



Natural Resource Management Plan  
for Seidls Lake Park  
South Saint Paul and Inver Grove Heights  
September 2023

# Table of Contents

Contacts .....	3
Landowners .....	3
Dakota County.....	3
Signatures.....	3
Landowner .....	3
Dakota County.....	3
Executive Summary .....	4
Natural Resource Assessment .....	4
Goals .....	5
Recommended and Prioritized Activities .....	7
Management Units .....	11
Estimated Costs .....	12
Summary of Property Ownership.....	12
Property Information .....	12
Restoration Funding Sources .....	12
Location and Landscape Context.....	12
Purpose of the Natural Resource Management Plan.....	13
Previous Natural Resource Management .....	14
Historical Land Use .....	14
Current and Adjacent Land Use .....	16
Current Land Features.....	17
Bedrock Geology .....	17
Surficial Geology .....	18
Topography .....	18
Aspect .....	18
Current Water Features .....	19
Groundwater .....	19
Surface Water .....	20
Soil Type .....	20
National Wetland Inventory .....	22
Wildlife .....	23
Vegetation .....	25
Land Cover Description of Current Conditions .....	25
Site Description & Recommended Plant Communities .....	27
Five-Year Work Plan .....	56
Other Considerations .....	66

Appendices .....	68
Appendix A: Observed Plant Species	68
Appendix B: Recommended Plant Species	71

## Contacts

### Landowners

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 Phone IGH: (651) 450-2500  
 Email: creller@ighmn.gov; bswoboda@ighmn.gov

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## Dakota County

14955 Galaxie Avenue, Apple Valley, MN 55124  
 Phone: 651-437-3191

## Signatures

### Landowner

As landowner of the property, we have reviewed and approve this Natural Resource Management Plan (NRMP). We agree to follow the guidelines included in this NRMP to manage the property. The NRMP will be used to develop a mutually acceptable Natural Resource Management Agreement (Management Agreement, MA) with the County to begin implementing the NRMP. Other applicable local, state, and federal laws and regulations not addressed within this NRMP will still be followed.

Name of Authorized Staff	Date

## Dakota County

Dakota County prepared and discussed this NRMP with the landowner. The County agrees to work with the landowner to use the NRMP as the basis for creating a jointly developed Management Agreement to implement the NRMP in a fair and reasonable manner. The County will assess and update the NRMP to assist the landowner in managing the property.

\_\_\_\_\_  
 Dakota County Staff

\_\_\_\_\_  
 Date

# Executive Summary

## General Property Description

Seidls Lake Park is a 37-acre park cooperatively owned and managed by the cities of South St Paul (7 acres) and Inver Grove Heights (30 acres) in northern Dakota County, Minnesota. The combined ownership and stewardship of the park necessitates the development of a comprehensive natural resources management plan that considers the natural resources as one system with management steps and objectives that can be completed by the municipalities cooperatively. This natural resource management plan (NRMP) has been developed to address that need.

The park is located southwest of the intersection of 4<sup>th</sup> Street and 13<sup>th</sup> Avenue South in South St Paul and north of Blaine Avenue in Inver Grove Heights. Woodlands with small pocket wetlands create the uplands of the park which surround Seidls Lake, a landlocked 6.5-acre DNR-protected waterbody. In addition to programmed park space at the south end of the park, a timber staircase crosses the steep topography within the southern woodland of the park and connects to a combined natural surface/paved trail on the east side of Seidls Lake. The trail will be improved, extended, and made ADA-accessible through work planned for 2023-2024.

As a complement to the planning and implementation of this infrastructure, this NRMP provides a detailed assessment of the natural resources in Seidls Lake Park, goals for natural resource improvement and restoration, and a set of recommended and prioritized activities to achieve these goals. These activities are organized by management units that have been developed for the park with divisions considering both municipal boundaries and differentiation in vegetation and land cover types. Costs associated with implementation of management activities across a 5-year timeline are provided.

## Natural Resource Assessment

The Natural Resources Assessment of Seidls Lake Park was conducted on September 26 and September 30, 2022. The assessment included preparatory aerial photo and map review of the park and surrounding area followed by an on-the-ground inventory of vegetation conditions, wildlife observations, evaluation of water resources, park infrastructure affecting natural resources, human use, and inspection for park misuse and erosion. Field notes, points of interest, draft management unit boundaries, and photos were recorded to document site conditions. Detailed plant species observations are included in Appendix A. This detailed assessment of natural resource conditions informs management goals listed in the following section.



Broadly, Seidls Lake Park can be described as a mature woodland encircling a small urban lake with small pocket wetlands. The secondary growth tree species— black walnut (*Juglans nigra*), green ash (*Fraxinus pensylvanica*), box elder (*Acer negundo*), Eastern cottonwood (*Populus deltoides*), pin oak (*Quercus ellipsoidalis*), and Siberian elm (*Ulmus pumila*)— are the dominant trees in the primarily closed canopy, but small open areas associated with the small wetlands or intentional clearing are present. As is common in many woodlands in the Upper Midwest, invasive species such as common buckthorn (*Rhamnus cathartica*), Tatarian honeysuckle (*Lonicera tatarica*), and garlic mustard (*Alliaria petiolata*) have greatly altered the respective shrub layer and herbaceous plant composition within the park. With dense shade and aggressive growth, these plants have displaced a more diverse understory typical of oak woodlands. Invasive earthworms, through rapid consumption of organic material in the soil profile, are contributing to both soil loss and the absence of conditions that would otherwise support a more abundant and diverse herbaceous plant community.



The vegetation and soil changes caused by invasive plants and earthworms (absence of a soil-stabilizing herbaceous layer and lack of soil organic matter) and the naturally steep topography of the park have contributed to soil loss and sheet and rill erosion. Areas of bare ground without vegetation or leaf litter are susceptible to sheet erosion during precipitation events, and where natural slope changes are present, the lack of fibrous root systems associated with herbaceous plants create conditions where gullies and washouts have formed. These destabilized soils have also contributed to erosion and rutting along natural surface trails within the park which has led to foot traffic around the areas of poor trail condition and trail widening.

Four wetlands occur within the park. Seidls Lake itself and the smaller wetlands to the west and south of the lake are classified as Shallow Open Water wetlands by the National Wetland Inventory based on data gathered between 2012-2015. The lake and the wetlands to its immediate west and south fall into the Non-Vegetated Aquatic Community type, and the southernmost wetland has a Shallow Open Water plant community. The plant community and other characteristics of the shoreline of Seidls Lake is indicative of highly fluctuating water and soil moisture levels including areas of bare ground and an abundance of smartweed (*Persicaria* species) which are early successional plants tolerant of soil moisture fluctuations.

Based on the natural resources assessment, the primary issues identified to be affecting the natural resource quality within the park are the abundance of woody and herbaceous invasive species, the associated lack of diversity within the plant communities, soil degradation and erosion, and water level fluctuations. The goals and prioritized activities in the following sections seek to address these primary issues.

## Goals

### **Goal 1: Reduce or eliminate invasive plants.**

At the root of several issues present in Seidls Lake Park is the abundance of invasive plant species. The two most abundant invasive plant species, common buckthorn (*Rhamnus cathartica*) and garlic mustard (*Alliaria petiolata*), have become dominant in the woodlands and displaced what would be a more diverse native plant community. Nearly monotypic stands of these species do not offer the myriad ecosystem services that native plants can provide. Common buckthorn does not provide floral resources for pollinators, the fruits of common buckthorn are not nutritious for bird species, and the dense thickets of buckthorn in the understory prevent wildlife movement and do not provide good cover. The dense shade that buckthorn creates leads to a sparse and low-diversity herbaceous plant community made up of only the most shade tolerant plants. A poorly vegetated understory with large areas of bare ground is susceptible to sheet and rill erosion. Buckthorn also increases soil nitrogen levels which foster increased weedy growth for species like garlic mustard. Buckthorn's aggressive growth and shading also prevent the germination and establishment of native shrub and tree species, and as a result, the tree canopy lacks recruitment of diverse species and becomes more evenly aged.

Similarly, garlic mustard has become well-established in the herbaceous layer at Seidls Lake Park. Garlic mustard's propensity for early and late season growth, tolerance for a wide range of light and soil moisture conditions, prolific seed production, and long-lived seed all contribute to its ability to become dominant in woodlands and wooded edges. Garlic mustard is also allelopathic, releasing chemicals into the soil to slow or prevent the growth of other plants, and may also inhibit the beneficial soil mycorrhizae which help tree roots take up water and nutrients. Garlic mustard takes advantage of early spring sun before trees are fully leafed out by flowering and setting seed before many woodland plants have entered flowering. For this reason, garlic mustard outcompetes native spring ephemerals and has drastically shifted woodland understories in the places it has become established.

Outside of the park woodlands, reed canary grass (*Phalaris arundinacea*) has become abundant. Typically, an invasive plant of wetlands and wet prairies, reed canary grass is tolerant of a wide range of soil moisture and is present in all open areas within the park including the pocket wetlands, the biofiltration basin at the southern edge of the park near

mowed turfgrass, and along the shoreline of Seidls Lake. Targeted removal of this species by repeated mowing and spot herbicide application will reduce the existing populations and prevent its spread by rhizomes and seed.

To a lesser extent, the presence of spotted knapweed (*Centaurea stoebe*) and round-leaf bittersweet (*Celastrus orbiculatus*) have also displaced native plants within the park, are diminishing associated ecosystem services, and have the potential to become well-established and spread to open niches as the removal of other invasive species occurs. Targeted removal of these two species will reduce the existing populations and prevent their spread to other areas of the park.

**Goal 2: Promote existing native plant communities.**

Diverse, native plant communities within the park provide wildlife habitat for a range of mammal, bird, and insect species, offer nectar resources for pollinators, create structural diversity that supports a wide array of habitats, stabilize soil by absorbing the force of rain and by holding soil in place with deep roots, store carbon, and support a thriving mosaic of plants for humans to steward and enjoy. These native plant communities have evolved with certain disturbance regimes, soil chemistries, soil fungi, and interactions with other species guilds, and ensuring that these conditions are sustained will lead to their long-term resilience. Support of existing native plant communities includes reducing invasive species, preventing new or reintroducing invasive species after eradication, preventing erosion and trampling with well-planned trail corridors, and maintaining historic disturbance regimes such as fire.

**Goal 3: Reestablish native plant communities.**

Where invasive species have been removed and where overall plant diversity is lacking, native plant communities can be reestablished. With guidance from the Field Guides to the [Native Plant Communities of Minnesota](#), species present in nearby reference locations, and remnant plant communities within the park, diverse native vegetation can be restored. Local ecotype seed suited to the site, herbaceous plant plugs, and bare root trees and shrubs are economical methods to reestablish native plants. Species selection, especially of trees, should be informed by recent research on the suitability of species given changing climate regimes. The planting of typical Minnesota-native and grown trees and shrubs can be supplemented with individuals grown in more southerly growth zones and/or species with native ranges to the south (assisted migration). Additionally, where native plant populations have persisted in the park and surrounding landscape, seed collection and redistribution of that seed can expand populations of species already well-adapted to the site. The reestablishment of native plant communities will greatly improve habitat, provide multiple ecosystem services, and be more resilient over the long-term.

**Goal 4: Plan and implement for climate resiliency.**

Minnesota's climate is changed and continues to warm, and precipitation events have become more frequent and extreme. In addition to the assisted migration of plant species considered native to the south, climate change mitigation can be incorporated into natural resource management. Preventing soil erosion during heavy precipitation and rapid snowmelt by establishing healthy plant communities, siting trails across gentle slopes, and promoting the development of soil organic matter will build resiliency during extreme precipitation. Related, understanding and responding to fluctuations in lake and wetland water levels caused by these events will assist in planning vegetation restoration and locating infrastructure. In addition to this resilience, preservation of both woodland and grassland native plant communities will foster carbon sequestration.

**Goal 5: Remediate existing erosion and prevent future erosion.**

The combination of steep topography, sandy loam soil types, and a discontinuous herbaceous layer in Seidls Lake Park make areas of the park prone to erosion. Deep gullies are present within the park, and portions of paved and natural surface trails have washed out during flood events. Soil movement into Seidls Lake causes turbidity, higher water temperatures, and in turn, algae blooms. Tied to the goals of reducing invasive species and reestablishing a native plant community, sheet and rill erosion and soil movement into lake would be reduced by a continuous herbaceous and

woody plant layer absorbing the force of raindrops and holding soil in place with deep roots. The senescence of plant material would also promote the development of soil organic matter over time and increase soil retention. Existing gullies and areas of less severe erosion could be targeted for planting and methods of erosion control such as bio logs, coconut fiber netting, check dams, erosion control barrier logs, and live staking.

**Goal 6: Develop a five-year implementation strategy and associated budget and develop a long-term natural resource monitoring and maintenance protocol.**

This natural resource management plan provides guidance for near-term restoration activities and associated costs by management unit. Activities that may be carried out by volunteers or municipal staff are identified, but typical costs for contracted labor are provided. This work is informed by on-the-ground site assessments, guidance of city staff, and successful implementation of these activities within similar ecological systems. In addition to short-term restoration, this plan also provides direction for the development of protocols for long-term natural resource monitoring and maintenance typical for these systems.

## Recommended and Prioritized Activities

The recommended activities for management of the natural resources within Seidl's Lake Park are centered on reduction and elimination of invasive plant species followed by reintroduction and reestablishment of native and climate-resilient plant species to transition the site toward sustaining native plant communities. Over time, these activities will improve habitat and reduce soil erosion and associated water quality impacts.

### **Invasive species reduction and elimination.**

Removal of established buckthorn and non-native honeysuckles and continual reduction or suppression of resprouts and new germinant plants will support the goal of their elimination within the park. Stands of mature buckthorn on flat hilltop areas in Units 4 North, 4 South, 10, and 9 could be forestry mowed when the ground is frozen. This is a relatively efficient and inexpensive method of removing buckthorn requiring minimal herbicide use. Forestry mowing shreds the buckthorn stump reducing its ability to resprout. Some stump sprouting will occur, and smaller diameter buckthorn, as well as newly germinating buckthorn, will persist after this treatment, and follow-up foliar herbicide treatments or goat grazing is necessary.

Goat grazing, a relatively novel method of managing smaller sapling-size buckthorn or buckthorn that has resprouted following initial removal, could be successfully utilized at Seidl's Lake Park. Goats should be deployed for two periods of grazing in the first and second years following initial buckthorn removal during which the goats will strip leaves and bark from small stems and resprouts in place of typical foliar application of herbicide. Goats are advantageous in the areas of steep terrain within the park because they can easily access these areas, create less soil disturbance than machinery or human foot traffic, and are very thorough. Goats are best used where native plant diversity is low and species loss is not a concern, which is the case in Units 1N, 1S, 4N, 4S, and 9. Additionally, most of the woodlands within the park exist on steep hills which preclude safe use of forestry mowers. In steep areas where remnant woodland native plant communities are to be protected (Units 10 and 11), buckthorn should be cut by hand flush to the ground in the fall while it is still actively growing, and a triclopyr-based herbicide should be applied to the cut stump. This method requires more time, and the cost is higher, but the result is also effective. Likewise, follow up treatments to manage smaller diameter buckthorn and new germinant plants are necessary but to protect native plants, judicious foliar herbicide treatment with triclopyr is best.

Initial removal of non-native honeysuckles and Siberian elm (*Ulmus pumila*) should be completed with the removal of buckthorn and concurrent follow-up herbicide treatments to manage resprouts. Non-native honeysuckles have similar growth patterns and habitat impacts as common buckthorn. Siberian elm's fast growth rate, high seed production, and high germination rate in favorable conditions can allow it to become dominant in disturbed and open habitats. Additionally, the leaf litter produced by Siberian elm may decrease germination and growth of competing species.

In tandem with manual removal or foliar herbicide application to manage resprouted invasive woody plants and new germinants, a simple graminoid (grass) seed mix should be installed after initial removal. The recommended species are silky wild rye (*Elymus villosus*), Canada wild rye (*E. canadensis*), Virginia wild rye (*E. virginicus*), bottlebrush grass (*E. hystrix*), switchgrass (*Panicum virgatum*), and fowl manna grass (*Glyceria striata*). These grasses are quick to establish, tolerant of shade, and are inexpensive enough to allow for high seeding rates and create quick cover after the disturbance of woody removal. The grasses stabilize bare ground, offer some habitat benefits, and can shade stumps and potential germinants of buckthorn reducing resprouting and the need for herbicide applications. With time and sustained reduction of buckthorn, it is recommended to introduce more diverse herbaceous and woody species to the site.

In conjunction with the removal of woody invasive species, removal of herbaceous invasive species should be undertaken. While weedy species such as common burdock (*Arctium minus*) and creeping Charlie (*Glechoma hederacea*) are present, garlic mustard (*Alliaria petiolata*) is ubiquitous throughout the park. Units 1 North and South, 4, 5, 8, 9, 10, 11, and 12 all contain garlic mustard in varying amounts; with the highest abundance is in Units 8, 9, and 10. Known small and discrete populations of garlic mustard can easily be hand-pulled by volunteers, park stewards, or park staff, while removal of larger stands of garlic mustard may necessitate mowing or hand-pulling by contractors. Where garlic mustard dominates the herbaceous layer, judicious use of a broadleaf herbicide is effective at quickly reducing large stands. As the shrub layer is opened up with the removal of invasive woody plants, garlic mustard and other weedy herbaceous plants will have increased sunlight and more growth advantage. As such, monitoring and response to new populations is key to eradication.

Within the park's woodland edges in Units 1 North and 1 South as well as the prairie Unit 6 and in small openings of other units, reed canary grass (*Phalaris arundinacea*) has taken a foothold. As with garlic mustard, increased sunlight with the removal of invasive woody plants will likely increase the size of these small populations. Targeting the currently small patches of reed canary grass now will negate the need for future intensive management. Because of reed canary grass's dense rhizomatic root system and phenology, a well-timed rhythm of mowing in spring and fall in combination with judicious spot herbicide application can be effective at reducing spread and eliminating existing patches.

Isolated populations of two especially problematic invasive species occur within Seidl's Lake Park: round-leaf bittersweet (*Celastrum orbiculata*) and spotted knapweed (*Centaurea stoebe*) occur in Units 11 and 7 respectively. Targeted removal of round-leaf bittersweet should be completed to reduce the chances of the plant spreading because of its ability to grow up and over native plants, blocking access to light, girdling trees, and making them more susceptible to ice and storm damage. It can establish large populations quickly due to its high levels of seed production, root suckering, and potential to hybridize with native American bittersweet. Because of round-leaf bittersweet's ability to aggressively regrow from the root, mechanical removal (pulling) must remove the entire root, which can be difficult. Mowing is only effective on small populations that can be mowed every two weeks during the growing season, and prescribed burning to remove the plant must be done annually in the spring, which is often infeasible or too frequent for adjacent native plant communities. A combined approach of cut stump herbicide application followed by foliar herbicide treatment of resprouts is the recommended method for management of the patch present at Seidl's Lake Park.

Spotted knapweed occurs on a south-facing hillside above the small wetland in Unit 7. Due to the steepness of this hillside, management of the plant should be done by municipal staff or through contracted labor. The slope's adjacency to water requires careful use of herbicide, and a selective herbicide such as aminopyralid is recommended to prevent off-target damage to grasses. Maintaining grass cover will stabilize the slope and help prevent reinvasion of knapweed from missed rosettes or germination from the seedbank. Monitoring this area for several years and appropriate follow-up management will be necessary.

#### **Hazard tree removal in trail corridors.**

Due to the abundance of green ash throughout the park and the advancement of emerald ash borer (EAB) across Dakota County, several diseased green ash trees are present along the trails and should be proactively removed to prevent park

user injury and damage to infrastructure. Green ash in areas of the park not accessible by trail can be retained for wildlife habitat. Removal of the hazard trees (approximately 15) could be combined with construction of planned trail improvements.

### **Reintroduction and reestablishment of native and climate-resilient plant species.**

In conjunction with the removal of invasive plant species, the establishment of native plant species within Seidls Lake Park is necessary to fill open plant community niches that are vulnerable to reinvasion and offer opportunities to create improved habitat. Revegetation in woodlands cleared of invasive woody plants should begin with the seeding of a simple graminoid mix containing quickly establishing species that will shade buckthorn seedlings and prevent germination and will also shade stumps that may otherwise resprout after cutting. These grass species include silky wild rye, Canada wild rye, Virginia wild rye, bottlebrush grass, switchgrass, and fowl manna grass. The reestablishment of an herbaceous layer will also create conditions suitable for effective prescribed burning in the future.

Once invasive woody plants are eliminated or considerably reduced, the reintroduction of both native shrubs and trees is recommended. The planting of bare root shrubs throughout the woodlands is cost effective, can rapidly create a shrub layer and provide wildlife cover, nesting habitat, and nectar and food resources. Also, once the understory is opened following invasive woody removal, the missing smaller size classes of native trees can be filled with either bare root trees or larger potted trees in key areas. Tree protection to prevent browse will be necessary.

Appendix B lists tree species recommended for restoration. In addition to these species, it is recommended to incorporate some tree species that are known to be climate change adapted. Recent research conducted by the U.S. Forest Service, Mississippi Park Connection, and further informed by data from private industry points to several tree species that are either native to the Twin Cities Metro area and highly adapted to the effects of climate change or native to more southerly (warmer and drier) growth zones and perform well within the Twin Cities Metro. Species from this list to consider for restoration at Seidls Lake Park include red maple (*Acer rubrum*), sugar maple (*Acer saccharum*), bitternut hickory (*Carya cordiformis*), hackberry (*Celtis occidentalis*), honeylocust (*Gleditsia triancanthos*), ironwood (*Ostrya virginiana*), white oak (*Quercus alba*), northern pin oak (*Quercus ellipsoidalis*), bur oak (*Quercus macrocarpa*), blackjack oak (*Quercus marilandica*), and northern red oak (*Quercus rubra*).

In addition to the restoration of woody plants, reintroduction of woodland herbaceous plants is recommended to create a more structurally diverse plant community, offer early season nectar resources for pollinators, stabilize erodible sandy soils with deep roots and the gradual addition of organic material as plants senesce. The establishment of native woodland plants can be phased and begin with small plantings near trails with subsequent plantings in areas where slope stabilization is needed. In less visible and less erodible areas where rapid establishment is less important, woodland seed mixes can be used instead to establish an herbaceous plant community.

Within the peripheral woodland edges, small openings at the south end of Seidls Lake, and surrounding the small wetlands, opportunities exist to reestablish habitat that differs from the woodlands of the park and create a more heterogenous landscape. Following removal of woody encroachment here and management of weedy species, the small grassland within Unit 6 lends itself to the establishment of a mesic or wet prairie. Cardinal flower, a wetland obligate species, is present in Unit 6 and suggests that this open pocket would support similarly moisture tolerant forbs such as marsh milkweed (*Asclepias incarnata*), common boneset (*Eupatorium perfoliatum*), spotted Joe pye weed (*Eutrochium maculatum*) and graminoid species such as Canada bluejoint (*Calamagrostis canadensis*), fowl manna grass (*Glyceria striata*) pointed broom sedge (*Carex scoparia*), and woolgrass (*Scirpus cyperinus*).

The prioritized activities for management of the natural resources within Seidls Lake Park are centered on protection of the remaining pockets of native plant communities and targeting the reduction and elimination of invasive plant species that are adjacent to these communities. A shared top priority is the reduction and elimination those invasive plant species that are most injurious to the site and the ecosystem services it may provide. Removal of invasive species is to be followed by reintroduction and reestablishment of native and climate-resilient plant species as noted in the previous section.

