common-buckthorn
- https://www.minnesotawildflowers.info/shrub/tatarian-honeysuckle

Garlic Mustard

Garlic mustard is an herbaceous biennial woodland plant thought to have been imported in the 1800s for use as food and medicine. The plant forms dense mats early in the growing season that shade and outcompete native vegetation. Garlic mustard also produces chemicals in the soil that slow growth of other plants. Its tiny, numerous seeds are easily spread by humans, wildlife, and moving water.

Two forms of garlic mustard may be encountered depending on whether first- or second-year growth is encountered. First year plants grow in low rosettes with kidney-shaped leaves. Second year plants grow 1-4 feet in height with kidney to heart shaped leaves ascending along the stem. White, 4-petaled flowers develop on second-year plants. Numerous pods of thin, curved seeds are produced that contain hundreds of seeds. The most distinctive feature of garlic mustard is the smell of garlic when leaves are crushed.

Additional information on garlic mustard can be found at the links below:

- https://www.dnr.state.mn.us/invasive species/terrestrialplants/herbaceous/garlicmustard.html
- https://www.minnesotawildflowers.info/flower/garlic-mustard

Motherwort

Motherwort is often found along woodland edges and disturbed areas like fields. This plant blooms June-August, is a perennial, and spreads through rhizomes

The plant can vary in size and shape as it grows. Stems are square and hairy with opposite oriented leaves. The leaves are lobbed in 3-5 parts with lower leaves being more deeply lobed. Leaves have prominent veins and toothed. Flowers are a pink to lavender color and are an irregular shape. They cluster around the stem

Here's more information on Motherwort.:

- https://www.minnesotawildflowers.info/flower/motherwort

Black Locust

Black locust is a perennial tree originally from the Appalachian area of the United States. It prefers to grow ins forest openings and edges and blooms in June.

Leaves are alternate and once compound with 7-23 leaflets. Leaflets are egg-shaped with smooth edges. The upper surface is smooth and lower surface has short hairs. They turn yellow in the fall.

Young shoots may have thorns. And the trunk matures to a dark grey brown that is deeply furrowed. Fruit is 2-4 inch-long thin pods and flowers and white and resemble other pea family plants.

Here's more information on black locust.:

- https://www.minnesotawildflowers.info/tree/black-locust

Dame's rocket

Dame's rocket is typically found in moist woodlands, along roadsides, and in open areas. Dame's rocket is often confused for native phlox, but phlox have 5 petals, while dame's rocket has 4 petals. Unfortunately, it is thought by many to be a native wildflower and is sometimes found in wildflower seed mixes and planted as an ornamental where it quickly escapes cultivation due to its high seed production.

It is a biennial plant that creates a rosette of leaves its first year and a flower stalk in its second year. It blooms heavily and produces a lot of seed, creating massive colonies. A single plant can have up to 30 white, to pink, to deep purple flowers, at the top of the plant. The stems are very hairy and leaves decrease in size from the bottom to the top of the plant. Seed is produced in thin pods that are about 4 inches long and contain a single row of seeds.

Here's more information on dame's rocket.:

- https://dnr.wisconsin.gov/topic/Invasives/fact/DamesRocket.html
- https://www.minnesotawildflowers.info/flower/dames-rocket

Reed Canary Grass

Reed canary grass is a cool-season perennial grass native to Eurasia and was frequently planted throughout Minnesota for forage and erosion control. Cool season grasses begin growth early in the growing season, giving them a competitive advantage against many plants. Reed canary grass thrives in many wetland environments and can form dense patches composed of few other species. This plant can be very difficult to manage due to its robust seed production, seed bank, and vegetative reproduction (rhizomes/tillers).

A common lookalike of reed canary grass is the native Canada bluejoint. Ensure confident identification of reed canary grass prior to any management action.

Additional information on reed canary grass can be found at the links below:

- https://www.ontarionon-indigenousplants.ca/wp-content/uploads/2016/06/OIPC_BMP_ReedCanaryGrass.pdf
- http://www.midwestprairies.com/portals/0/documents/RCG%20Control_WIDNR.pdf
- https://www.dnr.state.mn.us/non-indigenous species/terrestrialplants/grasses/reedcanarygrass.html

Narrow-leaf and Hybrid Cattails

Narrow-leaf and hybrid cattails are an emergent wetland non-indigenous species common to all types of waterbodies in Minnesota. It includes both the non-native narrow-leaf cattail (*Typha angustifolia*) and the hybrid of narrow-leaf cattail mixed with native broadleaf cattail. Non-indigenous cattail forms extremely dense stands with little native vegetation present. It generally provides poor wildlife habitat, although it offers good cover for several species. Distinguishing between hybrid, narrow-leaf, and broadleaf cattail is very difficult, as traits often overlap and has recently been documented as nearly impossible. Unfortunately, recent research indicates that it is not possible to identify non-indigenous cattail without the aid of genetic techniques. Perhaps the most characteristic trait of the non-indigenous cattail species is their aggressive spread and dense stands; the native broadleaf cattail is generally found growing alongside native species in healthy plant communities. The dense, monotypic stand of cattail present on the Protected Property is very typical of non-indigenous cattail, and morphological characteristics support this identification.

Additional information on non-indigenous cattail can be found at the links below:

- https://mfburchick.files.wordpress.com/2014/11/cattail-comparison.pdf
- https://www.wisconsinwetlands.org/updates/non-indigenous-plant-profile-cattails/
- https://www.dnr.state.mn.us/aquatic_plants/emergent_plants/cattails.html

Non-native Phragmites

There are two subspecies of *Phragmites* in Minnesota. One is native to the region and one is a European subspecies. These subspecies are very difficult to distinguish from one another. The *Phragmites* found on the Protected Property is the non-native subspecies.

Both subspecies grow in wet soils, such as in wetland, riparian, or shoreline areas. Distinguishing factors between the two include, ligule width, stem and leaf color, leaf sheath tightness, stem density, presence of fungal spots, and inflorescence size/shape. The small population found within the Protected Property has the leaf and stem color, hairs around the ligule, lack of fungal spots, and leaf sheath tightness consistant with the non-native subspecies.

Non-native *Phragmites* is tall with a blue-green leaf color and grows in dense stands. These dense stands push out native vegetation and significantly reduce habitat quality in the affected area.

Multiple years of treatment will likely be necessary for eradication in the affected area. Herbicide applications and mowing will be necessary for control. The current recommended treatment by the University of Minnesota is laid out underneath and should be considered when management activities are conducted throughout the Protected Property.

Summer mow (optional) → Fall herbicide application → Winter mow → Evaluation of treatment → Follow-up treatment.

Additional information can be found here:

- https://maisrc.umn.edu/phragmites-id
- https://www.minnesotawildflowers.info/grass-sedge-rush/european-common-reed
- Non-native subspecies of Phragmites (Common Reed) (Phragmites australis subsp. australis) | Minnesota DNR (state.mn.us)

Smooth Brome

Smooth brome is a non-native pasture grass that was planted throughout the state for forage and erosion control. It has since become established in many grasslands and other open habitats and is one of the most common roadside plants in Minnesota. Smooth brome is a cool season grass that begins growth early in the season before many warm season prairie plants. The early-season head start, and dense growth help smooth brome outcompete native species and dominate in large patches. Smooth brome can easily be confused with several native brome grasses. The native brome grasses, such as prairie brome (*Bromus kalmia*) are also cool season grasses and provide valuable natural competition.

Additional information on smooth brome can be found at the links below:

- https://www.dnr.state.mn.us/non-indigenous species/terrestrialplants/grasses/smoothbromegrass.html
- https://www.minnesotawildflowers.info/grass-sedge-rush/smooth-brome

Kentucky Bluegrass

Kentucky bluegrass is a non-native grass that is widespread in many landscapes and commonly planted as forage or turf. It is a common invader of grasslands. While it rarely forms dense monocultures, Kentucky bluegrass is often a dominant component of prairies and frequently is the only species growing beneath taller grasses. Like smooth brome, Kentucky bluegrass is a cool season grass. It is best identified by its relatively narrow linear leaves with boat-shaped tips and a spreading inflorescence. Several native bluegrasses, such as fowl bluegrass (*Poa palustris*), are also cool season grasses provide valuable natural competition.

Additional information on Kentucky bluegrass can be found at the links below:

- https://globalrangelands.org/state/north-dakota/kentucky-bluegrass
- https://prairieecologist.com/2012/11/28/dealing-with-a-pervasive-invasive-kentucky-bluegrass-in-prair

Native but Weedy Species

Red cedar

Red cedar is a native, small to mid-sized evergreen tree and is not a true cedar tree, but instead a juniper tree. They are a very hardy, drought tolerant tree, but are intolerant to fire and shade. In the current landscape, where fire is rare, it tends to invade open, dry habitats such as prairies, fields, and pastures. It poses a threat to prairie species due to its ability to invade a habitat type and shade out other, more desirable native plants. As some areas of the preserve transition to oak savanna, invasion by cedar trees is more likely.

The red cedar is easily identified by its round, bluish fruit, and small cones. The trunks of older trees have flattened vertical ridges that peel off in long, thin strips. Early in the season, the foliage is green, but by late summer and through winter, it turns reddish.

More information on red cedar can be found here:

- https://www.minnesotawildflowers.info/tree/eastern-red-cedar
- https://extension.sdstate.edu/woody-weeds-eastern-red-cedar

Prickly ash

Prickly ash is a native, perennial woody shrub that prefers partial shade to shade in forest clearings and along forest edges. Despite its name, it is not at all related to any of our native ash tree species. It spreads both through seeds and suckers, creating dense, thorny thickets. The plant also has a fragrant, citrusy scent.

Prickly ash is identified by its smooth, brown to gray stems that have a pair of sharp thorns just below each of its leaves. The leaves are 5-10 inches long with 5-11 leaflets that are 1-2 inches long. The leaves are dark green on top and pale green and hairy below. Flowers are green to reddish with five egg-shaped petals. The fruit is small, round, and red.

More information on prickly ash can be found here:

- https://www.minnesotawildflowers.info/shrub/prickly-ash
- https://conservationdigest.com/prickly-ash/

Appendix C: Landscape-Level Threats

Pests and Diseases

Early detection is a critical component of non-indigenous species management, and it is recommended managers of the Protected Property learn to identify these and other listed non-indigenous insects.

Managing forest and woodland areas for diversity in species, ages, and size class of trees, limits the susceptibility of forests for infestation by non-indigenous animals and native pests.

EMERALD ASH BORER

There are over 1 million ash trees in Hennepin County. Green, white, and black ash trees are found in Hennepin County, and all are susceptible to emerald ash borer (EAB). Most residents in the county live within 15 miles of an infested ash tree consequently, the risk of spread and infestation is very high.

Survey ash trees for D-shaped exit holes, canopy dieback, epicormics sprouts, larval galleries, or woodpecker flecking especially, all of which could indicate an infestation.

(MDA, 2023)

If an infestation of EAB is found within the Protected Property removing and replacing infested ash trees and/or ash trees in poor health is recommended.

Chemical treatment may also be used to treat and protect ash trees within the Protected Property; however, chemical treatments may pose a risk to pollinators, aquatic animals, and groundwater. Please follow the decision guideline below and contact Hennepin County staff with any questions about ash tree removal, treatment, and replacement.

Replacement trees for ash include paper birch, black cherry, bitternut hickory, hackberry, American basswood, red maple, sugar maple, white oak, bur oak, and red oak.

More information: https://www.mda.state.mn.us/eab

Decision guide for managing ash trees

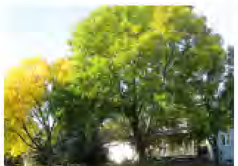
Start here: inventory your ash trees

- How many ash trees do you have?
- Where are they located?

Decide: Are you interested in saving your ash trees?

Yes → Determine if your ash trees are worth saving

No → Monitor and make a plan



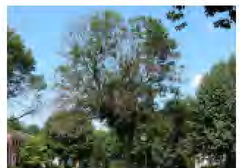
Determine if your ash trees are worth saving

- Are they healthy?
- Are they at least 30 inches in circumference (10 inches in diameter) at chest height?
- Do they show no or few signs of emerald ash borer infestation?
- Are they in a good location?
- Are they valuable to you?

Yes → Work with a certified arborist to treat your trees

No → Monitor and make a plan

I don't know → Hire a tree care professional



Monitor and make a plan

- Ash trees will eventually become infested and need to be removed
- Monitor for signs of emerald ash borer and make a plan for removing your trees.
- Consider planting a tree or two to replace any you remove. Plant the right tree for the location, and plant a variety of trees.

Work with a certified arborist to treat your trees

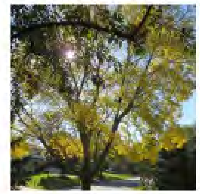
- Treat ash trees that are within five miles of an emerald ash borer infestation
- Hire a certified arborist to do a trunk injection of emamectin benzoate (commercial name Tree-age)
- Treat trees every two to three years in late spring
- Cost is typically $100 to $200 per tree, depending on the tree's size

Hire a tree care professional

- Hire an ISA-certified arborist. Arborists can help you assess, treat, remove, and replant trees. Find arborists near you at **treesaregood.org**.
- Get at least two estimates.
- Ask for references and insurance.
- Tip: Work with your neighbors to seek discounts for managing your trees all at once.

Identifying ash trees

Look for the following characteristics to determine if your tree is an ash tree:



Branches grow directly opposite from one another.

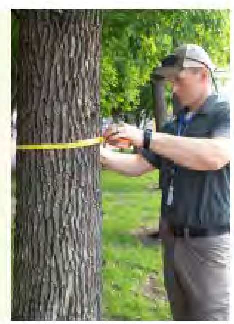
Compound leaves, or multiple leaves on one stalk.

Bark with diamond-shaped pattern.

Seeds that are oar-shaped and typically hang in clusters.

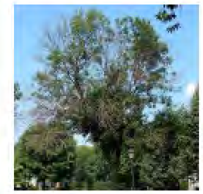
Measuring your trees

Measure the distance around the trunk at about 4.5 feet off the ground, or about chest height. This gives you the circumference. To get diameter, divide the circumference by 3.



Signs of emerald ash borer infestation

The following signs may indicate that an ash tree is infested with emerald ash borer.



Leaves on the top or on one part of the tree start dying.

Sprouts growing from the roots or base of the tree indicating that it is stressed.

Increased woodpecker activity with sections of the bark stripped away.

Adult beetles leaving the tree create D-shaped exit holes.

Larvae feeding on the tree's tissue leave a serpentine pattern underneath the bark.

Hennepin County
Environment and Energy
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hennepin.us/ashtrees

34-412-12-19

Hennepin

OAK WILT

Oak wilt is caused by the fungus *Ceratocystis fagacearum* and is responsible for killing large numbers of oaks every year in Minnesota. The primary carrier of the fungus is sap beetles. Oak wilt is most severe in red oak group species such as northern red oak and northern pin oak. Infected trees of the red oak group will show signs of wilting starting in the tree crown progressing downward as the infection perpetuates. Complete wilting can occur within as little as 4 weeks. Infected trees of the white oak group will show wilting scattered throughout the crown. Progression in white oaks is much slower, typically 2-5 years.

The most effective means to control the spread of oak wilt is a combination of root graft disruption and tree removal to stop below-ground spread. Infected trees should be removed after root grafts have been disrupted and before April 1; when the fungus begins to fruit, and the beetles begin to feed.

Risk of oak wilt fungus spread by sap beetles

Time of year*	Risk of insect spread	Advisory notes
April through mid-July	High	Don't wound, prune or fell oaks in oak wilt counties during this time period. Immediately cover unavoidable wounds with paint or shellac.
Mid-July through late October	Low	Depending on weather conditions and insect populations, infections could occur but would be rare. Immediately treat pruning wounds, stump surfaces of felled trees and other wounds if desired.
November through March	Safe	Now is the time to prune! Fungal pathogens and insect vectors are inactive.

* Exact dates for beginning and end of each time period may vary from year to year.

BUR OAK BLIGHT

Bur oak blight is a fungal disease which results in leaf browning and early loss of leaves. It is likely that increased above average rainfall has boosted the occurrence of the pathogen. Predicted climate change patterns are likely to perpetuate this trend. Because bur oak blight is a native disease made worse by wet springs and summers, it is not possible to control levels of the pathogen. Since many bur oaks tolerate some degree of the disease, we recommend leaving trees that are not susceptible so that they pass on potential resistance to the next generation.

EARTH WORMS

All earthworms and jumping worms are not native to Minnesota and arrived only after European settlement. Earthworms are very efficient at recycling fallen leaves, significantly reducing the natural duff layer of native forests. As a result, seedlings, ferns, and wildflowers often struggle to germinate and survive. Jumping worms also cause significant damage through changes in soil structure and chemistry. Once jumping and earthworms invade a forest there is no way to remove them; the only defense is prevention. **Do not dump or dispose of bait in the easement** and make sure mulch is sourced locally.

It may also be beneficial to discuss the harms of earthworms and jumping worms and the preventative measures with neighbors.

JAPANESE BEETLE

Japanese beetle larvae feed on plant roots and adults feed on the leaves of over 300 plant species. Fortunately, the damage is often only cosmetic and will not kill affected plants. Damaged leaves attract more beetles so minimizing beetles on plants should mean fewer beetles will be attracted to them. Removing damaged leaves and beetles from plants will mitigate attraction of new beetles. Don't use Japanese beetle traps! Traps are likely to only attract more insects to your yard. Chlorantraniliprole (Acelepryn®) is an insecticide that can provide two to four weeks protection from beetles and is also low risk to bees. Use of the insecticide is recommended from Late July through August during primary beetle feeding times. Landowners are encouraged to inspect nursery plants as a valuable method to prevent invasion of the Protected Property.

OTHER INSECT PESTS

The Asian-long horned beetle, sirex wood wasp, and brown marmorated stink bug are considered early detection invasive species as they have not yet been confirmed in the State of MN, however,

Climate Change

Hennepin County's climate is getting wetter year-round, and winter low temperatures are getting warmer. Climate vulnerability assessments make it clear that the risks posed to Hennepin County residents, infrastructure, and natural resources from climate change warrant an urgent, substantial, and coordinated response.

Climate change will add stress on our ecosystems, which are already impacted by invasive species, population growth, and development. Increased rainfall and more extreme weather will impact surface water and groundwater quality, strain the capacity of stormwater conveyance systems, and stress groundwater drinking supplies. Many native wildlife and plants are extremely sensitive to climate change impacts since they cannot adapt as fast as our climate is changing.

The impacts of the climate crisis are not felt equally by our residents due to variable access to resources, making the response to climate change an environmental justice issue that requires authentically engaging with communities, advancing efforts to dismantle systemic racism, and reducing disparities.

Protecting and enhancing natural resources like the Protected Property present make our communities more resilient. Protecting natural areas sequesters carbon, manages increased precipitation, provides habitat for native plants and wildlife, provides shade and shelter during hot weather, and makes our communities stronger and healthier.

Appendix D: Historical Context and Cultural Significance

Cultural Significance

The first people living in the region known as *Mnisota Makoce* or the Land of Misty Waters. (Minnesota) were members of diverse American Indian tribes who settled in the area as early as 6,000 BC.

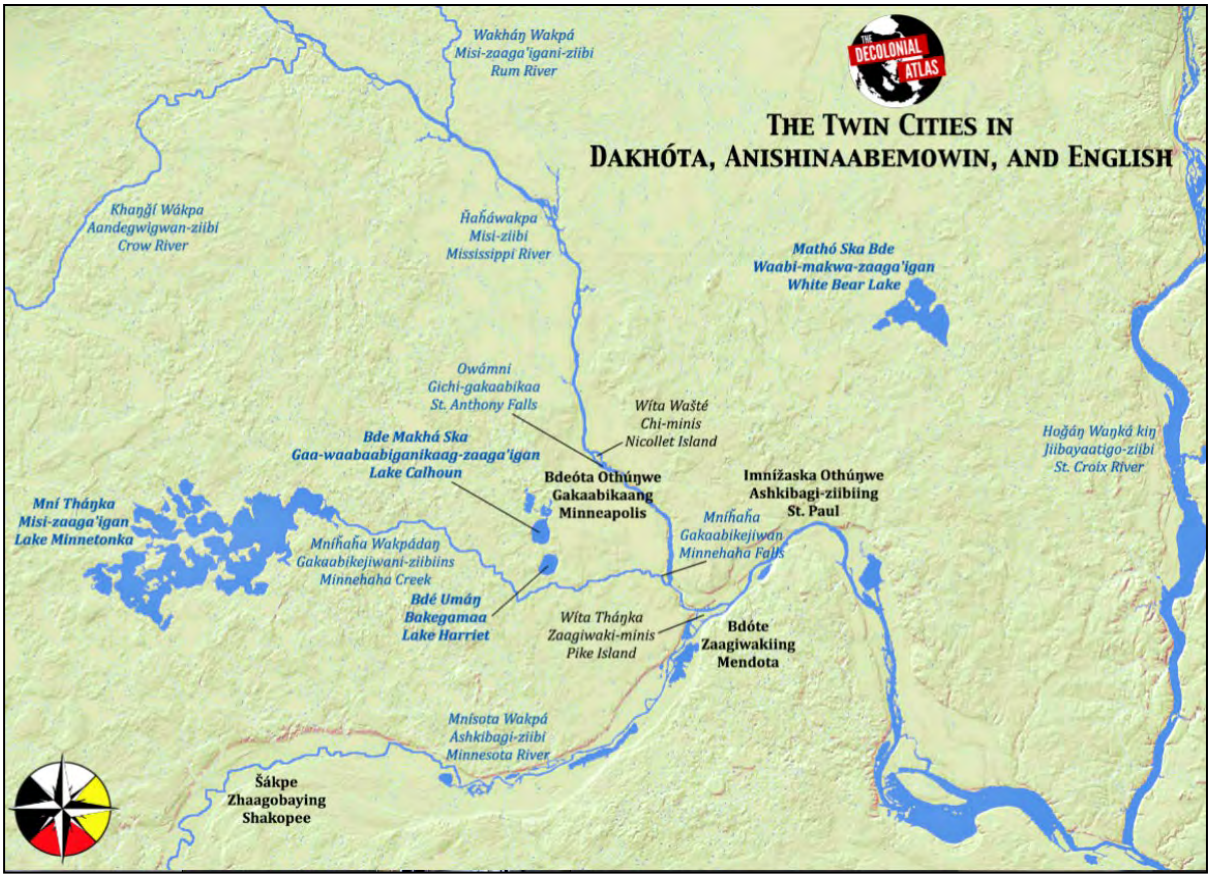
The geographic area of Hennepin County includes many historical villages, burial mounds, ceremonial and gathering sites, and seasonal foraging and hunting areas that are of great cultural, spiritual, and natural resource significance to people of the Dakhóta Nation and people of the Anishinaabeg (Ojibwe) Nation.