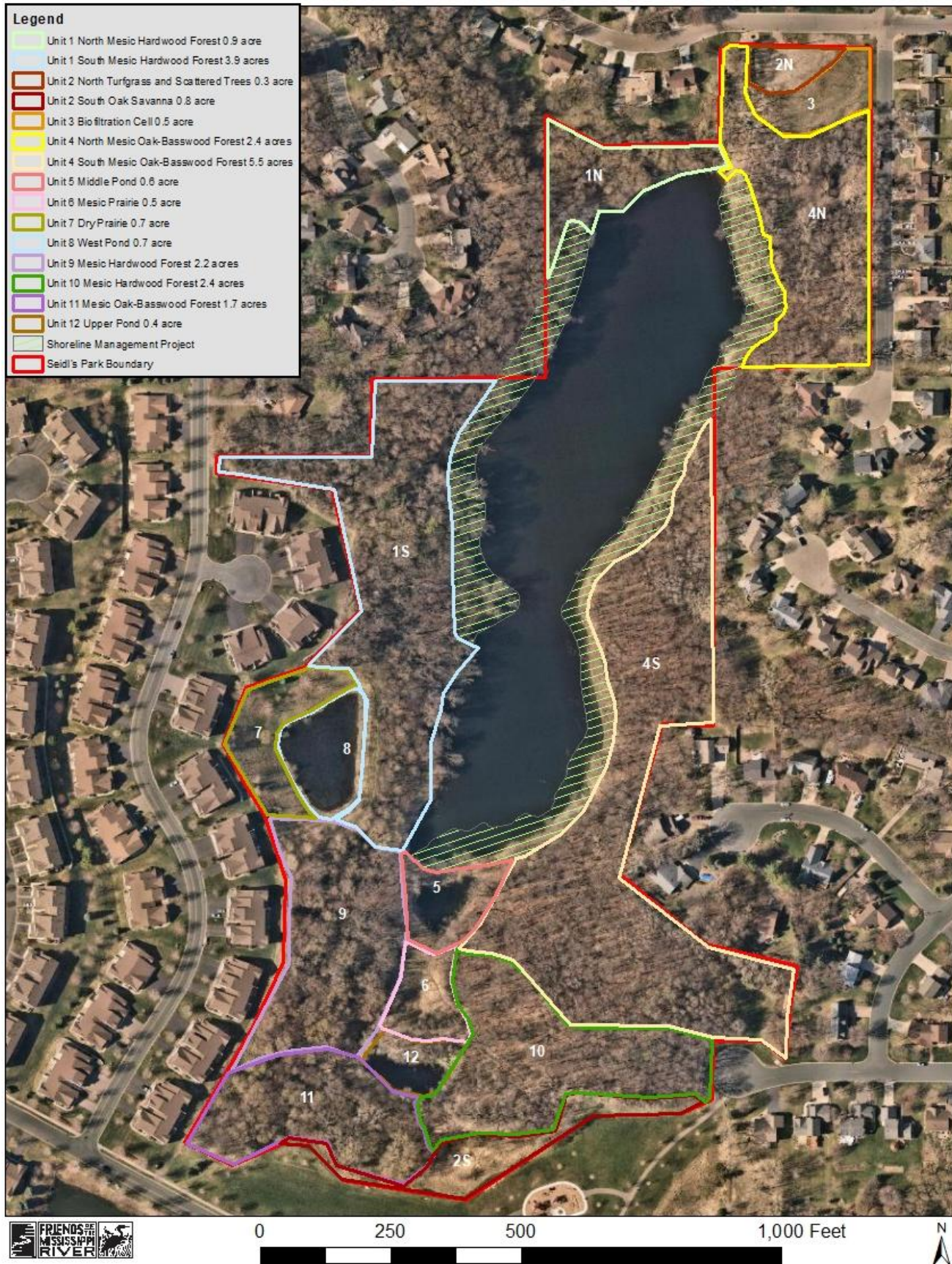


Due to the pervasiveness of common buckthorn throughout the site, and its considerable impact on native plant communities, habitat, soil erosion and degradation, and erosion, removal of this species is a high priority. If, due to budget or timing constraints, buckthorn removal within the park is to be phased, priority should be placed on management units where remaining pockets of native plant communities remain including Units 1S, 4S, 10, and 11. Secondly, buckthorn should be removed where it is more abundant and where native species are highly suppressed in Units 1N, 4N, and 9. As buckthorn is removed, Siberian elm also present in those units (Units 10 and 11) should also be eliminated. Revegetation of both herbaceous and woody species as previously described should be prioritized following invasive woody removal.

As this prioritized initial work is undertaken, reduction or elimination of those species that are minimal in abundance but have growth patterns that will likely cause significant habitat impacts. Removal of both round-leaf bittersweet in Unit 11 and spotted knapweed in Unit 7 should be targeted very early in restoration. Eliminating these two plants will prevent their spread to nearby native plant communities and the increased costs and resources to manage larger and more established populations.

As woody invasive species are reduced and eliminated, the abundance of invasive herbaceous species, such as garlic mustard, will likely increase as sunlight to the forest floor increases. Garlic mustard's growth patterns, high seed production, and long seed viability all point to the prioritization of its management in tandem or directly following invasive woody removal.

# Management Units



## Estimated Costs

The estimated costs for restoration of the management units over 5 years is summarized in the table below.

Management Unit Number	Cost Estimate
1 North	\$ 11,865
1 South	\$ 25,390
2 North	\$ 8,355
2 South	\$ 9,335
3	\$ 11,000
4 North	\$ 24,350
4 South (a)	\$ 26,615
4 South (b)	\$ 73,142
5, 8, and 12	\$ 21,619
6 and 7	\$ 11,207
<b>Total Cost Estimate</b>	<b>\$ 222,878</b>

Detailed cost estimates can be found in the Five-Year Work Plan. Estimated costs will be refined and finalized through a request for proposals from contactors.

## Summary of Property Ownership

### Property Information

Name: City of Inver Grove Heights, 8150 Barbara Avenue, Inver Grove Heights, MN and City of South St Paul, 125 3rd Avenue N, South St Paul, MN

Property Address: 2655 47<sup>th</sup> Street E, Inver Grove Heights, MN and 1415 4<sup>th</sup> Street S, South St Paul, MN  
Section 28, Township 28, and Range 22

Parcel Identification Numbers: 361990007010, 360280006010, 200281080010, 204400100011, 204402700010, 200281081011

Watershed: Lower Mississippi River Watershed Organization: Lower Mississippi River WMO

### Restoration Funding Sources

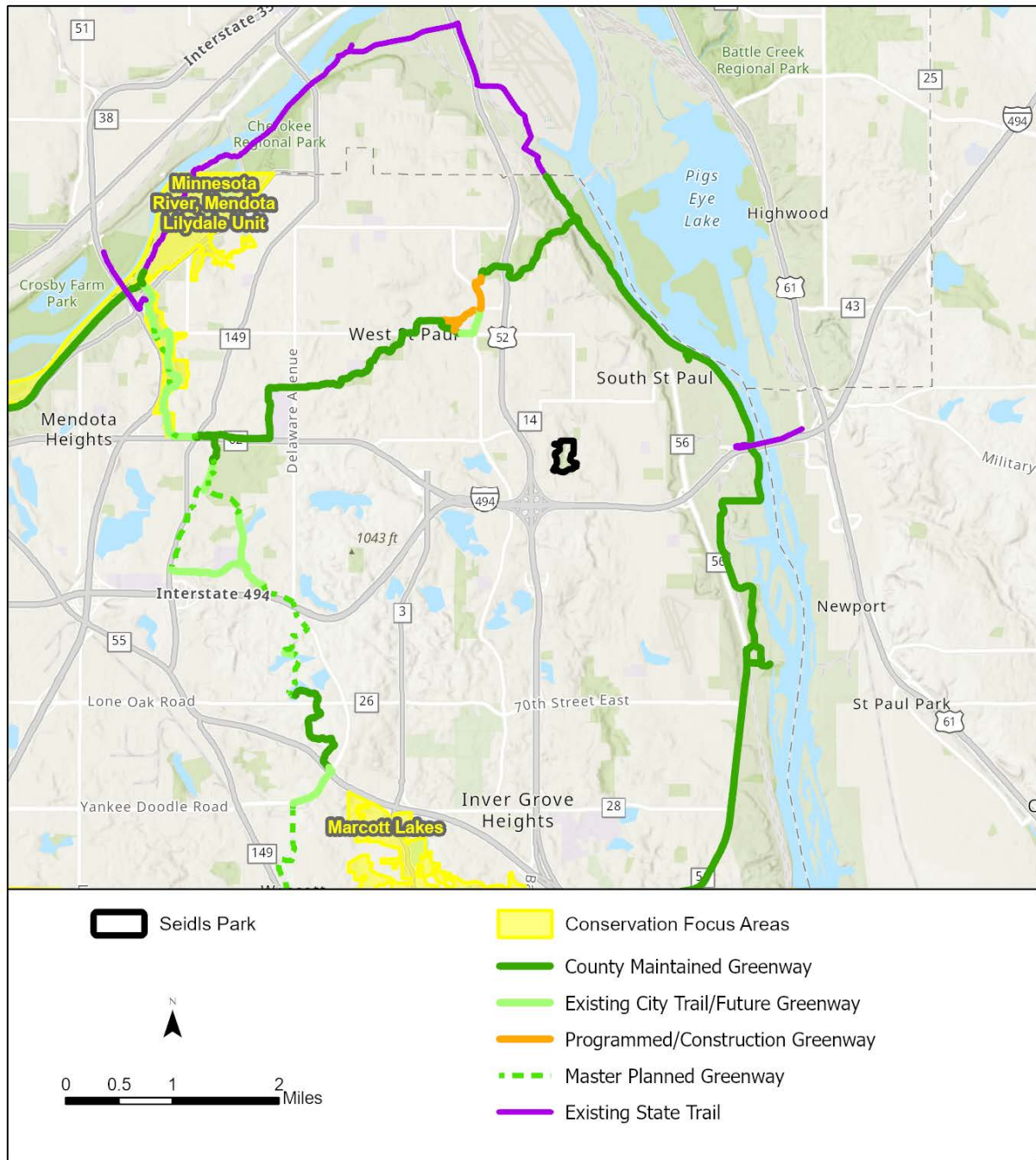
State Outdoor Heritage Fund and County Environmental Legacy Fund

## Location and Landscape Context

The property is in the Metro Region Eco-region as determined by the Minnesota Department of Natural Resources and in the [Click here to select option](#). Conservation Focus Area (CFA) identified in the 2020 Land Conservation Plan for Dakota County.



## Location within CFA



## Purpose of the Natural Resource Management Plan

The purpose of the Natural Resource Management Plan (NRMP) is to describe the existing natural resource conditions, goals, activities, and estimated costs for the property. The NRMP includes information on location; historic, existing, and adjacent land use; bedrock and surficial geology; soils; topography; groundwater and surface water; historic and existing vegetation; ecological impacts from land use, eliminated or restricted natural processes, invasive species, wildlife, disease, climate change, and other factors; plant communities and quality; and wildlife. Based on this information,

natural resource management goals and recommendations, including priorities are provided. The NRMP will be reviewed and updated every five years or as needed by the County to maintain its relevancy.

An initial five-year work plan describes restoration activities that will likely have the greatest ecological benefit relative to the resources required to implement the activities. Recommended activities generally include removing and controlling a growing list of invasive plant species, diversifying, and enhancing desirable vegetation and stabilizing streambanks or other eroding areas. Activities can then be completed by the Landowner, private contractors that specialize in ecological restoration, or conservation organizations.

A Joint Powers Agreement is then developed between the Landowner and the County to implement a mutually agreed upon workplan from the NRMP. Once the goals, priorities and mutual responsibilities are determined by the Landowner and the County, the County or one of its partners will issue a Request for Quote (RFQ) or Request for Bids (RFB) to potential contractors to implement the workplan. Based on contractor response to the RFQ or RFB and subsequent discussion between the Landowner and the County, the workplan describing the activities, schedule, respective roles and responsibilities, and cash or in-kind contributions of the Landowner, County or partners-is finalized. Landowner maintenance responsibilities for the duration of the JPA are also included.

## Previous Natural Resource Management

Three phases of infrastructure and associated restoration and habitat enhancements are in progress. Phase 1 included construction of the Seidls Lake Lift Station which was completed in the fall of 2021 and became operational in the spring of 2022. The lift station prevents high water conditions in Seidls Lake and associated damage to trails and infrastructure. Related to the ability to manage water levels in the lake, Phase 2 includes planned restoration and habitat improvements focused on the lake's shoreline and will be funded by a Conservation Partners Legacy grant of \$382,000. Phase 3 will reconstruct and extend the paved trail along the entire eastern side of the park and will be funded by a MNDNR Local Trail grant of \$250,000 awarded to the City of South St. Paul with the City of Inver Grove Heights as a project partner. Phases 2 and 3 will be designed and constructed concurrently. Specific natural resources management will include invasive woody species removal, improvement of lake overlooks, shoreland stabilization and plantings.

## Historical Land Use

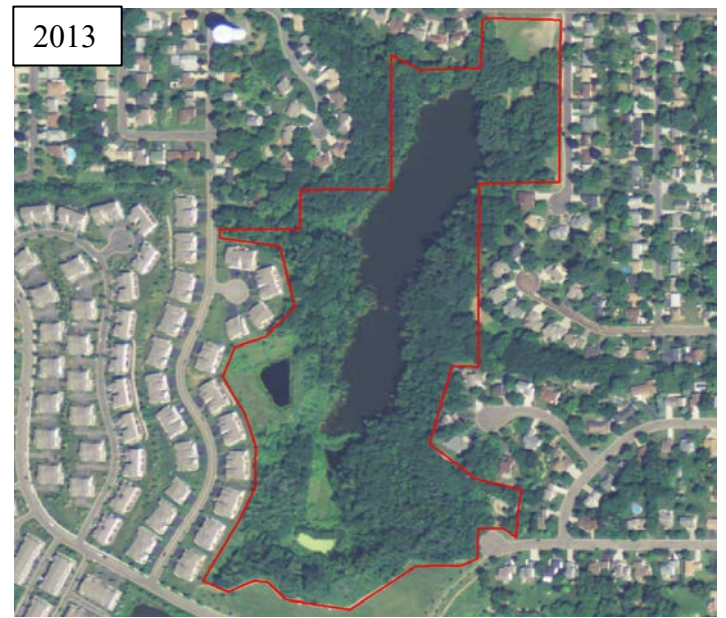
Prior to European colonization, natural processes and use by native peoples were the primary influences on the vegetation, water, and wildlife of the property. Following colonization, prairies were plowed, forests and woodlands cut, wetlands drained, fires suppressed, more intense agricultural practices introduced, including row cropping and livestock grazing, and industrial, commercial, and residential development expanded.

From the earliest aerial photographs (1937) to the present, the property was largely used for what appears to be tree farms and open space. The property was possibly grazed by livestock, as evidenced by the trails leading to the lake. The extent of open water waxes and wanes with time, but the lake is evidently larger in recent years. The park fills in with native trees with time.



1937





## Current and Adjacent Land Use

Current use of the Property directly affects existing vegetation, surface water, wildlife, and future management options for the Property.

Current use includes passive and active recreational use and stormwater management. Paved and natural surface trails within the park connect to adjacent neighborhoods and a playground at the park's southern extent. Seidls Lake receives stormwater that is managed by a biofiltration cell at the park's northeast corner.

Adjacent land use can also affect vegetation, surface water and wildlife management options for the Property, and may present opportunities to enlarge existing natural areas, create wildlife corridors and improve surface and groundwater.



Adjacent land use is entirely residential with both single-family homes and townhomes in the immediate vicinity. Backyards of these homes line the park boundary with some plant communities within the park being continuous with residential landscapes. Invasive species removal undertaken in the park should consider the presence of invasive species on adjacent parcels and the potential for management to extend beyond the park's boundaries.

## Most Recent Aerial Photo



## Current Land Features

### Bedrock Geology

Ancient oceans, beaches, reefs and mudflats, sand and clay, and marine animals were compressed over time and formed a variety of sedimentary rock layers (bedrock), with different depths and characteristics. In Dakota County, the type and depth of bedrock is important because the resulting layers contain groundwater, which is a primary source of drinking water for County residents. Although the soils and upper bedrock layers can be effective biological and chemical filters, groundwater quantity and quality are dependent on careful land use practices.

The major bedrock units found in Dakota County (County) include the Decorah, Platteville, Glenwood Sequence, underlain by St. Peter Sandstone, Prairie du Chien Group, Jordan Sandstone, St. Lawrence Formation, and the Franconia

Formation. Some of these layers may not exist at the Protected Property because of past geologic events. Bedrock in the County is typically more than 50 feet below the surface in areas north of the Vermillion River and less than 50 feet in areas south of the Vermillion River. In the County, the Prairie du Chien limestone is the most common bedrock first encountered beneath the surface, soil and unconsolidated sediments. Bedrock is important because its layers create the underground aquifers where groundwater is stored. As the primary source of drinking water for County residents, it is critical that the quantity and quality of this water is managed and protected.

## Surficial Geology

Dakota County was once covered by a series of advancing and retreating continental ice sheets, or glaciers. The glaciers directly and indirectly removed bedrock and deposited materials on top of the bedrock to form the surface features we see today.

The County has a very diverse surficial geology that created a very scenic and ecologically diverse landscape. The most recent glaciers extended south into the northern portion of the County and the resulting terminal moraines are characterized by a typical “knoll and basin” topography. South of these moraines, the rock surface is quite irregular. In some places, the softer rock was worn down and is much lower than the more resistant rock layers. This has created areas with isolated, mesa-like uplands, 100 to 200 feet above the surrounding land. Glacial deposits have partially concealed these uplands and covered their surfaces with only a thin layer of glacial drift. In some areas, especially the Minnesota and Mississippi River valleys, level alluvium and terrace deposits were formed by glacial rivers and contemporary floods. More level outwash plains, south of the moraines and north of the uplands, formed from melting glaciers and characterize much of the central portions of the County.

The surficial geology of the Protected Properties is important because it is a highly influential factor in determining site characteristics, such as topography, soil type, soil drainage, and floral structure and community composition. The Surficial Geology map indicates that the Superior Lobe Cromwell formation is present as till, lake sand and silt and ice-contact stratified deposits. Based on well records for sealed water wells (MN Well and Boring Sealing number H1564274 and H215078) and on or near the Protected Property the thickness of the glacial material ranges from 145 to 205 feet. There are no known or suspected unsealed wells associated with these properties.

## Topography

The land surface, whether it is level or covered by rolling or steep hills and valleys is an important factor in the development and formation of soil, past and future soil erosion, existence of water features, and the type and stability of vegetation that will grow in a given location. In general, more topographic variation will result in more complexity and diversity of vegetation communities and hydrologic features.

The Property is essentially a depression that is oriented north to south surrounded by steep east- and west-facing slopes. There are flatter areas on the periphery of the property.

## Aspect

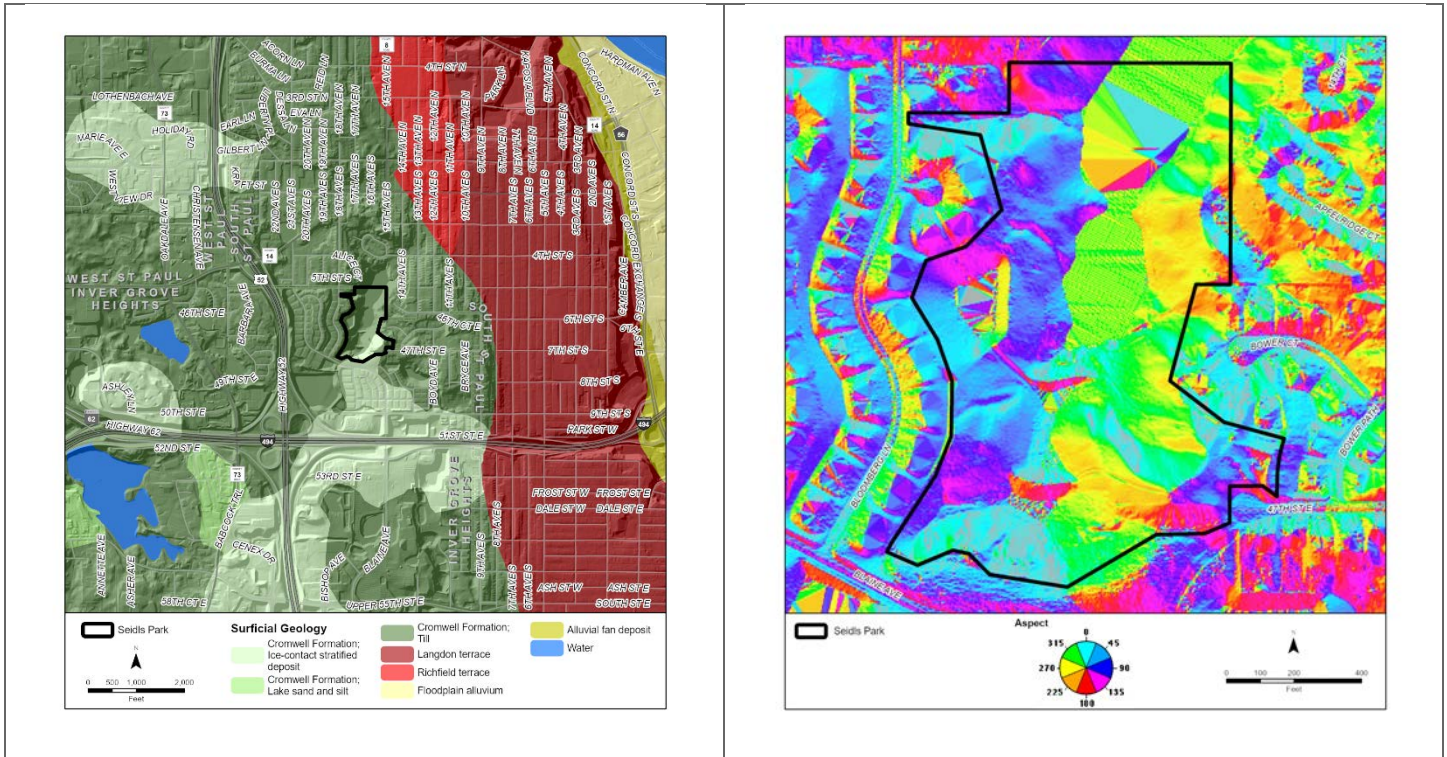
The directional orientation of slopes (aspect) can have a strong influence on soil temperature and moisture. In the northern hemisphere, north-facing slopes are often shaded, while south-facing slopes receive more solar radiation for a given surface area. As a result, soil temperatures and moisture on south-facing slopes are typically warmer and drier than those on north-facing slopes, in part, due to the increased solar radiation and direction of the prevailing winds in the summer. Soils on north-facing slopes tend to be cooler and wetter, due to diminished solar energy.



Surrounding the lake, the Property has a southern aspect (to the north of the lake), western (to the east), northern (to the south), and east-facing (to the west of the lake). It would be expected that the west- and south- facing slopes will be drier than the other slope aspects. That is seen in the second map below.

## Topography - Percent Slope

### Aspect



## Current Water Features

### Groundwater

Groundwater accumulates below the surface of the land and is stored in aquifers: complex, underground geologic layers of sand, gravel, and porous rock. Given groundwater's importance and potential vulnerability, it is important to be aware of the potential for groundwater contamination from activities at the surface. Factors to consider during natural resource management activities are depth to groundwater and the ability of the overlying geologic materials to protect the groundwater aquifer. Infiltration rates are based on the texture of surficial geology and soil type. The travel time varies from hours, days, months, even up to one year.

Due to its relative abundance, quality and reasonable access, groundwater provides drinking water for the majority of County citizens, irrigation water for agricultural crops (especially on the sandier soils in the eastern part of the County), and process and cooling water used by industrial and manufacturing companies. The amount of available groundwater appears to be stable, but there is growing concern about the supply of groundwater, due to increased agricultural irrigation, suburban water use, changing climate, and improved information on the role of groundwater to ecological systems like trout streams. At the same time, most of the County's groundwater is "highly sensitive" to surface



contamination. And once an aquifer is polluted, it is very expensive or prohibitive to improve its quality to drinking water standards.

Given its importance and potential vulnerability, it is important to be aware of the potential for groundwater contamination from pesticide and herbicide use. Factors to consider during natural resource management activities are depth to groundwater and the ability of the overlying geologic materials to protect the groundwater aquifer.