The magnificent land and vibrant waterways from which this Protected Property resides, are located upon the cultural, spiritual, and indigenous homeland of the *Dakota Oyate* (Dakota Nation). The Dakota people originated at the confluence of the Mnisota Wakpa (Minnesota River) and Haha Wakpa (Mississippi River), also known as *Bdote*, the center of the earth and the place of first creation of the first Dakhóta man and woman (Westerman and White, 2012). *Bdote* generally extends from the area where the Mississippi and Minnesota Rivers merge outward to the south, west, east, and north across all of Hennepin County, much of Ramsey and Dakota counties, and parts of Wright, Carver, Scott, Sherburn, Anoka and Washington counties.

Dakota summer lodge, 1846–1848. Watercolor painting by Seth Eastman. Dakota summer lodge, 1846–1848. Watercolor painting. Source: MNHS Collections.

This area is also of cultural significance to the Anishinaabeg who call this area Zaagiwakiing. Traditional homelands of the Anishinaabeg extend primarily north of Zaagiwakiing, and they would frequent this area to trade and meet with the Dakhóta.

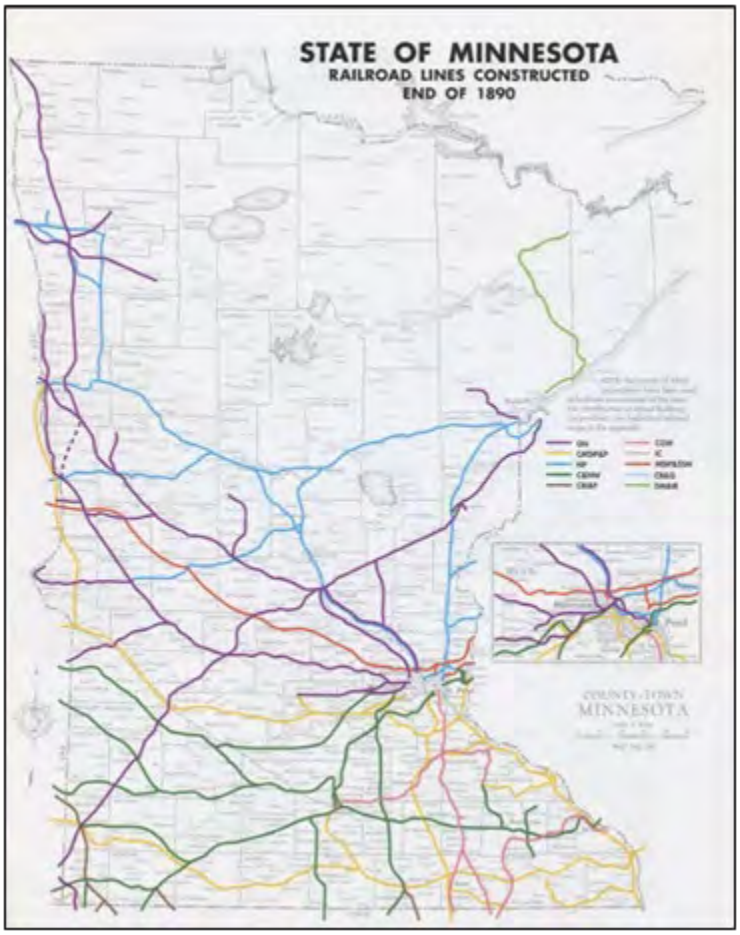
The Dakota became a sovereign nation in this area; a sovereignty that predates the sovereignty of the United States. The sovereignty status of the Dakota remains today. The four cohesive sub-divisions of the Dakota Oyate responsible for the stewardship of this land are the *Bdewakantunwan* (Village of the Sacred Lake), *Sisitunwan* (Village of Fish Scales), *Wahpekute* (Village of Shooting Leaves), and *Wahpetunwan* (Village of the Leaves) bands.



Decolonial Map of Bdote. Source: Decolonial Atlas (https://decolonialatlas.wordpress.com/2018/01/20/minneapolis-st-paul-in-dakota-and-ojibwe/)

The area generally agreed upon as *Bdote or Zaagiwakiing* includes several significant natural landmarks, including (the following list present the Dakotah and then the Anishinaabe name followed by the English name in parentheses):

- *Hahawakpa or Misi-ziibi* (Mississippi River)
- *Khangi Wakpa or Aandegwigwan-ziibi* (Crow River)
- *Mnisota Wakpa or Ashkibagi-ziibi* (Minnesota River)
- *Minihaha Wakapadan or Gakaabikejiwani-ziibiins* (Minnehaha Creek)
- *Mni Thanka or Misi-zaaga'igan* (Lake Minnetonka)
- *Bde Uman Bakegamaa* (Lake Harriet)
- *Bde Makha Ska or Gaa-waabaabiganikaag-zaaga'igan* (Bde Maka Ska)
- *Mnihaha or Gakaabikejiwan* (Minnehaha Falls)
- *Wita Waste or Chi-minis* (Nicollet Island)
- *Wita Thanka or Zaagiwaki-minis* (Pike Island)



The map depicted identifies existing rail across Minnesota by 1890 (MN Historical Society)

By the time French explorers and fur traders first passed through the area in the 17th century, the Dakhóta and Anishinaabeg had well-established societies in the region based on hunting and gathering.

Between 1805 and 1858, 12 treaties imposed by the United States government limited the Dakhóta to a small reservation along the Minnesota River. Ultimately, because of disingenuous treaties and genocide of American Indians, Dakhóta and Anishinaabeg people were exiled from the sacred homeland they had lived for thousands of years (Westerman and White, 2012).

Furthermore, federal land grants and expanding transit between 1870 and 1890 led to quick European settlement in undeveloped areas and further theft of American Indian land across Hennepin County and the greater United States. Consequently, the Twin Cities and surrounding areas are home to one of the largest and most diverse American Indian populations in the country.

"The United States' land seizures were a project of spiritual destruction that denied the Dakhóta free and unhindered access to the land that fundamentally shapes their identify and spirituality"

– Kristin Lin (The On Being Project Podcast)

Following the hostile land theft by settlers and the U.S. government, most of the land within Hennepin County was cleared for agriculture and development. This involved intensive wetland draining, prairie plowing, and forest clearing. These practices destroyed the lands, waters, and natural resources in Hennepin County that were and continue to be important for foraging, farming, maple syruping and sugaring camps, wild tobacco, deer hunting, seasonal camps, wild rice beds, and fishing.

Dakhóta were known to practice land stewardship, such as setting fire to woodlands and prairies as they would leave for fall and winter hunts, that helped create and maintain the natural resource value and history we seek to preserve and protect today. It is with great gratitude we recognize the land ethic and

stewardship of American Indians, whose continued dedication and action is helping to protect and care for our land and our water now and in the future.

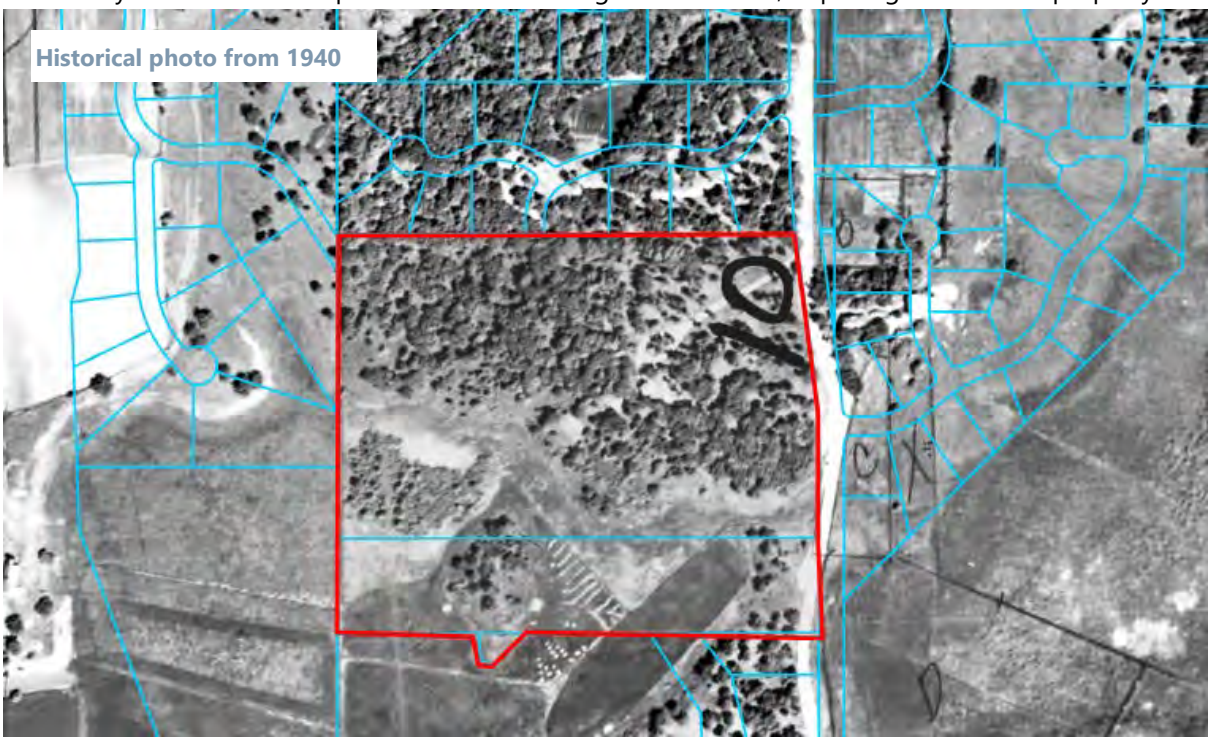
Ojibwa Portaging Around the Falls of St. Anthony," oil on canvas by George Catlin, 1835–1836. "Ojibwa Portaging Around the Falls of St. Anthony," oil on canvasCourtesy of the Smithsonian American Art Museum.

Historic Land Cover and Disturbance Regime

The easement area falls within the area generally agreed upon as Bdote. Its location within this important area, nearness to streams, lakes, wetlands, and woodland, and likely savanna and prairie, suggests this property was and is likely a significant location to *Dakhóta* and *Anishinaabe* people. It may have been used for foraging, hunting, and/or seasonal camps. This area is also near fishing resources due to its proximity to *Mni Thanka* or *Misi-zaaga'igan* (Lake Minnetonka).

The Proposed Protected Area is located within the Big Woods Subsection (Exhibit E). Historically, this subsection was covered by a large block of deciduous forest that was surrounded by tallgrass prairie and savanna. The irregular topography and presence of many lakes and wetlands protected much of the landscape from extensive fires that were common in the prairies. As a result, oak woodland and maple-basswood forests were the dominant land cover types in the subsection.

Based on Marschner pre-settlement vegetation mapping and bearing tree data from the Public Land Survey, the Protected Property was primarily covered by oak barrens and openings and common trees included Red Oak, Black Oak, Bur Oak, and Aspen. The Protected property also intersects land cover historically identified as wet prairie. The below image is from 1940, depicting areas of the property



potentially experienced hay and/or grazing in the southern extents of the site and that much of the norther area of the site was dominated by woodland. The openings between canopy suggest the system is consistent with an oak woodland structure and is the southern extent of a contiguous woodland area, much of which is still intact today.

According to the MN DNR, oak woodlands in MN ranged from small groves intermixed with prairie to chaparral systems of dense scrub communities. Intermittent windthrow and naturally generated fires

would have been likely disturbances on this site in addition to grazing pressure and fire set by Native Americans. Large herbivores such as bison and elk were once found in the county and played a role in maintaining the plant communities. These animals fed on the abundant forbs and grasses and played an important role in the pollination and distribution of seed. Under natural conditions (prior to settlement), native herbivores were free to move across the landscape and generally followed fire to where new vegetation was establishing. These patterns created a mosaic of different stages of plant succession across the landscape.