The DNR defines groundwater sensitivity as an area where natural geologic factors create a significant risk of groundwater degradation through the migration of waterborne contaminants. Migration of contaminants dissolved in water through unsaturated and saturated sediments is affected by many things, including biological degradation, and contaminant type and density. General assumptions include:

- Contaminants move conservatively with water
- Flow paths are vertical
- Permeability of the sediment is the controlling factor

Infiltration rates are based on the soil type and the texture of surficial geology. The pollution sensitivity of Prairie du Chien represents the approximate time it takes for water to move from land surface to the Prairie du Chien aquifer. The Property is mapped as either Moderate or High-Moderate with travel times to the Prairie du Chien ranging from years to decades.

## Surface Water

One of the unique, attractive, and important features of Dakota County is the amount and diversity of its surface waters. Major river systems, creeks and streams, reservoirs and lakes, and open wetlands are found throughout the County. Over time, most of these surface waters have been significantly degraded due to changes in the type, location and extent of agricultural use, and development.

The Property is in the [Click here to select option from drop-down menu](#). Watershed which drains to the [Click here to select option from down-down menu](#). River.

## Soil Type

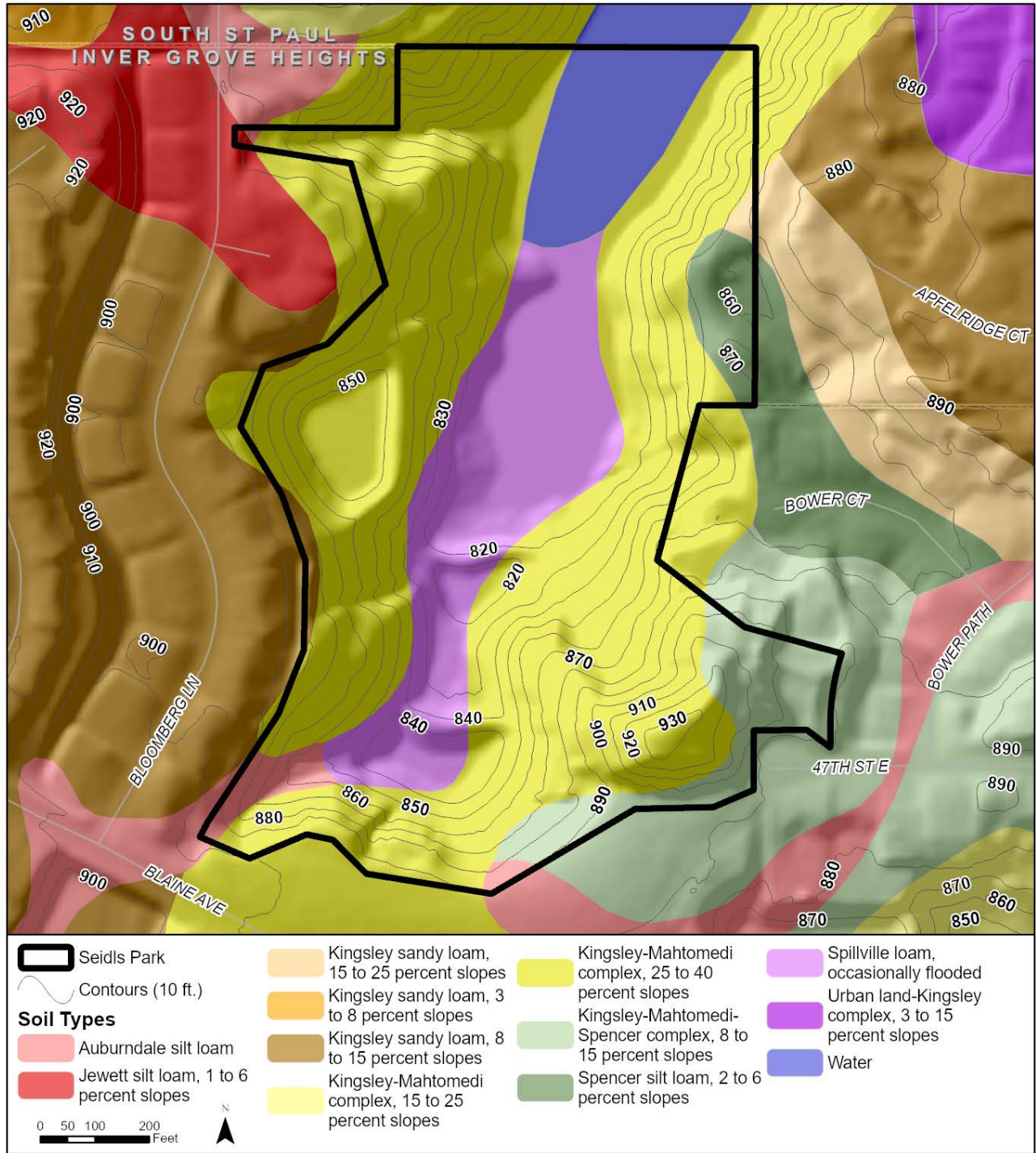
soils are the result of geologic, biologic, and hydrologic processes over time. Extensive work has been undertaken to identify and classify soils throughout the County. Soil types and depth have significant effects on existing and future vegetation.

The primary soils found within the Property are Kingsley-Mahtomedi Complex in the uplands and Spillville Loam, occasionally flooded.

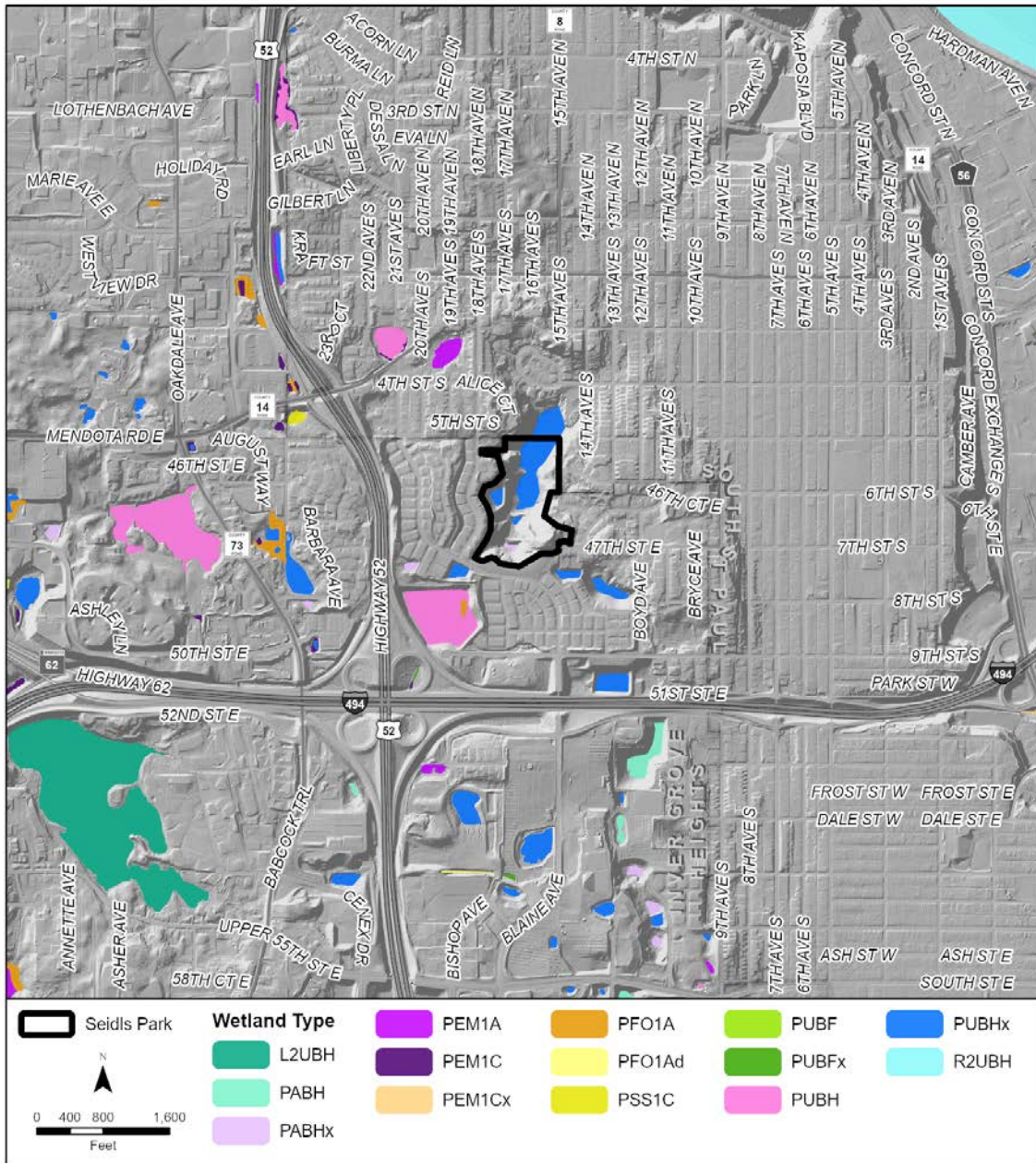
Mahtomedi Series: Consists of very deep, excessively drained, rapidly permeable soils formed in sandy outwash of Late Wisconsinan Age on glacial moraines and outwash plains. These upland soils have slopes ranging from 0 to 45 percent.

Kingsley series: Consists of very deep, well drained soils that formed in loamy glacial till on glacial moraines. These soils have moderate over moderately slow permeability. Slopes range from 2 to 40 percent.

Spillville series: Consists of very deep, moderately well drained or somewhat poorly drained soils formed in dark colored, medium-textured alluvium. Spillville soils are on nearly level flood plains and gently sloping slopes on uplands.



# National Wetland Inventory



Description for code PUBHx:

P System PALUSTRINE: The Palustrine System includes all nontidal wetlands dominated by trees, shrubs, emergents, mosses or lichens, and all such wetlands that occur in tidal areas where salinity due to ocean derived salts is below 0.5 ppt. Wetlands lacking such vegetation are also included if they exhibit all of the following characteristics: 1. are less than 8 hectares ( 20 acres ); 2. do not have an active wave-formed or bedrock shoreline feature; 3. have at low water a depth less than 2 meters (6.6 feet) in the deepest part of the basin; 4. have a salinity due to ocean-derived salts of less than 0.5 ppt. Subsystem :



UB Class UNCONSOLIDATED BOTTOM: Includes all wetlands and deep-water habitats with at least 25% cover of particles smaller than stones (less than 6- 7 cm), and a vegetative cover less than 30%. Sub-class: Modifier(s): H WATER REGIME Permanently Flooded: Water covers the land surface throughout the year in all years.

x SPECIAL MODIFIER Excavated: Lies within a basin or channel that have been dug, gouged, blasted or suctioned through artificial means.

## Wildlife

Dakota County is very ecologically diverse with a wide variety of wildlife habitat types. Coupled with abundant water resources, these habitats support many associated wildlife.

The following are relatively common species that are dependent on grassland, wetland and/or wooded habitat. Not all these species would be expected at any given site. Presence/absence can depend on multiple factors, including size and shape of habitat, proximity to other habitat types, degree of isolation, and structural and species diversity.

MAMMALS	
Bats - Big and Little Brown	Beaver
Chipmunk	Coyote
Fox, Gray and Red	Woodchuck
Eastern Cottontail	Deer Mouse
Northern Pocket Gopher	Meadow Vole
Mink	Eastern Mole
Muskrat	Raccoon
Short-tail Shrew	Squirrels - Gray and Red
Thirteen-lined ground squirrel	Short-tailed Weasel
Opossum	White-tailed Deer
BIRDS	
Canada Goose	Mallard
Wild Turkey	Great Blue Heron
Red-tailed Hawk	American Coot
Rock Pigeon	Mourning Dove
Owls- Barred and Great-horned	Ruby-throated Hummingbird
Woodpeckers - Downy, Hairy and Red-bellied	Blue Jay
American Crow	Black-capped Chickadee
White-breasted Nuthatch	House Wren
American Robin	Gray Catbird
European Starling	Cedar Waxwing
Common Yellowthroat	Sparrows – Chipping and Song
Northern Cardinal	Rose-breasted Grosbeak
Indigo Bunting	Red-winged Blackbird
Common Grackle	Brown-headed Cowbird
Baltimore Oriole	House Finch
American Goldfinch	House Sparrow
REPTILES	
Garter Snake	Red-bellied Snake
Painted Turtle	Snapping Turtle

AMPHIBIANS	
American Toad	Leopard Frog

The following are relatively uncommon species that are **Indicator Species** for larger, higher quality habitat areas:

MAMMALS - Grasslands	
American Badger	Franklin's Ground Squirrel
Plains pocket gopher	Prairie Vole (Species of special concern)
BIRDS - Grasslands	
Red-headed Woodpecker	American Kestrel
Eastern Kingbird	Loggerhead shrike (Endangered, SGGN)
Horned Lark	Tree Swallow
Northern rough-winged Swallow (SGCN)	Barn Swallow
Eastern Bluebird	Clay-colored Sparrow (SCGN)
Field Sparrow	Lark Sparrow
Savannah Sparrow (SPC)	Grasshopper sparrow (SCGN)
Henslow's sparrow (Endangered, SCGN)	Dickcissel (SGCN)
Eastern Meadowlark (SGCN)	
BIRDS - Forest or Woodlands	
Brown Thrasher	Eastern Towhee
Scarlet Tanager	Orchard Oriole
BIRDS - Wetlands	
Sedge Wren	Sora
Yellow-headed Blackbird	
REPTILES - Grasslands	
Bull snake (SPC)	Eastern racer (SPC, SGGN)
Plains (western) hognose snake (SPC)	Prairie skink
Six-lined racerunner (SGGN)	Smooth Green Snake (SGGN)





# Vegetation

The types and quality of vegetation found on the Property is determined by the many factors previously described in the Plan. Natural succession, or the gradual change in structure and species composition, occurs as the vegetation changes and naturally modifies in response to changes in various environmental variables (light, water, and nutrients) over time. These modifications change the variety of species most adapted to grow, survive and reproduce in an area and create slow and broadly predictable vegetative changes. High winds, flooding, drought, and wildfires can change the vegetation structure and composition very quickly and for long time periods. Human caused changes such as cultivation, grazing, and tree clearing will also have direct and indirect impacts on vegetation.

The effects of disturbance and succession can vary widely. Different areas will be at varying developmental stages, due to diverse local histories – particularly since the time of any last major disturbance. These conditions interact with inherent environmental variability (e.g., soils, climate, topography, etc.) to create a mosaic of vegetation in various conditions across the Property and the larger landscape.

## Land Cover Description of Current Conditions

The Minnesota Department of Natural Resources (DNR) developed a system called the Minnesota Land Cover Classification System (MLCCS), which integrates cultural and vegetative features of the landscape into one comprehensive land cover classification system. Based on changes in land use and plant communities over time, some of the classifications were updated to reflect current conditions.

MLCCS consists of five hierarchical levels that are reflected in the five-digit classification code. At the most general level, land cover is divided into either Natural/Semi-Natural cover types or Cultural cover types. The Cultural classification system is designed to identify developed areas impervious to water and vegetation patterns.

Level 1 - General growth patterns (e.g., forest, woodland, shrubland, etc.)

Level 2 - Plant types (e.g., deciduous, coniferous, grasslands, forbs, etc.)

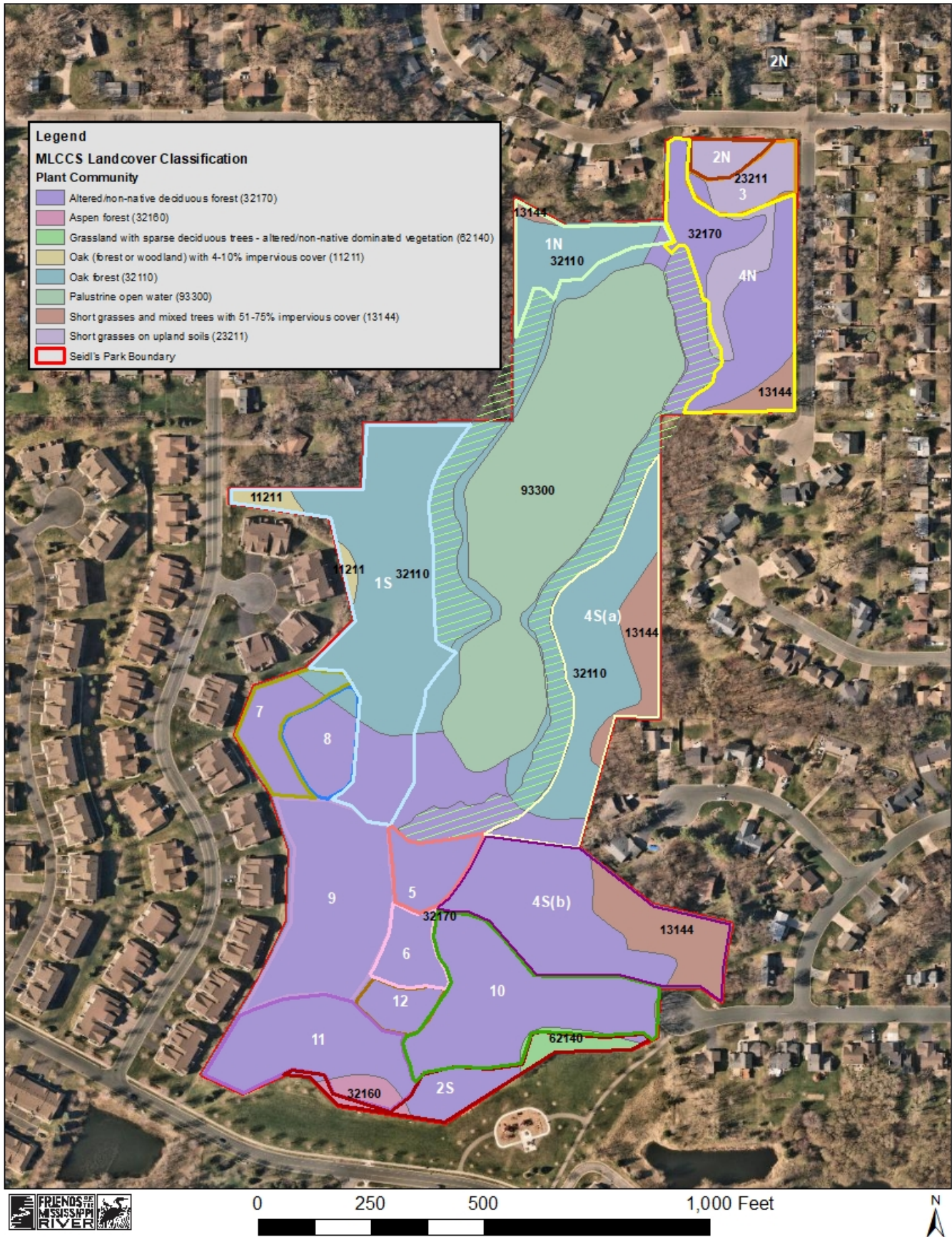
Level 3 - Soil hydrology (e.g., upland, seasonally flooded, saturated, etc.)

Levels 4 & 5 - Plant species composition, (e.g., floodplain forest, fen sedge, jack pine barrens, etc.)

The current MLCCS land cover of Seidl's Lake Park is predominantly "Altered non-native deciduous forest" in the northern and southern portions of the park and "Oak Forest" in the areas west and east of Seidl's Lake. With some nuance, these land cover classifications are accurate. The tree canopies in the northern one-quarter and southern one-third of the park are dominated by native tree species common in secondary growth forests (not old-growth forests). Green ash, black walnut, box elder, Eastern cottonwood, and pin oak are the most abundant tree species. Other oak species (bur, white, and red) are present but are not the dominant tree species. In much of the park's woodlands, common buckthorn dominates the shrub layer; buckthorn is suppressed only in canopy openings, wetlands, and where black walnut's allelopathy prevents its growth. Small openings associated with wetlands or the small, degraded grassland at the south end of Seidl's Lake maintain some native plant communities but are lacking in species diversity or structural diversity.

Soils within the woodlands are sandy loams that are fairly or somewhat well-drained, but the high degree of soil organic matter consumption by invasive earthworms has led to several areas of erosion and deep gullies. Earthworms have also greatly altered the herbaceous plant community. Many native species are present in the herbaceous layer, but there is a lack of abundance, cover, and species diversity. Soils within the wetland pockets are typically loams of types that can be occasionally flooded. Vegetation is consistent with these soil and moisture conditions and includes several native wet meadow and wet prairie species.

# Land Cover of Property



# Site Description & Recommended Plant Communities

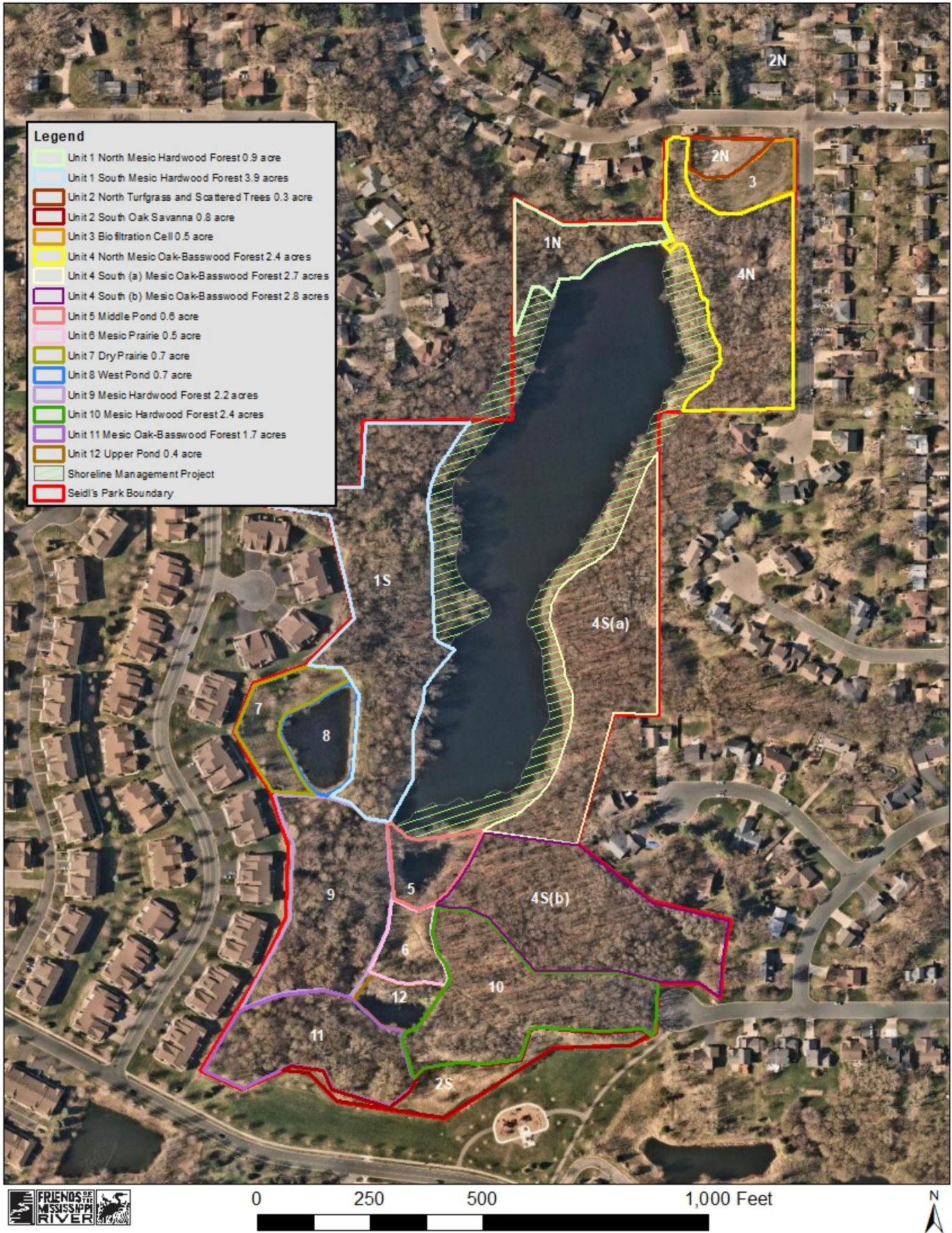
A site evaluation was conducted by Friends of the Mississippi River on Monday, September 26 and Friday, September 30, 2022.

Seidls Lake Park can be described as a mature woodland encircling a small urban lake with small pocket wetlands. The secondary growth tree species— black walnut, green ash, box elder, Eastern cottonwood, pin oak, and Siberian elm— are the dominant trees in the primarily closed canopy, but small open areas associated with the small wetlands or intentional clearing are present. As is common in many woodlands in the Upper Midwest, invasive species such as common buckthorn, Tatarian honeysuckle, and garlic mustard have greatly altered the respective shrub layer and herbaceous plant composition within the park. With dense shade and aggressive growth, these plants have displaced a more diverse understory typical of oak woodlands. Invasive earthworms, through rapid consumption of organic material in the soil profile, are contributing to both soil loss and the absence of conditions that would otherwise support a more abundant and diverse herbaceous plant community.

The Property was divided into Management Units, based on existing vegetation, land use, topography, restoration goals, and recommended activities.



# Management Units & Recommended Plant Communities





# Unit 1

## Sub-Unit: North



Photo Direction: South

Photo Description: Degraded woodland with dense mature and sapling common buckthorn and large slash piles.

Acres: 0.9 acres

MLCCS Land Cover types:

32110 Oak Forest; 32170 Altered/non-native deciduous forest

Ranking (based on MN DNR Natural Heritage's Element Occurrence Ranking Guidelines): D = Poor condition of natural community

General Description: Unit 1 North is an altered oak woodland with black walnut and hackberry representing significant elements of the tree canopy. The shrub layer is dominated by common buckthorn with Missouri gooseberry and common blackberry present to a small degree. The sparse herbaceous layer contains some tree seedlings as well as white snakeroot, garlic mustard, white avens, and Virginia creeper. Considerable slash piles are present especially at east edge of unit. The steepness of the unit's slopes and the lack of herbaceous layer contribute to areas of erosion especially adjacent to the lakeshore of Seidls Lake. Management of buckthorn and subsequent establishment of a more diverse herbaceous layer through graminoid seeding and eventually the seeding of forb species would greatly improve habitat. Thoughtful placement of cut logs of buckthorn laid perpendicular to the slope and positioned uphill of standing

trees will create a check dam to slow runoff and accumulate leaf litter preventing erosion and creating additional habitat.

Recommended Plant Communities: Southern Wet-Mesic Hardwood Forest (MHs49)

Description: Rich, wet-mesic lowland hardwood forests on level silty alluvium in stream valleys and on level glacial till bordering lakes. Sites are protected from fire, and soils remaining moist throughout the growing season.

Ground cover is mostly continuous (75-100%). Important species include false rue anemone (*Enemion biternatum*), blue phlox (*Phlox divaricata*), stemless blue violets (*Viola sororia* and *V. missouriensis*), hispid buttercup (*Ranunculus hispidus*), appendaged waterleaf (*Hydrophyllum appendiculatum*), Virginia spring beauty (*Claytonia virginica*), tall coneflower (*Rudbeckia laciniata*), white trout lily (*Erythronium albidum*), yellow trout lily (*E. americanum*), white bear sedge (*Carex albursina*), and hairy leaved sedge (*C. hirtifolia*). Other common and often abundant species include Virginia waterleaf (*Hydrophyllum virginianum*), cleavers (*Galium aparine*), and wood nettle (*Laportea canadensis*).

Shrub-layer cover is variable, ranging from sparse to continuous (5-100%); typical species are chokecherry (*Prunus virginiana*), Missouri gooseberry (*Ribes missouriensis*), basswood, sugar maple, black ash, hackberry, bitternut hickory, American elm, red elm, and rock elm.

Subcanopy is generally patchy to continuous (25-100% cover), with sugar maple, basswood, hackberry, ironwood, black ash, and elms the most common species.

Canopy cover is mostly interrupted to continuous (50-100%). Species composition is variable, but basswood, black ash, sugar maple, American elm, red elm, rock elm, green ash, hackberry, box elder, and bur oak are common. Bitternut and black walnut are present in some stands.



# Unit 1

## Sub-Unit: South

18



Photo Direction: South

Photo Description: Mixed deciduous woodland with large black walnut the dominant canopy species and green ash and hackberry present in the subcanopy. Gooseberry is the primary shrub layer species, and the herbaceous layer is rather sparse and lacks diversity.

Acres: 3.9 acres

MLCCS Land Cover types:

32110 Oak forest; 11211 Oak (forest or woodland) with 4-10% impervious cover

Ranking (based on MN DNR Natural Heritage's Element Occurrence Ranking Guidelines): C = Moderate condition natural community

General Description: Unit 1 South, while classified as an oak woodland, contains very few oaks in the canopy or subcanopy. The canopy does, however, contain many basswood trees and also black walnut, and some walnuts are in the 20-30" diameter size class. The dense shade and allelopathy of these walnuts create a challenging growing environment. Gooseberry dominates the shrub layer, and only the most shade-tolerant herbaceous species are persisting. Species and structural diversity in the unit will improve with natural senescence of the black walnut, and



prescriptive thinning could be considered. The relatively gentle slopes within the unit are less prone to erosion despite the somewhat sparse herbaceous layer, but a more diverse and continuous plant community would provide considerably greater habitat benefits. Because this unit is not accessible by trail, the investment in instant and showy plantings is not necessary, but seeding in natural openings or openings created by removal of minimal buckthorn would be especially helpful in improving habitat.

Recommended Plant Communities: Southern Wet-Mesic Hardwood Forest (MHs49)

Description: Rich, wet-mesic lowland hardwood forests on level silty alluvium in stream valleys and on level glacial till bordering lakes. Sites are protected from fire, and soils remaining moist throughout the growing season.

Ground cover is mostly continuous (75-100%). Important species include false rue anemone (*Enemion biternatum*), blue phlox (*Phlox divaricata*), stemless blue violets (*Viola sororia* and *V. missouriensis*), hispid buttercup (*Ranunculus hispidus*), appendaged waterleaf (*Hydrophyllum appendiculatum*), Virginia spring beauty (*Claytonia virginica*), tall coneflower (*Rudbeckia laciniata*), white trout lily (*Erythronium albidum*), yellow trout lily (*E. americanum*), white bear sedge (*Carex albursina*), and hairy leaved sedge (*C. hirtifolia*). Other common and often abundant species include Virginia waterleaf (*Hydrophyllum virginianum*), cleavers (*Galium aparine*), and wood nettle (*Laportea canadensis*).

Shrub-layer cover is variable, ranging from sparse to continuous (5-100%); typical species are chokecherry (*Prunus virginiana*), Missouri gooseberry (*Ribes missouriensis*), basswood, sugar maple, black ash, hackberry, bitternut hickory, American elm, red elm, and rock elm.

Subcanopy is generally patchy to continuous (25-100% cover), with sugar maple, basswood, hackberry, ironwood, black ash, and elms the most common species.

Canopy cover is mostly interrupted to continuous (50-100%). Species composition is variable, but basswood, black ash, sugar maple, American elm, red elm, rock elm, green ash, hackberry, box elder, and bur oak are common. Butternut and black walnut are present in some stands.

## Unit 2

### Sub-Unit: North



Photo Direction: Northwest

Photo Description: Mowed, compacted turf with newly planted trees showing signs of drought stress and physical damage.

Acres: 0.3 acres

MLCCS Land Cover types: 23211 Altered/non-native deciduous forest

Ranking (based on MN DNR Natural Heritage's Element Occurrence Ranking Guidelines): D = Poor condition of natural community

General Description: Unit 2 North is mowed turf on compacted soils with recently planted trees. The unit was used as a laydown/staging area for construction of the biofiltration basin to this unit's south. Decompaction of soils, reduction of mowing, overseeding with an appropriate no-mow native seed mix, and the protection and consistent watering of newly planted trees will improve the condition of this unit as a formalized park space and may provide some habitat benefits. The addition of native, flowering shrubs to the perimeter of this unit would provide additional cover and an early season nectar source for pollinators.

Recommended Plant Communities: None



## Unit 2

### Sub-Unit: South



Photo Direction: Southeast

Photo Description: Slope at northern extent of unit dominated by reed canary grass and other cool season grasses.

Acres: 0.8 acres

MLCCS Land Cover types: 13144 Short grasses and mixed trees with 51-75% impervious cover

Ranking (based on MN DNR Natural Heritage's Element Occurrence Ranking Guidelines): D = Poor condition of natural community

General Description: Unit 2 South is the southern extent of the park bordering the programmed space of the park. The unit is perched at the top of the slope and is primarily herbaceous but is dominated by reed canary grass, smooth brome, and cool season turfgrass. Crown vetch and creeping Charlie are also present. This unit would benefit from the reduction or elimination of reed canary grass and crown vetch to prevent their further spread. Once these invasive species are managed, the seeding of height-appropriate and shade-tolerant native grassland species would create prairie habitat that is not otherwise represented within Seidls Lake Park. The unit could also benefit from additional structural habitat diversity, and the planting of native shrubs such as serviceberry, prairie rose, black chokeberry, and nannyberry.

Recommended Plant Communities: Southern Mesic Savanna (UPs24)

Description: Sparsely treed communities with tallgrass-dominated ground layers on somewhat poorly drained to well-drained loam soils mainly formed in unsorted glacial till, sometimes in a thin loess layer over till, and locally in lacustrine sediments and outwash deposits. Present primarily on level to gently rolling sites. Drought stress is irregular in occurrence and usually not severe.

There is only one vegetation plot for this class; description is based mainly on inference from Southern Mesic Prairie (UPs23) and Southern Dry Savanna (UPs14).

Graminoid cover is interrupted to continuous (50–100%). Tallgrasses dominate, but several mid-height grasses are also important. Big bluestem (*Andropogon gerardii*) and Indian grass (*Sorghastrum nutans*) are the dominant tallgrasses, with prairie dropseed (*Sporobolus heterolepis*) either a codominant or subdominant component. On the drier end of the moisture gradient, little bluestem (*Schizachyrium scoparium*), porcupine grass (*Stipa spartea*), and side-oats grama (*Bouteloua curtipendula*) are important.

Forb cover is sparse to patchy (5–50%). The most common species are heart-leaved alexanders (*Zizia aptera*), heath aster (*Aster ericoides*), stiff and Canada goldenrods (*Solidago rigida* and *S. canadensis*), purple and white prairie clovers (*Dalea purpurea* and *D. candida*), silverleaf scurfpea (*Pedimelum argophyllum*), stiff sunflower (*Helianthus pauciflorus*), white sage (*Artemisia ludoviciana*), northern bedstraw (*Galium boreale*), and smooth blue aster (*Aster laevis*). Maximilian's sunflower (*Helianthus maximiliani*), tall meadow-rue (*Thalictrum dasycarpum*), prairie phlox (*Phlox pilosa*), and gray-headed coneflower (*Ratibida pinnata*) are common in moister examples; rough blazing star (*Liatris aspera*), Missouri and gray goldenrods (*Solidago missouriensis* and *S. nemoralis*), and bird's foot coreopsis (*Coreopsis palmata*) are common in drier ones.

Woody vines are a minor component. Virginia creeper (*Parthenocissus* spp.) is frequently present, and wild grape (*Vitis riparia*) is occasionally present.

Shrub layer is patchy to interrupted (50–75% cover) and composed of low (< 20in [50cm]) semi-shrubs, taller (up to 6ft [2m]) shrubs, and oak seedlings and saplings (< 6ft). The low semi-shrubs leadplant (*Amorpha canescens*), prairie rose (*Rosa arkansana*), and poison ivy (*Toxicodendron rydbergii*) are generally common. Common taller shrubs are chokecherry (*Prunus virginiana*), American hazelnut (*Corylus americana*), smooth sumac (*Rhus glabra*), gray dogwood (*Cornus racemosa*), wolfberry (*Symphoricarpos occidentalis*), low juneberry (*Amelanchier humilis*), and wild plum (*Prunus americana*).

Trees are scattered or in scattered clumps, with total cover < 70% and typically 25– 50%. Bur oak is most common, but northern pin oak is also usually present.

Notes: The exotic grasses Kentucky bluegrass (*Poa pratensis*) and smooth brome (*Bromus inermis*) are often problematic in UPs24. Pennsylvania sedge (*Carex pensylvanica* var. *pensylvanica*), a native graminoid that is naturally a minor component of UPs24, increases in abundance with prolonged heavy grazing. With fire suppression, trees other than the oaks become established, especially green ash, quaking aspen, and basswood.



## Unit: 3

Sub-Units: None



Photo Direction: Southwest

Photo Description: Biofiltration cell at the northeast corner of Seidl's Lake Park. Cell is dominated by native species but requires management to remove seedling trees and wild parsnip.

Acres: 0.5 acres

MLCCS Land Cover types: 23211 Short grasses on upland soils

Ranking (based on MN DNR Natural Heritage's Element Occurrence Ranking Guidelines): C = Moderate condition natural community

General Description: Unit 3 is an artificially created basin designed to collect and filter stormwater before discharging to Seidl's Lake. The basin provides wet prairie or wet meadow habitat in addition to its water quality benefits. The planted vegetation is primarily native wet prairie species, tree seedlings germinating from the surrounding woodlands have become established and should be removed to prevent shading of species that are dependent on full sun conditions and to prevent damage to the cell. Wild parsnip (*Pastinaca sativa*) is present at the western edge of the basin and should be eradicated to prevent its spread and potential harm to maintenance workers or park visitors. A significant area of heavy sediment is present at the east end of the basin, and this sediment should be removed to prevent eventual filling of the basin and loss of plants.

Recommended Plant Communities: None



## Unit 4

### Sub-Units: North



Photo Direction: North

Photo Description: Canopy of large aspen with a shrub layer dominated by common buckthorn and a somewhat sparse understory.

Acres: 2.4 acres

MLCCS Land Cover types: 32170 Altered/non-native deciduous forest; 23211 Short grasses on upland soils; 13144 Short grasses and mixed trees with 51-75% impervious cover

Ranking (based on MN DNR Natural Heritage's Element Occurrence Ranking Guidelines): C = Moderate condition natural community

General Description: Unit 4 North is a deciduous forest with a canopy dominated by pin oak and significant cover of secondary growth species such as green ash, Eastern cottonwood, black walnut, and quaking aspen (*Populus tremuloides*). Steep topography at the unit's eastern edge and western edge near Seidls Lake border a plateau which is the site of an aspen grove. This differentiated structure allows greater sunlight penetration to the forest floor which supports a more robust herbaceous plant community with Jack in-the-pulpit (*Arisaema triphyllum*), heart-leaved aster (*Symphotrichum cordifolium*), lady fern (*Athyrium filix-femina*), wild strawberry (*Fragaria virginiana*), and Pennsylvania

sedge (*Carex pensylvanica*) all present but lacking in abundance. Herbaceous layer improvements following buckthorn management in this unit and throughout the park could use this plant community as reference habitat providing a species list of native plants that have successfully persisted on the site. Poison ivy (*Toxicodendron radicans*) is also present at the northeastern corner of the unit but is away from the main trail as to not pose a threat to park users.

Recommended Plant Communities: Southern Wet-Mesic Hardwood Forest (MHs49)

Description: Rich, wet-mesic lowland hardwood forests on level silty alluvium in stream valleys and on level glacial till bordering lakes. Sites are protected from fire, and soils remaining moist throughout the growing season.

Ground cover is mostly continuous (75-100%). Important species include false rue anemone (*Enemion biternatum*), blue phlox (*Phlox divaricata*), stemless blue violets (*Viola sororia* and *V. missouriensis*), hispid buttercup (*Ranunculus hispidus*), appendaged waterleaf (*Hydrophyllum appendiculatum*), Virginia spring beauty (*Claytonia virginica*), tall coneflower (*Rudbeckia laciniata*), white trout lily (*Erythronium albidum*), yellow trout lily (*E. americanum*), white bear sedge (*Carex albursina*), and hairy leaved sedge (*C. hirtifolia*). Other common and often abundant species include Virginia waterleaf (*Hydrophyllum virginianum*), cleavers (*Galium aparine*), and wood nettle (*Laportea canadensis*).

Shrub-layer cover is variable, ranging from sparse to continuous (5-100%); typical species are chokecherry (*Prunus virginiana*), Missouri gooseberry (*Ribes missouriensis*), basswood, sugar maple, black ash, hackberry, bitternut hickory, American elm, red elm, and rock elm.

Subcanopy is generally patchy to continuous (25-100% cover), with sugar maple, basswood, hackberry, ironwood, black ash, and elms the most common species.

Canopy cover is mostly interrupted to continuous (50-100%). Species composition is variable, but basswood, black ash, sugar maple, American elm, red elm, rock elm, green ash, hackberry, box elder, and bur oak are common. Bitternut and black walnut are present in some stands.



## Unit 4

### Sub-Units: South



Photo Direction: Southeast

Photo Description: A pin oak stand dominates the canopy with an understory of black walnut and black cherry saplings. The shrub layer is dominated by common buckthorn. Moderate regeneration of pin oak is present.

Acres: 5.5 acres

MLCCS Land Cover types: 32110 Oak forest; 13144 Short grasses with mixed trees with 51-75% impervious cover

Ranking (based on MN DNR Natural Heritage's Element Occurrence Ranking Guidelines): C = Moderate condition natural community

General Description: Unit 4 South is an oak forest with a mixed deciduous subcanopy. Pin oak is the dominant canopy tree and despite buckthorn occupying between 50-75% of the shrub layer, pin oak regeneration is present both in the subcanopy and seedlings are present. The herbaceous layer, like Unit 4 North, is moderately robust with several native species present or common. A combination of buckthorn management, restoration of a more diverse shrub layer, and planting or seeding to create a more continuous and sustaining herbaceous plant community.

Recommended Plant Communities: Southern Wet-Mesic Hardwood Forest (MHs49)

Description: Rich, wet-mesic lowland hardwood forests on level silty alluvium in stream valleys and on level glacial till bordering lakes. Sites are protected from fire, and soils remaining moist throughout the growing season.

Ground cover is mostly continuous (75-100%). Important species include false rue anemone (*Enemion biternatum*), blue phlox (*Phlox divaricata*), stemless blue violets (*Viola sororia* and *V. missouriensis*), hispid buttercup (*Ranunculus hispidus*), appendaged waterleaf (*Hydrophyllum appendiculatum*), Virginia spring beauty (*Claytonia virginica*), tall coneflower (*Rudbeckia laciniata*), white trout lily (*Erythronium albidum*), yellow trout lily (*E. americanum*), white bear sedge (*Carex albursina*), and hairy leaved sedge (*C. hirtifolia*). Other common and often abundant species include Virginia waterleaf (*Hydrophyllum virginianum*), cleavers (*Galium aparine*), and wood nettle (*Laportea canadensis*).

Shrub-layer cover is variable, ranging from sparse to continuous (5-100%); typical species are chokecherry (*Prunus virginiana*), Missouri gooseberry (*Ribes missouriensis*), basswood, sugar maple, black ash, hackberry, bitternut hickory, American elm, red elm, and rock elm.

Subcanopy is generally patchy to continuous (25-100% cover), with sugar maple, basswood, hackberry, ironwood, black ash, and elms the most common species.

Canopy cover is mostly interrupted to continuous (50-100%). Species composition is variable, but basswood, black ash, sugar maple, American elm, red elm, rock elm, green ash, hackberry, box elder, and bur oak are common. Bitternut and black walnut are present in some stands.



## Unit 5

Sub-Units: None



Photo Direction: North

Photo Description: Linear wetland at the south end of Seidls Lake with herbaceous vegetation dominated by early successional and wet-tolerant species such as smartweed, white avens, and reed canary grass.

Acres: 0.6 acre

MLCCS Land Cover types: 32170 Altered/non-native deciduous forest

Ranking (based on MN DNR Natural Heritage's Element Occurrence Ranking Guidelines): C = Moderate condition natural community

General Description: Unit 5, while classified as forest, is primarily an open water wetland bounded by a rather abrupt transition to the upland forests of the park related to a sharp change in topography. Fluctuating water levels in Seidls Lake and its nearby wetlands are common due to stormwater inputs and the rapid inflows of water from the steep and sparsely vegetated surrounding landscape. As a result, the herbaceous vegetation in the wetland edge comprises many early successional species such as smartweed. Reed canary grass is also present, and a significant population exists on the western edge of the wetland. Small remnant populations of native sedges and forbs such as lake sedge (*Carex lacustris*), dark green bulrush (*Scirpus atrovirens*), and cardinal flower (*Lobelia cardinalis*) are also present in the wetland vegetation. These and similar species could be used as reference when developing a restoration plant species list following elimination of the reed canary grass pockets. Consideration of soil moisture fluctuations should also influence plant species selection.

## Recommended plant communities: Southern Wet Prairie (WPs54)

Description: Grass-dominated but forb-rich herbaceous communities on poorly drained to very poorly drained loam soils formed in lacustrine sediments, unsorted glacial till, or less frequently outwash deposits. Typically in slight depressions, sometimes on very gentle slopes. Flooded for brief periods at most; upper part of rooting zone is not saturated for most of growing season, but saturation usually persists in lower zone for much of season.

Graminoid cover is usually continuous (75-100%). Tallgrasses dominate, but several mid-height and low grasses and sedges are also important. Prairie cordgrass (*Spartina pectinata*), and big bluestem (*Andropogon gerardii*), are the dominant tallgrasses; Indian grass (*Sorghastrum nutans*) and switchgrass (*Panicum virgatum*) are frequently important. Narrow reedgrass (*Calamagrostis stricta*) is a major species in the western part of the state. Woolly sedge (*Carex pellita*) is often an important component, and rigid sedge (*C. tetanica*) and flattened spikerush (*Eleocharis compressa*) are frequently present. Mat muhly grass (*Muhlenbergia richardsonis*) is sometimes abundant, growing under taller species or even forming most of the cover on saline sites in western Minnesota.

Forb cover is sparse to patchy (5-50%). Canada goldenrod (*Solidago Canadensis*) and giant, sawtooth, or Nuttall's sunflower (*Helianthus giganteus*, *H. grosseserratus*, or *H. nuttallii*) are typically most common. Other common taller forbs are giant goldenrod (*Solidago gigantea*), tall meadow-rue (*Thalictrum dasycarpum*), eastern panicled aster (*Aster lanceolatus*), and great blazing star (*Liatris pycnostachys*). Common midheight species are heath aster (*Aster ericoides*), clasping dogbane (*Apocynum sibiricum*), Virginia mountain mint (*Pycnanthemum virginianum*), and golden alexanders (*Zizia aurea*). Common strawberry (*Fragaria virginiana*), golden or false golden ragwort (*Senecio aureus* or *S. pseudoaureus*), and stemless blue violets (*Viola sororia* and *V. nephrophylla*) are typically common in the lowest layer. Forb diversity and height decrease where soil salinity is elevated.

Shrub layer is absent to sparse (0-25% cover). The low semi-shrub prairie rose (*Rosa arkansana*) is most frequent; red-osier dogwood (*Cornus sericeus*) and pussy willow (*Salix discolor*) are occasional.



## Unit 6

Sub-Units: None



Photo Direction: South

Photo Description: Wooded wetland edge and trail on the eastern edge of Unit 6 with a Cooper's hawk (*Accipiter cooperii*) perched over the trail.

Acres: 0.5 acre

MLCCS Land Cover types: 32170 Altered/non-native deciduous forest

Ranking (based on MN DNR Natural Heritage's Element Occurrence Ranking Guidelines): D = Poor condition of natural community

General Description: Unit 6 is a small upland opening south of Seidls Lake that has considerable woody encroachment from the surrounding woodlands, but remnant mesic vegetation is present. Cool season grasses dominate the edge of this unit, and the western edge is closing in with woody cover of green ash, black walnut, and willows in the shrub layer. Targeted removal of the woody species to prevent further encroachment and shading is recommended along with seeding openings with a moderately diverse wet prairie mix. Future restoration could include plug planting along the trail to further diversify the herbaceous plant community and improve aesthetics for park users.