Appendix E: Ecological Context Maps

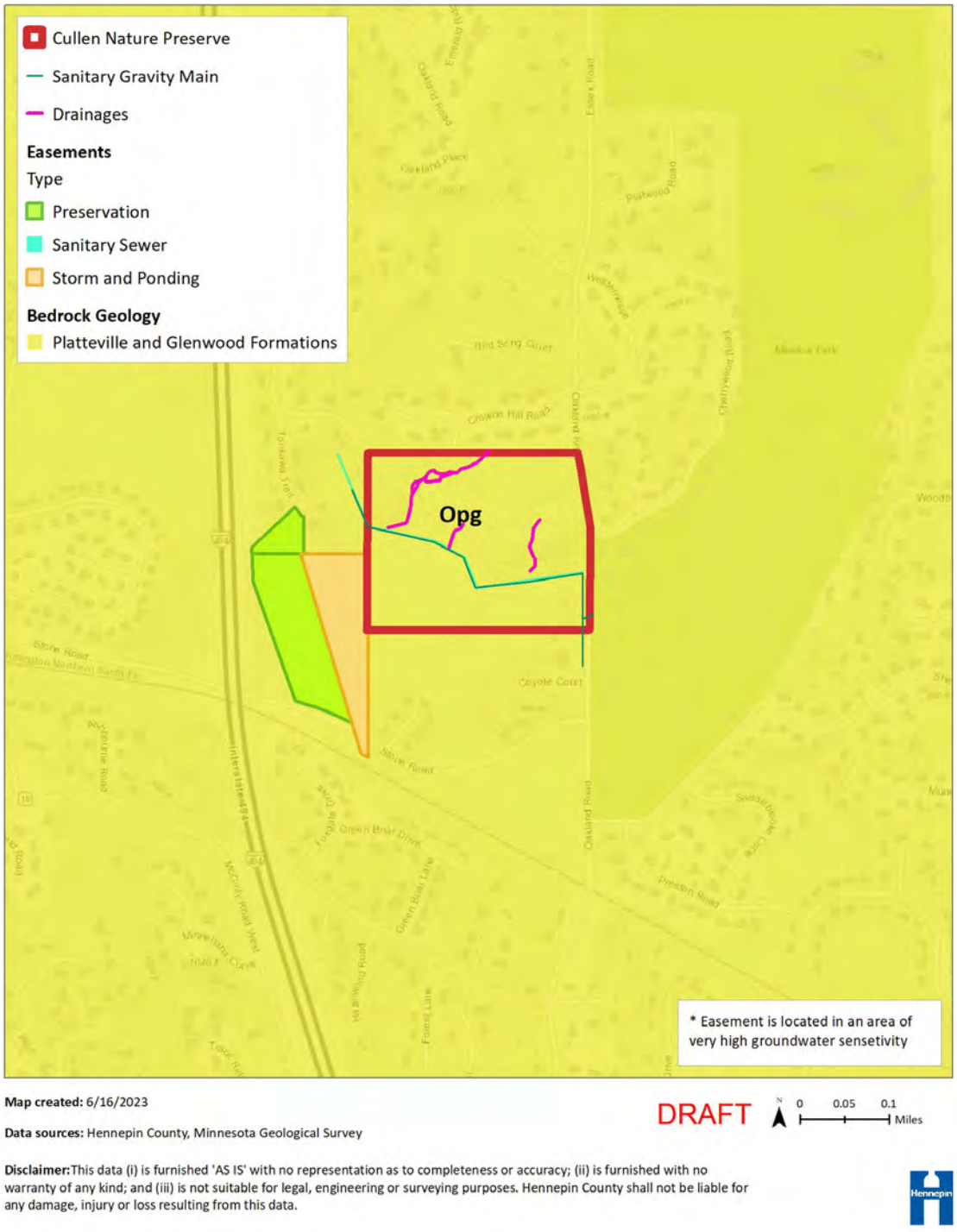


Figure 18: Bedrock Geology

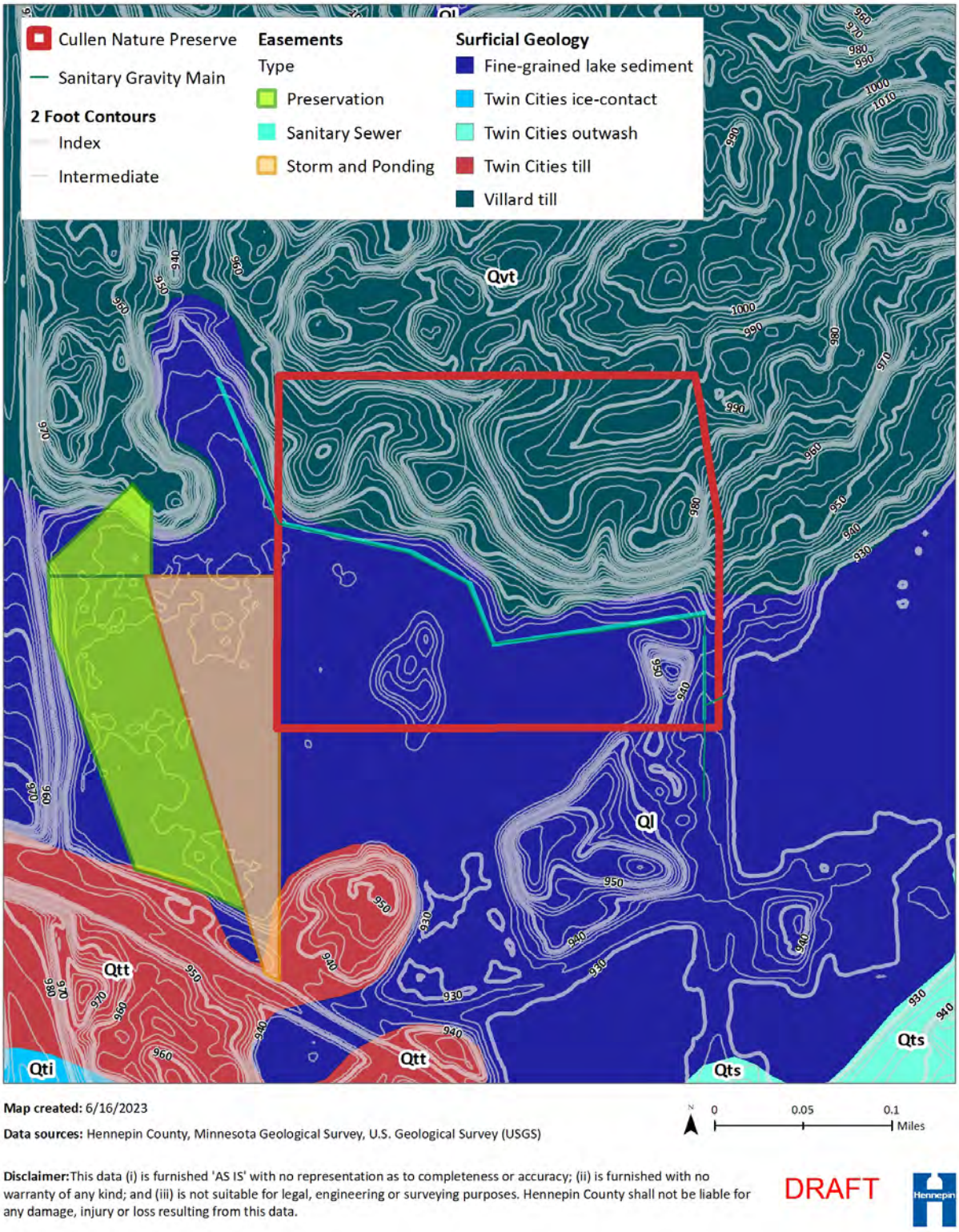


Figure 19: Surficial Geology

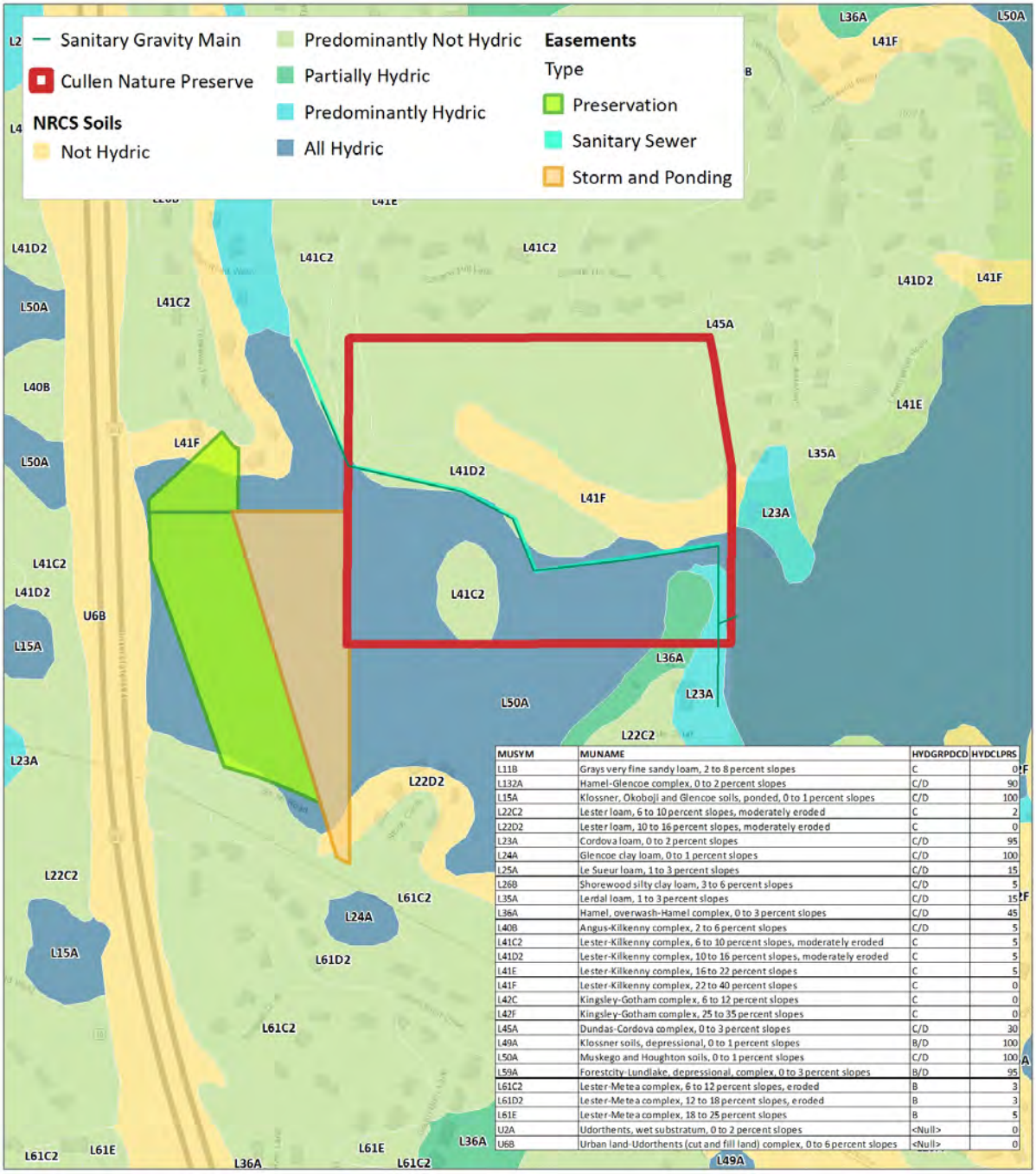
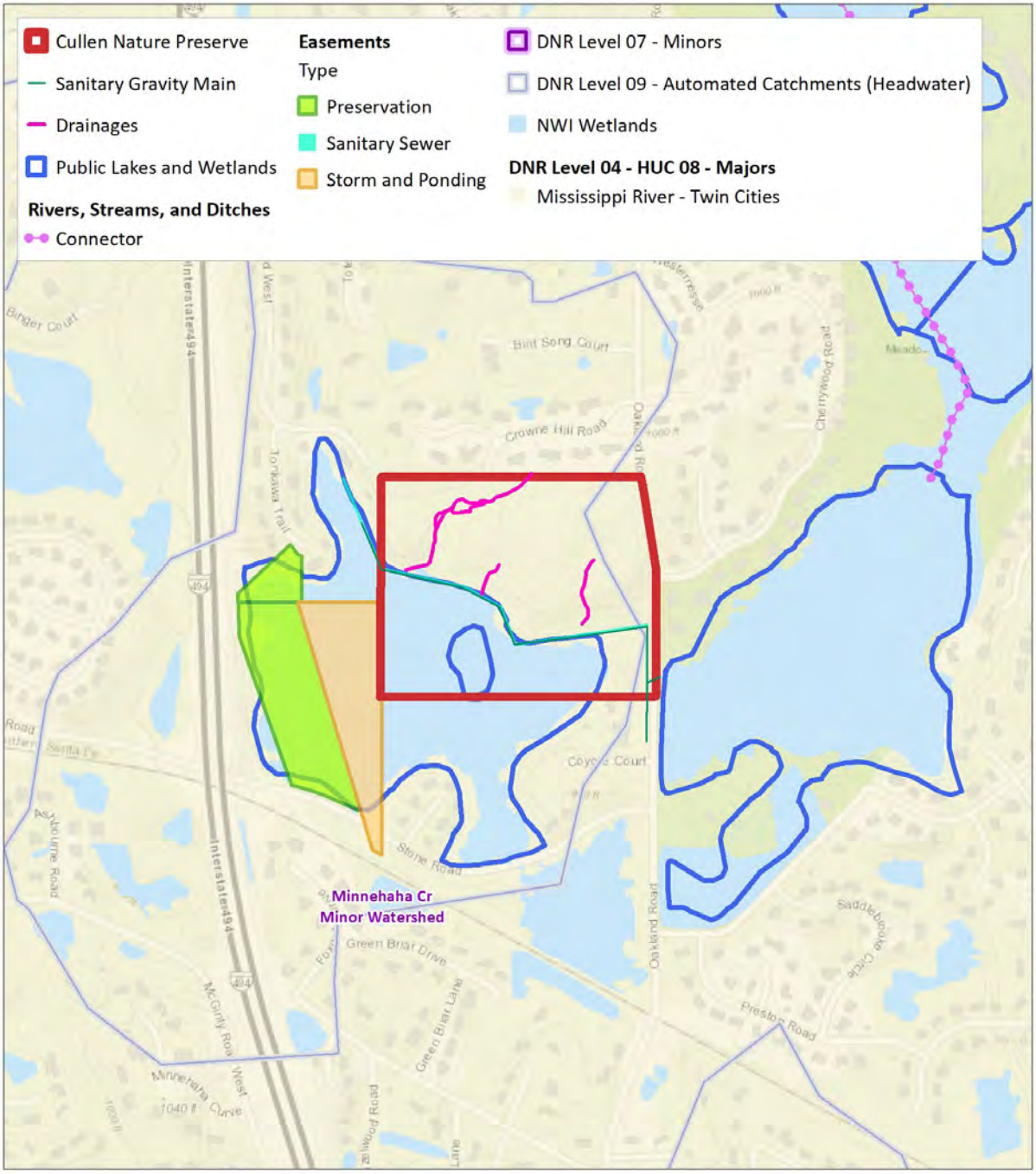


Figure 20: Soils



Map created: 6/16/2023

Data sources: Hennepin County, Federal Emergency Management Agency (FEMA), U.S. Geological Survey (USGS), DNR Watersheds - DNR Level 09 - DNR AutoCatchments, Minnesota DNR – Fisheries (11/01/2013), DNR Watersheds - DNR Level 04 - HUC08 - Majors and DNR Level 07 - Minors, Minnesota DNR - Division of Waters - Watershed Delineation Project (9/15/2009)

Disclaimer: This data (i) is furnished 'AS IS' with no representation as to completeness or accuracy; (ii) is furnished with no warranty of any kind; and (iii) is not suitable for legal, engineering or surveying purposes. Hennepin County shall not be liable for any damage, injury or loss resulting from this data.

Figure 21: Watershed

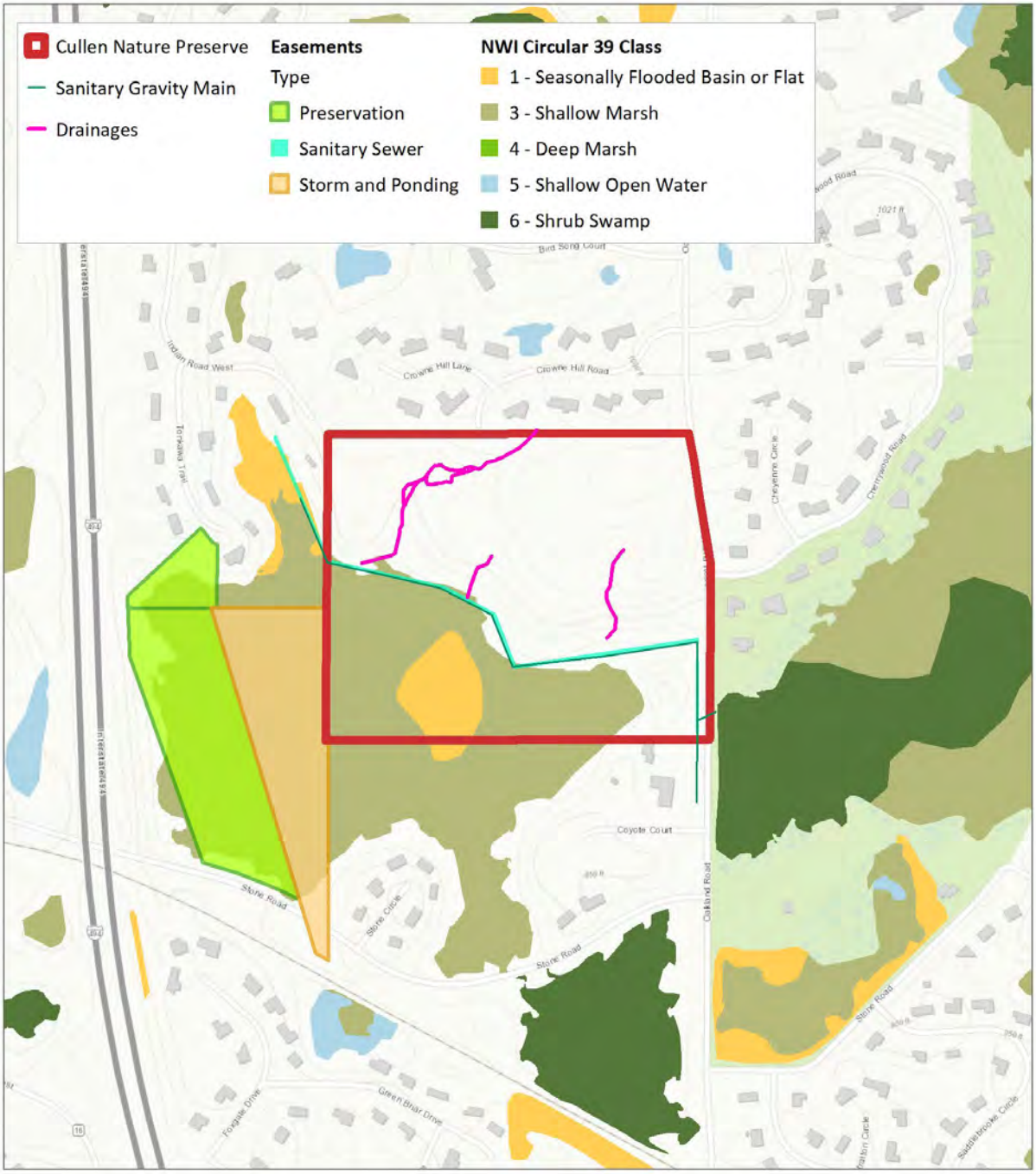


Figure 22: Wetlands

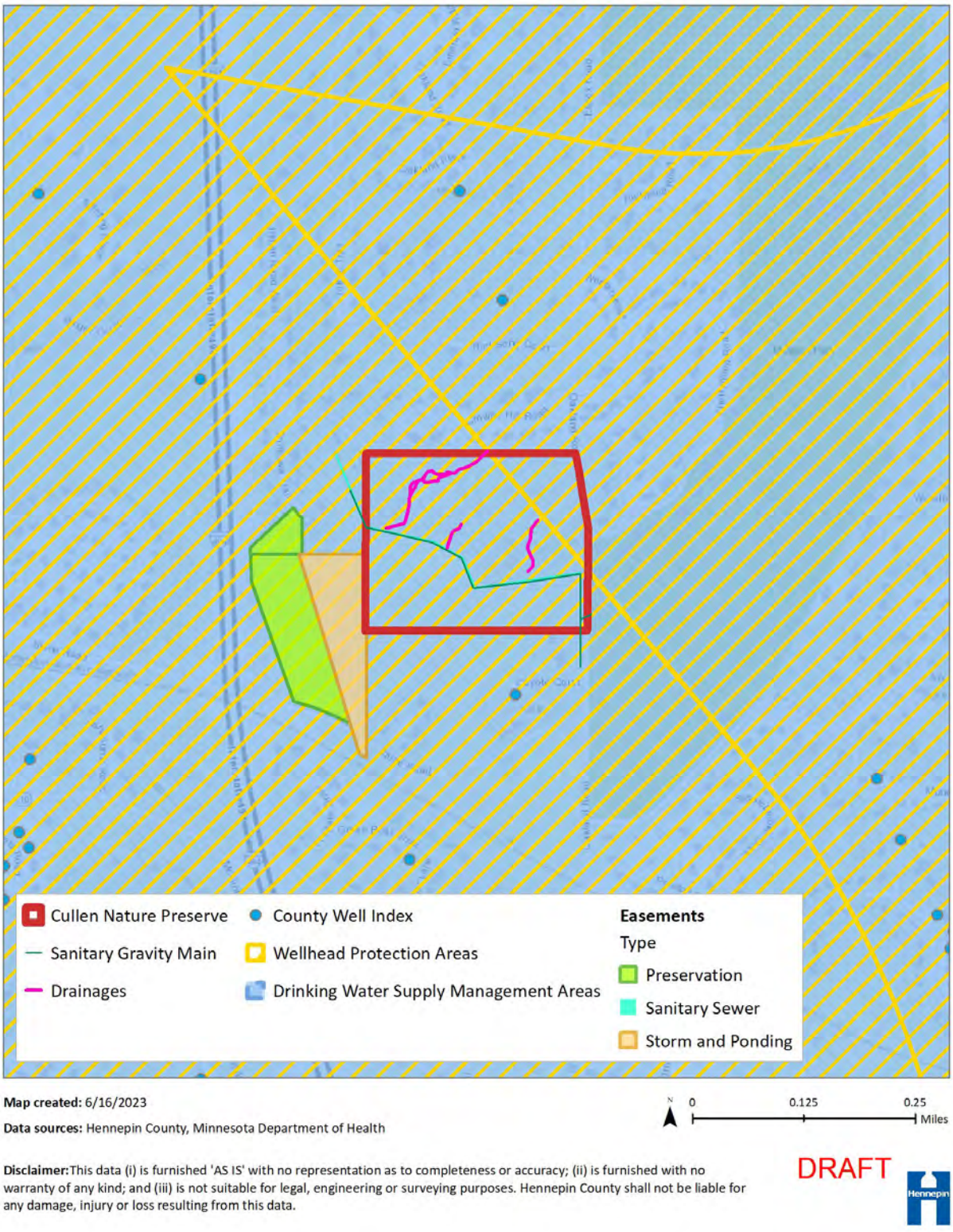


Figure 23: Groundwater

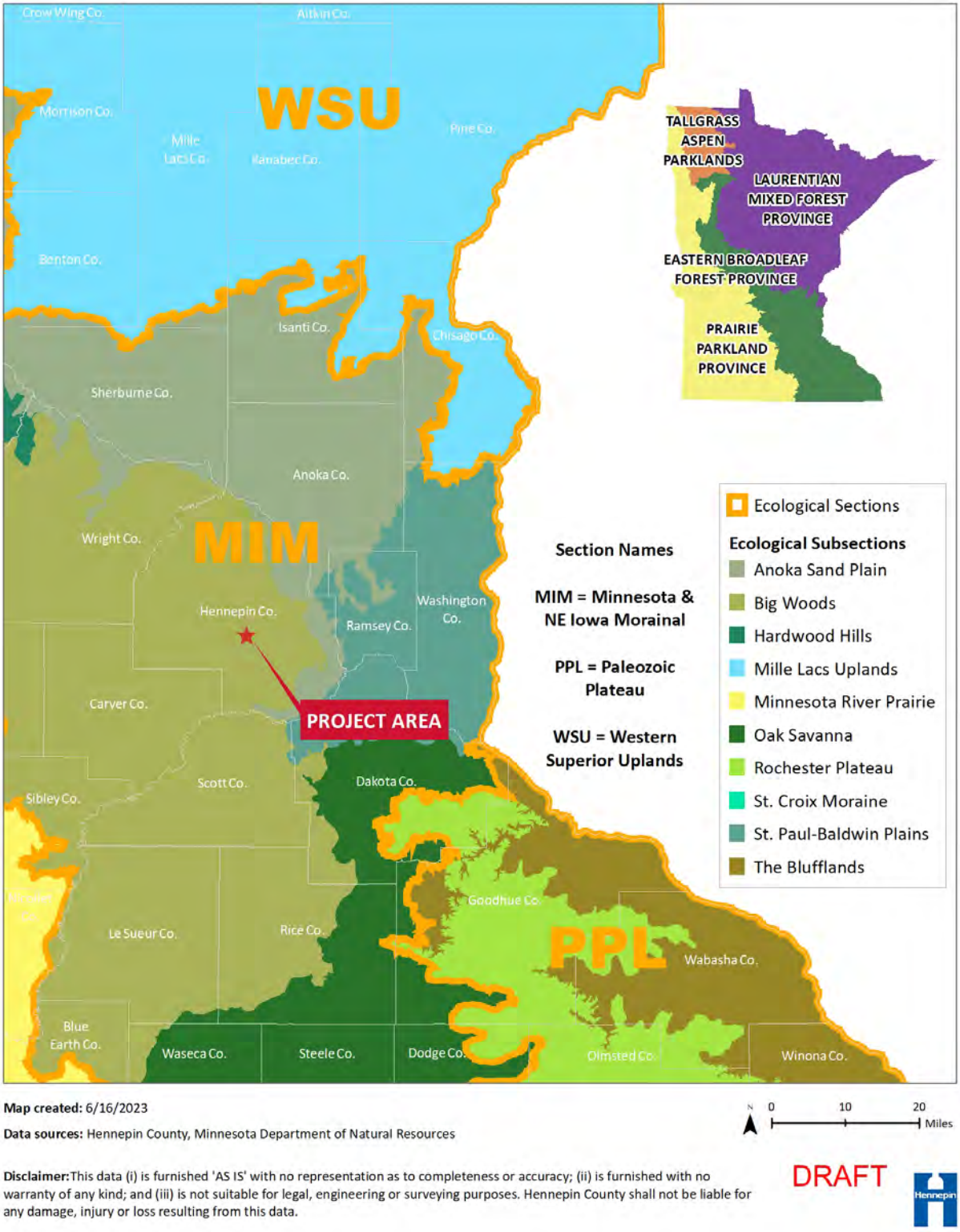


Figure 24: Ecoregion

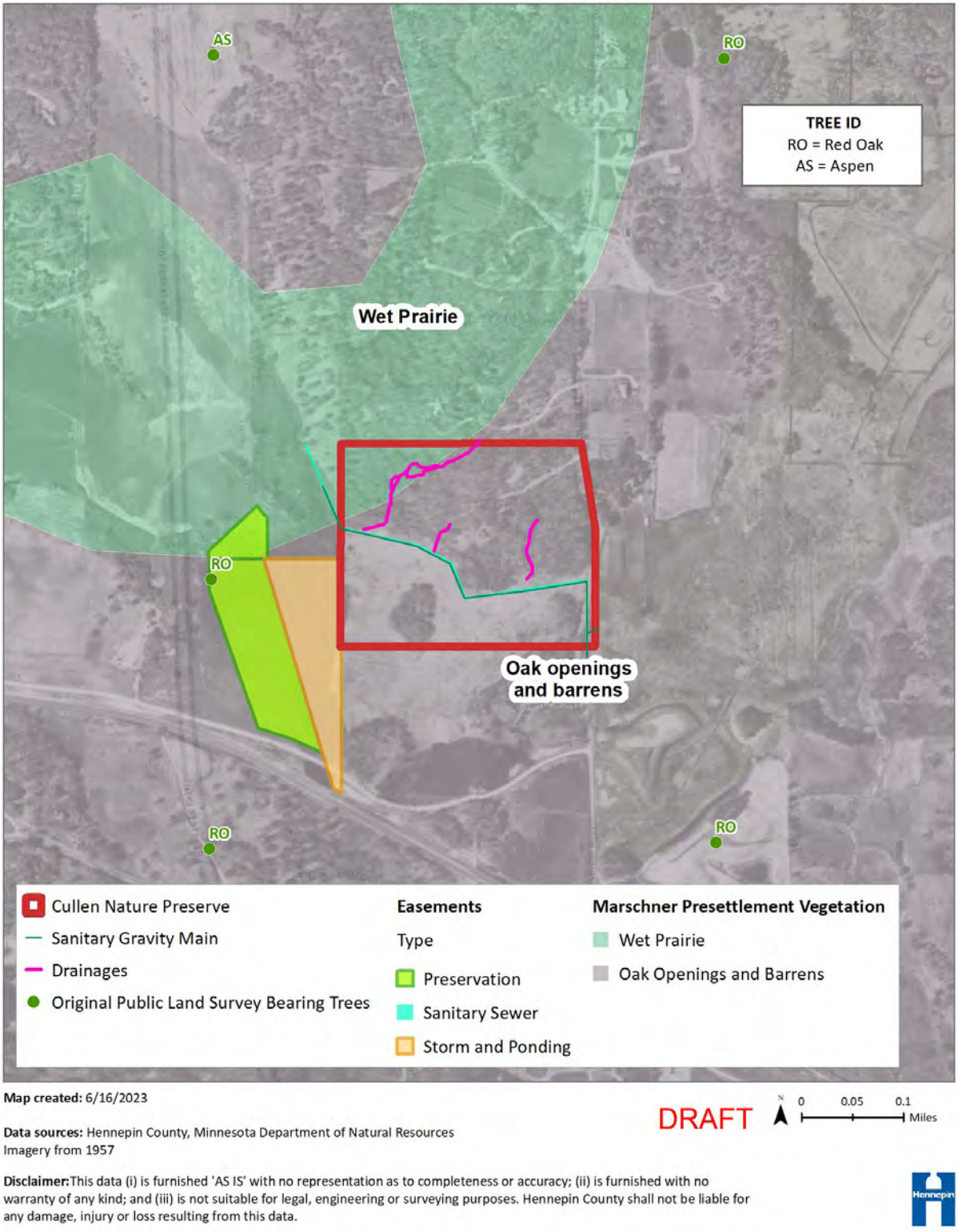


Figure 25: Historic Land Cover

Appendix F: Creating Habitat

Monitoring Wildlife

Monitor wildlife to determine if they are using habitat nest boxes or restored habitat, and if there are issues related to predators. Wildlife cameras and wildlife boxes may be available for monitoring from Hennepin County.