Recommended Plant Communities: Southern Mesic Prairie (UPs23)

Description: Grass-dominated but forb-rich herbaceous communities on somewhat poorly drained to well-drained loam soils mainly formed in unsorted glacial till, sometimes in a thin loess layer over till, and locally in lacustrine sediments and outwash deposits. Communities in this class occur primarily on level to gently rolling sites. Drought stress is irregular in occurrence and usually not severe.

Graminoid cover is usually continuous (75-100%). Tallgrasses dominate, but several mid-height grasses are also important. Species composition is fairly uniform, although relative abundances shift across the moisture gradient within the community. Big bluestem (*Andropogon gerardii*) and Indian grass (*Sorghastrum nutans*) are the dominant tallgrasses, with prairie dropseed (*Sporobolus heterolepis*) either codominant or subdominant component. On the drier end of the gradient, little bluestem (*Schizachyrium scoparium*), porcupine grass (*Stipa spartea*), and side-oats grama (*Bouteloua curtipendula*) are important. On moister sites, switchgrass (*Panicum virgatum*) may be common, and prairie cordgrass (*Spartina pectinata*) is usually present. Leiberg's panic grass (*Panicum leibergii*) is distinctive, although usually minor in terms of cover.

Forb cover is sparse to patchy (5-50%). Forb species composition also responds to moisture. A number of species are common across the moisture gradient, including heart-leaved alexanders (*Zizia aptera*), heath aster (*Aster ericoides*), stiff and Canada goldenrods (*Solidago rigida* and *S. canadensis*), purple and white prairie clovers (*Dalea purpea* and *D. candida*), silverleaf scurfpea (*Pedimelum argophyllum*), stiff sunflower (*Helianthus pauciflorus*), white sage (*Artemisia ludoviciana*), northern bedstraw (*Galium boreale*), and smooth blue aster (*Aster laevis*). Maximilian's sunflower (*Helianthus maximiliani*), tall meadow-rue (*Thalictrum dasycarpum*), prairie phlox (*Phlox pilosa*), and gray-headed coneflower (*Ratibida pinnata*) are most common on the moister end of the gradient. Rough blazing star (*Liatris aspera*), Missouri and gray goldenrods (*Solidago missouriensis* and *S. nemoralis*), and bird's foot coreopsis (*Coreopsis palmata*) are common in the drier end. Rattlesnake master (*Eryngium yuccifolium*) and compass plant (*Silphium laciniatum*) are typical species in southeastern Minnesota but are rare to absent in the community elsewhere. Narrow-leaved purple coneflower (*Echinacea pallida* var. *angustifolia*) is common in the drier end of the gradient in the CGP but absent from the EBF province.

Shrub layer is sparse (5-25% cover). The low semi-shrubs leadplant (*Amorpha canescens*) and prairie rose (*Rosa arkansana*) are generally common. Sparse patches of wolfberry (*Symphoricarpos occidentalis*) are occasional. Gray dogwood (*Cornus racemosa*), American hazelnut (*Corylus americana*), and wild plum (*Prunus Americana*) are rare.

Trees are absent except where fire suppression has allowed invasion by woody species.

Notes: Kentucky bluegrass (*Poa pratensis*), an introduced species, is invariably present; it increases in the prolonged absence of fire but becomes dominant only with heavy grazing pressure. Smooth brome (*Bromus inermis*), another exotic, is a very troublesome invasive species favored by disturbance, including natural disturbance by pocket gophers.



## Unit 7

Sub-Units: None



Photo Direction: North

Photo Description: South facing hillside above small open water wetland with a dense cover of invasive spotted knapweed.

Acres: 0.7 acre

MLCCS Land Cover types: 32170 Altered/non-native deciduous forest

Ranking (based on MN DNR Natural Heritage's Element Occurrence Ranking Guidelines): D = Poor condition of natural community

General Description: While classified as non-native deciduous forest, Unit 7 is a small, rather open hillside on the north slope above Unit 6. The hillside is very steep and dominated by non-native herbaceous vegetation and a few volunteer trees. Most importantly, there is a large and dense patch of spotted knapweed on the hillside to the east end. Spotted knapweed is an especially troublesome invasive plant due to its high seed production (about 1,000 seeds per plant) and long seed viability (about 7 years) with an ability to germinate throughout the growing season. These growth habits allow it to become the dominant herbaceous plant quickly filling open areas. Spotted knapweed is easily spread by wind, water, wildlife, and vehicles. Its management in Unit 7 should be targeted as soon as possible as to prevent spread into

other units especially in consideration of planned ground disturbance for the shoreline restoration project. Spotted knapweed's dense patches cause areas of bare ground beneath the plants causing increased soil runoff and increased sedimentation in waterbodies. Management should include initial spot herbicide treatment followed by regular spot mowing to prevent flowering and seed production of plants germinating from the seed bank. Any flowering or seed-bearing plants should be pulled and bagged with removal equipment cleaned well before leaving the unit. The area should be monitored for new basal rosettes developing from the seed bank. Once spotted knapweed is eliminated in this unit, the slope should be planted with native plant species that are deep rooted and thrive in full sun and sandy soil. These species include pearly everlasting (*Anaphalis margaritacea*), butterfly weed (*Asclepias tuberosa*), side oats grama (*Bouteloua curtipendula*), harebell (*Campanula rotundifolia*), silky prairie clover (*Dalea villosa*), junegrass (*Koeleria macrantha*), dotted blazing star (*Liatris punctata*), and many others.

Recommended plant communities: Southern Dry Prairie (UPs13)

Description: Southern dry prairie is a grass-dominated herbaceous community on level to steeply sloping sites with droughty soils. Typical sites include steep, bedrock-cored bluffs and steep erosional slopes on glacial till along larger river valleys and meltwater drains elsewhere. Slopes on ice-contact features (kames, eskers, collapsed outwash) and dunes formed in outwash sands are also typical sites for UPs13, as are more level terraces in coarse outwash in river valleys. Soils are somewhat excessively to excessively drained, usually highly permeable, coarse-textured sandy loams or loamy sands, often with a substantial gravel fraction, but they may be finer textured on steep slopes, formed in either glacial till or in loess and residuum. Soils are mollisols, with dark, organic-enriched upper horizons, although these horizons are usually thinner and have lower organic content than soils of mesic prairies.

Moderate growing-season moisture deficits occur most years, and severe moisture deficits are frequent, especially during periodic regional droughts. As for all prairie classes in Minnesota, recurrent fire is necessary to prevent succession of UPs13 to woodland or forest, although the fire frequency required to maintain dry prairies is lower than for mesic prairies because the xeric conditions and lower fertility of the sites somewhat inhibit tree and shrub invasion.

Graminoid cover is patchy to continuous (50 percent to 100 percent). Mid-height and shortgrass species are prominent, although tallgrass species are typically important as well. Overall species composition varies considerably, reflecting variation in soils and topography; several species in the community are restricted to sites on deep sands. Little bluestem (*Schizachyrium scoparium*) is generally the dominant grass; other major mid-height grasses are side oats grama (*Bouteloua curtipendula*), prairie dropseed (*Sporobolus heterolepis*), porcupine grass (*Stipa spartea*), and plains muhly (*Muhlenbergia cuspidata*).

Forb cover is sparse to patchy (5 percent to 50 percent). Species composition is more variable than that of graminoids. Common species that are more abundant in UPs13 than in other UP classes include gray goldenrod (*Solidago nemoralis*), silky aster (*Aster sericeus*), aromatic aster (*A. oblongifolius*), dotted blazing star (*Liatris punctata*), hairy golden aster (*Chrysopsis villosa*), pasqueflower (*Anemone patens*), harebell (*Campanula rotundifolia*), western ragweed (*Ambrosia psilostachya*), false boneset (*Kuhnia eupatorioides*), and flowering spurge (*Euphorbia corollata*). Also common are purple prairie clover (*Dalea purpurea*), heath aster (*Aster ericoides*), stiff goldenrod (*Solidago rigida*), rough blazing star (*Liatris aspera*), stiff sunflower (*Helianthus pauciflorus*), hoary puccoon (*Lithospermum canescens*), bird's foot coreopsis (*Coreopsis palmata*), and bearded birdfoot violet (*Viola palmata* var. *pedatifida*). Distinctive minor species include green milkweed (*Asclepias viridiflora*), narrow-leaved puccoon (*Lithospermum incisum*), silky prairie clover (*Dalea villosa*), and plantain-leaved pussytoes (*Antennaria plantaginifolia*).

The shrub layer is sparse (less than five percent cover) and composed mostly of low (less than 20 inch) shrubs, primarily leadplant, with prairie rose and sage wormwood often present. The taller shrub smooth sumac is also often present. Trees are absent or consist of occasional bur oak or black oak; other species may sometimes be present, having invaded as a result of fire suppression.



Forb (flowering plants) cover is sparse to patchy (5 percent to 50 percent). Important forb species include flowering spurge, sky blue aster, bird's foot coreopsis, and bearded birdfoot violet, false boneset cylindrical blazing star, gray-headed coneflower, and compass plant.

## Unit 8

Sub-Units: None



Photo Direction: North

Photo Description: Treed buffer of the small open water wetland west of Seidls Lake containing black walnut, green ash, box elder, and hackberry trees with an herbaceous layer of non-native cool season grasses such as smooth brome and reed canary grass.

Acres: 0.5 acre

MLCCS Land Cover types: 32170 Altered/non-native deciduous forest; 32110 Oak forest

Ranking (based on MN DNR Natural Heritage's Element Occurrence Ranking Guidelines): C = Moderate condition natural community

General Description: Unit 8, while classified as deciduous forest, is centered on a small open water wetland with a deciduous tree buffer. The wetland's physical separation being upslope from Seidls Lake creates a unique pocket of diverse habitat as well as a corridor within the park. The wetland buffer lacks herbaceous species diversity, but the addition of some wet prairie/wetland edge plantings would be a straightforward restoration that would greatly improve



the habitat benefits of this unit. Management of the volunteer trees around the open water will be necessary to prevent future shading and loss of a more diverse understory. Water quality in the wetland appears to be good based on the presence of duckweed (*Lemna* spp.) across the surface of the water. The wetland is geographically separated from nearby neighborhoods and is protected from lawn fertilizer runoff and phosphorus inputs associated with lawns and landscaping which bodes well for its continued good water quality.

Recommended plant communities: Southern Wet Prairie (WPs54)

Description: Grass-dominated but forb-rich herbaceous communities on poorly drained to very poorly drained loam soils formed in lacustrine sediments, unsorted glacial till, or less frequently outwash deposits. Typically, in slight depressions, sometimes on very gentle slopes. Flooded for brief periods at most; upper part of rooting zone is not saturated for most of growing season, but saturation usually persists in lower zone for much of season.

Graminoid cover is usually continuous (75-100%). Tallgrasses dominate, but several mid-height and low grasses and sedges are also important. Prairie cordgrass (*Spartina pectinata*), and big bluestem (*Andropogon gerardii*), are the dominant tallgrasses; Indian grass (*Sorghastrum nutans*) and switchgrass (*Panicum virgatum*) are frequently important. Narrow reedgrass (*Calamagrostis stricta*) is a major species in the western part of the state. Woolly sedge (*Carex pellita*) is often an important component, and rigid sedge (*C. tetanica*) and flattened spikerush (*Eleocharis compressa*) are frequently present. Mat muhly grass (*Muhlenbergia richardsonis*) is sometimes abundant, growing under taller species or even forming most of the cover on saline sites in western Minnesota.

Forb cover is sparse to patchy (5-50%). Canada goldenrod (*Solidago Canadensis*) and giant, sawtooth, or Nuttall's sunflower (*Helianthus giganteus*, *H. grosseserratus*, or *H. nuttallii*) are typically most common. Other common taller forbs are giant goldenrod (*Solidago gigantea*), tall meadow-rue (*Thalictrum dasycarpum*), eastern panicled aster (*Aster lanceolatus*), and great blazing star (*Liatris pycnostachys*). Common midheight species are heath aster (*Aster ericoides*), clasping dogbane (*Apocynum sibiricum*), Virginia mountain mint (*Pycnanthemum virginianum*), and golden alexanders (*Zizia aurea*). Common strawberry (*Fragaria virginiana*), golden or false golden ragwort (*Senecio aureus* or *S. pseudoreus*), and stemless blue violets (*Viola sororia* and *V. nephrophylla*) are typically common in the lowest layer. Forb diversity and height decrease where soil salinity is elevated.

Shrub layer is absent to sparse (0-25% cover). The low semi-shrub prairie rose (*Rosa arkansana*) is most frequent; red-osier dogwood (*Cornus sericeus*) and pussy willow (*Salix discolor*) are occasional.

## Unit 9

Sub-Units: None



Photo Direction: Northeast

Photo Description: A very degraded woodland with a nearly continuous shrub canopy of mature and senescing common buckthorn and a ground layer of nearly entirely buckthorn seedlings where few shrub canopy gaps exist.

Acres: 2.2 acres

MLCCS Land Cover types: 32170 Altered/non-native deciduous forest

Ranking (based on MN DNR Natural Heritage's Element Occurrence Ranking Guidelines): D = Poor condition of natural community

General Description: Unit 9 is the most degraded unit within Seidl's Lake Park. Common buckthorn entirely dominates the shrub layer and creates a subcanopy that prevents the establishment and growth of nearly any other woody species with the exception of some large black walnut at the northern edge of the unit. Very few individuals of extremely shade tolerant herbaceous plants are present, and the majority of herbaceous cover is the non-native and invasive species garlic mustard. Small openings on the western and eastern edges of the unit contain common burdock (*Arctium minus*) and Canada thistle (*Cirsium arvense*). The buckthorn in this unit is so aged and shaded that natural senescence is occurring. Minor amounts of black raspberry (*Rubus occidentalis*) are present in canopy gaps at the base of the slope on the unit's southeastern edge. German yellowjackets (*Vespula germanica*) are also present in this unit likely with nests in downed logs.

## Recommended Plant Communities: Southern Wet-Mesic Hardwood Forest (MHs49)

Description: Rich, wet-mesic lowland hardwood forests on level silty alluvium in stream valleys and on level glacial till bordering lakes. Sites are protected from fire, and soils remaining moist throughout the growing season.

Ground cover is mostly continuous (75-100%). Important species include false rue anemone (*Enemion biternatum*), blue phlox (*Phlox divaricata*), stemless blue violets (*Viola sororia* and *V. missouriensis*), hispid buttercup (*Ranunculus hispidus*), appendaged waterleaf (*Hydrophyllum appendiculatum*), Virginia spring beauty (*Claytonia virginica*), tall coneflower (*Rudbeckia laciniata*), white trout lily (*Erythronium albidum*), yellow trout lily (*E. americanum*), white bear sedge (*Carex albursina*), and hairy leaved sedge (*C. hirtifolia*). Other common and often abundant species include Virginia waterleaf (*Hydrophyllum virginianum*), cleavers (*Galium aparine*), and wood nettle (*Laportea canadensis*).

Shrub-layer cover is variable, ranging from sparse to continuous (5-100%); typical species are chokecherry (*Prunus virginiana*), Missouri gooseberry (*Ribes missouriensis*), basswood, sugar maple, black ash, hackberry, bitternut hickory, American elm, red elm, and rock elm.

Subcanopy is generally patchy to continuous (25-100% cover), with sugar maple, basswood, hackberry, ironwood, black ash, and elms the most common species.

Canopy cover is mostly interrupted to continuous (50-100%). Species composition is variable, but basswood, black ash, sugar maple, American elm, red elm, rock elm, green ash, hackberry, box elder, and bur oak are common. Bitternut and black walnut are present in some stands.



## Unit 10

Sub-Units: None



Photo Direction: West

Photo Description: Degraded woodland with a substantial cover of common buckthorn and minimal herbaceous vegetation. Sandy soils, lack of stabilizing vegetation, earthworm consumption of leaf litter, and steep slopes have given way to several deep gullies within the unit.

Acres: 2.4 acres

MLCCS Land Cover types: 32170 Altered/non-native deciduous forest

Ranking (based on MN DNR Natural Heritage's Element Occurrence Ranking Guidelines): D = Poor condition of natural community

General Description: Unit 10's classification as a non-native deciduous forest is accurate. The woodland's canopy includes several tree species with a relatively high abundance of individuals in comparison to other forested areas of the park. Silver maple, green ash, black walnut, and American elm are all present in the canopy, but black locust and Siberian elm are established in this unit. Common buckthorn dominates the shrub layer, with only small amounts of Missouri gooseberry and tree seedlings present in this layer. The herbaceous vegetation is indicative of dense shading and earthworm invasion. Garlic mustard, white snakeroot, and common burdock are the dominant herbaceous species, and large patches of Kentucky bluegrass and crown vetch are present in canopy gaps and at the woodland edges to the south of the unit. As a main entry point to the park, and an area with considerable weediness, the addition of a boot brush station at the trail entrance would help to prevent the transportation of additional weed seed into the park.

Recommended Plant Communities: Southern Wet-Mesic Hardwood Forest (MHs49)

Description: Rich, wet-mesic lowland hardwood forests on level silty alluvium in stream valleys and on level glacial till bordering lakes. Sites are protected from fire, and soils remaining moist throughout the growing season.

Ground cover is mostly continuous (75-100%). Important species include false rue anemone (*Enemion biternatum*), blue phlox (*Phlox divaricata*), stemless blue violets (*Viola sororia* and *V. missouriensis*), hispid buttercup (*Ranunculus hispidus*), appendaged waterleaf (*Hydrophyllum appendiculatum*), Virginia spring beauty (*Claytonia virginica*), tall coneflower (*Rudbeckia laciniata*), white trout lily (*Erythronium albidum*), yellow trout lily (*E. americanum*), white bear sedge (*Carex albursina*), and hairy leaved sedge (*C. hirtifolia*). Other common and often abundant species include Virginia waterleaf (*Hydrophyllum virginianum*), cleavers (*Galium aparine*), and wood nettle (*Laportea canadensis*).

Shrub-layer cover is variable, ranging from sparse to continuous (5-100%); typical species are chokecherry (*Prunus virginiana*), Missouri gooseberry (*Ribes missouriensis*), basswood, sugar maple, black ash, hackberry, bitternut hickory, American elm, red elm, and rock elm.

Subcanopy is generally patchy to continuous (25-100% cover), with sugar maple, basswood, hackberry, ironwood, black ash, and elms the most common species.

Canopy cover is mostly interrupted to continuous (50-100%). Species composition is variable, but basswood, black ash, sugar maple, American elm, red elm, rock elm, green ash, hackberry, box elder, and bur oak are common. Butternut and black walnut are present in some stands.



## Unit 11

Sub-Units: None



Photo Direction: West

Photo Description: Slope with considerable drainage from nearby homes. Netted erosion control materials are persisting, but the ground layer herbaceous vegetation is very sparse and weedy, and the ground is primarily bare.

Acres: 1.7 acres

MLCCS Land Cover types: 32170 Altered/non-native deciduous forest

Ranking (based on MN DNR Natural Heritage's Element Occurrence Ranking Guidelines): D = Poor condition of natural community



General Description: Unit 11 is accurately classified as an altered deciduous forest with green ash, black walnut, and pin oak representing the dominant canopy trees. The shrub layer, while light, is dominated by common buckthorn. Past management of this species is apparent as many brush piles are present in the unit. Wetter edges of the unit at its northeastern extent have a more diverse composition of herbaceous plant species including jack-in-the-pulpit and lady fern. At the southwestern corner of this unit downslope from homes on Bloomberg Lane, a population of round-leaf bittersweet has become established and should be targeted for removal. It is a large plant and is entwined with riverbank grape (*Vitis riparia*) on the hillside and will likely need to be cut at its base and stump treated to ensure its eradication.

Recommended Plant Communities: Southern Wet-Mesic Hardwood Forest (MHs49)

Description: Rich, wet-mesic lowland hardwood forests on level silty alluvium in stream valleys and on level glacial till bordering lakes. Sites are protected from fire, and soils remaining moist throughout the growing season.

Ground cover is mostly continuous (75-100%). Important species include false rue anemone (*Enemion biternatum*), blue phlox (*Phlox divaricata*), stemless blue violets (*Viola sororia* and *V. missouriensis*), hispid buttercup (*Ranunculus hispidus*), appendaged waterleaf (*Hydrophyllum appendiculatum*), Virginia spring beauty (*Claytonia virginica*), tall coneflower (*Rudbeckia laciniata*), white trout lily (*Erythronium albidum*), yellow trout lily (*E. americanum*), white bear sedge (*Carex albursina*), and hairy leaved sedge (*C. hirtifolia*). Other common and often abundant species include Virginia waterleaf (*Hydrophyllum virginianum*), cleavers (*Galium aparine*), and wood nettle (*Laportea canadensis*).

Shrub-layer cover is variable, ranging from sparse to continuous (5-100%); typical species are chokecherry (*Prunus virginiana*), Missouri gooseberry (*Ribes missouriensis*), basswood, sugar maple, black ash, hackberry, bitternut hickory, American elm, red elm, and rock elm.

Subcanopy is generally patchy to continuous (25-100% cover), with sugar maple, basswood, hackberry, ironwood, black ash, and elms the most common species.

Canopy cover is mostly interrupted to continuous (50-100%). Species composition is variable, but basswood, black ash, sugar maple, American elm, red elm, rock elm, green ash, hackberry, box elder, and bur oak are common. Bitternut and black walnut are present in some stands.

## Unit 12

Sub-Units: None



Photo Direction: South

Photo Description: Undercut and eroding trail edges lack deep-rooted and stabilizing vegetation.

Acres: 0.4 acre

MLCCS Land Cover types: 32170 Altered/non-native deciduous forest

Ranking (based on MN DNR Natural Heritage's Element Occurrence Ranking Guidelines): C = Moderate condition natural community

General Description: Unit 12 contains a small open water wetland and a natural surface trail in the park's southwestern corner. Herbaceous vegetation on the wetland's edge is somewhat diverse and non-weedy. Species present here will provide good references for revegetation of other wooded wetland or lake edges in the park. The trail is in poor condition in places with steep and eroding trail edges. Regrading these trail edges or building tiers of coir logs and seeding or planting in pockets will help to stabilize the trail and prevent future erosion. Management of buckthorn in this unit could be tied into management to be undertaken in Units 9 and 10. Steep slopes in these units will likely necessitate hand-cutting and herbicide stump treatment as opposed to forestry mowing.



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Shrub-layer cover is variable, ranging from sparse to continuous (5-100%); typical species are chokecherry (*Prunus virginiana*), Missouri gooseberry (*Ribes missouriensis*), basswood, sugar maple, black ash, hackberry, bitternut hickory, American elm, red elm, and rock elm.

Subcanopy is generally patchy to continuous (25-100% cover), with sugar maple, basswood, hackberry, ironwood, black ash, and elms the most common species.

Canopy cover is mostly interrupted to continuous (50-100%). Species composition is variable, but basswood, black ash, sugar maple, American elm, red elm, rock elm, green ash, hackberry, box elder, and bur oak are common. Butternut and black walnut are present in some stands.

## Five-Year Work Plan

This five-year work plan describes restoration activities that will likely have the greatest ecological benefit relative to the resources required to implement the activities. Recommended activities generally include removing and controlling a growing list of invasive plant species, diversifying, and enhancing desirable vegetation and stabilizing streambanks or other eroding areas. Activities can then be completed by the Landowner, private contractors that specialize in ecological restoration, conservation organizations, or in some cases, volunteers.

**Note: City/Landowner and County columns will be completed during development of the Natural Resource Management Agreement (MA). Black font in table refers to City of Inver Grove Heights’ responsibilities. Red font indicates City of South Saint Paul responsibilities. Total does not include the alternate for goat grazing.**

Season & Year	Unit-Subunit	Activity	Area [Acres]	Estimated Cost [\$]	City/Landowner (Forthcoming in JPA)	County (Forthcoming in JPA)
Fall 1	1N	Cut buckthorn; stump treat with Garlon 3A or Garlon 4 depending on temperatures. Drop material in low density areas and pile and burn in high density areas.	0.9	2,250.00	\$	\$
Fall 1	1N	Hand-broadcast seeding of simple graminoid seed mix (MNL Buckthorn Replacement Mix) to establish herbaceous cover. Contractor supplies seed. (Includes seed cost).	0.5	375.00		
Spring 1	1N	Spot spray flowering, second-year garlic mustard prior to seed set.	0.9	810.00		

Season & Year	Unit-Subunit	Activity	Area [Acres]	Estimated Cost [€]	City/Landowner (Forthcoming in JPA)	County (Forthcoming in JPA)
		Scout entirety of each unit; assume garlic mustard is present across 1/3 of each unit.				
Spring 2	1N	Spot herbicide treatment of resprouted/new germinant buckthorn.	0.9	540.00		
Spring 2	1N	Spot spray flowering, second-year garlic mustard prior to seed set or hold volunteer event to pull and bag flowering garlic mustard. Scout entirety of each unit; assume garlic mustard is present in 1/3 of each unit.	0.9	720.00		
Spring 3	1N	Spot herbicide treatment of resprouted/new germinant buckthorn.	0.9	540.00		
Spring 3	1N	Spot spray flowering, second-year garlic mustard prior to seed set or hold volunteer event to pull and bag flowering garlic mustard.	0.9	630.00		
Spring 3	1N, 1S, 4N, 4S, 9, 10, 11	ALTERNATE: 2 week-long deployments of goats rotated through units with initial buckthorn removal completed.	13.5	\$20,000.00		
Early fall 4	1N	Plant 100 bare root native trees and shrubs within buckthorn removal areas. (Black chokeberry, red-osier dogwood, red elderberry, ironwood)	0.9	1,000.00		
Fall 5	1N	Plant 500 bare root native trees and shrubs within buckthorn removal areas. (Black chokeberry, red-osier dogwood, red elderberry, ironwood)	0.9	5,000.00		
Fall 1	1S	Brush saw buckthorn; stump treat with Garlon 3A or Garlon 4 depending on temperatures. Drop material in low density areas (0.6 acres) and pile and burn in high density areas (3.3 acres). Cut, pile and burn dead trees.	3.9	9,750.00		
Fall 1	1S	Hand-broadcast seeding of simple graminoid seed mix (MNL Buckthorn Replacement Mix) to establish herbaceous cover. Estimate seeding 1/2 of total acreage. Contractor supplies seed. (Includes seed cost).	2	1,500.00		
Winter 1	1S	Cut approx. 20 Siberian elm and black locust trees avg. 10" diameter/treat stumps. Cut all dead ash.	2	4,000.00		
Spring 2	1S	Spot spray flowering, second-year garlic mustard prior to seed set. Scout entirety of each unit; assume	1.3	1,040.00		



Season & Year	Unit-Subunit	Activity	Area [Acres]	Estimated Cost [€]	City/Landowner (Forthcoming in JPA)	County (Forthcoming in JPA)
		garlic mustard is present across 1/3 of unit.				
Fall 2	1S	Spot herbicide treatment of resprouted/new germinant buckthorn.	3.9	2,340.00		
Spring 3	1S	Spot spray flowering, second-year garlic mustard prior to seed set or hold volunteer event to pull and bag flowering garlic mustard. Scout entirety of each unit; assume garlic mustard is present in 1/3 of each unit.	1.3	1,040.00		
Fall 3	1S	Spot herbicide treatment of resprouted/new germinant buckthorn.	3.9	2,340.00		
Spring 4	1S	Spot spray flowering, second-year garlic mustard prior to seed set or hold volunteer event to pull and bag flowering garlic mustard.	1.3	1,040.00		
Fall 5	1S	Plant 500 bare root native trees and shrubs within buckthorn removal areas. (Black chokeberry, gray dogwood, red elderberry, American hazelnut, nannyberry, ironwood)	3.9	2,340.00		
Spring 1	2N	Repair/replace browse protection on planted trees; prune damaged limbs and flush cut dead trees.	0.3	360.00		
Summer 1	2N	Install gator bags on planted trees or provide supplemental water to trees.	0.3	360.00		
Fall 1	2N	Inter-seed or snow seed BWSR 35-261 or BWSR "Little bluestem urban prairie" pilot mix.	0.3	300.00		
Fall 1	2N	Remove gator bags and provide supplemental water to trees before ground freezes. Prune damaged limbs.	0.3	360.00		
Spring 2	2N	Repair/replace browse protection on planted trees.	0.3	360.00		
Spring 2	2N	Eliminate mowing by 6' width on unit perimeters except near trails.	0.3	\$0.00		
Summer 2	2N	Reinstall gator bags or provide supplemental water to trees.	0.3	270.00		
Fall 2	2N	Remove gator bags and provide supplemental water to trees before ground freezes. Prune damaged limbs.	0.3	360.00		
Spring 3	2N	Repair/replace browse protection on planted trees.	0.3	360.00		
Summer 3	2N	Mow newly seeded areas only twice during growing season except near trails.	0.3	225.00		
Summer 3	2N	Plant pollinator supporting, native shrubs where screening is needed.	0.3	3,000.00		

Season & Year	Unit-Subunit	Activity	Area [Acres]	Estimated Cost [€]	City/Landowner (Forthcoming in JPA)	County (Forthcoming in JPA)
		(American hazelnut, Nannyberry, New Jersey tea, Ninebark).				
Fall 3	2N	Remove gator bags and provide supplemental water to trees and shrubs before ground freezes. Prune damaged limbs.	0.3	360.00		
Spring 4	2N	Repair/replace browse protection on planted trees.	0.3	360.00		
Summer 4	2N	Install gator bags on planted trees or provide supplemental water to trees and shrubs.	0.3	360.00		
Fall 4	2N	Inter-seed or snow seed BWSR 35-261 or BWSR "Little bluestem urban prairie" pilot mix.	0.3	300.00		
Fall 4	2N	Remove gator bags and provide supplemental water to trees and shrubs before ground freezes. Prune damaged limbs.	0.3	360.00		
Spring 5	2N	Repair/replace browse protection on planted trees.	0.3	360.00		
Summer 5	2N	Provide supplemental water to shrubs, as needed.	0.3	300.00		
Spring 2	2S	Mow reed canary grass lobe/hillside twice before early June targeting boot stage or when the seed head has swollen in the leaf sheath but not yet emerged.	0.2	200.00		
Fall 2	2S	Mow reed canary grass lobe/hillside once in early September targeting boot stage or when the seed head has swollen in the leaf sheath but not yet emerged.	0.2	240.00		
Fall 2	2S	Spot spray reed canary grass and other perennial cool season grasses at woodland edge/slope in late September	0.2	300.00		
Spring 3	2S	Eliminate mowing by 6' width on unit north perimeter except near trails. Mow reed canary grass lobe/hillside twice before early June.	0.2	200.00		
Fall 3	2S	Spot spray reed canary grass, smooth brome, and Kentucky bluegrass at woodland edge/slope.	0.4	600.00		
Fall 3	2S	Inter-seed or snow seed native woodland edge/savanna mix (BWSR 36-211 or similar). Contractor supplies seed. (Includes seed cost.)	0.8	800.00		
Summer 4	2S	Mow newly seeded areas twice during growing season when growth reaches 8-10" and mow to a height of 4-5" to reduce weedy competition.	0.8	600.00		



Season & Year	Unit-Subunit	Activity	Area [Acres]	Estimated Cost [\\$]	City/Landowner (Forthcoming in JPA)	County (Forthcoming in JPA)
Summer 4	2S	Plant pollinator supporting, native shrubs where screening is needed. (American hazelnut, Nannyberry, New Jersey tea, Ninebark).	20	3,000.00		
Spring/Summer 5	2S	2-3 IPM visits	0.7	735.00		
Summer 5	2S	Provide supplemental water to shrubs, as needed.	0.7	700.00		
Fall 5	2S	Inter-seed or snow seed native woodland edge/savanna mix (BWSR 36-211 or similar) in bare areas. Contractor supplies seed. (Includes seed cost.)	0.3	525.00		
Spring/Summer 6	2S	2-3 IPM visits	0.7	735.00		
Summer 6	2S	Provide supplemental water to shrubs, as needed.	0.7	700.00		
Spring 1	3	Mow annual/biennial weeds in basin and surrounding upland to 4-5" height (common mullein, common and giant ragweed, etc.)	0.5	500.00		
Summer 1	3	Spot spray perennial weeds (Canada thistle, spotted knapweed, etc.)	0.5	750.00		
Fall 1	3	Cut and stump treat approx. 50 volunteer trees and shrubs in basin.	0.5	1,000.00		
Spring 2	3	Mow annual/biennial weeds in basin and surrounding upland to 4-5" height (common mullein, common and giant ragweed, etc.)	0.5	500.00		
Summer 2	3	Spot spray perennial weeds (Canada thistle, spotted knapweed, etc.)	0.5	750.00		
Fall 2	3	Cut and stump treat all volunteer trees and shrubs in basin.	0.5	1,000.00		
Early winter 2	3	Remove accumulated sediment from inlet and basin. Sediment depth to be determined by city staff.	0.5	2,500.00		
Spring 3	3	Mow annual/biennial weeds in basin and surrounding upland (common mullein, common and giant ragweed, etc.)	0.5	500.00		
Spring 3	3	Overseed areas disturbed by sediment removal using species from original installation or BWSR 33-261 or 33-262 depending on moisture regimes.	0.5	1,000.00		
Spring/Summer 3	3	Mow newly seeded areas once in late spring and once in mid-summer to 4-5" height.	0.5	750.00		
Spring 4	3	Mow annual/biennial weeds in basin and surrounding upland (common mullein, common and	0.5	500.00		

Season & Year	Unit-Subunit	Activity	Area [Acres]	Estimated Cost [\\$]	City/Landowner (Forthcoming in JPA)	County (Forthcoming in JPA)
		giant ragweed, etc.) and newly seeded areas				
Summer 4	3	Spot spray perennial weeds (Canada thistle, spotted knapweed, etc.)	0.5	\$750.00		
Spring 5	3	Mow annual/biennial weeds in basin and surrounding upland (common mullein, common and giant ragweed, etc.)	0.5	500.00		
Fall/winter 1	4N	Invasive shrub removal: A combination of forestry mowing and cut and paint removal of non-native, invasive shrubs	2.4	5,400.00		
Fall/winter 1	4N	Green ash removal. City or contractors to remove approx. 15 hazard ash trees along trails.		-		
Fall/winter 1	4N	Erosion control: use cut material to add natural wood erosion bars to slopes and gullies.	1.0	500.00		
Fall/winter 1	4N	Install additional natural wood erosion bars in gullies and on bare slopes across approx. 500' near trail edge to hold soil.	1.0	2,000.00		
Spring 2	4N	Spot spray invasive herbaceous species including garlic mustard, dame's rocket, and burdock.	2.4	1,920.00		
Spring 2	4N	Create diversion pathways. Install erosion mats and plant grass strips to further control gully erosion, if needed. Approximately 12 woodland gullies each ~20' in length and 15' in width.	1.0	1,500.00		
Fall 2	4N	Spot spray woody invasive seedlings and re-sprouts	2.4	1,440.00		
Fall 2	4N	Seed edges, open gaps, and eroded areas with a simple graminoid mix (MNL Buckthorn Replacement Mix) to establish herbaceous layer. Contractor supplies seed. (Includes seed costs)	2.4	750.00		
Spring 3	4N	Spot spray invasive herbaceous species including garlic mustard, dame's rocket, and burdock.	2.4	1,680.00		
Fall 3	4N	Spot spray woody invasive seedlings and re-sprouts	2.4	1,440.00		
Spring 4	4N	Spot spray invasive herbaceous species including garlic mustard, dame's rocket, and burdock.	2.4	1,680.00		
Fall 4	4N	Spot spray woody invasive seedlings and re-sprouts	2.4	1,440.00		
Fall 4	4N	Plant 200 bareroot trees and shrubs in gaps and removal areas. (Ironwood, hackberry, red maple, bitternut hickory, American sycamore, white oak, northern red oak, sugar maple, ninebark,	2.0	2,000.00		



Season & Year	Unit-Subunit	Activity	Area [Acres]	Estimated Cost [\\$]	City/Landowner (Forthcoming in JPA)	County (Forthcoming in JPA)
		chokecherry, nannyberry, black chokeberry)				
Summer 5	4N	Water planted trees and shrubs as needed	2.0	1,000.00		
Fall 5	4N	Seed or plant 400 woodland wildflowers along trail edges. (Wild columbine, wild ginger, woodland phlox, early buttercup, bloodroot, large-flowered trillium)	2.0	1,600.00		
Fall/winter 1	4Sa	Invasive shrub removal: A combination of forestry mowing and cut and paint removal of non-native, invasive shrubs	2.7	6,075.00		
Fall/winter 1	4Sa	Green ash removal. Contractors to remove all dead ash trees		-		
Fall/winter 1	4Sa	Erosion control: use appropriate salvaged cut material to add natural wood erosion bars to slopes and gullies. Utilize approximately 50 logs.	50 logs	1,000.00		
Fall/winter 1	4Sa	Install additional natural wood erosion bars in gullies and on bare slopes near trail edge to hold soil		4,000.00		
Spring 2	4Sa	Spot spray invasive herbaceous species including garlic mustard, dame's rocket, and burdock. Assumes presence across 2/3 of unit.	1.6	1,120.00		
Spring 2	4Sa	Create diversion pathways. Install erosion mats and plant grass strips to further control gully erosion, if needed. Determine quantity in consultation with selected contractor.		3,000.00		
Fall 2	4Sa	Spot spray woody invasive seedlings and re-sprouts	2.7	1,620.00		
Fall 2	4Sa	Seed edges, open gaps, and eroded areas with a simple graminoid seed mix (MNL Buckthorn Replacement Mix. Contractor supplies seed. (Includes seed costs)	1.4	840.00		
Spring 3	4Sa	Spot spray invasive herbaceous species including garlic mustard, dame's rocket, and burdock. Assumes presence across 2/3 of units.	1.6	1,120.00		
Fall 3	4Sa	Spot spray woody invasive seedlings and re-sprouts	2.7	1,620.00		
Fall 4	4Sa	Spot spray woody invasive seedlings and re-sprouts	2.7	1,620.00		
Fall 4	4Sa	Plant 250 bareroot trees and shrubs in gaps and removal areas. (Ironwood, hackberry, red maple, bitternut hickory, white oak, northern red oak, sugar maple,	2.0	2,000.00		

Season & Year	Unit-Subunit	Activity	Area [Acres]	Estimated Cost [\$]	City/Landowner (Forthcoming in JPA)	County (Forthcoming in JPA)
		ninebark, chokecherry, nannyberry, black chokeberry)				
Summer 5	4Sa	Water planted trees and shrubs as needed	2.0	1,000.00		
Fall 5	4Sa	Seed or plant woodland wildflowers along trail edges. (Wild columbine, wild ginger, woodland phlox, early buttercup, bloodroot, large-flowered trillium plugs or plants or BWSR 36-211 seed mix)	2.0	1,600.00		
Fall 1	4sb, 9, 10, 11	Cut woody invasives; stump treat all Siberian elm, black locust, honeysuckle, and buckthorn (4" dia+ for buckthorn) with Garlon 3A. Cut/pile all dead ash. Drop material in low density areas and pile for burning in high density areas.	9.1	20,475.00		
Winter 1	4sb, 9, 10, 11	Burn piles.	9.1	2,730.00		
Fall 2	4sb, 9, 10, 11	Foliar herbicide treatment of resprouted/new germinant buckthorn.	9.1	6,370.00		
Fall 2	4sb, 9, 10, 11	Hand-broadcast seeding of simple graminoid seed mix (MNL Buckthorn Replacement Mix) to establish herbaceous cover. Estimate seeding 1/2 of total acreage. Contractor supplies seed. (Includes seed cost).	9.1	10,192.00		
Spring 3	4sb, 9, 10, 11	Spot spray flowering, second-year garlic mustard prior to seed set or hold volunteer event to pull and bag flowering garlic mustard. Scout entirety of each unit; assume garlic mustard is present in 1/3 of each unit.	9.1	3,185.00		
Fall 3	4sb, 9, 10, 11	Foliar herbicide treatment of resprouted/new germinant buckthorn.	9.1	6,370.00		
Spring 4	4sb, 9, 10, 11	Spot spray flowering, second-year garlic mustard prior to seed set or hold volunteer event to pull and bag flowering garlic mustard. Scout entirety of each unit; assume garlic mustard is present in 1/3 of each unit.	9.1	3,185.00		
Late spring 4	4sb, 9, 10, 11	Plant plugs of showy native forbs on trail edges.	990 plugs	1,980.00		
Spring/Summer 4	4sb, 9, 10, 11	One IPM visit, no herbicide	9.1	3,185.00		
Fall 4	4sb, 9, 10, 11	Source and broadcast woodland seed BWSR 36-211.	9.1	12,285.00		
Spring/Summer 5	4sb, 9, 10, 11	One IPM visit, no herbicide	9.1	3,185.00		
Fall 5	4sb, 9, 10, 11 (1S)	Plant 500 bare root native trees and shrubs within buckthorn		Cost covered in Unit 1S.		

Season & Year	Unit-Subunit	Activity	Area [Acres]	Estimated Cost [\$]	City/Landowner (Forthcoming in JPA)	County (Forthcoming in JPA)
		removal areas. (Black chokeberry, gray dogwood, red elderberry, American hazelnut, nannyberry, ironwood)				
Spring 1	5, 8, 12	Mow all weedy/invasive species within pond buffers to 4-5”.	1.7	595.00		
Summer 1	5, 8, 12	Mow all weedy/invasive species within pond buffers to 4-5”.	1.7	595.00		
Fall 1	5, 8, 12	Cut/stump treat all undesirable woody species within pond buffers.	1.7	3,825.00		
Spring 2	5, 8, 12	Mow once all weedy/invasive species within pond buffers to 4-5” height.	1.7	2,550.00		
Summer 2	5, 8, 12	Mow twice all weedy/invasive species within pond buffers to 4-5” height.	1.7	3,400.00		
Summer 2	5, 8, 12	Spot treat persistent perennial weeds in pond buffers with aquatic safe herbicide.	1.7	2,550.00		
Fall 2	5, 8, 12	Foliar herbicide treatment of resprouted/new germinant buckthorn.	1.7	1,190.00		
Spring/Summer 3	5, 8, 12	Spot treat persistent perennial weeds in pond buffers with aquatic safe herbicide.	1.7	595.00		
Spring 4	5, 8, 12	Plant 425 plugs of native pond edge/stormwater appropriate species in buffers to increase diversity/provide habitat. Species: marsh milkweed, spotted Joe pye weed, obedient plant, blue vervain. Seed areas not affected by moisture fluctuations. Contractor supplies plugs and seed. (Includes seed and plant cost.)	1.7	3,291.00 (seed) 648.00 (plugs)		
Spring 4	5, 8, 12	Mow newly seeded areas once in late spring to 4-5” height.	1.7	595.00		
Summer 4	5, 8, 12	Mow newly seeded areas once in mid-summer to 4-5” height.	1.7	595.00		
Spring 5	5, 8, 12	IPM visit, no herbicide.	1.7	595.00		
Summer 5	5, 8, 12	IPM visit, no herbicide.	1.7	595.00		
Fall/winter 1	6, 7	Forestry mow (or cut and treat non-native woody brush and trees. Push boundaries of unit into surrounding woodland by minimum 15 feet to reduce woody reestablishment. Pile and burn cut material.	1.2	2,700.00		
Summer/Fall 2	6, 7	Mow (0.5 acre) and hand mow (0.7 acre) twice	1.2	745.00		
Spring 3	6, 7	Non-selective herbicide overspray	1.2	420.00		
Late spring 3	6, 7	Prescribed burn to remove thatch. Allow burn to run into neighboring units.	1.2	1,128.00		



Season & Year	Unit-Subunit	Activity	Area [Acres]	Estimated Cost [\$]	City/Landowner (Forthcoming in JPA)	County (Forthcoming in JPA)
Winter 2	6, 7	Purchase mesic prairie mix (0.5 acre) and dry prairie mix (0.7 acre). Broadcast seed post-burn.	1.2	450.00		
Spring 2	6, 7	Conduct prescribed burn on project area to remove thatch. Let burn run into neighboring units.	1.2	375.00		
Summer 2	6, 7	Mow (2x) establishing prairie	1.2	745.00		
Summer 3	6, 7	Spot spray (2x) establishing prairie	1.2	350.00		
Summer 4	6, 7	Mow or spot spray as needed based on species present (2-3x) establishing prairie	1.2	840.00		
Summer 4	6, 7	Mow or spot spray as needed based on species present (1x) establishing prairie	1.2	420.00		
Summer 5	6, 7	Mow or spot spray as needed based on species present (1x) establishing prairie	1.2	420.00		
Summer 4	6, 7	Mow or spot spray as needed based on species present (1x) establishing prairie	1.2	175.00		
Spring 5	6, 7	Prescribed burn on newly established mesic prairie	1.2	1,128.00		
Spring 5	6, 7	Purchase supplemental forb seed for mesic prairie (0.5 acre) and dry prairie (0.7 acre).	1.2	927.00		
Spring 5	6, 7	Broadcast supplemental seed post-burn	1.2	384.00		
<b>TOTAL for the City of Inver Grove Heights</b>				<b>167,308.00</b>		
<b>TOTAL for the City of South Saint Paul</b>				<b>54,820.00</b>		
<b>TOTAL</b>				<b>222,128.00</b>		

**Notes regarding the work plan.**

Units requiring similar restoration work have been grouped so that when bid, an economy of scale can be realized. Tasks suited to city staff have been indicated as such. For tasks with seeding operations, whether seed costs are included in the estimated cost or if seed costs are separate are indicated as such.

## Other Considerations

There can be other factors that should be taken into account in managing natural resources. A checked box indicates some of these other considerations for this property:

- Agriculture-Crops and Livestock Grazing – Comments: Click here to enter text or type N/A
- Alteration of Natural Water Bodies - Comments: Click here to enter text or type N/A
- Buildings, Improvements, Small Structures – Comments: Click here to enter text or type N/A
- Fences, including adjacent fences – Comments: Click here to enter text or type N/A
- Harmful Insects and Invasive or Exotic Species – Comments: Common buckthorn, Tatarian honeysuckle, Siberian elm, black locust, round-leaved bittersweet, garlic mustard, spotted knapweed, reed canary grass, wild parsnip, German yellowjackets
- Harvesting of Timber, Berries, or Fruit – Comments: Click here to enter text or type N/A
- Motorized Vehicles – Comments: Click here to enter tex. or type N/A
- Pesticide and Herbicide Use – Comments: Judicious and targeted herbicide use is recommended for specific species on this property.
- Recreational Activities – Comments: Passive recreation is expected to continue on this property.
- Recreational Horseback Riding - Comments: Click here to enter tex. or type N/A
- Residential, Commercial, or Industrial Activities – Comments: Click here to enter text or type N/A
- Signs – Comments: Trail maps and interpretive signage is recommended.
- Storm-water Conveyance, including from Adjacent Properties – Comments: Stormwater conveyance to this property is currently occurring through the biofiltration cell and direct runoff.
- Trails – Comments: Maintenance of existing trails and extension of those trails is expected.
- Utilities and Septic Systems, Roads, Parking Areas, Paths, and Trails – Comments: Click here to enter text or type N/A
- Waste Sites – Comments: Click here to enter text or type N/A

# Trails





# Appendices

## Appendix A: Observed Plant Species

The following plant species were identified at the Property for each land management unit, on Monday, September 26, 2022, by Friends of the Mississippi River ecologists. Relative amount of cover for individual species and vegetation layers: + (0-1%), 1 (1-5%), 2 (5-25%), 3 (25-50%), 4 (50-75%), 5 (75-100%).

Observed Plant Species Recorded at the Property (for each Unit)

Unit #	Native/Non-Native	Type	Common Name	Scientific Name	% Cover
4,6,9,10,11,12	Native	Groundcover	Box elder	<i>Acer negundo</i>	1
4	Native	Groundcover	Black snakeroot	<i>Actaea racemosa</i>	+
4	Native	Groundcover	Baneberry	<i>Actaea rubra</i>	+
1,4,5,6,7,8,9,10,11,12	Native	Groundcover	White snakeroot	<i>Ageratina altissima</i>	2
1,4,5,8,9,10,11,12	Non-native	Groundcover	Garlic mustard	<i>Alliaria petiolata</i>	2
4	Native	Groundcover	Common ragweed	<i>Ambrosia artemisiifolia</i>	1
12	Native	Groundcover	Hog peanut	<i>Amphicarpaea bracteata</i>	+
4	Native	Groundcover	Plantain-leaved pussytoes	<i>Antennaria plantaginifolia</i>	+
6,11,12	Non-native	Groundcover	Wild chervil	<i>Anthriscus sylvestris</i>	+
4	Native	Groundcover	Columbine	<i>Aquilegia canadensis</i>	+
1,4,5,6,7,8,9,10,11,12	Non-native	Groundcover	Common burdock	<i>Arctium minus</i>	2
5,6,8,12	Native	Groundcover	Tall agrimony	<i>Agrimonia gryposepala</i>	+
4,11	Native	Groundcover	Jack-in-the-pulpit	<i>Arisaema triphyllum</i>	+
4	Native	Groundcover	Heart-leaved aster	<i>Aster cordifolius</i>	+
4,9,11,12	Native	Groundcover	Lady fern	<i>Athyrium filix-femina</i>	+
5,8,12	Native	Groundcover	American sloughgrass	<i>Beckmannia syzigachne</i>	2
5,8,11,12		Groundcover	False nettle	<i>Boehmeria cylindrica</i>	1
4	Native	Groundcover	False aster	<i>Boltonia asteroides</i>	+
7	Non-native	Groundcover	Smooth brome	<i>Bromus inermis</i>	2
4	Native	Groundcover	Pennsylvania sedge	<i>Carex pennsylvanica</i>	1
11	Non-native	Groundcover	Bittersweet	<i>Celastrus orbiculatus</i>	1
1,4,5,7,9,10,11,12	Native	Groundcover	Hackberry	<i>Celtis occidentalis</i>	1
7	Non-native	Groundcover	Spotted knapweed	<i>Centaurea stoebe</i>	2
		Groundcover	cf. grass	<i>cf. grass</i>	
10		Groundcover	Common lamb's quarters	<i>Chenopodium giganteum</i>	+
5,8,10,11,12		Groundcover	Enchanter's nightshade	<i>Circaea lutetiana</i>	1
4,6,7,9,10,11	Non-native	Groundcover	Canada thistle	<i>Cirsium arvense</i>	1
6	Non-native	Groundcover	Bull thistle	<i>Cirsium vulgare</i>	+
11	Native	Groundcover	Fringed willowherb	<i>Epilobium ciliatum</i>	+
4,5,6,8,9,11,12		Groundcover	Daisy fleabane	<i>Erigeron annuus</i>	+
4,10,11,12	Native	Groundcover	Wild strawberry	<i>Fragaria spp.</i>	1
1,4,5,6,8,9,10,11,12	Native	Groundcover	Green ash	<i>Fraxinus pennsylvanica</i>	1
4,6	Native	Groundcover	Northern bedstraw	<i>Galium boreale</i>	+
4	Native	Groundcover	Fragrant bedstraw	<i>Galium triflorum</i>	+
1,4,5,8,9,10,11,12	Native	Groundcover	White avens	<i>Geum canadense</i>	2

Unit #	Native/Non-Native	Type	Common Name	Scientific Name	% Cover
6,11,12	Non-native	Groundcover	Creeping Charlie	<i>Glechoma hederacea</i>	2
5,6,8,10,11,12		Groundcover	Virginia stickseed	<i>Hackelia virginiana</i>	1
6		Groundcover	Greater St. John's-wort	<i>Hypericum pyramidatum</i>	2
6	Native	Groundcover	Black walnut	<i>Juglans nigra</i>	1
6	Native	Groundcover	Eastern red cedar	<i>Juniperus virginiana</i>	+
4,6,9		Groundcover	Prickly lettuce	<i>Lactuca serriola</i>	+
10	Non-native	Groundcover	Motherwort	<i>Leonurus cardiaca</i>	1
12	Native	Groundcover	Cardinal flower	<i>Lobelia cardinalis</i>	+
4,5,8,9,12	Non-native	Groundcover	Tatarian honeysuckle	<i>Lonicera tatarica</i>	1
4,11,12	Native	Groundcover	False Solomon's seal	<i>Maianthemum racemosum</i>	+
12	Native	Groundcover	Ostrich fern	<i>Matteuccia struthiopteris</i>	1
10	Non-native	Groundcover	Alfalfa	<i>Medicago sativa</i>	+
7	Non-native	Groundcover	Yellow sweet clover	<i>Melilotus officinalis</i>	+
1		Groundcover	Moonseed	<i>Menispermum canadense</i>	+
6		Groundcover	White mulberry	<i>Morus alba</i>	+
11		Groundcover	Catmint	<i>Nepeta racemosa</i>	+
4	Native	Groundcover	Wood sorrel	<i>Oxalis spp.</i>	+
12	Native	Groundcover	Sensitive fern	<i>Onoclea sensibilis</i>	+
1,4,5,7,8,9,10,11,12	Native	Groundcover	Virginia creeper	<i>Parthenocissus quinquefolia</i>	2
4,5,6,7,8,9,10,11,12		Groundcover	Reed canary grass	<i>Phalaris arundinacea</i>	2
5,8	Native	Groundcover	Swamp smartweed	<i>Persicaria amphibia</i>	2
4,10	Non-native	Groundcover	Clearweed	<i>Pilea pumila</i>	1
4,9,10		Groundcover	Broadleaf plantain	<i>Plantago major</i>	+
6,7,8,10	Non-native	Groundcover	Kentucky bluegrass	<i>Poa pratensis</i>	3
5,8,12	Native	Groundcover	Eastern cottonwood	<i>Populus deltoides</i>	+
4	Native	Groundcover	Quaking aspen	<i>Populus tremuloides</i>	+
1,4,9,10,11	Native	Groundcover	Black cherry	<i>Prunus serotina</i>	1
11	Native	Groundcover	Chokecherry	<i>Prunus virginiana</i>	+
4,9,12	Native	Groundcover	Red oak	<i>Quercus rubra</i>	+
1,4,5,6,8,9,10,11,12	Non-native	Groundcover	Common buckthorn	<i>Rhamnus cathartica</i>	3
10	Native	Groundcover	Smooth sumac	<i>Rhus glabra</i>	+
1,4,9	Native	Groundcover	Missouri gooseberry	<i>Ribes missouriensis</i>	1
5,6,7,8,12	Native	Groundcover	Common blackberry	<i>Rubus allegheniensis</i>	2
1,4,6,7,9,10,12	Native	Groundcover	Black raspberry	<i>Rubus occidentalis</i>	2
6,10,11	Non-native	Groundcover	Crown vetch	<i>Securigera varia</i>	2
4		Groundcover	Common greenbrier	<i>Smilax rotundifolia</i>	+
4,11		Groundcover	Bittersweet nightshade	<i>Solanum dulcamara</i>	+
1,4,5,6,7,8,9,10,11,12		Groundcover	Canada goldenrod	<i>Solidago canadensis</i>	2
7	Native	Groundcover	Giant goldenrod	<i>Solidago gigantea</i>	+
6	Native	Groundcover	Showy goldenrod	<i>Solidago speciosa</i>	1
4,11	Native	Groundcover	American mountain ash	<i>Sorbus americana</i>	+
4,12		Groundcover	Chickweed	<i>Stellaria media</i>	+

Unit #	Native/Non-Native	Type	Common Name	Scientific Name	% Cover
6,10	Native	Groundcover	Panicled aster	<i>Symphotrichum lanceolatum</i>	+
4	Native	Groundcover	Calico aster	<i>Symphotrichum lateriflorum</i>	+
6		Groundcover	Common dandelion	<i>Taraxacum officinale</i>	+
1	Native	Groundcover	American basswood	<i>Tilia americana</i>	+
4	Native	Groundcover	Poison ivy	<i>Toxicodendron radicans</i>	+
5,7,8	Non-native	Groundcover	Narrow-leaved cattail	<i>Typha latifolia</i>	1
5,8,12	Non-native	Groundcover	Siberian elm	<i>Ulmus pumila</i>	1
5,8,9,10,11,12	Native	Groundcover	Stinging nettle	<i>Urtica dioica</i>	1
4		Groundcover	Common mullein	<i>Verbascum thapsus</i>	+
6	Native	Groundcover	White vervain	<i>Verbena urticifolia</i>	+
4,6,12	Native	Groundcover	Downy yellow violet	<i>Viola pubescens</i>	1
4,5,6,8,10,11,12	Native	Groundcover	Riverbank grape	<i>Vitis riparia</i>	1
6,8,11	Non-native	Understory	Amur maple	<i>Acer ginnala</i>	+
4,5,6,7,8,10,11,12	Native	Understory	Box elder	<i>Acer negundo</i>	2
4,5,8,12	Native	Understory	Silver maple	<i>Acer saccharinum</i>	1
8,11,12	Native	Understory	Hackberry	<i>Celtis occidentalis</i>	+
4,6,11	Native	Understory	Round-leaved dogwood	<i>Cornus alternifolia</i>	+
4,5,8,12	Native	Understory	Gray dogwood	<i>Cornus racemosa</i>	+
11	Non-native	Understory	Burning bush	<i>Euonymus alatus</i>	+
5,6,7,8,10,11,12	Native	Understory	Green ash	<i>Fraxinus pennsylvanica</i>	2
1,4,5,6,7,8,9,10,11,12	Native	Understory	Black walnut	<i>Juglans nigra</i>	2
4,6	Native	Understory	Eastern red cedar	<i>Juniperus virginiana</i>	+
5,7,8,11,12	Non-native	Understory	Tatarian honeysuckle	<i>Lonicera tatarica</i>	1
6		Understory	Crabapple	<i>Malus spp.</i>	+
4,5,7,8,12		Understory	White mulberry	<i>Morus alba</i>	+
5,8,12	Native	Understory	Eastern cottonwood	<i>Populus deltoides</i>	1
4	Native	Understory	Quaking aspen	<i>Populus tremuloides</i>	+
4,9	Native	Understory	Black cherry	<i>Prunus serotina</i>	1
11+	Native	Understory	Chokecherry	<i>Prunus virginiana</i>	
4	Native	Understory	Pin oak	<i>Quercus palustris</i>	1
1,4,5,6,7,8,9,10,11,12	Non-native	Understory	Common buckthorn	<i>Rhamnus cathartica</i>	4
4,5	Native	Understory	Smooth sumac	<i>Rhus glabra</i>	+
1,8,9,10,11,12	Native	Understory	Missouri gooseberry	<i>Ribes missouriensis</i>	2
1	Native	Understory	Common blackberry	<i>Rubus allegheniensis</i>	2
6,9	Native	Understory	Black raspberry	<i>Rubus occidentalis</i>	2
5,6,8,12	Native	Understory	Black willow	<i>Salix nigra</i>	1
8,9,11,12	Native	Understory	Red-berried elder	<i>Sambucus racemosa</i>	1
1,4	Native	Understory	American basswood	<i>Tilia americana</i>	+
5,8,9,10,12	Non-native	Understory	Siberian elm	<i>Ulmus pumila</i>	1
4,12	Native	Understory	Nannyberry	<i>Viburnum lentago</i>	1
4	Native	Understory	Prickly ash	<i>Zanthoxylum americanum</i>	+
5,8,9,10,11,12	Native	Canopy	Box elder	<i>Acer negundo</i>	1
8,10,12	Native	Canopy	Silver maple	<i>Acer saccharinum</i>	1



Unit #	Native/Non-Native	Type	Common Name	Scientific Name	% Cover
4	Native	Canopy	Paper birch	<i>Betula papyrifera</i>	1
1	Native	Canopy	Hackberry	<i>Celtis occidentalis</i>	1
4,5,8,9,10,11,12	Native	Canopy	Green ash	<i>Fraxinus pennsylvanica</i>	3
1,4,5,8,9,10,11,12	Native	Canopy	Black walnut	<i>Juglans nigra</i>	3
4	Native	Canopy	Eastern red cedar	<i>Juniperus virginiana</i>	+
5,8,12		Canopy	White mulberry	<i>Morus alba</i>	+
4,5,8,11,12	Native	Canopy	Eastern cottonwood	<i>Populus deltoides</i>	2
4	Native	Canopy	Quaking aspen	<i>Populus tremuloides</i>	2
4,11	Native	Canopy	Black cherry	<i>Prunus serotina</i>	1
9	Native	Canopy	White oak	<i>Quercus alba</i>	+
4,12	Native	Canopy	Bur oak	<i>Quercus macrocarpa</i>	+
4,11	Native	Canopy	Pin oak	<i>Quercus palustris</i>	2
11	Native	Canopy	Red oak	<i>Quercus rubra</i>	1
4,10	Non-native	Canopy	Black locust	<i>Robinia pseudoacacia</i>	1
5,8,11,12	Native	Canopy	Black willow	<i>Salix nigra</i>	+
1	Native	Canopy	American basswood	<i>Tilia americana</i>	2
4,8,10,11,12	Native	Canopy	American elm	<i>Ulmus americana</i>	1
5,8,10,12	Non-native	Canopy	Siberian elm	<i>Ulmus pumila</i>	2
11	Native	Canopy	Slippery elm	<i>Ulmus rubra</i>	+

## Appendix B: Recommended Plant Species

The following plant, shrub and tree species are included in the *Field Guide to the Native Plant Communities of Minnesota: The Eastern Broadleaf Forest* (DNR 2005). They are representative of each native plant community. Not all species are readily available from the nursery industry. Some species are not suited for restoration in areas with human use (i.e., poison ivy)

UNITS 1N, 1S, 4N, 4S, 9, 10, 11, and 12: Southern Wet-Mesic Hardwood Forest (MHs49)			
Forbs, Ferns, and Fern Allies			
Scientific Name	Common Name	Scientific Name	Common Name
<i>Hydrophyllum virginianum</i>	Virginia Waterleaf	<i>Urtica dioica</i>	Stinging Nettle
<i>Galium aparine</i>	Cleavers	<i>Smilacina racemosa</i>	Common False Solomon's seal
<i>Laportea candensis</i>	Wood nettle	<i>Solidago flexicaulis</i>	Zig-zag goldenrod
<i>Phlox divaricata</i>	Blue Phlox	<i>Erythronium albidum</i>	White Trout Lily
<i>Caulophyllum thalictroides</i>	Blue cohosh	<i>Osmorhiza longistylis</i>	Aniseroot
<i>Geum canadense</i>	White Avens	<i>Smilax ecirrata</i> , <i>S. Herbacea</i> , and <i>S. Illnoensis</i>	Carrion Flower
<i>Geranium maculatum</i>	Wild Geranium	<i>Ranunculus hispidus</i>	Hispid Buttercup
<i>Enemion biternatum</i>	False Rue Anemone	<i>Rudbeckia laciniata</i>	Tall Coneflower

<i>Asarum canadense</i>	Wild Ginger	<i>Claytonia virginica</i>	Virginia Spring Beauty
<i>Allium tricoccum</i>	Wild leek	<i>Anemone acutiloba</i>	Sharp-lobed hepatica
<i>Viola sororia</i> and similar <i>Viola species</i>	Stemless Blue Violets	<i>Uvularia grandiflora</i>	Large-flowered bellwort
<i>Osmorhiza claytonii</i>	Clayton's sweet cicely	<i>Impatiens spp.</i>	Touch-me-not
<i>Viola pubescens</i>	Yellow Violet	<i>Phodophyllum petatum</i>	Mayapple
<i>Cryptotaenia canadensis</i>	Honewort	<i>Circaea lutetiana</i>	Common Enchanter's Nightshade
<i>Arisaema triphyllum</i>	Jack-in the-pulpit	<i>Cardamine concatenata</i>	Cut-leaved toothwort
<i>Dicentra cucullaria</i>	Dutchman's Breeches	<i>Trillium flexipes</i>	Drooping Trillium
<i>Sanguinaria canadensis</i>	Bloodroot	<i>Hydrophyllum appendiculatum</i>	Appendaged waterleaf
<i>Urtica dioica</i>	Stinging Nettle		
<b>Grasses and Sedges</b>			
<b>Scientific Name</b>	<b>Common Name</b>	<b>Scientific Name</b>	<b>Common Name</b>
<i>Elymus hisitrix</i>	Bottlebrush grass	<i>Carex albursina</i>	White bear Sedge
<i>Carex hirtifolia</i>	Hairy-leaved sedge	<i>Carex blanda</i>	Bland Sedge
<i>Carex sprengei</i>	Sprengel's Sedge	<i>Carex amphibola</i>	Ambiguous Sedge
<b>Woody Vines</b>			
<b>Scientific Name</b>	<b>Common Name</b>	<b>Scientific Name</b>	<b>Common Name</b>
<i>Parthenocissus spp</i>	Virginia Creeper		
<b>Shrubs</b>			
<b>Scientific Name</b>	<b>Common Name</b>	<b>Scientific Name</b>	<b>Common Name</b>
<i>Prunus virginiana</i>	Chokecherry	<i>Ribes cynosbati</i>	Prickly gooseberry
<i>Ribes missouriense</i>	Missouri Gooseberry	<i>Crataegus spp.</i>	Hawthorn
<i>Zanthoxylum americanum</i>	Prickly Ash	<i>Cornus alternifolia</i>	Pagoda dogwood
<i>Viburnum lentago</i>	Nannyberry	<i>Sambucus racemosa</i>	Red-berried elder
<b>Trees</b>			
<b>Scientific Name</b>	<b>Common Name</b>	<b>Scientific Name</b>	<b>Common Name</b>
<i>Tilia americana</i>	American basswood	<i>Acer negundo</i>	Box Elder
<i>Fraxinus nigra</i>	Black Ash	<i>Quercus macrocarpa</i>	Bur Oak
<i>Acer saccharum</i>	Sugar Maple	<i>Ulmus thomasii</i>	Rock Elm

<i>Ulmus americana</i>	American Elm	<i>Ostrya virginiana</i>	Ironwood
<i>Celtis occidentalis</i>	Hackberry	<i>Juglans cinerea</i>	Butternut
<i>Ulmus rubra</i>	Red Elm	<i>Carya Cordiformis</i>	Bitternut Hickory
<i>Fraxinus pennsylvanica</i>	Green Ash	<i>Carpinus caroliniana</i>	Blue Beech

**UNIT 2S: Southern Mesic Savanna (UPs24)-is based mainly on inference from Southern Mesic Prairie (UPs23) and Southern Dry Savanna (UPs14). The DNR does not provide a species list for UPs24. What follows is the list for Southern Dry Savanna (UPs14)**

Forbs			
Scientific Name	Common Name	Scientific Name	Common Name
<i>Allium stellatum</i>	Prairie wild onion	<i>Anemone cylindrica</i>	Long-headed Thimbleweed
<i>Anemone patens</i>	Pasque flower	<i>Antennaria sp</i>	Pussytoes
<i>Artemisia dracuncululus</i>	Tarragon	<i>Artemisia ludoviciana</i>	Western mugwort
<i>Asclepias syriaca</i>	Common milkweed	<i>Asclepias tuberosa</i>	Butterflyweed
<i>Asclepias verticillata</i>	Whorled milkweed	<i>Asclepias viridiflora</i>	Green milkweed
<i>Aster ericoides</i>	Heath aster	<i>Aster laevis</i>	Smooth blue aster
<i>Aster oblongifolius</i>	Aromatic aster	<i>Aster oolentangiensis</i>	Sky-blue aster
<i>Aster prenanthoides</i>	Crooked-stemmed aster	<i>Aster sericeus</i>	Silky Aster
<i>Astragalus crassicaarpus</i>	Buffalo bean	<i>Calylophus serrulata</i>	Toothed evening primrose
<i>Campanula rotundifolia</i>	Harebell	<i>Chrysopsis villosa</i>	Prairie Golden aster
<i>Comandra umbellata</i>	Bastard toad-flax	<i>Coreopsis palmata</i>	Coreopsis
<i>Cycloloma atripifolium</i>	Winged pigweed	<i>Dalea candida</i>	White prairie clover
<i>Dalea purpurea</i>	Purple prairie clover	<i>Dalea villosa</i>	Silky prairie clover
<i>Delphinium carolinianum</i>	Prairie larkspur	<i>Desmodium illinoense</i>	Illinois tick-trefoil
<i>Euphorbia corollata</i>	Flowering spurge	<i>Hedeona hispida</i>	Mock pennyroyal
<i>Helianthemum bicknellii</i>	Hoary frostweed	<i>Helianthus pauciflorus</i>	Stiff sunflower
<i>Kuhnia eupatorioides</i>	False boneset	<i>Lathyrus venosus</i>	Veiny pea
<i>Lechea stricta</i>	Prairie pinweed	<i>Lespedeza capitata</i>	Round-headed bush clover



<i>Liatris aspera</i>	Rough blazing star	<i>Liatris punctata</i>	Dotted blazing star
<i>Linum sulcatum</i>	Grooved Yellow Flax	<i>Lithospermum canescens</i>	Hoary puccoon
<i>Lithospermum caroliniense</i>	Hairy puccoon	<i>Lithospermum incisum</i>	Narrow-leaved puccoon
<i>Mirabilis hirsuta</i>	Hairy four-o'clock	<i>Monarda fistulosa</i>	Wild bergamot
<i>Monarda punctata</i>	Horsemint	<i>Oenothera biennis</i>	Common evening primrose
<i>Oenothera cielandii</i>	Cleland's evening primrose	<i>Onosmodium molle</i>	False gromwell
<i>Oxalis cmx.</i>	Wood sorrel	<i>Pediomelum argophyllum</i>	Silvery scruf pea
<i>Pediomelum esculentum</i>	Prairie turnip	<i>Penstemon grandiflorus</i>	Large-flowered penstemon
<i>Pysalis heterophylla</i>	Clammy ground cherry	<i>Pysalis virginana</i>	Virginia ground cherry
<i>Potentilla arguta</i>	Tall cinquefoil	<i>Ratibida pinnata</i>	Yellow coneflower
<i>Rudbeckia hirta</i>	Black-eyed Susan	<i>Silene antirrhina</i>	Sleepy catchfly
<i>Smilacina stellata</i>	Starry false Solomon's seal	<i>Smilax ecirrata</i>	Erect carrion flower
<i>Solidago missouriensis</i>	Missouri goldenrod	<i>Solidago nemoralis</i>	Gray goldenrod
<i>Solidago ptaricoides</i>	Upland White Aster	<i>Solidago rigida</i>	Stiff goldenrod
<i>Solidago speciosa</i>	Showy goldenrod	<i>Thalictrum dasycarpum</i>	Tall meadow-rue
<i>Tradescantia occidentalis</i>	Western spiderwort	<i>Verbena stricta</i>	Hoary vervain
<i>Veronicastrum virginicum</i>	Culver's root	<i>Viola palmata</i>	Bearded birdfoot violet
<i>Viola pedatifida</i>	Prairie violet	<i>Zizia aptera</i>	Heart-leaved Alexanders
<b>Grasses, Rushes, and Sedges</b>			
<b>Scientific Name</b>	<b>Common Name</b>	<b>Scientific Name</b>	<b>Common Name</b>
<i>Andropogon gerardii</i>	Big bluestem	<i>Aristida basiramea</i>	Base-branched three awned
<i>Bouteloua curtipendula</i>	Sideoats grama	<i>Bouteloua hirsuta</i>	Hairy grama
<i>Bromus kalmii</i>	Kalm's brome	<i>Calamovilfa longifolia</i>	Sand reedgrass
<i>Carex foenea</i>	Hay sedge	<i>Carex muhlenbergii</i>	Muhlenberg's sedge
<i>Carex pensylvanica</i>	Pennsylvania sedge	<i>Carex tenera</i>	Marsh-straw sedge
<i>Carex siccata</i>	Hay sedge	<i>Cyperus lupulinus</i>	Hop-like cyperus
<i>Cyperus schweinitzii</i>	Schweinitz cyperus	<i>Digitaria cognata</i>	Fall witch grass
<i>Elymus trachycaulus</i>	Slender wheatgrass	<i>Elymus wiegandii</i>	Canada wild rye
<i>Eragrostis spectabilis</i>	Purple lovegrass	<i>Koeleria pyramidata</i>	Junegrass

<i>Muhlenbergia cuspidata</i>	Plains muhly grass	<i>Panicum leibergii</i>	Leiberg's panic grass
<i>Panicum oligosanthos</i>	Scribner's panic grass	<i>Panicum perlongum</i>	Long-leaved panic grass
<i>Panicum virgatum</i>	Switchgrass	<i>Panicum wilcoxianum</i>	Wilcox's panic grass
<i>Schizachyrium scoparium</i>	Little bluestem	<i>Sorghastrum nutans</i>	Indian grass
<i>Sporobolus cryptandrus</i>	Sand dropseed	<i>Sporobolus heterolepis</i>	Prairie dropseed
<i>Stipa spartea</i>	Porcupine grass	<i>Stipa spartea</i>	Porcupine grass
<b>Shrubs</b>			
<b>Scientific Name</b>	<b>Common Name</b>	<b>Scientific Name</b>	<b>Common Name</b>
<i>Amelanchier humilis</i>	Low juneberry	<i>Corylus americana</i>	American hazelnut
<i>Prunus virginiana</i>	Chokecherry	<i>Rhus glabra</i>	Smooth sumac
<i>Rhus typhina</i>	Staghorn sumac		
<b>Semi-shrubs</b>			
<b>Scientific Name</b>	<b>Common Name</b>	<b>Scientific Name</b>	<b>Common Name</b>
<i>Amorpha canescens</i>	Leadplant	<i>Artemisia frigida</i>	Prairie sagewort
<i>Ceanothus americanus</i>	American New Jersey tea	<i>Rosa arkansana</i>	Prairie Rose
<b>Trees</b>			
<b>Scientific Name</b>	<b>Common Name</b>	<b>Scientific Name</b>	<b>Common Name</b>
<i>Quercus ellipsoidalis</i>	Northern Pin Oak	<i>Quercus macrocarpa</i>	Bur oak

#### UNIT 5 and UNIT 8: Southern Wet Prairie (WPs54)

<b>Forbs</b>			
<b>Scientific Name</b>	<b>Common Name</b>	<b>Scientific Name</b>	<b>Common Name</b>
<i>Achillea millefolium</i>	Yarrow	<i>Euphorbia corollata</i>	Flowering spurge
<i>Agastache foeniculum</i>	Blue giant-hyssop	<i>Euthamia graminifolia</i>	Grass-leaved goldenrod
<i>Anemone canadensis</i>	Canada anemone	<i>Fragaria virginiana</i>	Common strawberry
<i>Apios americana</i>	Groundnut	<i>Galium triflorum</i>	Three-flowered bedstraw
<i>Apocynum sibiricum</i>	Clasping dogbane	<i>Gentiana x billingtonii</i>	Closed gentian
<i>Asclepias incarnata</i>	Swamp milkweed	<i>Gentianopsis procera</i>	Smaller fringed gentian
<i>Aster lanceolatus</i>	Panicled aster	<i>Geum aleppicum</i>	Yellow avens

<i>Aster novae-angliae</i>	New England aster	<i>Geum canadense</i>	White avens
<i>Aster firmus</i>	Red-stemmed aster	<i>Helenium autumnale</i>	Autumn sneezeweed
<i>Aster umbellatus</i>	Flat-topped aster	<i>Helianthus giganteus</i>	Giant sunflower
<i>Calystegia sepium</i>	Hedge bindweed	<i>Helianthus grosseserratus</i>	Sawtooth sunflower
<i>Campanula aparinoides</i>	Marsh bellflower	<i>Hypoxis hirsuta</i>	Yellow star-grass
<i>Castilleja coccinea</i>	Indian paintbrush	<i>Iris versicolor</i>	Northern blue Flag
<i>Chelone glabra</i>	White turtlehead	<i>Krigia biflora</i>	Two-flowered Cynthia
<i>Chenopodium desiccatum</i>	Narrow-leaved lamb's quarters	<i>Lathyrus palustris</i>	Marsh vetchling
<i>Cicuta maculata</i>	Spotted water-hemlock	<i>Lathyrus venosus</i>	Veiny pea
<i>Cirsium muticum</i>	Swamp thistle	<i>Liatris ligulistylis</i>	Northern plains blazing star
<i>Comandra umbellata</i>	Bastard toad-flax	<i>Liatris pycnostachya</i>	Gayfeather
<i>Desmodium canadense</i>	Canadian tick-trefoil	<i>Lilium michiganense</i>	Michigan lily
<i>Epilobium species</i>	Willow-herb (multiple species)	<i>Liparis loeselii</i>	Loesel's twayblade
<i>Eupatorium maculatum</i>	Spotted Joe-pye weed	<i>Lobelia siphilitica</i>	Great lobelia
<i>Eupatorium perfoliatum</i>	Common boneset	<i>Lobelia spicata</i>	Rough-spiked lobelia
<i>Lycopus americanus</i>	Cut-leaved bugleweed	<i>Oenothera perennis</i>	Perennial evening-primrose
<i>Lycopus uniflorus</i>	Northern bugleweed	<i>Oxalis species</i>	Wood-sorrel
<i>Lysimachia ciliata</i>	Fringed loosestrife	<i>Oxypolis rigidior</i>	Cowbane
<i>Lysimachia quadriflora</i>	Prairie loosestrife	<i>Parnassia glauca</i>	American grass-of-Parnassus
<i>Lythrum alatum</i>	Wing-angled loosestrife	<i>Pedicularis canadensis</i>	Wood-betony
<i>Maianthemum stellatum</i>	Starry false Solomon's-seal	<i>Pedicularis lanceolata</i>	Swamp lousewort
<i>Mentha arvensis</i>	Common mint	<i>Phlox pilosa</i>	Prairie phlox
<i>Mimulus ringens</i>	Purple monkey-flower	<i>Platanthera lacera</i>	Ragged fringed-orchid
<i>Oenothera perennis</i>	Perennial evening-primrose*	<i>Platanthera psycodes</i>	Small purple fringed-orchid
<i>Oxalis species</i>	Wood-sorrel	<i>Polygala sanguinea</i>	Purple milkwort
<i>Oxypolis rigidior</i>	Cowbane	<i>Polygala senega</i>	Seneca snakeroot
<i>Parnassia glauca</i>	American grass-of-Parnassus	<i>Polygonum amphibium</i>	Water smartweed
<i>Pedicularis canadensis</i>	Wood-betony	<i>Polygonum punctatum</i>	Dotted smartweed



<i>Pedicularis lanceolata</i>	Swamp lousewort	<i>Potentilla simplex</i>	Old-field cinquefoil
<i>Phlox pilosa</i>	Prairie phlox	<i>Prenanthes racemosa</i>	Smooth rattlesnake-root
<i>Platanthera lacera</i>	Ragged fringed-orchid	<i>Prenanthes racemosa</i>	Smooth rattlesnake-root
<i>Platanthera psycodes</i>	Small purple fringed-orchid	<i>Pycnanthemum virginianum</i>	Virginia mountain-mint
<i>Polygala sanguinea</i>	Purple milkwort	<i>Ratibida pinnata</i>	Gray-headed coneflower
<i>Polygala senega</i>	Seneca snakeroot	<i>Rubus pubescens</i>	Dwarf raspberry
<i>Polygonum amphibium</i>	Water smartweed	<i>Rudbeckia laciniata</i>	Goldenglow
<i>Polygonum punctatum</i>	Dotted smartweed	<i>Saxifraga pensylvanica</i>	Swamp saxifrage
<i>Potentilla simplex</i>	Old-field cinquefoil	<i>Scutellaria parvula</i>	Prairie skullcap
<i>Prenanthes racemosa</i>	Smooth rattlesnake-root	<i>Senecio aurea</i>	Golden ragwort
<i>Lycopus uniflorus</i>	Northern bugleweed	<i>Silphium perfoliatum</i>	Cup-plant
<i>Lysimachia ciliata</i>	Fringed loosestrife	<i>Sisyrinchium mucronatum</i>	Pointed-petal blue-eyed grass
<i>Lysimachia quadriflora</i>	Prairie loosestrife	<i>Solidago canadensis</i>	Canada goldenrod
<i>Lythrum alatum</i>	Wing-angled loosestrife	<i>Solidago gigantea</i>	Giant goldenrod
<i>Maianthemum stellatum</i>	Starry false Solomon's-seal	<i>Solidago riddellii</i>	Riddell's goldenrod
<i>Mentha arvensis</i>	Common mint	<i>Stachys palustris</i>	Woundwort
<i>Mimulus ringens</i>	Purple monkey-flower	<i>Teucrium canadense</i>	Germander
<i>Thalictrum dasycarpum</i>	Tall meadow-rue	<i>Veronicastrum virginicum</i>	Culver's root
<i>Thalictrum dasycarpum</i>	Tall meadow-rue	<i>Vicia americana</i>	American vetch
<i>Triglochin maritima</i>	Seaside arrow-grass	<i>Viola species</i>	Violet (multiple species)
<i>Verbena hastata</i>	Blue vervain	<i>Zizia aurea</i>	Golden alexanders
<i>Vernonia fasciculata</i>	Bunched ironweed		
<b>Grasses, Rushes, and Sedges</b>			
<b>Scientific Name</b>	<b>Common Name</b>	<b>Scientific Name</b>	<b>Common Name</b>
<i>Agrostis hyemalis</i>	Rough bent-grass	<i>Dicanthelium boreale</i>	Northern panic grass
<i>Andropogon gerardii</i>	Big bluestem	<i>Eleocharis compressa</i>	Flattened spike-rush
<i>Bromus ciliatus</i>	Fringed brome	<i>Eriophorum angustifolium</i>	Narrow-leaved cotton-grass
<i>Calamagrostis canadensis</i>	Bluejoint	<i>Glyceria striata</i>	Fowl manna-grass
<i>Calamagrostis stricta</i>	Bog reed-grass	<i>Hierochloe odorata</i>	Sweet grass

<i>Carex bebbii</i>	Bebb's sedge	<i>Juncus nodosus</i>	Knotty rush
<i>Carex buxbaumii</i>	Buxbaum's sedge	<i>Juncus tenuis</i>	Path rush
<i>Carex conoidea</i>	Field sedge	<i>Juncus vaseyi</i>	Vasey's rush
<i>Carex granularis</i>	Granular sedge	<i>Juncus dudleyi</i>	Dudley's rush
<i>Carex haydenii</i>	Hayden's sedge	<i>Leersia oryzoides</i>	Rice cut grass
<i>Carex interior</i>	Inland sedge	<i>Muhlenbergia frondosa</i>	Swamp satin-grass
<i>Carex lacustris</i>	Lake-sedge	<i>Muhlenbergia glomerata</i>	Clustered muhly grass
<i>Carex sartwellii</i>	Sartwell's sedge	<i>Panicum virgatum</i>	Switchgrass
<i>Carex scoparia</i>	Pointed-broom sedge	<i>Poa palustris</i>	Fowl meadow-grass
<i>Carex stipata</i>	Awl-fruited sedge	<i>Scirpus atrovirens</i>	Dark green bulrush
<i>Carex stricta</i>	Tussock-sedge	<i>Scirpus cyperinus</i>	Wool-grass
<i>Carex tenera</i>	Marsh-straw sedge	<i>Sorghastrum nutans</i>	Indian grass
<i>Carex tetanica</i>	Wood-sedge	<i>Spartina pectinata</i>	Prairie cord-grass
<i>Carex pellita</i>	Woolly sedge	<i>Sphenopholis obtusata</i>	Prairie wedge-grass
<b>Fern and Fern Allies</b>			
<b>Scientific Name</b>	<b>Common Name</b>	<b>Scientific Name</b>	<b>Common Name</b>
<i>Equisetum arvense</i>	Field horsetail	<i>Ophioglossum pusillum</i>	Adder's-tongue
<i>Equisetum pratense</i>	Meadow horsetail	<i>Thelypteris palustris</i>	Northern marsh-fern
<i>Onoclea sensibilis</i>	Sensitive fern		
<b>Shrubs</b>			
<b>Scientific Name</b>	<b>Common Name</b>	<b>Scientific Name</b>	<b>Common Name</b>
<i>Cornus racemosa</i>	Gray dogwood	<i>Salix discolor</i>	Pussy willow
<i>Cornus sericea</i>	Red-osier dogwood	<i>Salix petiolaris</i>	Slender willow
<i>Salix bebbiana</i>	Bebb's willow	<i>Spiraea alba</i>	Meadowsweet*
<b>Trees</b>			
<b>Scientific Name</b>	<b>Common Name</b>	<b>Scientific Name</b>	<b>Common Name</b>
<i>Quercus macrocarpa</i>	Bur oak		

## UNIT 6: Southern Mesic Prairie (UPs23)

### Forbs

Scientific Name	Common Name	Scientific Name	Common Name
<i>Allium stellatum</i>	Prairie wild onion	<i>Allium canadense</i>	Wild Garlic
<i>Anemone cylindrica</i>	Long-headed thimbleweed	<i>Anemone virginiana</i>	Virginia Thimbleweed
<i>Anemone canadensis</i>	Canada anemone	<i>Antennaria spp.</i>	Pussytoes
<i>Apocynum androsaemifolium</i>	Spreading dogbane	<i>Artemisia frigida</i>	Prairie Sagewort
<i>Asclepias tuberosa</i>	Butterfly weed	<i>Asclepias syriaca</i>	Common milkweed
<i>Aster oolentangiensis</i>	Skyblue aster	<i>Aster ericoides</i>	Heath aster
<i>Aster lanceolatum</i>	Panicled Aster	<i>Aster novae-angliae</i>	New England Aster
<i>Aster laevis</i>	Smooth blue aster	<i>Astragalus canadensis</i>	Canada Milkvetch
<i>Campanula rotundifolia</i>	Harebell	<i>Chrysopsis villosa</i>	Prairie golden Aster
<i>Comandra umbellata</i> var. <i>umbellata</i>	Bastard toadflax	<i>Coreopsis palmata</i>	Stiff Tickseed
<i>Dalea purpurea</i> var. <i>purpurea</i>	Purple prairie clover	<i>Dalea candida</i>	White prairie clover
<i>Desmodium canadense</i>	Canada tick trefoil	<i>Euphorbia corollata</i>	Flowering Spurge
<i>Euthamia graminifolia</i>	Grass-leaved goldenrod	<i>Fragaria virginiana</i>	Common strawberry
<i>Galium boreale</i>	Northern bedstraw	<i>Gentiana balingtoni</i>	Closed Gentian
<i>Geum triflorum</i>	Prairie Smoke	<i>Helenium autumnale</i>	Autumn Sneezeweed
<i>Helianthus maximiliani</i>	Maximilian's sunflower	<i>Helianthus pauciflorus</i>	Stiff sunflower
<i>Heliopsis helianthoides</i> var. <i>scabra</i>	Ox-eye	<i>Heuchera richardsonii</i>	Alumroot
<i>Lathyrus venosus</i>	Veiny Pea	<i>Lespedeza capitata</i>	Round-headed Bush-clover
<i>Liatris aspera</i>	Rough blazing star	<i>Liatris ligulistylis</i>	Northern plains blazing star
<i>Liatris pycnostachya</i>	Gay Feather	<i>Lilium philadelphicum</i> var. <i>andinum</i>	Wood lily
<i>Lobelia spicata</i>	Rough Spiked Lobelia	<i>Mirabilis hirsuta</i>	Hairy four o'clock
<i>Monarda fistulosa</i>	Wild bergamot	<i>Oenothera biennis</i>	Common evening-primrose
<i>Pedicularis canadensis</i>	Wood betony	<i>Phlox pilosa</i> var. <i>fulgida</i>	Prairie phlox
<i>Physalis heterophylla</i>	Clammy Ground-cherry	<i>Polygala polygala</i>	Racemed milkwort
<i>Potentilla arguta</i>	Tall cinquefoil	<i>Pycnanthemum virginianum</i>	Virginia mountain mint
<i>Ratibida pinnata</i>	Gray-headed coneflower	<i>Rudbeckia hirta</i>	Black-eyed Susan



<i>Sisyrinchium compestre</i>	Field blue-eyed grass	<i>Smilacina stellata</i>	Starry False Solomon Seal
<i>Smilacina racemosum</i>	False Solomon's Seal	<i>Solidago nemoralis</i>	Gray goldenrod
<i>Solidago missouriensis</i>	Missouri goldenrod	<i>Solidago ptarmicoides</i>	Upland White Aster
<i>Solidago speciosa</i>	Showy goldenrod	<i>Thalictrum dasycarpum</i>	Tall meadow-rue
<i>Tradescantia bracteata</i>	Bracted Spiderwort	<i>Veronicastrum virginicum</i>	Culver's Root
<i>Vicia americana</i>	American vetch	<i>Viola pedata</i>	Prairie Bird-foot Violet
<i>Zizia aptera</i>	Heart-leaved alexanders	<i>Artemisia campestris</i>	Tall wormwood

### Grasses, Rushes, and Sedges

Scientific Name	Common Name	Scientific Name	Common Name
<i>Andropogon gerardii</i>	Big bluestem	<i>Bromus kalmii</i>	Kalm's Brome
<i>Carex bicknellii</i>	Bicknell's Sedge	<i>Carex muehlenbergii</i>	Muhlenberg's Sedge
<i>Carex meadii</i>	Mead's Sedge	<i>Carex tenera</i>	Remote Sedge
<i>Elymus canadensis</i>	Canada Wild Rye	<i>Elymus trachycaulus</i>	Slender wheatgrass
<i>Eragrostis spectabilis</i>	Purple Lovegrass	<i>Muhlenbergia mexicana</i>	Mexican satin-grass
<i>Panicum oligosanthes</i>	Few-flowered Panic grass	<i>Panicum virgatum</i>	Switchgrass
<i>Panicum perlongum</i>	Long-leaved panic grass	<i>Schizachyrium scoparium</i> <i>var. scoparium</i>	Little bluestem
<i>Sorghastrum nutans</i>	Indian grass	<i>Sporobolus heterolepis</i>	Prairie dropseed
<i>Stipa spartea</i>	Porcupine grass		

### Semi-Shrubs (Generally common)

Scientific Name	Common Name	Scientific Name	Common Name
<i>Amorpha canescens</i>	Leadplant (generally common)	<i>Rosa arkansana</i>	Prairie rose

### Shrubs (Occasional)

Scientific Name	Common Name	Scientific Name	Common Name
<i>Symphoricarpos occidentalis</i>	Wolfberry		

### Shrubs (Rare)

<i>Cornus racemosa</i>	Grey Dogwood	<i>Corylus americana</i>	American Hazelnut
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## UNIT 7 Southern Dry Prairie (UPs13)

### Forbs

Scientific Name	Common Name	Scientific Name	Common Name
<i>Anemone cylindrica</i>	Long-headed thimbleweed	<i>Liatris punctata</i>	Dotted blazing star
<i>Antennaria spp.</i>	Pussytoes	<i>Liatris cylindracea</i>	Cylindric blazing star
<i>Aquilegia canadensis</i>	Columbine	<i>Linum sulcatum</i>	Grooved yellow flax
<i>Asclepias verticillata</i>	Whorled milkweed	<i>Lobelia spicata</i>	Rough-spiked Lobelia
<i>Asclepias tuberosa</i>	Butterfly-weed	<i>Lysimachia ciliate</i>	Fringed loosestrife
<i>Asclepias viridiflora</i>	Green milkweed	<i>Mirabilis hirsute</i>	Hairy four-o'clock
<i>Asclepias syriaca</i>	Common milkweed	<i>Monardella fistulosa</i>	Wild bergamot
<i>Aster sericeus</i>	Silky aster	<i>Another biennia</i>	Common evening-primrose
<i>Aster Oolentan-giensis</i>	Sky-blue aster	<i>Oenothera clelandii</i>	Cleland's evening-primrose
<i>Aster ericoides</i>	Heath aster	<i>Oxalis violacea</i>	Violet wood-sorrel
<i>Aster laevis</i>	Smooth aster	<i>Pedimelum esculentum</i>	Prairie-turnip
<i>Astragalus Crassi-carpus</i>	Buffalo-bean	<i>Pedimelum argophyllum</i>	Silvery scurf-pea
<i>Calylophus serrulata</i>	Toothed evening primrose	<i>Penstemon grandiflorus</i>	Large-flowered beard-tongue
<i>Campanula rotundifolia</i>	Harebell	<i>Physalis virginiana</i>	Ground-cherry
<i>Coreopsis palmata</i>	Stiff tickseed	<i>Potentilla arguta</i>	Tall cinquefoil
<i>Dalea purpurea</i>	Purple prairie-clover	<i>Pycnanthemum virginianum</i>	Virginia mountain-mint
<i>Dalea candida</i>	White prairie-clover	<i>Scutellaria leonardi</i>	Leonard's skullcap
<i>Delphinium carolini-anum</i>	Prairie larkspur	<i>Senecio plattensis</i>	Prairie ragwort
<i>Desmodium illinoense</i>	Illinois tick-trefoil	<i>Silene antirrhina</i>	Sleepy catchfly
<i>Euphorbia corollata</i>	Flowering spurge	<i>Sisyrinchium campestre</i>	Field blue-eyed grass
<i>Gnaphalium Obtuse-folium</i>	Sweet everlasting	<i>Solidago nemoralis</i>	Gray goldenrod
<i>Helianthemum bicknellii</i>	Hoary frostweed	<i>Solidago rigida</i>	Stiff goldenrod
<i>Helianthus pauciflorus</i>	Stiff sunflower	<i>Solidago speciosa</i>	Showy goldenrod
<i>Heuchera richardsonii</i>	Alum-root	<i>Tradescantia occidentalis</i>	Western spiderwort
<i>Hypericum perforatum</i>	Common St. John's-wort	<i>Viola pedatifida</i>	Prairie bird-foot violet
<i>Kuhnia eupato-roides</i>	False boneset	<i>Viola pedata</i>	Bird-foot violet
<i>Lespedeza capitata</i>	Round-headed bush-clover	<i>Zizia aptera</i>	Heart-leaved alexanders
<i>Liatris aspera</i>	Rough blazing star	<i>Liatris cylindracea</i>	Cylindric blazing star

Grasses and Sedges			
Scientific Name	Common Name	Scientific Name	Common Name
<i>Andropogon gerardii</i>	Big bluestem	<i>Panicum oligosanthos</i>	Few-flowered panic grass
<i>Bouteloua curtipendula</i>	Side-oats grama	<i>Panicum wilcoxianum</i>	Wilcox's panic grass
<i>Bouteloua hirsuta</i>	Hairy grama	<i>Panicum perlongum</i>	Long-leaved panic grass
<i>Calamovilfa longifolia</i>	Sand reed-grass	<i>Panicum linearifolium</i>	Linnear-leaved panic grass
<i>Carex pensylvanica</i>	Sunshine sedge	<i>Panicum leibergii</i>	Leiberg's panic grass
<i>Cyperus schweinitzii</i>	Schweinitz' cyperus	<i>Schizachyrium scoparium</i>	Little bluestem
<i>Cyperus lupulinus</i>	Hop-like cyperus	<i>Sorghastrum nutans</i>	Indian grass
<i>Elymus wiegandii</i>	Canada wild rye	<i>Sporobolus heterolepis</i>	Prairie dropseed
<i>Eragrostis spectabilis</i>	Purple lovegrass	<i>Sporobolus asper</i>	Rough dropseed
<i>Muhlenbergia cuspidata</i>	Plains muhly	<i>Stipa spartea</i>	Porcupine-grass
Shrubs			
Scientific Name	Common Name	Scientific Name	Common Name
<i>Rosa cmx</i>	Smooth wild rose	<i>Amorpha canescens</i>	Lead-plant