Creating and providing refuges and shelter

Snags and downed trees

- Leaving snags and downed decaying logs can provide habitat and refugia for many species.
- Snags are used by over 43 species of birds and 26 species of mammals in the Midwest. Both hard and soft (more decomposed) snags are used by wildlife.
- Snags can serve and nesting sites, foraging sites, and perching locations.

Turtle basking log

- 5-10 logs at least 6-inches in diameter can be placed along the pond margin with part of each log submerged and most of the log bottom touching the ground or water.
- Logs can also be placed within a pond, anchored by a large rock or brick.
- Place a large log half in and half out of the wetland. Turtles and birds will use it to bask and hunt from.
- Before placing anything in a wetland to make sure you have needed approvals related to state, local, and federal water rules.

Brush piles

- Brush piles can be placed in upland areas along the edges of woods. These piles should be a minimum of 12-15 feet in diameter and 5 feet tall.
- Piles can also be placed in shallow water (two feet or less) along the edge of a wetland. They are great for frog and salamander eggs.
- Construct piles of brush using DNR guidelines located here: https://erc.cals.wisc.edu/woodlandinfo/files/2017/09/WM-221.pdf

Rock piles

- Rock piles placed on the north side of the pond are great sunning sites for turtles
- Create a rock pile in an upland area away from the delineated wetland using large and medium sized rocks to create a refuge for reptiles, amphibians, and small mammals: https://www.wildlifecenter.org/sites/default/files/PDFs/backyard/Habitat%20Rock%20Piles.pdf

Create nesting habitat for pollinators

Some common stem-nesting bees and their nests

Leaf cutter bees (*Megachile*) - whole or chewed leaf plug, use hollow stems or dig into pithy stems.

Resin bees (*Heriades*) - resin plug, use hollow stems.

Mason bees (*Osmia*) - chewed leaf or mud plug, use hollow stems.

Small mason bees (*Hoplitis*) - chewed leaf plug, often pebbles, sometimes dig into pithy stems.

Small carpenter bees (*Ceratina*) - no plug, female guards nest end, usually dig into pithy stems.

Yellow faces bees (*Hylaeus*) - cellophane plug, use hollow stems.

Plants used for nesting

Scientific name	Common name
Agastache	hyssop
Andropogon gerardii	big blue stem
Arnoglossum atriplicifolium	pale Indian plantain
Artemisia	native sages
Asclepias incarnata	swamp milkweed
Baptisia australis	blue wild indigo
Echinacea	cone flowers
Eupatorium perfoliatum	common boneset
Cirsium	native thistles
Eutrochium	Joe Pye weeds
Helianthus	sunflower
Heliopsis helianthoides	smooth oxeye, early sunflower
Liatris	blazing stars
Monarda fistulosa	wild bergamot, bee balm
Panicum virgatum	switchgrass
Pycnanthemum	mountain mints
Ratibida pinnata	pinnate prairie coneflower
Rhus	sumacs
Rosa	roses
Rubus	raspberries
Sambucus	elderberry
Silphium perfoliatum	cup plant
Solidago	goldenrods
Sorghastrum nutans	indiangrass
Symphyotrichum	asters
Thalictrum	meadow rues
Vernonia fasciculata	prairie ironweed
Veronicastrum virginicum	Culver's root
Zizia aurea	golden Alexander

Plants listed are from surveys and observations of authors. Many more plants are likely hosts. Please share your observations of bee nests to help this list grow.

Content by Colleen Satyshur, Research Scientist and Elaine Evans, Extension Educator with contributions from Sarah Foltz Jordan, Xerces Society and Heather Holm. Photos by Heather Holm, Colleen Satyshur and Thea Evans.

For more information visit **www.beelab.umn.edu**

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ENVIRONMENT AND NATURAL RESOURCES TRUST FUND

Appendix G: Community Condition Guidelines

Community Conditions (Grade) are Identified based on the following guidelines (Guidelines generally follows MN DNR Condition Ranking Guidelines):

Plant community and land cover grade assignment guidelines

GRADE (QUALITY)	GUIDELINES FOR RANK ASSESSMENT
A (Excellent)	• They have species composition, structure, and ecological processes typical of the natural or historic range of the community and have been little degraded by recent human activity or non-indigenous species. • Species richness is high for the type of ecosystem and species of mature vegetation conditions are present (e.g., uncommon species). • Site has a natural water regime (hydrology), such as no evidence that natural water table levels have been altered by ditching, irrigation pumping, upslope gravel mining, water impounding, etc.
B (Good)	• They include plant communities with modest degradation or that were degraded in the past but have recovered and now have relatively natural composition and structure. B-rank communities normally will return to A-rank condition with protection or appropriate management. • Some evidence of ecologically disruptive disturbance or some indication of appropriate disturbance. Species richness may be high for the type of ecosystem, but some weedy and non-indigenous species are present and expected uncommon species are absent. • Hydrology is generally intact
C (Fair)	• They show strong evidence of human-caused degradation but retain some characteristic species and have some potential for recovery with protection and management. • Species richness is moderate too low for the type, few uncommon species are present. Weedy and non-indigenous plants are evident, but do not dominate any vegetation layer. • Wetland systems experience a noticeable bounce in water levels after normal rainfall; generally, the watershed has more than 20 percent agricultural plus developed lands, or runoff is partially controlled to pre-development levels.
D (Poor)	• The original composition and structure of the community have been severely altered by human-caused degradation or invasion by exotic species. They have little chance of recovery to their natural or historic condition. • Species richness is low for the type of ecosystem and uncommon species are absent. Weedy and non-indigenous species are a large part of the biomass in one or more vegetation layers (e.g., complete buckthorn coverage in the shrub layer). • Hydrology is heavily altered and beyond restoration due to ditching, impounding, landform alteration, highly impervious watershed, and fragmentation.

Appendix H: Observed Plant Species

bold=Introduced, noxious, or Non-native Species

Common Name	MN DNR Scientific Name
Forbs and Ferns	
Three-seeded mercury	*Acalypha rhomboidea*
Common Yarrow	*Achillea millefolium*
Red baneberry	*Actaea rubra*
Bishop's goutweed	***Aegopodium podagraria***
Purple giant hyssop	*Agastache scrophulariifolia*
White snakeroot	*Ageratina altissima*
Roadside agrimony	*Agrimonia striata*
Garlic mustard	***Allaria petiolaria***
Wild leek	*Allium tricoccum*
Hog peanut	*Amphicarpaea bracteata*
Thimbleweed	*Anemone*
Canada anemone	*Anemone canadensis*
Wood anemone	*Anemone quinquefolia*
Wood anemone	*Anemone quinquefolia*
Field pussytoes	*Antennaria neglecta*
Wild columbine	*Aquilegia canadensis*
Spikenard	*Aralia racemosa*
Burdock	***Arctium minus***
Jack-in-the-pulpit	*Arisaema triphyllum*
Saw-tooth wormwood	*Artemesia serrata*
Wild ginger	*Asarum canadense*
Poke milkweed	*Asclepias exaltata*
Common milkweed	*Asclepias syriaca*

Common Name	MN DNR Scientific Name
Lady fern	*Athyrium Filix-femina*
Yellow Rocket	***Barbarea vulgaris***
Hoary alyssum	***Berteroa incana***
Swamp/nodding beggarticks	*Bidens cernua*
Tall beggarticks	*Bidens vulgata*
Small-spike false nettle	*Boehmeria cylindrica*
Smooth Brome	***Bromus inermis***
Canada bluejoint grass	*Calamagrostis canadensis*
Marsh marigold	*Caltha palustris*
Hedge bindweed	*Calystegia sepium*
Creeping/European bellflower	***Campanula rapunculoides***
Pennsylvania bittercress	*Cardamine pensylvanica*
Mouse-ear chickweed	***Cerastium fontanum***
Maple-leaf Goosefoot	*Chenopodium simplex*
Water hemlock/ spotted cowbane	*Cicuta maculata*
Broad-leaved enchanter's nightshade	*Circaea lutetiana*
Canada thistle	***Cirsium arvense***
Field thistle	*Cirsium discolor*
Bull thistle	***Cirsium vulgare***
European lily of the valley	***Convallaria majalis***
Marestail/horseweed	*Conyza canadensis*
Canadian honewort	*Cryptotaenia canadensis*
Pointed-leaf tick-trefoil	*Desmodium (Hylodesmum) glutinosum*
Deptford pink	***Dianthus armeria***
Fern species	*Dryopteris spp.*
Willow herb	*Epilobium coloratum*
Pilewort	*Erechtites hieraciifolius*

Common Name	MN DNR Scientific Name
Philadelphia Fleabane	*Erigeron philadelphicus*
Prairie fleabane	*Erigeron strigosus*
Common boneset	*Eupatorium perfolatum*
Leafy spurge	***Euphorbia virgata***
Large-leaved aster	*Eurybia macrophylla*
Sweet scented joe-pye weed	*Eutrochium purpureum*
Woodland strawberry	*Fragaria vesca*
Wild strawberry	*Fragaria virginiana*
Showy orchid	*Galearis spectabilis*
Cleavers	*Galium aparine*
Northern bedstraw	*Galium boreale*
Fragrant bedstraw	*Galium triflorum*
Closed Bottle Gentian	*Gentiana andrewsii*
Wild geranium	*Geranium maculatum*
White avens	*Geum canadense*
Ground-ivy	***Glechoma hederacea***
Nodding stickseed	*Hackelia deflexa*
Virginia Stickseed	*Hackelia virginiana*
Woodland sunflower	*Helianthus strumosus*
Virginia waterleaf	*Hydrophyllum virginianum*
Common St. John's Wort	***Hypericum perforatum***
Jewelweed	*Impatiens capensis*
Nipplewort	***Lapsana communis***
Motherwort	***Leonurus cardiaca***
Butter and eggs	***Linaria vulgaris***
Lily-leaved twayblade	*Liparis liliifolia*
American gromwell	*Lithospermum latifolium*

Common Name	MN DNR Scientific Name
Bird's-foot trefoil	***Lotus corniculatus***
Creeping Jenny	***Lysimachia nummularia***
Purple loosestrife	***Lythrum salicaria***
Canada mayflower	*Maianthemum canadense*
False solomon's seal	*Maianthemum racemosum*
Starry false solomon's seal	*Maianthemum stellatum*
Ostrich fern	*Matteuccia struthiopteris*
White sweet clover	***Melilotus alba***
Yellow sweet clover	***Melilotus officinalis***
Bluntleaf Sandwort	*Moerhingia lateriflora*
Wild bergamot	*Monarda fistulosa*
Ghost pipe	*Monotropa uniflora*
White mulberry	***Morus alba***
Giant chickweed	*Myosoton aquaticum*
Sensitive fern	*Onoclea sensibilis*
Wooly sweet cicely	*Osmorhiza claytonii*
Southern Wood Sorrell	*Oxalis dillenii*
Wood Sorrel	*Oxalis spp.*
Yellow Wood Sorrel	*Oxalis stricta*
Pennsylvania Pellitory	*Parietaria pensylvanica*
Swamp smartweed	*Persicaria amphibia*
Nodding smartweed	*Persicaria lapathifolia*
Lady's thumb	***Persicaria maculosa***
Pennsylvania smartweed	*Persicaria pensylvanica*
Dotted smartweed	*Persicaria punctata*
Arrow-leaved tearthumb	*Persicaria sagitata*
American lopseed	*Phryma leptostachya*

Common Name	MN DNR Scientific Name
Black-fruited clearweed	*Pilea fontana*
Dwarf clearweed	*Pilea pumila*
Common plantain	***Plantago major***
Rugel's plantain	*Plantago rugelii*
Smooth Solomon's seal	*Polygonatum biflorum*
Common simplex	*Potentilla simplex*
White rattlesnake-root	*Prenanthes alba*
Heal-all	*Prunella vulgaris*
Little-leaf buttercup	*Ranunculus abortivus*
Hispid buttercup	*Ranunculus hispidus*
Hooked buttercup	*Ranunculus recurvatus*
Dooryard dock	***Rumex longifolia***
Bloodroot	*Sanguinaria canadensis*
Black snakeroot	*Sanicula canadensis*
Lance-leaf Figwort	*Scrophularia lanceolata*
Marsh scullcap	*Scutellaria galericulata*
Mad-dog skullcap	*Scutellaria lateriflora*
White campion	***Silene latifolia***
Blue ridge carrion flower	*Smilax lasioneura*
Bitter nightshade	***Solanum dulcamara***
Tall goldenrod	*Solidago altissima*
Canada goldenrod	*Solidago canadensis*
Zig-zag goldenrod	*Solidago flexicaulis*
Giant goldenrod	*Solidago gigantea*
Marsh hedge nettle	*Stachys palustris*
Aster spp.	*Symphyotrichum spp.*
Calico aster	*Symphytrichum lateriflorum*

Common Name	MN DNR Scientific Name
Common dandelion	***Taraxacum officianale***
American Germander	*Teucrium canadense*
Tall meadow rue	*Thalictrum dasycarpum*
Early meadow rue	*Thalictrum dioicum*
Rue anemone	*Thalictrum thalictroides*
Poison ivy	*Toxicodendron radicans*
Red clover	***Trifolium pratens***
White clover	***Trifolium repens***
Trillium	*Trillium*
Nodding trillium	*Trillium cernuum*
Prairie Trillium	*Trillium recurvatum*
Perfoliate horse gentian	*Triosteum perfoliatum*
Stinging nettle	*Urtica dioica*
Large-flowered bellwort	*Uvularia grandiflora*
Common mullein	***Verbascum thapsus***
Blue vervain	*Verbena hastata*
White vervain	*Verbena urticifolia*
White vervain	*Verbena urticifolia*
Common speedwell	***Veronica officinalis***
Thyme-leaf speedwell	***Veronica serpyllifolia***
Culver's Root	*Veronicastrum virginicum*
Periwinkle	***Vinca minor***
Yellow Violet	*Viola pubescens*
Common blue violet	*Viola sororia*
Violets	*Viola sororia*
Golden alexander	*Zizia aurea*

Common Name	MN DNR Scientific Name
Grasses, Sedges, Rushes	
Common Woodland Sedge	*Carex blanda*
Short-beak sedge	*Carex brevior*
Hairy wood sedge	*Carex hirtifolia*
Great Bladder Sedge	*Carex intumescens*
Pennsylvania sedge	*Carex pensylvanica*
Eastern Star Sedge	*Carex radiata*
Rosy sedge	*Carex rosea*
Sprengel's (Long-beaked) Sedge	*Carex sprengelii*
Awl-fruited sedge	*Carex stipata*
Orchard grass	***Dactylis glomerata***
Broad-leaved panic grass	*Dichanthelium latifolium*
Smooth crabgrass	***Digitaria ischaemum***
Bottlebrush grass	*Elymus hystrix*
Quackgrass	***Elymus repens***
Virginia wild rye	*Elymus virginicus*
Red fescue	***Festuca rubra***
Nodding fescue	*Festuca subverticillata*
Path rush	*Juncus tenuis*
Reed canary grass	***Phalaris arundinacea***
American common reed	*Phragmites australis subsp. americanus*
European common reed	***Phragmites australis subsp. australis***
Kentucky bluegrass	***Poa pratensis***
Foxtails	***Setaria spp.***
Narrow-leaved cattail	***Typha angustifolia***
Hybrid cattail	***Typha x hybrida***

	MN DNR Scientific Name
Shrubs	
Amur Maple	***Acer ginnala***
Barberry	***Berberis sp.***
Pagoda dogwood	*Cornus alternifolia*
Gray dogwood	*Cornus racemosa*
Red twig dogwood	*Cornus sericea*
Thornless hawthorn	***Crataegus crus-galli***
Burning bush	***Euonymus alatus***
Glossy buckthorn	***Frangula alnus***
Winterberry	*Ilex verticillata*
Non-native honeysuckles	***Lonicera spp.***
Tatarian honeysuckle	***Lonicera tatarica***
Common/European buckthorn	***Rhamnus cathartica***
Wild black currant	*Ribes americanum*
Gooseberry	*Ribes sp.*
Black locust	***Robinia pseudoacacia***
Black raspberry	*Rubus occidentalis*
Red-berried elder	*Sambucus racemosa*
Wolfberry	*Symphoricarpos occidentalis*
Nannyberry	*Viburnum lentago*
Guelder-rose	***Viburnum opulus var opulus***
Downy arrowwood	*Viburnum rafinesquianum*
Prickly Ash	*Zanthoxylum americanum*

Common Name	MN DNR Scientific Name
Trees	
Boxelder	*Acer negundo*
Red maple	*Acer rubrum*
Silver maple	*Acer saccharinum*
Sugar maple	*Acer sacchaum*
Hackberry	*Celtis occidentalis*
Green ash	*Fraxinus pennsylvanica*
Black walnut	*Juglans nigra*
Crabapple	***Malus sp.***
Ironwood	*Ostrya virginiana*
White Spruce	*Picea glauca*
Red pine	*Pinus resinosa*
Eastern white pine	*Pinus strobus*
Scotch pine	*Pinus sylvestris*
Cottonwood	*Populus deltoides*
Bigtooth aspen	*Populus grandidentata*
Trembling aspen	*Populus tremuloides*
Black cherry	*Prunus serotina*
Choke cherry	*Prunus virginiana*
White oak	*Quercus alba*
Northern pin oak	*Quercus ellipsoidalis*
Bur oak	*Quercus macrocarpa*
Red oak	*Quercus rubra*
Willow sp.	*Salix sp.*

Crack willow	***Salix X fragilis***
American basswood	*Tilia americana*
Red elm	*U. rubra*
American elm	*Ulmus americana*

Common Name	**MN DNR Scientific Name**
Vines	
American bittersweet	*Celastrus scandens*
Moonseed	*Menispermum canadense*
Woodbine	*Parthenocissus inserta*
Virginia creeper	*Parthenocissus quinquefolia*
Riverbank grape	*Vitis riparia*

Minnetonka Park Board Item 9
Meeting of October 11, 2023

Subject:	Information Items
Park Board related goal:	N/A
Park Board related objective:	N/A
Brief Description:	The following are informational items and developments that have occurred since the last park board meeting.

Park Restoration Projects – Purgatory, Hilloway, and Ford Park

Restoration and Maintenance Plans for Purgatory, Hillloway, and Ford Park were presented to the Park Board at the May 2023 meeting. These plans summarized current ecological conditions, identified and described target plant communities, mapped the division of labor (Staff, volunteers, contractors), and laid our restoration processes and stages for the next five years. These plans forward the concepts laid out in the Natural Resources Master Plan (NRMP) in regards to high priority areas and target plant community strategies.

Significant restoration work is underway at all three parks. Staff has performed forestry mowing and substantial removal of non-desirables woody species throughout the summer.

In Purgatory Park, staff has assisted in expanding current volunteer restoration areas on the west side of the park within the remnant short grass prairie and establishing oak savanna. Staff has contracted with Minnesota Native Landscapes to expand the existing areas under restoration in the previously identified high priority areas including the oak ridge and areas south of the creek. Contractor work is set to begin in October and extend into the winter. A new oak savanna area will begin to be established over the winter as the contractor removes a large stand of the non-native European poplar trees south of the oak ridge. Purgatory Park is also scheduled to have prescribed burns performed in the prairie and oak savanna areas this fall.

In Hilloway Park, staff has also contracted with Minnesota Native Landscapes and a similar schedule of work will occur, with removals beginning fall 2024. Staff will perform follow-up management over previously forestry mowed areas using techniques known as critical cuts and foliar over-sprays to control buckthorn resprouts.

At Ford Park, large scale areas of buckthorn were forestry mown and removed by hand. Temporary cover crops to control erosion and protect open soil from weeds has already been installed. In 2024, forestry staff will be working with Hennepin County staff to develop planting plans for the forest improvement as part of a significant grant partnership.

In all areas under active restoration, native seeding and on-going management will be performed throughout the 2024 growing season. A large lot of native seed mixes has been ordered and will be installed this fall in locations ready to accept seed by the volunteer cohorts throughout the park system.

Minnetonka Park Board Item 10
Meeting of October 11, 2023

Upcoming Meeting Schedule				
Day	**Date**	**Meeting Type**	**Agenda Business Items**	**Special Notes**
Wed	11/1/23	Regular	•	No meeting
Wed	12/6/23	Regular	• Strategic Plan • Purgatory Park Master Plan Review	
Wed	1/3/24	Regular	• Strategic Plan	
Wed	2/7/24	Regular	•	
Wed	3/6/24	Regular	•	
Wed	4/3/24	Regular	•	

Other meetings and activities to note:

Day	Date	Description	Special Notes
Friday	Oct. 27	Burwell Spooktacular	Burwell House/Grounds
Saturdays	Nov. 11, Dec. 9, Feb. 10	Winter Farmers Market	Minnetonka Community Center

Items to be scheduled: