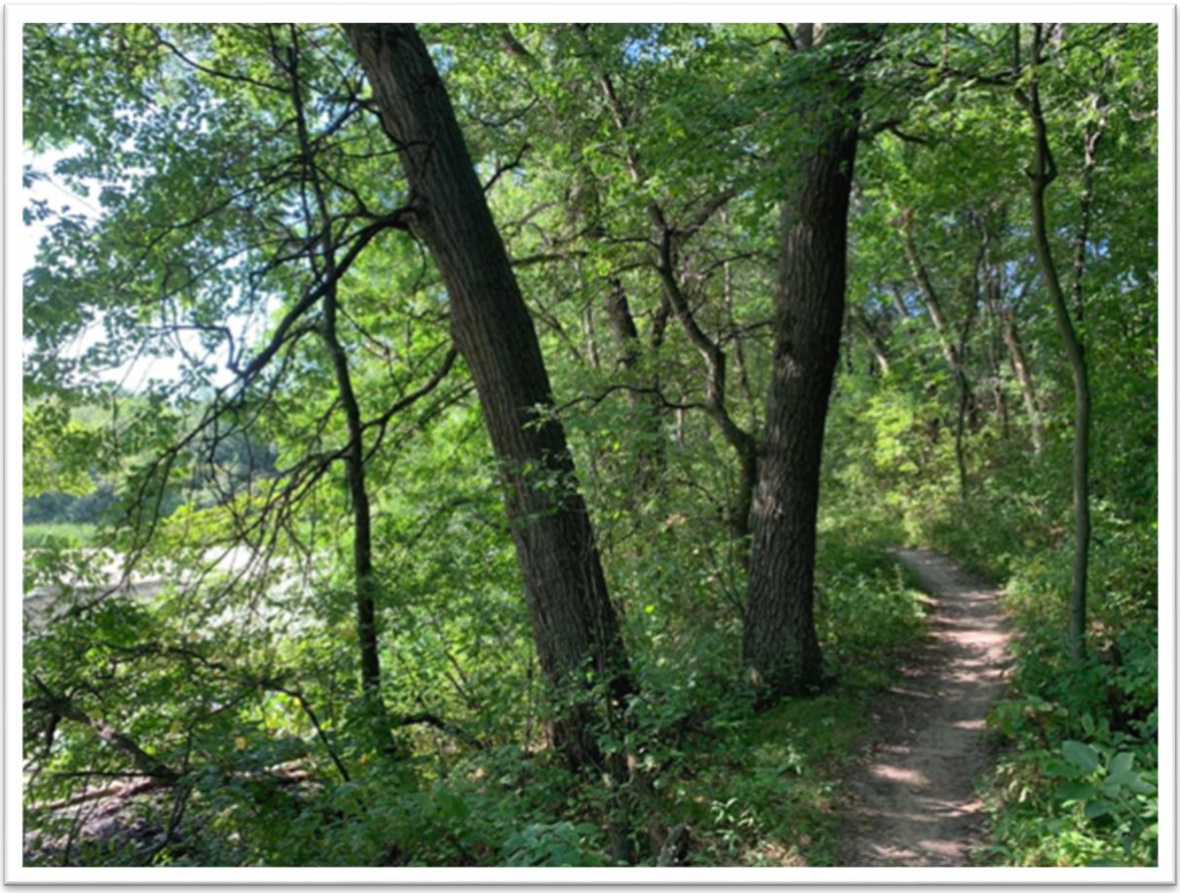

A trail winds along the west side of the emergent marsh in Unit 8.

Natural Resource Management Plan for the City of Inver Grove Heights Harmon Park Reserve and Salem Hills Park March 2024

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Contacts

Landowner

Name: Brian Swoboda, Park Superintendent, City of Inver Grove Heights
Address: 8150 Barbara Avenue, Inver Grove Heights, MN 55057
Phone (Office): 651-450-2582
Email: bswoboda@ighmn.gov

Dakota County

Project Lead: Joe Walton
Address: 14955 Galaxie Avenue, Apple Valley, MN 55124
Phone: 952-891-7507
Email: Joseph.Walton@CO.DAKOTA.MN.US

Signatures

Landowner

As landowner of the property, I have reviewed and approve this Natural Resource Management Plan (NRMP). I agree to follow the guidelines included in this NRMP to manage the property. The NRMP will be used to develop a mutually acceptable Joint Powers Agreement (JPA) 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: Adam Lares, Inver Grove Heights Parks and Recreation Director	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.

_____ _____

Tom Lewansky, Natural Resource Manager Date

Executive Summary

General Property Description

Harmon Park Reserve and Salem Hills Park are adjacent parks and comprise a total of 88-acres owned and managed by Inver Grove Heights in northern Dakota County, Minnesota. Land for the Harmon Park Reserve was donated with the intent on protecting it from development. Salem Hills Park is a City park that includes several amenities in addition to natural space. The stewardship and ongoing restoration of the adjacent parks 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 municipality. This natural resource management plan (NRMP) has been developed to address that need.

The park is located southeast of the intersection of Upper 55th Street East and Annette Avenue East and extends to northwest of the intersection of Babcock Trail and 65th Street East in Inver Grove Heights. Woodlands and savanna with small pocket wetlands create the perimeter of the park which surrounds the central prairie, a 6.5-acre prairie restoration that has been ongoing since the 1990's. Combined gravel and dirt mountain bike and hiking trails covering over 4 miles traverse the park and cross through all plant communities. Two areas containing mountain bike skills features exist in the wooded area to the north of the tennis courts and in the prairie area to the very south of the park. In addition to the prairie restoration, pine and conifer plantings have also been completed.

This NRMP provides a detailed assessment of the natural resources in Harmon Park Reserve and Salem Hills Parks, 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 Harmon Park Reserve and Salem Hills Park was conducted on October 6, 2022 and May 3, 2023. 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, Harmon Park Reserve and Salem Hills Park can be described as a mosaic of habitats including mature woodland, wetland pockets, degraded oak savanna, and restored prairie. There are two types of woodlands present in the park. In the north and south, mature deciduous woodlands contain box elder (*Acer negundo*), green ash (*Fraxinus pennsylvanica*), cottonwood (*Populus deltoides*), black cherry (*Prunus serotina*), northern pin oak (*Quercus ellipsoidalis*), red oak (*Quercus rubra*), bur oak (*Quercus macrocarpa*) and American elm (*Ulmus americana*). The woodlands in the middle of the park are mixed coniferous-deciduous and contain additional species including eastern red cedar (*Juniperus virginiana*), several spruce species (*Picea* spp.), red pine (*Pinus resinosa*) and white pine (*Pinus strobus*). As is common in many woodlands in the Upper Midwest, invasive species such as amur maple (*Acer ginnala*), 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 woodlands. 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.

Three wetlands and some additional wetter areas occur within the park. The marsh in the center of the park is classified as a wetland with an unconsolidated bottom by the National Wetland Inventory (NWI) based on data gathered between 2012-2015. It appears to be natural based on aerial photograph records but was likely altered by human activities and connects to an adjacent stormwater pond that lies outside of the park to the east. The plant community is indicative of highly fluctuating water and high nutrient availability based on the presence of reed canary grass (*Phalaris arundinacea*) and willows (*Salix* sp.). Two palustrine emergent wetlands are located in the park, one in the northeast of the central section of the park and another that just crosses the central-western park boundary. Both of these areas contain native plant communities. An additional wet area exists in the northeast section of the southern 1/3 of the park. This area is not classified on the NWI but does contain wetland vegetation, likely a result of receiving neighboring stormwater runoff. Nearly all the wet areas within the park contain aggressive invasive species including reed canary grass (*Phalaris arundinacea*) and/or hybridized or narrow-leaved cattail (*Typha angustifolia*).

Degraded oak savanna exists in a large central corridor running the length of the park from north to south. White oak (*Quercus alba*), bur oak (*Quercus macrocarpa*), and quaking aspen (*Populus tremuloides*) are present within the understory and tree canopy. The herbaceous layer consists of Kentucky bluegrass (*Poa pratensis*), Canada goldenrod (*Solidago canadensis*), and Missouri gooseberry (*Ribes missouriensis*) among many others. Fire suppression has resulted in several uniform stands of early successional tree species including box elder (*Acer negundo*) and quaking aspen, as well as large monocultures of smooth sumac (*Rhus glabra*). Without substantial woody removal and reintroduction of prescribed fire, these areas will trend toward woodland.

The central prairie lies in the southern 1/3 of the park. This area was initially restored from an agricultural field in 2003. The prairie is dominated by nonnative and invasive cool season grasses including Kentucky bluegrass (*Poa pretensis*), smooth brome (*Bromus inermis*), and Timothy (*Phleum pratense*). There are areas of native prairie species including Indian grass (*Sorghastrum nutans*), lance leaf coreopsis (*Coreopsis lanceolata*), wild lupine (*Lupinus perennis*), round headed bush clover (*Lespedeza capitata*), golden alexanders (*Zizia aurea*), and white wild indigo (*Baptisia alba*). Several populations of herbaceous invasive species including birds-foot trefoil (*Lotus corniculatus*), spotted knapweed (*Centaurea stoebe*), leafy spurge (*Euphorbia esula*), and crown vetch (*Securigera varia*) exist along trail edges and mow breaks. The application of prescribed fire has prevented surrounding woody encroachment, and this unit is largely free of woody species. A mountain bike trail loops around this unit and in some areas has led to erosion adjacent to the trail. This restored prairie does provide some floral resources for pollinators, but could be improved through continued management of nonnative cool season grasses and invasive forbs.

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 and lack of adequate disturbance regimes, the associated lack of diversity within the plant communities, and erosion because of extensive mountain bike trails. 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 Harmon Park Reserve and Salem Hills Park is the abundance of invasive plant species. The two most abundant invasive plant species, Amur maple (*Acer ginnala*) and common buckthorn *(Rhamnus cathartica)* have become dominant in the woodlands and displaced what would be a more diverse native plant community. Large stands of these species do not offer the myriad ecosystem services that native plants can provide. Neither species provides floral resources for pollinators or adequate nutrition for bird species. Amur maple releases allelopathic chemicals into the soil, preventing other species from surviving and reducing diversity. Buckthorn creates dense shade, which leads to a sparse and low-diversity herbaceous plant community made up of only the most shade tolerant plants. Large areas of bare ground related to the sparse understory vegetation are susceptible to sheet and rill erosion. Buckthorn also increases soil nitrogen levels which foster increased weedy growth for species like garlic mustard. Both species' aggressive growth, shading, and alteration of soil chemistry 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.

In open areas, the understory is dominated by invasive forbs and grasses. Spotted knapweed (*Centaurea stoebe*), birds-foot trefoil (*Lotus corniculatus*), and crown vetch (*Securigera varia*) are invasive forbs that thrive in sunny, disturbed environments. These species are able to rapidly colonize disturbed areas and create monocultures, outcompeting and eliminating space for native forbs. Populations of these plants exist along nearly every mountain bike trail and mow break within the park and have been creeping into the interior of areas that are full sun. Similarly, invasive grasses including Kentucky bluegrass (*Poa pratenses*) and smooth brome (*Bromus inermis*) are mixed into the understory along trails and in open areas. Kentucky bluegrass is a standard turf lawn species that poses a threat to prairie and savanna communities because it forms a thick, monoculture mat, preventing other species from co-existing. Additionally, both Kentucky bluegrass and smooth brome are exceptional at taking up nitrogen and other nutrients faster than native plants, giving them the competitive edge. Integrated management of these five priority invasive species and prevention of additional weedy establishment paired with reintroduction of native species will be necessary to improve habitat. Finding innovative solutions to slow the spread of these species along trails will greatly assist in management efforts.

Garlic mustard is established in the herbaceous layer at Harmon Park Reserve and Salem Hills Park, particularly in the deciduous woodland communities. 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. Management of this species while it is not dominant and in conjunction with buckthorn removal will improve the chances for garlic mustard to be eliminated or reduced to a manageable level.

In wetter areas, 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 emergent marsh, pocket wetlands, low-lying areas, and oak savannas adjacent to the marsh. Targeted removal of this species by repeated mowing, spot herbicide application, and introduction of shade and aggressive native wet-tolerant plants where appropriate will reduce the existing populations and prevent its spread by rhizomes and seed.

To a lesser extent, the presence of round-leaf bittersweet *(Celastrus orbiculatus),* Tartarian honeysuckle (*Lonicera tatarica*), black locust (*Robinia pseudoacacia*), and Siberian elm (*Ulmus pumila*) 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 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. 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 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: Reduce the negative impacts of mountain bike trails.
Some areas of Harmon Park Reserve and Salem Hills Park are negatively impacted by the mountain bike trails. Mountain bikes and equipment used to maintain trails assist in the spread of invasive species, both by transporting species from one area of the park to another, and transporting species from other parks into a new park. Nearly every trail is lined with populations of nonnative species. In alignment with the goal of reducing or eliminating invasive species, practices to encourage all users to clean their bikes and maintenance equipment before and after use could be explored. Additionally, heavy mountain bike traffic in combination with sandy loam soil types and a discontinuous herbaceous layer leave some segments of trail prone to erosion. In areas where deep gullies have formed, secondary trails adjacent to original trails have formed. This outward expansion contributes to increased soil compaction, which reduces many species' ability to establish adjacent to the trail, ultimately contributing to further erosion as the soil is not stabilized with a robust root system. Currently, users are asked not to use the trail if the course is muddy to protect against erosion. Installing BMPs to reduce further soil erosion would stabilize the soil, stand up to heavy mountain bike use, and provide a way to reduce the negative feedback resulting from soil erosion. BMPs include adding gravel, large flat stones, or wood features which could also introduce a technical skill element to the mountain bike course.

Goal 5: Plan and implement for climate resiliency.
Minnesota's climate has 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, the preservation of both woodland and grassland native plant communities will foster carbon sequestration.

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. These recommendations are 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 Harmon Park Reserve and Salem Hills Park are centered on reduction and elimination of invasive plant species, reintroduction of disturbance regimes, 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 increase biodiversity and resiliency. Recommendations are categorized by general habitat type. Phases of restoration are suggested in the summary section below.

Woodland and Forest

Invasive species reduction and elimination
Removal of established buckthorn, amur maple, 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. Pockets of mature buckthorn on flat areas in Units 1, 3 and 12 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 are necessary. In areas where remnant forest native plant communities are to be protected (Units 1A, 5, 12A, 12B and 12C), 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. Given that portions of these units have been forestry mowed in the past to remove large, mature buckthorn plants, this more time and cost intensive method is the next step to managing remaining re-sprouts. Likewise, follow up treatments to manage smaller diameter buckthorn and new germinant plants are necessary but to protect neighboring native plants, judicious foliar herbicide treatment with triclopyr is best.

Initial removal of amur maple (*Acer ginnala*), 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 but cut-stem treatment with glyphosate-based herbicides is more effective. Amur maple and Siberian elm's fast growth rate, high seed production, and high germination rate in favorable conditions can allow them to become dominant in disturbed and open habitats. There are large pockets of Unit 3B and 3C where amur maple has become a monoculture that can be forestry mowed. In open areas where amur maple has colonized (all savanna units), removal should be paired with forestry mowing to open the canopy, and targeted removal of individual trees may be necessary.

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. These species create quick cover after the disturbance of woody removal and 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, the 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 present in patches throughout all wooded areas of the park. 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.

Hazard tree removal

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 45) could be combined with woody invasive species removal methods.

Reestablishment of native species

Once invasive woody plants are eliminated or considerably reduced, the reintroduction of both native shrubs and trees is recommended. The planting of bare root trees and shrubs throughout the woodlands is cost effective, can rapidly create a shrub layer and provide wildlife cover, nesting habitat, and nectar and food resources. In the mesic hardwood forest units (1A, 1B, 5, 12A, 12B, and 12C), initial invasive woody and green ash removal will create gaps in forest age structure that intentional planting will fill over time. Once the understory is opened following invasive woody and green ash removal, the missing size classes of native trees can be filled with bare root trees. In the mixed white pine-oak woodland units (3A, 3B, and 3C), deciduous species can be added after selectively thinning out dense stands of conifers to increase diversity over time. These units will likely be missing key age classes of trees in the short term, but over the course of 20-30 years age structure will return.

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 Harmon Park Reserve and Salem Hills 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 park benches and natural gathering places with subsequent seeding in less visible areas where rapid establishment is less important.

Wetlands

Invasive species reduction and elimination
Removal of reed canary grass (*Phalaris arundinacea*) and continual reduction or suppression of resprouts and new germinant plants will support the goal of their elimination within the park. Reed canary grass can be challenging to eliminate once large monocultures are established. A combination of mowing, herbicide use, and establishment of shade cover is recommended. Mowing or weed-whipping areas inaccessible by mowers multiple times for 1-2 full growing seasons will exhaust the energy stored within the plant's large, rhizomatous root system. After the stand exhibits signs of stress, an aquatic safe herbicide can be used to spot spray in areas where native diversity should be maintained (Units 4, 6, 7A, and 9) and broadcast sprayed in large monoculture areas (Units 7B, 8, and 11). Herbicides containing imazapyr are especially effective on reed canary grass.

Reestablishment of native species
Once invasive wetland species are eliminated or considerably reduced, the reintroduction of native shrubs and/or native perennial grasses, sedges, and forbs is recommended. A prescribed fire should be conducted after herbicide treatment of invasive species and before reestablishing native species to remove thatch buildup and allow for good seed-soil contact for plant establishment. Following a fall prescribed fire, the wetlands should be seeded with diverse, hydrologically appropriate seed mixes that provide good pollinator resources. A sedge meadow seed mix should be used for Unit 6, a shallow emergent marsh seed mix for Unit 8, a wet prairie mix for Unit 11, and a native stormwater mix for Units 7A, 7B, and 7C. Although the native plant community trajectories for these units varies, the management is similar because of similar invasive species. Appendix B lists additional species suggested for restoration.

Savanna

Reintroduction of disturbance regime / Invasive species reduction and elimination
The first step in moving the areas targeted for savanna restoration away from woodland is substantial tree removal to open up the canopy and increase light availability to the groundlayer. Over time, a lack of disturbance has led to the uniform establishment of pioneer tree species including box elder (*Acer negundo*), quaking aspen (*Populus tremuloides),* amur maple (*Acer ginnala*) and Siberian elm (*Ulmus pumila*). Although some of the woody growth is native, oak savanna plant communities require less than 25% canopy cover by oak and hickory species rather than woodland species. Forestry mowing is the most cost-effective way to remove woody cover of small diameter, while individually felling large trees may be necessary to achieve canopy cover goals. Additional nonnative woody removal of common buckthorn and honeysuckles can be conducted at the same time. Similar to forestry mowing described in the woodland invasive species management section above, follow-up treatments to manage smaller diameter woody resprouts and new germinant plants are necessary, but to protect neighboring native plants, judicious foliar herbicide treatment with triclopyr is best. Also, a simple grass seed mix should be installed after removal. Grasses are quick to establish, inexpensive enough to allow for high seeding rates, and can provide some competition for woody resprouts. As there is likely to be thick wood

mulch after forestry mowing, two successive years of spring seeding may be necessary to get enough grass establishment to ultimately carry enough fuel for a prescribed burn.

After initial woody removal, the increased light availability is likely to lead to population booms of common herbaceous invasive and weedy species including garlic mustard (*Alliaria petiolata*), burdock (*Arctium minus*), and Canada thistle (*Cirsium arvense*). Garlic mustard can be managed as described above in the woodland section. Similar to reed canary grass, Canada thistle spreads via rhizomes and by seed. For large patches, repeated mowing during the spring and summer will starve the root system of energy. After continual mowing, applying herbicide in the fall before frost will allow for maximum effectiveness because the plant will draw the herbicide down into the root system. In areas where other native diversity is present and herbicide use could be damaging, targeted spot mowing before plants go to seed can be effective but may take longer to control than mowing in combination with herbicide.

Nonnative cool season grasses present in the savanna are also a target for reduction and elimination. Kentucky blue grass (*Poa pratensis*), a commonly introduced turf grass species, is particularly aggressive within prairie systems because of its shallow root system, ability to rapidly colonize and take up nutrients. Kentucky blue grass, alongside other nonnative cool season grasses present in the savanna, will be suppressed with spring burns and the subsequent seeding of native, warm season grasses.

Reestablishment of native species
Following initial woody removal and reduction of invasive species, a prescribed burn is recommended to remove thatch and woody debris, suppress any remaining invasive or weedy plant populations, and open up the soil surface. A fall burn paired with broadcasting a savanna seed mix during the dormant season is suggested for best results. Oak savanna seed mixes generally contain species that can adapt to varying light conditions, ranging from full sun to partial shade. Depending on the remaining canopy cover after woody removal, more shade-tolerant species may be added to the mix if necessary if the remaining canopy is greater than 25%. Appendix B lists additional species suggested for restoration. Seeded areas should be mowed for one year to dampen weed growth and encourage native plants to establish robust root systems. Finally, reestablishment of appropriate tree species for oak savanna should be conducted via planting bare root trees in Units 2A, 2B and 9A and strategically planting a few containerized trees in Unit 4. Although oak trees presently exist within these units, recruitment is likely low and planting trees will jumpstart establishing the proper canopy. Trees such as bur oak (*Quercus macrocarpa*), white oak (*Quercus alba*), and shagbark hickory (*Carya ovata*) are recommended to do well based on climate resiliency projections in this region.

Erosion control
Erosion along the trail resulting from heavy mountain bike use is prevalent in some areas. To limit future erosion and widening of soil compaction zones adjacent to the trail, the installation of best management practices (BMPs) is recommended. BMPs can be as simple as installing gravel in areas of the trail that are eroded to protect the soil surface, or as complex as installing larger rocks or wood features that both protect the soil surface and act as a technical skill element.

Prairie

Invasive species reduction and elimination
Management of nonnative cool season grasses from the prairie is a priority to increase floral diversity and provide better quality habitat for pollinators. Kentucky bluegrass (*Poa pratensis*) and smooth brome (*Bromus inermis*) are distributed throughout the prairie, intermixed with other native grass and forb species. To selectively target these populations, management via prescribed fire is recommended in the spring to damage the cool season grasses before native species emerge for the season. Following burns, the prairie should be seeded with a warm season graminoid (grass) seed mix containing species such as big bluestem (*Andropogon*

gerardii), side oats grama (*Bouteloua curtipendula*), June grass (*Koeleria macrantha*), little bluestem (*Schizachyrium scoparium*), and sand dropseed (*Sporobolus cryptandrus*). These warm season grasses will begin to grow as soil temperatures increase and will be able to compete with nonnative cool season grasses after herbicide treatment. Over time, these warm-season grasses will provide good fuel for future prescribed fires.

An additional priority is targeted removal of several invasive forb populations. Currently, there are populations of leafy spurge (*Euphorbia esula*), spotted knapweed (*Centaurea stoebe*), birds-foot trefoil (*Lotus corniculatus*), crown vetch (*Securigera varia*), and Canada thistle (*Circium arvense*) adjacent to mountain bike trails and mow breaks within the prairie. As some of these populations exist adjacent to native forb populations, timing spot applications of herbicide in early spring and late fall before and after the native plants are active is one way to limit nontarget impacts. If those herbicide windows are missed, mowing and removal of flowers before plants go to seed is a good alternative to reduce the seed bank. Consistently conducting spot treatment visits 3-4 times annually will help reduce these populations over time.

Promote existing and increase native plant diversity
The central prairie currently contains several native prairie species in small populations throughout the unit. There are some spring and summer flowering species present, but the majority of native forbs produce flowers late in the season. These include goldenrods (Canada goldenrod, giant goldenrod, stiff goldenrod, and showy goldenrod) and asters (heath aster, panicled aster, calico aster, and New England aster). While these species provide great habitat in the fall, the abundance and diversity of early- and mid-season species could be increased to create sufficient nectar resources throughout the entire year. A cost-effective method for adding diversity is to add seed to small pockets equally distributed throughout the entire unit to create diverse zones of floral resources and save on seed costs. Forbs such as golden alexanders (*Zizia aurea*), prairie phlox (*Phlox pilosa*) and large-flowered beardtongue (*Penstemon grandiflorus*) provide exceptional early season resources, and leadplant (*Amorpha canescens*), whorled milkweed (*Asclepias verticillata*), and button blazing star (*Liatris aspera*) are among some of the options for adding mid-season floral diversity. Over time, these small established populations will expand outward and ideally increase diversity throughout the entire unit.

Erosion control
Similar to the savanna native plant community, erosion along mountain bike trails within the prairie unit is an issue that should be prioritized. Implementation of BMPs to reduce erosion and reduce invasive species seed spread is recommended.

Summary & Phasing

The prioritized activities for management of the natural resources within Harmon Park Reserve and Salem Hills Park are centered on increasing diversity within the native plant communities and targeting the reduction and elimination of invasive plant species prevalent throughout the park. A shared top priority is the reduction and elimination of 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 significant effort already taken to control common buckthorn throughout the site, and its considerable impact on native plant communities, habitat, soil erosion and degradation, and erosion, the 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 efforts have already been concentrated and native plant communities are present (Units 1A, 2A, 2B, 5, 12A, 12B, 12C). Secondarily, amur maple and buckthorn should be removed from altered native plant communities in Units 3A, 3B, and 3C. As amur maple and buckthorn are removed, Tartarian honeysuckle (Units 2A, 2B, 4, 5) and Siberian elm (Units

2A, 2B, 5) also present should 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, the reduction or elimination of those species that are isolated to certain areas at present but have growth patterns that will likely cause significant habitat impacts should come next. Removal of spotted knapweed (all units adjacent to trails), birds-foot trefoil (Units 3B, 3C, 9, 10), crown vetch (Units 3B, 3C, 9, 10), leafy spurge (Unit 10), and round-leaf bittersweet (Units 9 and 12A) should be targeted very early in restoration. Eliminating emerging invaders largely spread via mountain bike trails 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 and Canada thistle, will likely increase as sunlight to the understory 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.

A potential breakdown of phases is described below. This considers including units with similar management tasks within each phase, both to achieve economies of scale whereby the cost per acre is reduced as well as simplify the management strategy at any given time. Additionally, it spreads the cost out over a longer period of time, making restoration implementation more feasible.

Phase 1: Habitat Enhancement
Units 1A, 2A, 2B, 5, 12A, 12B, 12C
Significant effort has been taken to control common buckthorn in some of these units. It is a priority to continue progressing on these woodland and savanna units to restore native plant communities. Costs are moderate and impact is high.

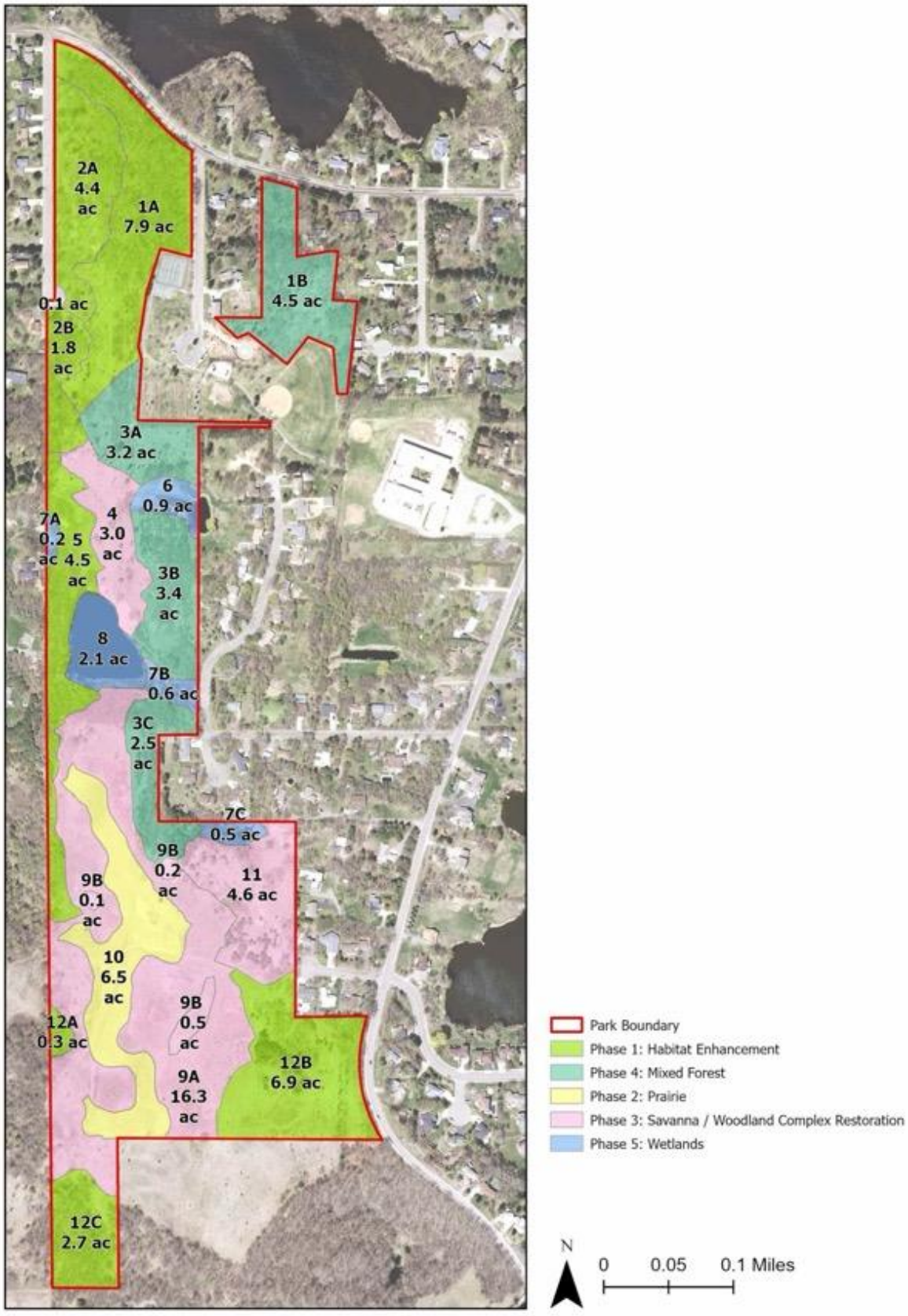
Phase 2: Prairie
Unit 10
The central prairie has been a target for restoration activities for many years. Invasive species management and increases in native species diversity is relatively low-cost and high impact.

Phase 3: Savanna / Woodland Complex Restoration
Units 4, 9A, 9B, 11
Restoring these units to oak savanna will take significant cost and effort, but maintenance will be cost-effective in the long term. Additionally, reconstruction of oak savanna habitat could provide key habitat resources to threatened and endangered species.

Phase 4: Mixed Forest
Units 1B, 3A, 3B, 3C
Invasive species management, especially common buckthorn and amur maple is the key management priority in these units. These units contain tree canopies that are not consistent with native plant communities in this region, and restoration of a historical community is costly and moderate impact.

Phase 5: Wetlands
Units 6, 7A, 7B, 7C, 8
Maintaining native plant communities in urban wetlands and stormwater infrastructure is challenging and costly due to the constant influx of nutrients and seeds from up stream. Restoration costs are high and likelihood of success is low-moderate.

Restoration Phase Map



Estimated Costs

The estimated costs for restoration of the management units over five years is summarized in the table below. Management units where tasks are similar and economies of scale can be achieved have been combined.

Phase	Unit	Estimated Cost
1	Unit 1A	$50,525
	Units 5, 12A, 12B, 12C	$63,075
	Units 2A, 2B	$63,600
	Subtotal Phase 1	**$177,200**
2	Unit 10	$43,750
	Subtotal Phase 2	**$43,750**
3	Unit 4	$43,550
	Units 9A, 9B	$166,060
	Unit 11	$68,865
	Subtotal Phase 3	**$278,475**
4	Unit 1B	$24,750
	Units 3A, 3B, 3C	$58,950
	Subtotal Phase 4	**$58,950**
5	Units 7A, 7B, 7C	$21,390
	Units 6, 8	$39,650
	Subtotal Phase 5	**$61,040**
	Grand Total	**$619,415**

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

Landowner: City of Inver Grove Heights
Mailing Address: 8150 Barbara Avenue, Inver Grove Heights, MN 55077-3412
Property Address: 1642 Upper 55th Street
Section 5, Township 27, and Range 22 (Harmon Park Reserve)
Section 32, Township 28, and Range 22 (Salem Hills Park)
Harmon Park Reserve Parcel Identification Numbers: 200050006010

Salem Hills Park Parcel Identification Numbers: 200321083013, 200321083012, 200321081012, and 200321082030

Watershed: Lower Mississippi River
Watershed Organization: Lower Mississippi River WMO
LSOHC Eco-Region: Metro Region

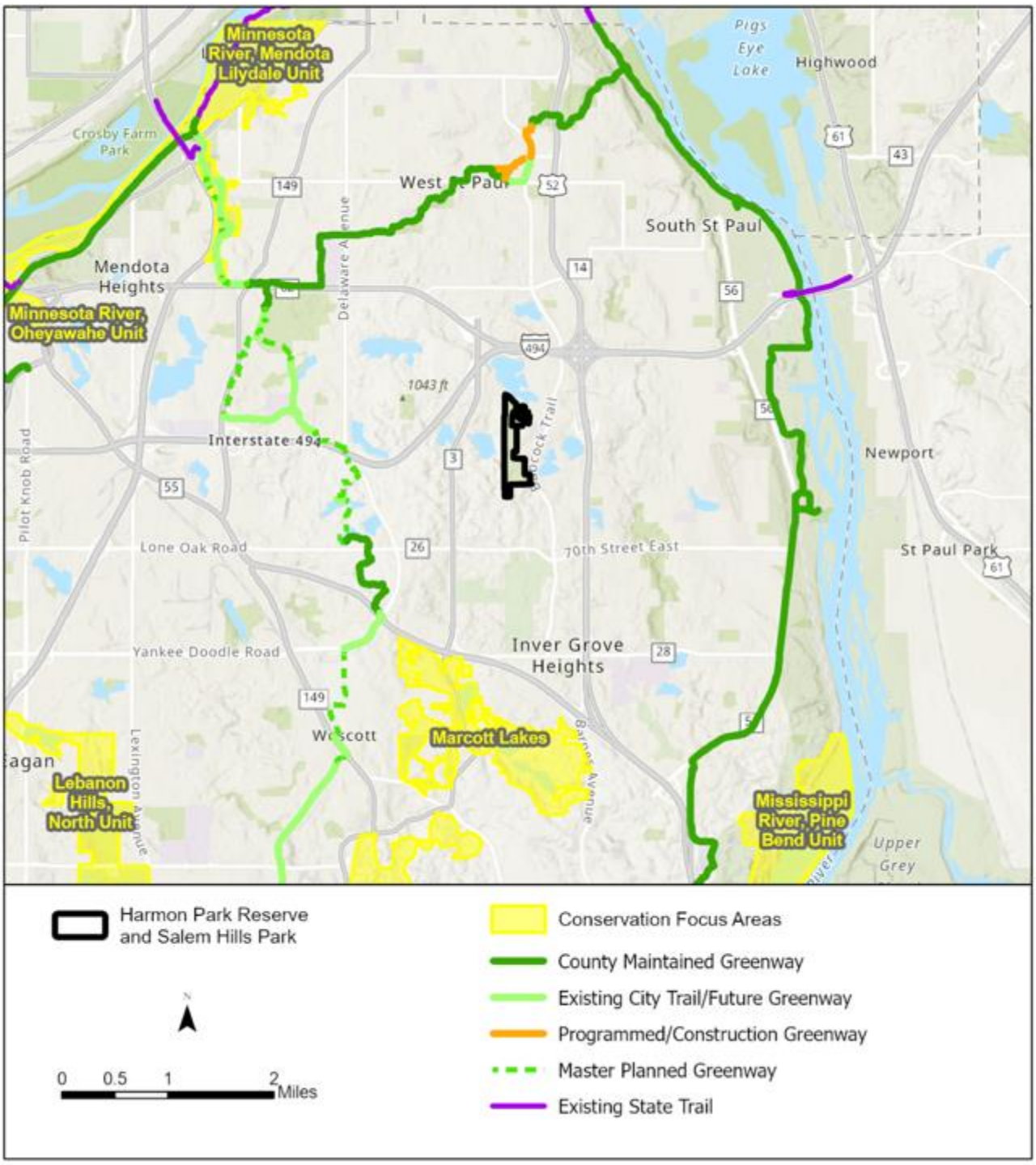
Restoration Funding Sources

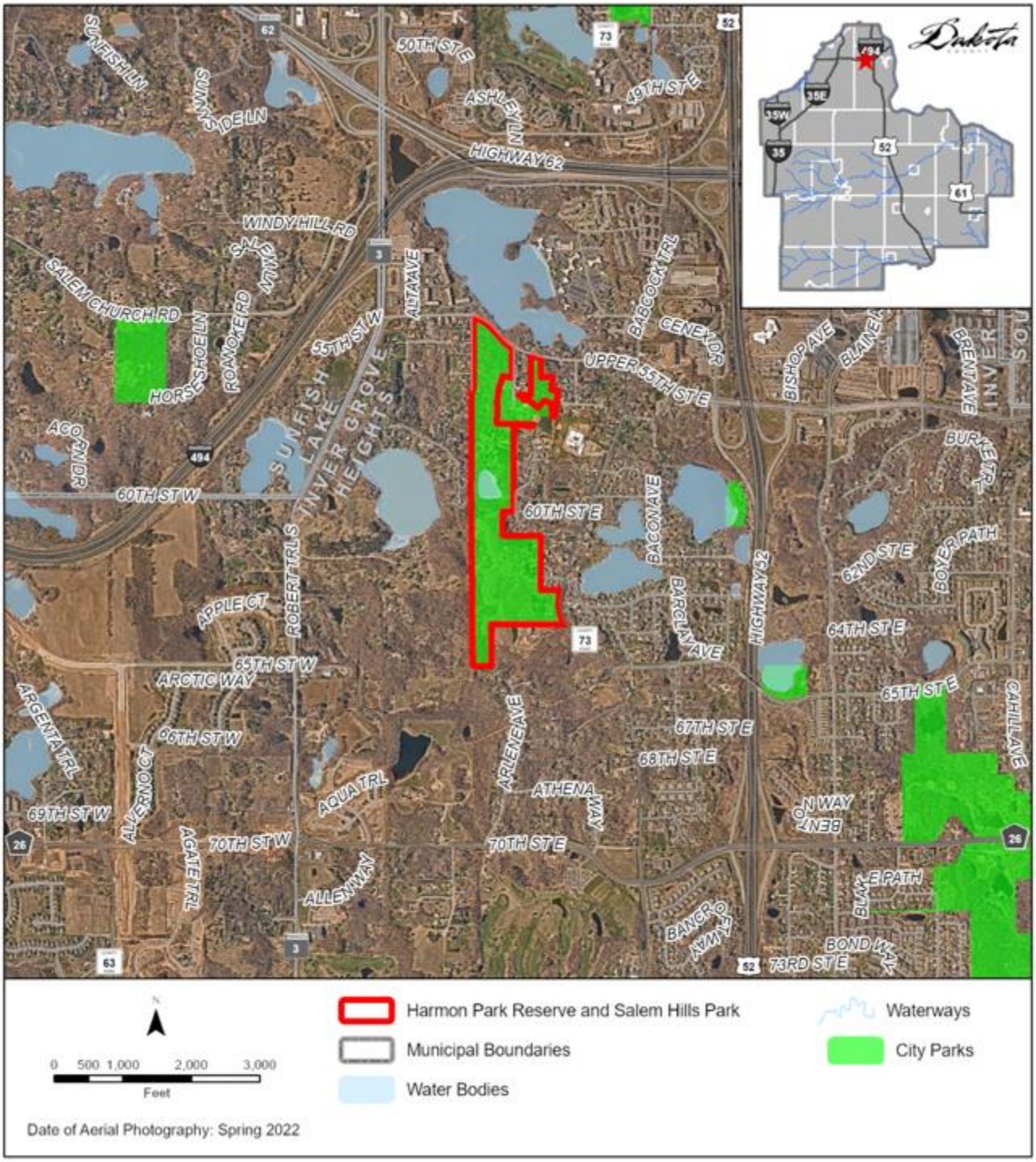
☒ State Outdoor Heritage Fund
☒ County Environmental Legacy Fund
☒ State Environmental and Natural Resources Trust Fund
☒ City

Location and Landscape Context

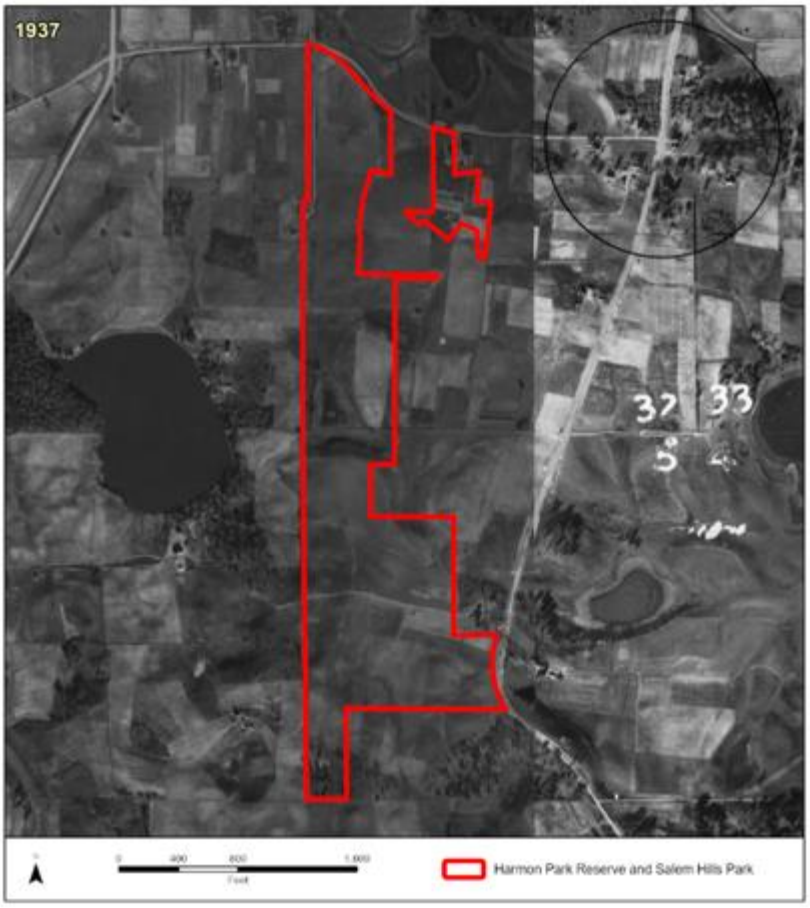
The property is in the Metro Region Eco-region as determined by the Minnesota Department of Natural Resources.

Location




Dakota
494
35W
35E
35
52
61
SUNFISH LN
SUNNYSIDE LN
50TH ST E
ASHLEY LN
49TH ST E
HIGHWAY 62
WINDY HILL RD
SALEM CHURCH RD
HORSESHOE LN
ROANOKE RD
55TH ST W
ACORN DR
494
60TH ST W
SUNFISH LAKE
INVER GROVE HEIGHTS
ROBERT TRL S
APPLE CT
65TH ST W
ARCTIC WAY
ARGENTA TRL
96TH ST W
69TH ST W
70TH ST W
AGATE TRL
ALLEY WAY
AQUA TRL
ATHENA WAY
70TH ST E
ARLENE AVE
67TH ST E
68TH ST E
60TH ST E
BACONAVE
BARCLAY AVE
HIGHWAY 52
UPPER 55TH ST E
BABCOCK TRL
CENEX DR
BISHOP AVE
BLAINE
BRENTAVE
INVERNESS
BURKE TRL
62ND ST E
BOYER PATH
64TH ST E
65TH ST E
CAHILL AVE
BENT TRL N
BLAKE PATH
BANCROFT WAY
BOND WAY
73RD ST E
63
26
3
73
Harmon Park Reserve and Salem Hills Park
Municipal Boundaries
Water Bodies
Waterways
City Parks
N
0 500 1,000 2,000 3,000
Feet
Date of Aerial Photography: Spring 2022

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.

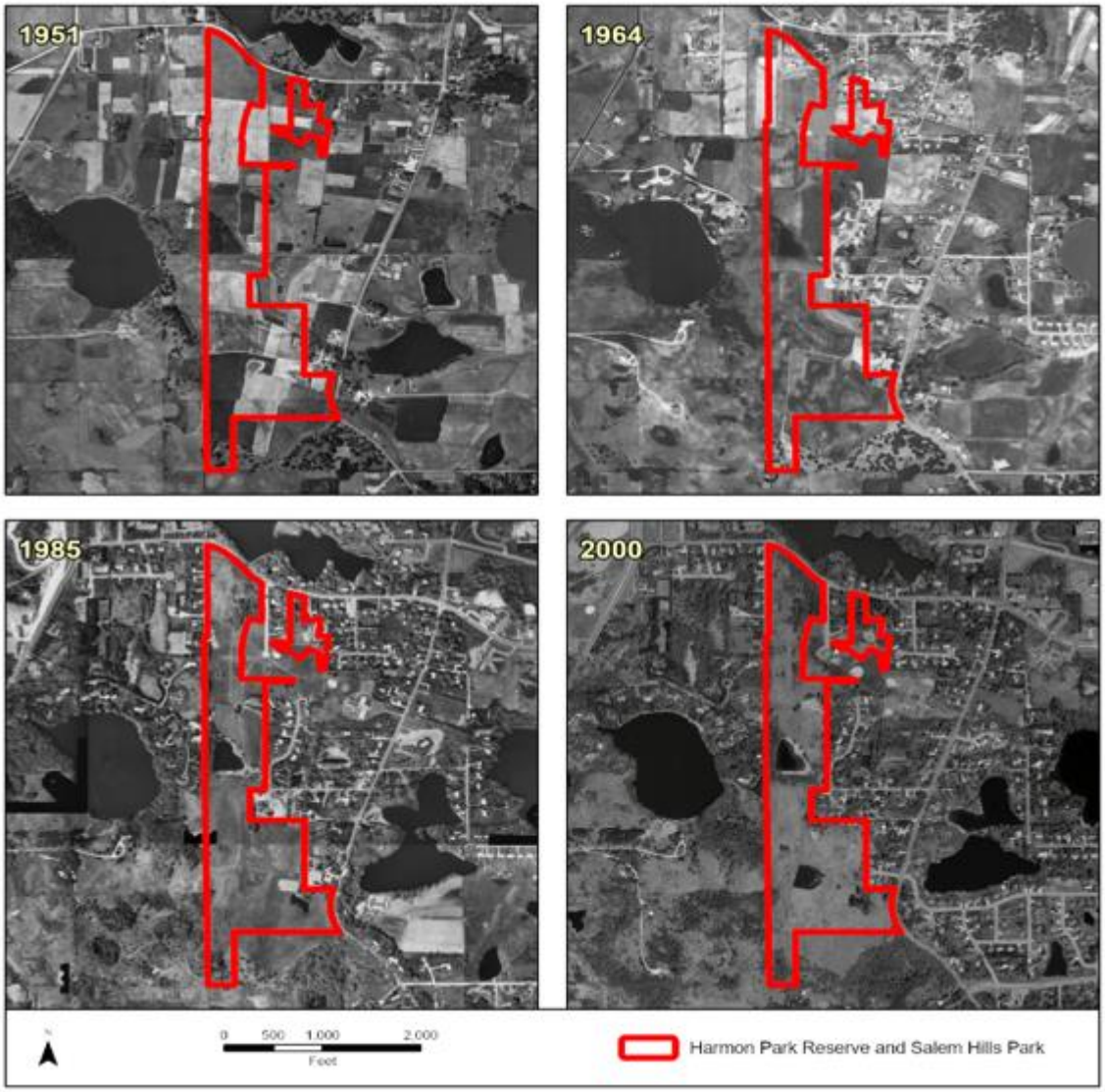
An initial five-year work plan describes restoration activities that will likely have the greatest ecological benefit relative to the resources required to implement the activities. Recommended activities generally include removing and controlling a growing list of invasive plant species, diversifying, 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.

Historical Land Use

Prior to European settlement, 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 dated 1937, the property was largely used for agriculture. Agricultural uses start to disappear in 1985 and visible trails are apparent. In the photo below from 2000, the trail disappears from the property, and it becomes mostly open space.



Current and Adjacent Land Use

In addition to historic land use, current use of the property directly affects existing vegetation, surface water, wildlife, and future management options. Current human use includes hiking and mountain biking. There is a vast multi-use trail network in the park that sees extensive use. As a result, bikers and hikers transport invasive species along the trail corridors, which negatively impacts the plant communities in the park.

Adjacent land use can also affect the property's vegetation, surface water, and wildlife. Management options may present opportunities to enlarge existing natural areas, create wildlife corridors, and improve surface water and groundwater.

Adjacent land use includes open space and residential single-family homes. Stormwater runoff from adjacent lawns outlets into structures within the park for treatment. This water carries nutrients and pollutants, which negatively impact downstream water quality and plant communities. Adjacent development pressure makes this park reserve more meaningful to wildlife because it provides nearly 80 acres of contiguous habitat.

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 bedrock formations in the County are marine sedimentary rocks of Paleozoic age (453-523 million years ago), a time when shallow seas covered southeastern Minnesota, and formed where sand, silt and clay, and carbonate material accumulated on the sea floor. Coarse particles were deposited in the shoreface and finer particles settled out in quieter, deeper water in the offshore shelf (see MN Geological Survey webpage Paleozoic Geology | College of Science and Engineering, accessed in July 19, 2022). The sand, clay, and marine animals became compressed and formed a variety of sedimentary rock layers, with different depths and characteristics forming thick, laterally extensive sandstone, shale, and dolomitic limestone layers.

Surficial Geology

Dakota County was once covered by a series or 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 surficial geology of the City Park 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 Superior Lobe Cromwell formation is present as till.

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.

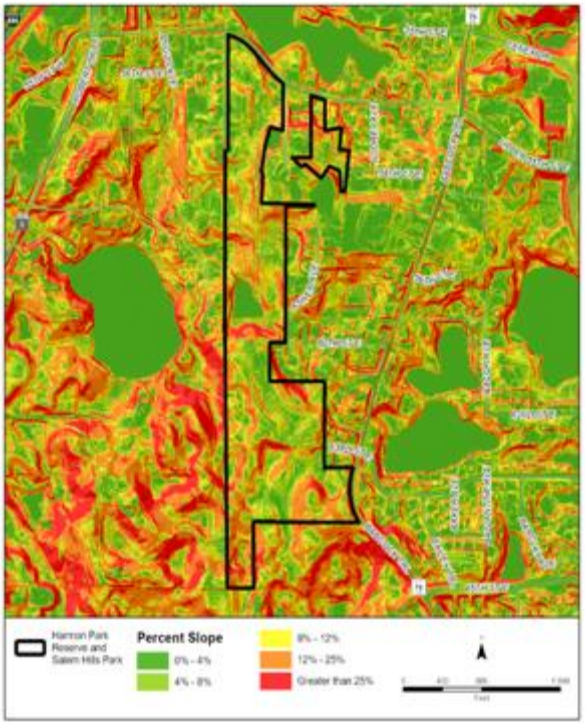
The Property has some steeper slopes intermingled with relatively flat areas. The Property presents a rolling undulating surface.

Aspect

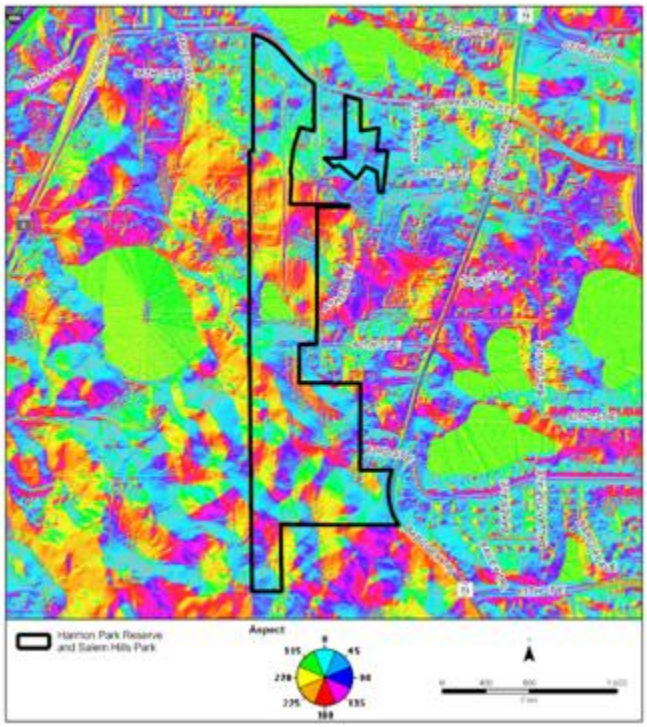
The directional orientation of slopes (aspect) can have a strong influence on soil temperature and moisture. In the northern hemisphere, north-facing slopes are often shaded, while south-facing slopes receive more solar radiation for a given surface area. As a result, soil temperatures and moisture on 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.

The Property's ground surface has proportionately slightly more north-facing as south facing slopes, that present as ridges and valleys.

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.

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 travel time varies from hours to approximately a year. The pollution sensitivity of buried sand and gravel aquifers and of the first buried bedrock surface represents the approximate time it takes for water to move from land surface to the aquifer. Five relative classes of geologic sensitivity are based on overlapping time of travel ranges (Very High, High, Medium, Low, and Very Low). The pollution sensitivity is inversely proportional to the time of travel.

- In areas of higher sensitivity contaminants may reach the groundwater within hours to months.
- In areas of lower sensitivity there is time for a surface contamination source to be investigated, and possibly corrected, before serious groundwater pollution develops.

The sensitivity of the Protected Properties is low. Even given the low sensitivity, 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, which is as shallow as 98 feet according to nearby well records, and the ability of the overlying geologic materials to protect the groundwater aquifer.

There are no known or suspected unsealed wells associated with the Property.

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.

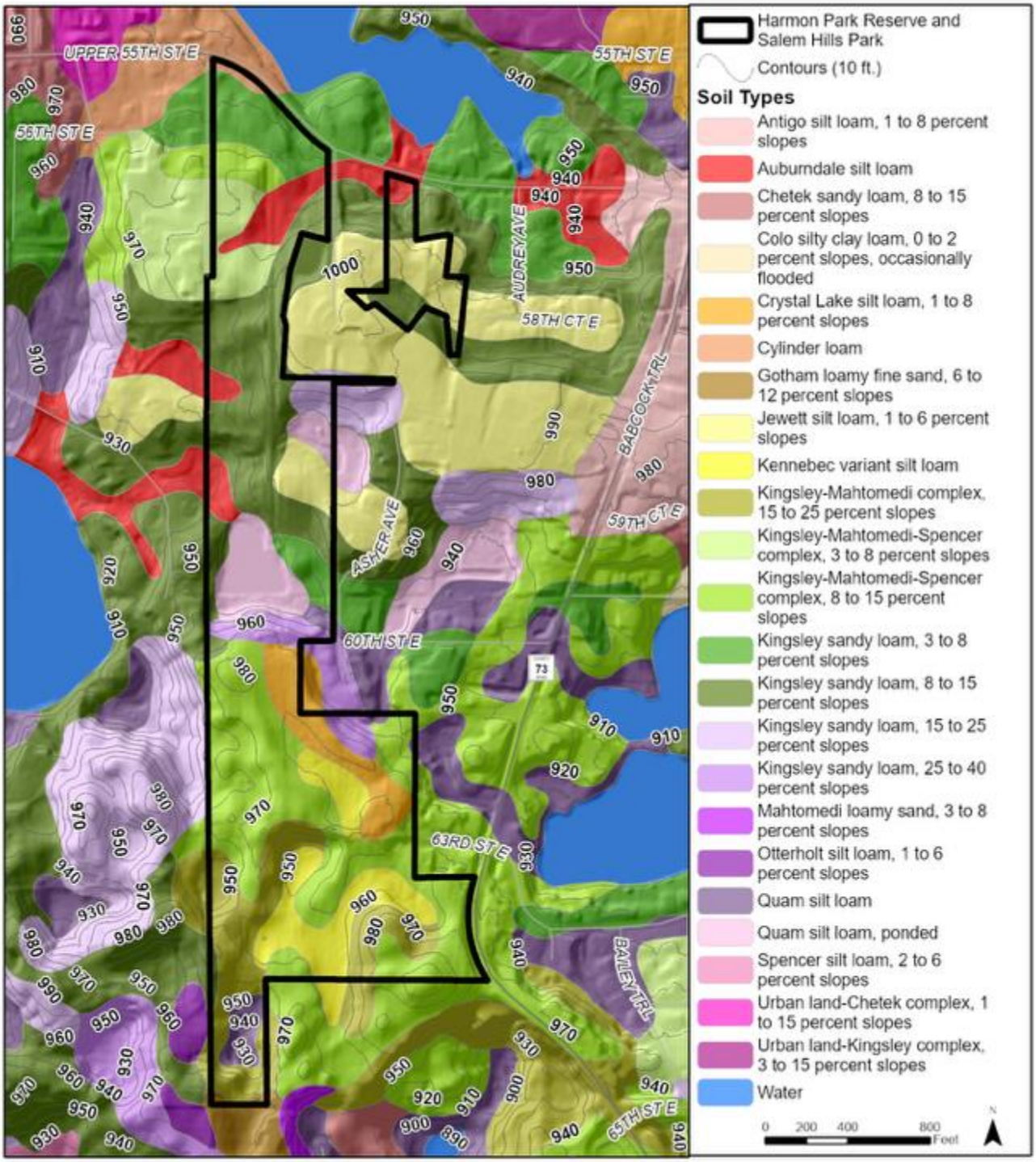
The Property is in the Lower Minnesota River Watershed which drains to the Mississippi River. There are several small ponds and wetlands on the Property that will be described more fully below.

Soil

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 series: very deep, well-drained soils formed in loamy glacial till on glacial moraines.

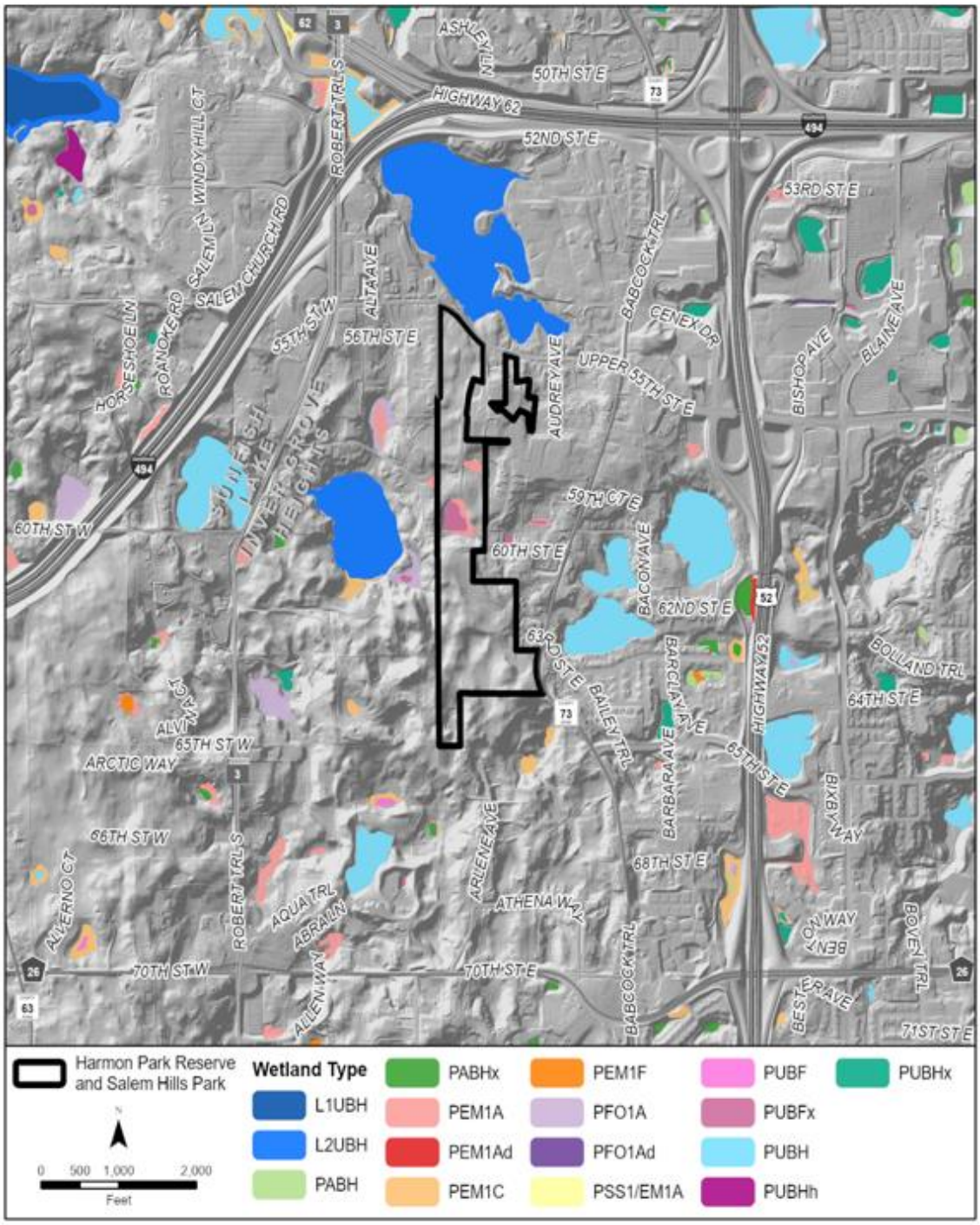

Harmon Park Reserve and Salem Hills Park
Contours (10 ft.)
Soil Types
Antigo silt loam, 1 to 8 percent slopes
Auburndale silt loam
Chetek sandy loam, 8 to 15 percent slopes
Colo silty clay loam, 0 to 2 percent slopes, occasionally flooded
Crystal Lake silt loam, 1 to 8 percent slopes
Cylinder loam
Gotham loamy fine sand, 6 to 12 percent slopes
Jewett silt loam, 1 to 6 percent slopes
Kennebec variant silt loam
Kingsley-Mahtomedi complex, 15 to 25 percent slopes
Kingsley-Mahtomedi-Spencer complex, 3 to 8 percent slopes
Kingsley-Mahtomedi-Spencer complex, 8 to 15 percent slopes
Kingsley sandy loam, 3 to 8 percent slopes
Kingsley sandy loam, 8 to 15 percent slopes
Kingsley sandy loam, 15 to 25 percent slopes
Kingsley sandy loam, 25 to 40 percent slopes
Mahtomedi loamy sand, 3 to 8 percent slopes
Otterholt silt loam, 1 to 6 percent slopes
Quam silt loam
Quam silt loam, ponded
Spencer silt loam, 2 to 6 percent slopes
Urban land-Chetek complex, 1 to 15 percent slopes
Urban land-Kingsley complex, 3 to 15 percent slopes
Water
0 200 400 800 Feet
N
UPPER 55TH ST E
55TH ST E
58TH ST E
58TH CT E
59TH CT E
60TH ST E
63RD ST E
65TH ST E
AUDREY AVE
ASHER AVE
BABCOCK TRL
BAILEY TRL
73

National Wetland Inventory

The wetlands codes represented on the property are:

PEM1A: Palustrine emergent persistent wetland, temporarily flooded. Fresh or interior marsh, persistent vegetation, topographically high.

PUBFx: Non-tidal wetland dominated by trees, shrubs, and/or emergent vegetation, which have an unconsolidated bottom, and lies in a basin or channel that has been dug through artificial means by man.



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.

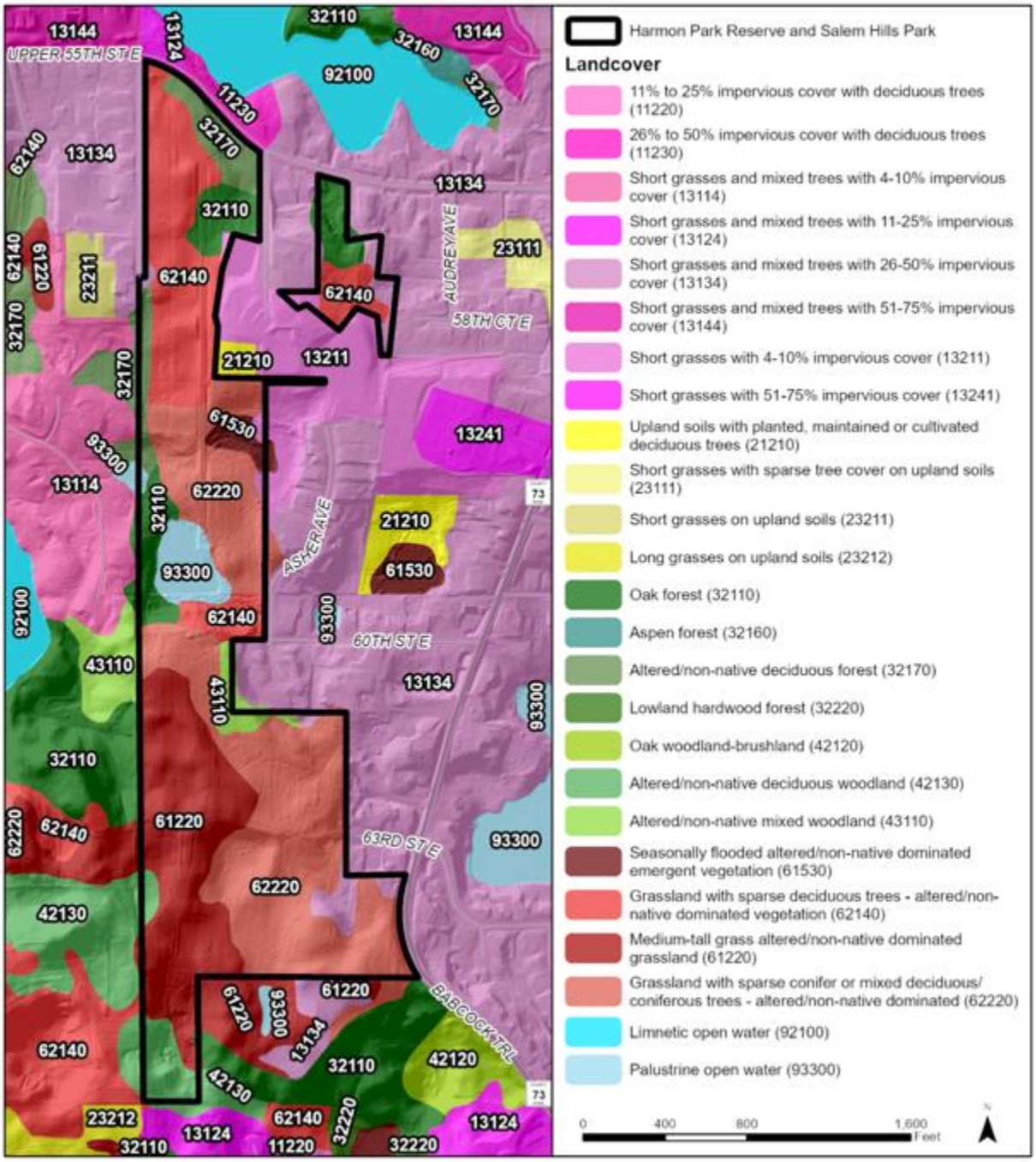
MLCCS consists of five hierarchical levels that are reflected in the five-digit classification code. At the most general level, land cover is divided into either Natural/Semi-Natural cover types or Cultural cover types. The Cultural classification system is designed to identify developed areas impervious 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 Harmon Park Reserve and Salem Hills Park is predominantly “Grassland with sparse altered nonnative deciduous trees” and “Altered nonnative deciduous forest” in the northern portion of the park, “Grassland with sparse conifer or mixed trees” in the central portion, and “Medium-tall, altered nonnative dominated grassland” in the southern areas of the park. With some nuance, these land cover classifications are accurate. In forested areas, the tree canopy is dominated by native species common in secondary growth forests including box elder, green ash, black walnut, silver maple, and northern pin oak. The shrub layer is dominated by nonnative invasive common buckthorn and Tartarian honeysuckle. Many native species are present in the herbaceous layer, but there is a lack of abundance, cover, and species diversity.

Within the central and southern grasslands, there are large areas of deciduous tree encroachment by native pioneer species including quaking aspen and box elder. The understory remains Kentucky bluegrass. Additional pockets of white pine, red pine, blue spruce, and black spruce plantings exist along the perimeter. The central prairie has some areas of native species diversity including bergamot, common yarrow, and New England aster, but largely consists of Kentucky bluegrass and foxtail. The abundance of mountain bike trails contributes to soil erosion, where single-track lanes have exposed the sandy soil below.

Land Cover of Property



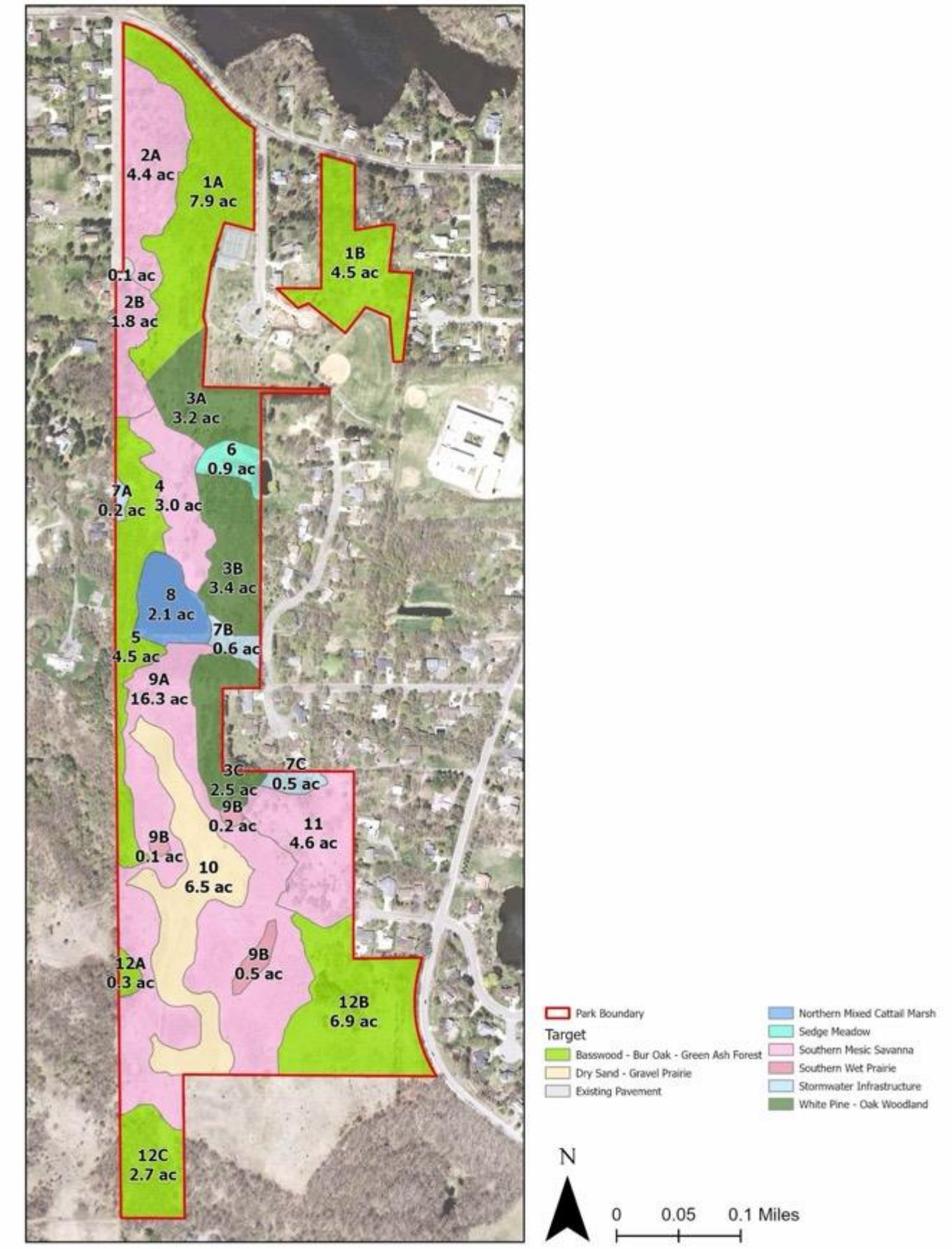
Site Description & Recommended Plant Communities

A site evaluation was conducted by Friends of the Mississippi River on Thursday, October 6, 2022, and Wednesday, May 3, 2023.

Harmon Park Reserve and Salem Hills Park can be described as a prairie and savanna complex containing a few wetlands, situated between mature woodland. Shrubs such as smooth sumac and pioneer tree species including quaking aspen and red oak take advantage of the open tree canopy within the savanna, while invasive species including spotted knapweed, crown vetch, birds-foot trefoil, leafy spurge, and Kentucky bluegrass dominate the central prairie. Several pocket wetlands and one larger emergent marsh exist in low-lying areas within the park. They are dominated by cattails and reed canary grass. Within the mature woodland, the secondary growth tree species— red oak, box elder, green ash, black walnut, silver maple, and northern pin oak— are the dominant trees in the primarily closed canopy. As is common in many woodlands in the Upper Midwest, invasive species such as amur maple, 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 invasive beetle, Emerald ash borer (EAB), has infested many green ash throughout the park, contributing to a shift in tree 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 1A: West contiguous

Photo Description: Oak forest with buckthorn in Unit 1A.

Acres: 7.9 acres

MLCCS Land Cover types: 32110 Oak forest; 32170 Altered/non-native deciduous forest; 32140 Grassland with sparse deciduous trees - altered/non-native dominated vegetation.

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

General Description: Unit 1A is an oak forest in the northeast corner of the contiguous section of the park. The eastern section of the A Sawmill Loop mountain biking trail runs through this unit and it is more heavily used than Unit 1B. The canopy in this unit is predominantly green ash, silver maple, with some boxelder, black walnut, pin and bur oak. Buckthorn dominates the shrub and ground layers. Spring ephemerals, including wild ginger & early meadow rue, are also present in the ground later. Management of buckthorn and establishment of a more diverse herbaceous layer would greatly improve the habitat. Many EAB infested and dead ash are present, including hazard trees along trails; if any are removed, they could be replaced with basswood and oak.

Recommended Plant Communities: MHs38 Southern Mesic Oak-Basswood Forest/ MHs38b Basswood - Bur Oak - (Green Ash) Forest.

Description: Mesic hardwood or, occasionally, hardwood-conifer forests. Present on wind-deposited silt on bedrock bluffs, on calcareous till on rolling till plains, and, rarely, in association with natural fire breaks in prairie landscapes or on
weakly calcareous till on stagnation moraines.

Ground-layer cover is patchy to interrupted (25–75%); important species include zigzag goldenrod (*Solidago flexicaulis*), large-flowered bellwort (*Uvularia grandiflora*), and Virginia waterleaf (*Hydrophyllum virginianum*). Other common species include Clayton's sweet cicely (*Osmorhiza claytonia*), Virginia creeper (*Parthenocissus* spp.), bloodroot (*Sanguinaria canadensis*), lopseed (*Phryma leptostachya*), common enchanter's nightshade (*Circaea lutetiana*), early meadow-rue (*Thalictrum dioicum),* wild sarsaparilla (*Aralia nudicaulis*), Pennsylvania sedge (*Carex pensylvanica*), and honewort (*Cryptotaenia canadensis*).

Shrub-layer cover is patchy to interrupted (25–75%); common species include sugar maple, ironwood, prickly gooseberry (*Ribes cynosbati*), and chokecherry (*Prunus virginiana*).

Subcanopy cover is interrupted to continuous (50–100%); important species include ironwood, sugar maple, and basswood. American elm, red elm, and bitternut hickory are occasionally present, with blue beech occasional in southeastern and east-central Minnesota.

Canopy cover is interrupted to continuous (50–100%); the most common species are basswood, northern red oak, and sugar maple, with bur oak and green ash replacing northern red oak in importance in western Minnesota, especially in the CGP, and white oak abundant in some stands in eastern Minnesota. On rare occasions a supercanopy with abundant white pine is present.

MHs38b Basswood - Bur Oak - (Green Ash) Forest
Mesic hardwood forests on hummocky topography or near lakes on till plains and stagnation moraines; slopes are generally not steep. Canopy most often is dominated by basswood, bur oak, or green ash, with northern red oak abundant in a few stands. Subcanopy and shrub layer have abundant ironwood with occasional basswood. In general, MHs38b can often be distinguished from the other types in this class by the presence of abundant green ash in the canopy and abundant Virginia waterleaf in the ground layer. It is further distinguished from MHs38c by lower frequency of northern red oak and almost complete lack of sugar maple in the canopy. Additional species that can help to distinguish MHs38b include snowberry or wolfberry (*Symphoricarpos albus* or *S. occidentalis*), starry false Solomon's seal (*Smilacina stellata*), and nodding trillium (*Trillium cernuum*). MHs38b has been documented in the MIM, CGP, and RRV.

Unit 1
Sub-Unit 1B: East island

Photo Description: Oak forest with buckthorn ground cover in Unit 1B.

Acres: 4.5 acres

MLCCS Land Cover types: 32110 Oak forest; 32140 Grassland with sparse deciduous trees - altered/non-native dominated vegetation; 13134 Short grasses and mixed trees with 26-50% impervious cover.

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

General Description: Unit 1B is a degraded oak forest northwest of the parking lot by the water tower with green ash and silver maple representing significant elements of the canopy; cherry and a few mature oaks are also present. The shrub and subcanopy layer is dominated by buckthorn. The unit has little ground cover besides buckthorn, although white snakeroot, Virginia stickseed, and Virginia creeper are present to a small degree. Management of buckthorn and subsequent establishment of a more diverse herbaceous layer would greatly improve habitat. Many EAB (emerald ash borer) infested and dead ash are present; if any are removed they could be replaced with basswood and bur oak. Some tree plantings are already present. A hiking trail but no mountain bike trails are present in this unit.

Recommended Plant Communities: MHs38 Southern Mesic Oak-Basswood Forest/ MHs38b Basswood - Bur Oak - (Green Ash) Forest.

Description: Mesic hardwood or, occasionally, hardwood-conifer forests. Present on wind-deposited silt on bedrock bluffs, on calcareous till on rolling till plains, and, rarely, in association with natural fire breaks in prairie landscapes or on
weakly calcareous till on stagnation moraines.

Ground-layer cover is patchy to interrupted (25–75%); important species include zigzag goldenrod (*Solidago flexicaulis*), large-flowered bellwort (*Uvularia grandiflora*), and Virginia waterleaf (*Hydrophyllum virginianum*). Other common species include Clayton's sweet cicely (*Osmorhiza claytonia*), Virginia creeper (*Parthenocissus* spp.), bloodroot (*Sanguinaria canadensis*), lopseed (*Phryma leptostachya*), common enchanter's nightshade (*Circaea lutetiana*), early meadow-rue (*Thalictrum dioicum),* wild sarsaparilla (*Aralia nudicaulis*), Pennsylvania sedge (*Carex pensylvanica*), and honewort (*Cryptotaenia canadensis*).

Shrub-layer cover is patchy to interrupted (25–75%); common species include sugar maple, ironwood, prickly gooseberry (*Ribes cynosbati*), and chokecherry (*Prunus virginiana*).

Subcanopy cover is interrupted to continuous (50–100%); important species include ironwood, sugar maple, and basswood. American elm, red elm, and bitternut hickory are occasionally present, with blue beech occasional in southeastern and east-central Minnesota.

Canopy cover is interrupted to continuous (50–100%); the most common species are basswood, northern red oak, and sugar maple, with bur oak and green ash replacing northern red oak in importance in western Minnesota, especially in the CGP, and white oak abundant in some stands in eastern Minnesota. On rare occasions a supercanopy with abundant white pine is present.

MHs38b Basswood - Bur Oak - (Green Ash) Forest
Mesic hardwood forests on hummocky topography or near lakes on till plains and stagnation moraines; slopes are generally not steep. Canopy most often is dominated by basswood, bur oak, or green ash, with northern red oak abundant in a few stands. Subcanopy and shrub layer have abundant ironwood with occasional basswood. In general, MHs38b can often be distinguished from the other types in this class by the presence of abundant green ash in the canopy and abundant Virginia waterleaf in the ground layer. It is further distinguished from MHs38c by lower frequency of northern red oak and almost complete lack of sugar maple in the canopy. Additional species that can help to distinguish MHs38b include snowberry or wolfberry (*Symphoricarpos albus* or *S. occidentalis*), starry false Solomon's seal (*Smilacina stellata*), and nodding trillium (*Trillium cernuum*). MHs38b has been documented in the MIM, CGP, and RRV.

Unit 2

Sub-Unit 2A: North

Photo Description: A multi-use trail cuts through the disturbed grassland in Unit 2A.

Acres: 4.4 acres

MLCCS Land Cover types: 62140 Grassland with sparse deciduous trees - altered/non-native dominated vegetation

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

General Description: Unit 2A is a disturbed grassland with sparse deciduous trees and little mature canopy cover. The eastern section of the A Sawmill Loop single-track mountain biking trail winds through the unit. The existing canopy and subcanopy is a patchy mix of quaking aspen, amur maple, boxelder, silver maple, green ash, eastern red cedar, crabapple, elm, and cottonwood; some bur oaks are also present. The shrub layer is dominated in some areas by amur maple, dogwood, buckthorn, and nonnative honeysuckle. Sumac and quaking aspen are encroaching in the shrub layer from Unit 1B to the east. The herbaceous layer is grassy and contains both non-native species such as Kentucky blue grass, burdock, buckthorn, and amur maple, as well as natives such as Virginia creeper, bedstraw, Virginia stickseed, and goldenrods. The present trees currently provide some buffering to residents along the northwest edge of the park. Without management, this unit would trend

toward a degraded deciduous forest over time. However, given that there is consistent herbaceous cover in the understory, removal of some woody vegetation and reintroduction of fire would allow this unit to trend toward savanna. Savanna habitat is rare and restoration could provide habitat for rare species including the red headed woodpecker.

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 (*Pediomelum 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 (R*osa 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.

Unit 2

Sub-Unit 2B: South

Photo Description: Native and non-native woody and herbaceous cover compete in Unit 2B.

Acres: 1.8 acres

MLCCS Land Cover types: 62140 Grassland with sparse deciduous trees - altered/non-native dominated vegetation

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

General Description: The central section of Unit 2 (Unit 2B) is more heavily wooded than areas to the north and south. The canopy and subcanopy include elm, black walnut, green ash, white pine, and blue spruce. The shrub layer is invaded with buckthorn and amur maple. Common milkweed, Virginia stickseed, bedstraw and goldenrod are present in the ground layer, along with non-native reed canary grass, Kentucky bluegrass, mullein, burdock, and Canada thistle. Extensive woody removal in Unit 2B is recommended to connect Unit 2A to Unit 2C to form a continuous savanna. In addition to tree removal, this unit would benefit from understory clearing, invasive species removal, and native ground-cover plantings. Without management, this unit would trend toward a degraded deciduous forest over time. However, given that there is consistent herbaceous cover in the understory, removal of some woody vegetation and reintroduction of fire would allow this unit to trend

toward savanna. Savanna habitat is rare and restoration could provide habitat for rare species including the red headed woodpecker.

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 (*Pediomelum 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 (R*osa 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-Unit 3A: North

Photo Description: Conifers from Boy Scout plantings in the 1990s are present in the canopy in Unit 3A.

Acres: 3.2 acres

MLCCS Land Cover types: 62140 Grassland with sparse deciduous trees - altered/non-native dominated vegetation; 62220 Grassland with sparse conifer or mixed deciduous/coniferous trees – altered/non-native dominated

Ranking (based on MN DNR Natural Heritage's Element Occurrence Ranking Guidelines): C/D Fair to poor condition of natural plant community.

General Description: Unit 3A is south-east of the maintained park grounds. Mature white and red pine are both present in the canopy, as are white spruce, eastern red cedar, red oak, cottonwood, and black walnut. Buckthorn and amur maple are present in the understory and shrub layer, along with some cherry, Bitternut hickory, and silver maple. White snakeroot, Virginia stickseed, red clover, and Virginia creeper fill in gaps of the herbaceous layer in areas not coated with a bed of conifer needles. Although this unit would likely historically have been Maple-Basswood forest, conifers from forest restoration projects planted by Boy Scouts in the early 1990s have spread throughout the park and become well established in Unit 3A. These plantations have changed the plant community and soil chemistry sufficiently to warrant a different target plant community throughout Unit 3.

Removal of mature conifers at this stage is not recommended, and maintaining a pine-oak woodland will provide a diversity of habitat types to support wildlife and birds within the park. Targeted removal of buckthorn and amur maple will help open the understory and ground layer for more diverse native herbaceous species that are currently missing. Hazard green ash trees affected by EAB should be removed near trails; others can be left dying to provide habitat.

Recommended Plant Communities: FDs27 Southern Dry-Mesic Pine-Oak Woodland/ FDs27b White Pine - Oak Woodland

Description: Dry-mesic (or dry) hardwood or pine-hardwood woodlands on sand deposits, primarily in the blufflands of southeastern Minnesota.

Ground-layer cover is variable, ranging from sparse to interrupted (5–75%), with prairie species often present. Important species include flowering spurge (*Euphorbia corollata*), pussytoes (*Antennaria* spp.), harebell (*Campanula rotundifolia*), elliptic shinleaf (*Pyrola elliptica*), white rattlesnakeroot (*Prenanthes alba*), round-lobed hepatica (*Anemone americana*), downy rattlesnake plantain (*Goodyera pubescens*), heart-leaved aster (*Aster cordifolius*), and yarrow (*Achillea millefolium*). Other common species include northern bedstraw (*Galium boreale*), Clayton's sweet cicely (*Osmorhiza claytonii*), lopseed (*Phryma leptostachya*), columbine (*Aquilegia canadensis*), hog peanut (*Amphicarpaea bracteata*), white snakeroot (*Eupatorium rugosum*), bracken (*Pteridium aquilinum*), and Pennsylvania sedge (*Carex pensylvanica*). The community provides important habitat for several rare sand-loving plants, especially Canada forked chickweed (Paronychia canadensis) and marginal shield fern (*Dryopteris marginalis*) and also rough-seeded fameflower (*Talinum rugospermum*), goat's rue (*Tephrosia virginiana*), ebony spleenwort (*Asplenium platyneuron*), and seaside three-awn (*Aristida tuberculosa*).

Climbing plants and vines are common but generally short. Common species include Virginia creeper (*Parthenocissus vitacea*) and wild grape (*Vitis riparia*).

Shrub-layer cover is mostly patchy to interrupted (25–75%). White pine, bitternut hickory, white oak, pin cherry, and eastern red cedar are important tree saplings, while ninebark (*Physocarpus opulifolius*), bush juniper (*Juniperus communis*), and black raspberry (*Rubus occidentalis*) are important shrubs. Other common shrub-layer species include American hazelnut (*Corylus americana*), prickly ash (*Zanthoxylum americanum*), black cherry, gray dogwood (*Cornus racemosa*), and common poison ivy (*Toxicodendron rydbergii*). Pipsissewa (*Chimaphila umbellata*) and leadplant (*Amorpha canescens*) are typical half-shrubs.

Subcanopy is sparse to patchy (25–100% cover) and often poorly differentiated from the canopy. White pine, eastern red cedar, black cherry, black oak, and white oak are often present.

Canopy cover is patchy to interrupted (25–75%). Canopy is typically dominated by one or more of the following: white pine, jack pine, black oak, or bitternut hickory. Other common species include bur oak, northern pin oak, white oak, and paper birch. Northern red oak, black cherry, quaking aspen, and basswood are occasional.

FDs27b White Pine - Oak Woodland (Sand)
Dry-mesic pine-hardwood woodlands. The presence of white pine and northern red oak in the canopy and understory helps to distinguish FDs27b from the other types in this class. Important herbaceous plants include wild sarsaparilla (*Aralia nudicaulis*), zigzag goldenrod (*Solidago flexicaulis*), common enchanter's nightshade (*Circaea lutetiana*), harebell, bastard toadflax (*Comandra umbellata*), and carrion flowers (Smilax spp.). FDs27b is uncommon.

Unit 3
Sub-Unit 3B: Central

Photo Description: Pine trees planted by the Boy Scouts in the 1990's can be seen in the background, with low diversity understory in the foreground beneath an invasive Amur Maple tree canopy in Unit 3B.

Acres: 3.5 acres

MLCCS Land Cover types: 62220 Grassland with sparse conifer or mixed deciduous/coniferous trees – altered/non-native dominated

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

General Description: Unit 3B extends south of the sedge meadow in Unit 7 along the eastern edge of the property and houses a pine reforestation project installed by Boy Scouts in the early 1990s. Mature white and red pine are both present in the canopy, as are white spruce, eastern red cedar, red oak, black walnut, and cottonwood. Amur maple dominates the understory and shrub layer. Some pockets are a monoculture of amur maple with no other species present. There is a mix of groundcover species depending in light availability, ranging from ostrich fern, Virginia stickseed, and white snakeroot in shaded areas to spotted knapweed, reed canary grass, and crown vetch in sunnier areas near trails. Although this unit would likely historically have been Maple-Basswood forest , conifers from the pine plantation have spread and become well established. These

plantations have changed the plant community and soil chemistry sufficiently to warrant a target plant community that historically would not have been present in this area throughout Unit 3. Removal of mature conifers at this stage is not recommended, and maintaining a pine-oak woodland will provide a diversity of habitat types to support wildlife and birds within the park. Targeted removal of amur maple will help open the understory and ground layer for more diverse native herbaceous species that are currently missing.

Recommended Plant Communities: FDs27 Southern Dry-Mesic Pine-Oak Woodland/ FDs27b White Pine - Oak Woodland

Description: Dry-mesic (or dry) hardwood or pine-hardwood woodlands on sand deposits, primarily in the blufflands of southeastern Minnesota.

Ground-layer cover is variable, ranging from sparse to interrupted (5–75%), with prairie species often present. Important species include flowering spurge (*Euphorbia corollata*), pussytoes (*Antennaria* spp.), harebell (*Campanula rotundifolia*), elliptic shinleaf (*Pyrola elliptica*), white rattlesnakeroot (*Prenanthes alba*), round-lobed hepatica (*Anemone americana*), downy rattlesnake plantain (*Goodyera pubescens*), heart-leaved aster (*Aster cordifolius*), and yarrow (*Achillea millefolium*). Other common species include northern bedstraw (*Galium boreale*), Clayton's sweet cicely (*Osmorhiza claytonii*), lopseed (*Phryma leptostachya*), columbine (*Aquilegia canadensis*), hog peanut (*Amphicarpaea bracteata*), white snakeroot (*Eupatorium rugosum*), bracken (*Pteridium aquilinum*), and Pennsylvania sedge (*Carex pensylvanica*). The community provides important habitat for several rare sand-loving plants, especially Canada forked chickweed (Paronychia canadensis) and marginal shield fern (*Dryopteris marginalis*) and also rough-seeded fameflower (*Talinum rugospermum*), goat's rue (*Tephrosia virginiana*), ebony spleenwort (*Asplenium platyneuron*), and seaside three-awn (*Aristida tuberculosa*).

Climbing plants and vines are common but generally short. Common species include Virginia creeper (*Parthenocissus vitacea*) and wild grape (*Vitis riparia*).

Shrub-layer cover is mostly patchy to interrupted (25–75%). White pine, bitternut hickory, white oak, pin cherry, and eastern red cedar are important tree saplings, while ninebark (*Physocarpus opulifolius*), bush juniper (*Juniperus communis*), and black raspberry (*Rubus occidentalis*) are important shrubs. Other common shrub-layer species include American hazelnut (*Corylus americana*), prickly ash (*Zanthoxylum americanum*), black cherry, gray dogwood (*Cornus racemosa*), and common poison ivy (*Toxicodendron rydbergii*). Pipsissewa (*Chimaphila umbellata*) and leadplant (*Amorpha canescens*) are typical half-shrubs.

Subcanopy is sparse to patchy (25–100% cover) and often poorly differentiated from the canopy. White pine, eastern red cedar, black cherry, black oak, and white oak are often present.

Canopy cover is patchy to interrupted (25–75%). Canopy is typically dominated by one or more of the following: white pine, jack pine, black oak, or bitternut hickory. Other common species include bur oak, northern pin oak, white oak, and paper birch. Northern red oak, black cherry, quaking aspen, and basswood are occasional.

FDs27b White Pine - Oak Woodland (Sand)
Dry-mesic pine-hardwood woodlands. The presence of white pine and northern red oak in the canopy and understory helps to distinguish FDs27b from the other types in this class. Important herbaceous plants include wild sarsaparilla (*Aralia nudicaulis*), zigzag goldenrod (*Solidago flexicaulis*), common enchanter's nightshade (*Circaea lutetiana*), harebell, bastard toadflax (*Comandra umbellata*), and carrion flowers (Smilax spp.). FDs27b is uncommon.

Unit 3
Sub-Unit 3C: South

Photo Description: Unit 3C has a coniferous tree canopy resulting from a boy scout tree planting in the 1990's. The understory is low diversity, largely due to a thick layer of pine needles and acidic soils from the pine and amur maple trees.

Acres: 2.5 acres

MLCCS Land Cover types: 62220 Grassland with sparse conifer or mixed deciduous/coniferous trees – altered/non-native dominated

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

General Description: Unit 3C extends south of the marsh and willow-dogwood drainage way along the eastern edge of the property and contains an area that was reforested with pines by Boy Scouts in the early 1990s. Mature white and red pine are present in the canopy, as are white spruce, eastern red cedar, red oak, aspen, green ash, and silver maple. Amur maple is dominant in the subcanopy in some areas. The shrub layer contains buckthorn and amur maple in many areas, as well as green ash, Virginia creeper, and black cherry. The ground layer is sparse in places dominated amur maple. Although this unit would likely historically have been Maple-Basswood forest, conifers from the pine plantation have spread and become well established. These plantations have changed the plant community and soil chemistry sufficiently to warrant a different target plant community

throughout Unit 3. Removal of mature conifers at this stage is not recommended, and maintaining a pine-oak woodland will provide a diversity of habitat types to support wildlife and birds within the park. Targeted removal of buckthorn and amur maple will help open the understory and ground layer for more diverse native herbaceous species that are currently missing or sparse.

Recommended Plant Communities: FDs27 Southern Dry-Mesic Pine-Oak Woodland/ FDs27b White Pine - Oak Woodland

Description: Dry-mesic (or dry) hardwood or pine-hardwood woodlands on sand deposits, primarily in the blufflands of southeastern Minnesota.

Ground-layer cover is variable, ranging from sparse to interrupted (5–75%), with prairie species often present. Important species include flowering spurge (*Euphorbia corollata*), pussytoes (*Antennaria* spp.), harebell (*Campanula rotundifolia*), elliptic shinleaf (*Pyrola elliptica*), white rattlesnakeroot (*Prenanthes alba*), round-lobed hepatica (*Anemone americana*), downy rattlesnake plantain (*Goodyera pubescens*), heart-leaved aster (*Aster cordifolius*), and yarrow (*Achillea millefolium*). Other common species include northern bedstraw (*Galium boreale*), Clayton's sweet cicely (*Osmorhiza claytonii*), lopseed (*Phryma leptostachya*), columbine (*Aquilegia canadensis*), hog peanut (*Amphicarpaea bracteata*), white snakeroot (*Eupatorium rugosum*), bracken (*Pteridium aquilinum*), and Pennsylvania sedge (*Carex pensylvanica*). The community provides important habitat for several rare sand-loving plants, especially Canada forked chickweed (Paronychia canadensis) and marginal shield fern (*Dryopteris marginalis*) and also rough-seeded fameflower (*Talinum rugospermum*), goat's rue (*Tephrosia virginiana*), ebony spleenwort (*Asplenium platyneuron*), and seaside three-awn (*Aristida tuberculosa*).

Climbing plants and vines are common but generally short. Common species include Virginia creeper (*Parthenocissus vitacea*) and wild grape (*Vitis riparia*).

Shrub-layer cover is mostly patchy to interrupted (25–75%). White pine, bitternut hickory, white oak, pin cherry, and eastern red cedar are important tree saplings, while ninebark (*Physocarpus opulifolius*), bush juniper (*Juniperus communis*), and black raspberry (*Rubus occidentalis*) are important shrubs. Other common shrub-layer species include American hazelnut (*Corylus americana*), prickly ash (*Zanthoxylum americanum*), black cherry, gray dogwood (*Cornus racemosa*), and common poison ivy (*Toxicodendron rydbergii*). Pipsissewa (*Chimaphila umbellata*) and leadplant (*Amorpha canescens*) are typical half-shrubs.

Subcanopy is sparse to patchy (25–100% cover) and often poorly differentiated from the canopy. White pine, eastern red cedar, black cherry, black oak, and white oak are often present.

Canopy cover is patchy to interrupted (25–75%). Canopy is typically dominated by one or more of the following: white pine, jack pine, black oak, or bitternut hickory. Other common species include bur oak, northern pin oak, white oak, and paper birch. Northern red oak, black cherry, quaking aspen, and basswood are occasional.

FDs27b White Pine - Oak Woodland (Sand)
Dry-mesic pine-hardwood woodlands. The presence of white pine and northern red oak in the canopy and understory helps to distinguish FDs27b from the other types in this class. Important herbaceous plants include wild sarsaparilla (*Aralia nudicaulis*), zigzag goldenrod (*Solidago flexicaulis*), common enchanter's nightshade (*Circaea lutetiana*), harebell, bastard toadflax (*Comandra umbellata*), and carrion flowers (Smilax spp.). FDs27b is uncommon.

Unit 4

Photo Description: Goldenrod and sparse shrub and canopy cover on a low hill along the mountain bike trail in Unit 4.

Acres: 3 acres

MLCCS Land Cover types: 62220 Grassland with sparse conifer or mixed deciduous/coniferous trees – altered/non-native dominated

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

General Description: Soil in Unit 4 is sandy and topography is hilly moving down towards the marsh. Bur oak, pin oak, cottonwood, white pine, and black walnut are present with sparse canopy cover. Buckthorn, amur maple, and gray dogwood are present in the shrub layer. Ground cover in the Unit 4 is continuous as the canopy is more open than that of Units 2A and 2B. Goldenrods and New England aster are present in the ground layer along with non-natives such as spotted knapweed, crown vetch, birds-foot trefoil, mullein, dandelion, burdock, Canada thistle, Kentucky bluegrass and smooth brome. This unit would benefit from herbaceous and graminoid invasive species removal and native ground-cover plantings. Some oak tree planting has already occurred in this unit. Without management, this unit would trend toward a degraded woodland over time. However, given that there is consistent herbaceous cover in the understory, removal of invasive woody and herbaceous species

paired with the reintroduction of fire would allow this unit to trend toward savanna. Savanna habitat is rare and restoration could provide habitat for rare species including the red headed woodpecker.

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 (*Pediomelum 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 (R*osa 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 5

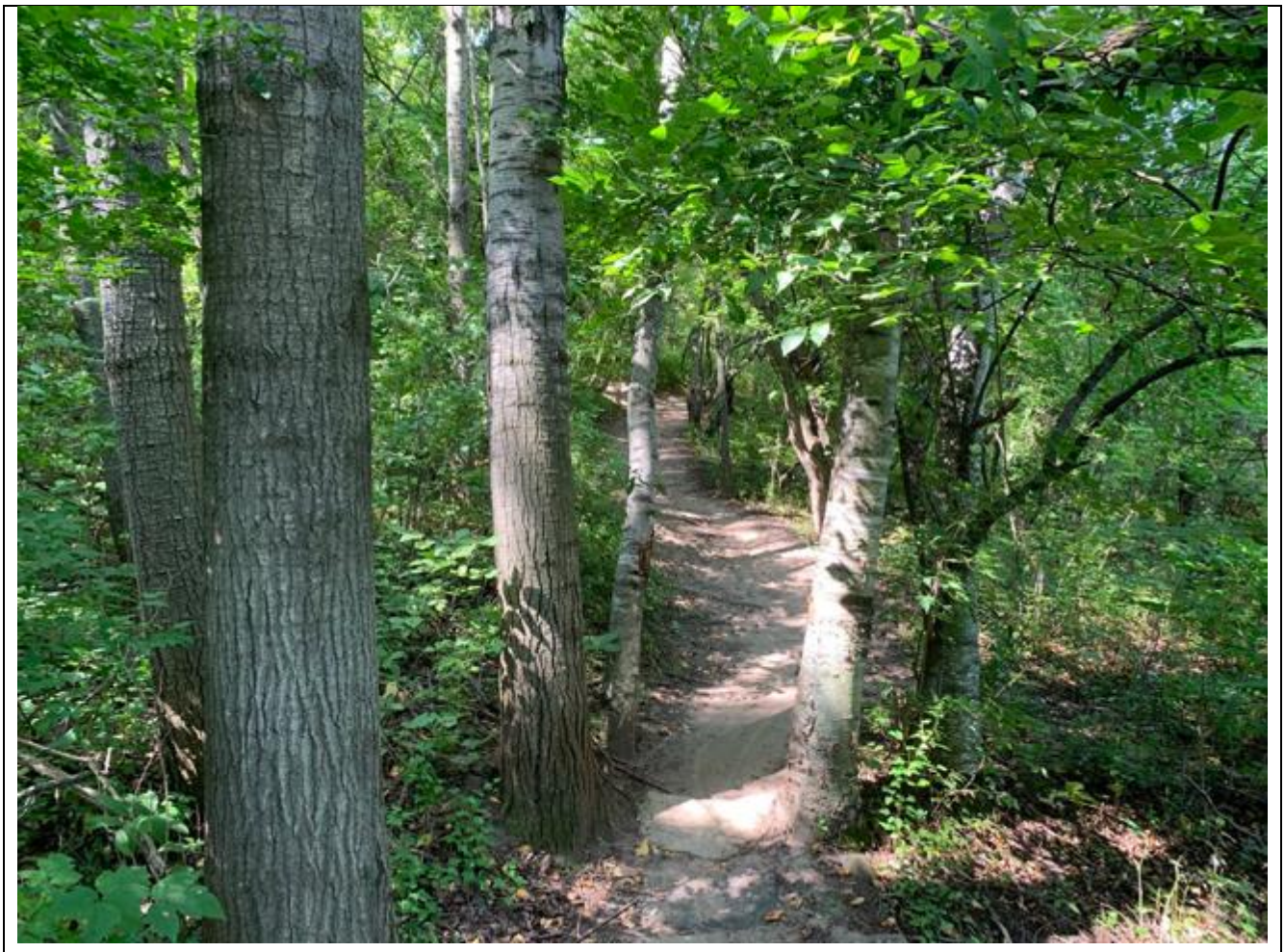


Photo Description: A mountain bike trail runs through the diverse canopy and understory present in the oak forest of Unit 5.

Acres: 4.5 acres

MLCCS Land Cover types: 32110 Oak forest; 61220 Medium-tall altered/non-native dominated grassland; 62220 Grassland with sparse conifer or mixed deciduous/coniferous trees – altered/non-native dominated

Ranking (based on MN DNR Natural Heritage's Element Occurrence Ranking Guidelines): B/C = good to fair condition of natural community.

General Description: Unit 5 is a forested unit that is located along the west edge of the park spanning from north of the marsh (Unit 8) to nearly the middle of the prairie (Unit 10). This unit contains the highest quality wooded area within the entire park directly west of the marsh. Cottonwood, green ash, black cherry, red oak, quaking aspen and amur maple are present in the canopy and small buckthorn saplings, gooseberry, and gray dogwood exist in the shrub layer. The shrub layer is relatively sparse, leaving space for a diverse understory consisting of several native species including wild ginger, false rue anemone, wild geranium, and at least two sedge species, among others. Invasive species management within this unit should be performed with the upmost care to preserve the existing native plant community and minimize negative impacts. With targeted removal of amur maple, basswood can be planted as a replacement.

Recommended Plant Communities: MHs38 Southern Mesic Oak-Basswood Forest/ MHs38b Basswood - Bur Oak - (Green Ash) Forest.

Description: Mesic hardwood or, occasionally, hardwood-conifer forests. Present on wind-deposited silt on bedrock bluffs, on calcareous till on rolling till plains, and, rarely, in association with natural fire breaks in prairie landscapes or on
weakly calcareous till on stagnation moraines.

Ground-layer cover is patchy to interrupted (25–75%); important species include zigzag goldenrod (*Solidago flexicaulis*), large-flowered bellwort (*Uvularia grandiflora*), and Virginia waterleaf (*Hydrophyllum virginianum*). Other common species include Clayton's sweet cicely (*Osmorhiza claytonia*), Virginia creeper (*Parthenocissus* spp.), bloodroot (*Sanguinaria canadensis*), lopseed (*Phryma leptostachya*), common enchanter's nightshade (*Circaea lutetiana*), early meadow-rue (*Thalictrum dioicum),* wild sarsaparilla (*Aralia nudicaulis*), Pennsylvania sedge (*Carex pensylvanica*), and honewort (*Cryptotaenia canadensis*).

Shrub-layer cover is patchy to interrupted (25–75%); common species include sugar maple, ironwood, prickly gooseberry (*Ribes cynosbati*), and chokecherry (*Prunus virginiana*).

Subcanopy cover is interrupted to continuous (50–100%); important species include ironwood, sugar maple, and basswood. American elm, red elm, and bitternut hickory are occasionally present, with blue beech occasional in southeastern and east-central Minnesota.

Canopy cover is interrupted to continuous (50–100%); the most common species are basswood, northern red oak, and sugar maple, with bur oak and green ash replacing northern red oak in importance in western Minnesota, especially in the CGP, and white oak abundant in some stands in eastern Minnesota. On rare occasions a supercanopy with abundant white pine is present.

MHs38b Basswood - Bur Oak - (Green Ash) Forest
Mesic hardwood forests on hummocky topography or near lakes on till plains and stagnation moraines; slopes are generally not steep. Canopy most often is dominated by basswood, bur oak, or green ash, with northern red oak abundant in a few stands. Subcanopy and shrub layer have abundant ironwood with occasional basswood. In general, MHs38b can often be distinguished from the other types in this class by the presence of abundant green ash in the canopy and abundant Virginia waterleaf in the ground layer. It is further distinguished from MHs38c by lower frequency of northern red oak and almost complete lack of sugar maple in the canopy. Additional species that can help to distinguish MHs38b include snowberry or wolfberry (Symphoricarpos albus or S. occidentalis), starry false Solomon's seal (*Smilacina stellata*), and nodding trillium (*Trillium cernuum*). MHs38b has been documented in the MIM, CGP, and RRV.

Unit 6

Photo Description: Reed canary grass dominates the wet meadow in Unit 6.

Acres: 0.9 acres

MLCCS Land Cover types: 93300 Palustrine open water

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

General Description: Unit 6 is a wet meadow located along the east edge of the property in the central third of the park. Half of the unit is boarded by the B loop mountain bike trail. The tree canopy of the meadow is largely open, with one young black walnut tree present. The shrub layer has pockets of gray dogwood. The unit is largely dominated by graminoids in the herbaceous layer consisting of invasive reed canary grass monocultures surrounding pockets of orchard grass and ostrich fern. There are non-wetland species along the trail including spotted knapweed, Virginia creeper, and grapevine. Hydrologically, this unit is functioning like a sedge meadow. Ecologically, the entire area will need to undergo management to remove invasive reed canary grass and re-establish native species such as tussock sedge, soft-stem bulrush, swamp milkweed and joe pye weed. These efforts will increase diversity, provide floral resources for pollinators, and increase habitat value for frogs, turtles, and other invertebrates.

Recommended Plant Communities: WMn82 Northern Wet Meadow/Carr, WMn82b Sedge Meadow

Description: Open wetlands dominated by dense cover of broad-leaved graminoids or tall shrubs. Present on mineral to sapric peat soils in basins and along streams.

Moss cover most often is < 5% but can range to > 75%. Brown mosses are usually dominant, but Sphagnum can be dominant on some sites.

Graminoid layer consists of dense stands of mostly broad-leaved graminoids, including bluejoint (*Calamagrostis canadensis*), lake sedge (*Carex lacustris*), tussock sedge (*C. stricta*), and beaked sedge (*C. utriculata*).

Forb cover is variable, with tufted loosestrife (*Lysimachia thyrsiflora*), marsh bellflower (Campanula aparinoides), marsh skullcap (*Scutellaria galericulata*), and great water dock (*Rumex orbiculatus*) common, and small or three-cleft bedstraw (*Galium tinctorium* or *G. trifidum*), bulb-bearing water hemlock (*Cicuta bulbifera*), northern bugleweed (*Lycopus uniflorus*), linear-leaved, marsh, or downy willow-herb (*Epilobium leptophyllum*, *E. palustre*, or *E. strictum*), water smartweed (*Polygonum amphibium*), and northern marsh fern (*Thelypteris palustris*) occasional.

Shrub cover is variable. Tall shrubs such as willows (*Salix* spp.), red-osier dogwood (Cornus sericea), and speckled alder (*Alnus incana*) can be dense, along with meadowsweet (*Spiraea alba*). Paper birch, black ash, red maple, American elm, and tamarack saplings are occasionally present in the shrub layer.

Trees taller than 16ft (5m) are rarely present and if so, have low cover (< 25%).

WMn82b Sedge Meadow
Open wetlands with abundant broad-leaved graminoids, and shrub cover typically < 25%. The invasive species common reed grass (*Phragmites australis*) and reed canary grass (*Phalaris arundinacea*) have become increasingly abundant in this community type over the past several decades, reducing species diversity in many occurrences. WMn82b is divided into four subtypes, based on dominant graminoid species.

Unit 7

Sub-Unit 7A: West

Photo Description: The B loop trail skirts the edge of a wetland on the west boundary of the park in Unit 7A.

Acres: 0.25 acres

MLCCS Land Cover types: 32170 Altered/non-native deciduous forest; 93300 Palustrine open water

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

General Description: This subunit skirts the edge of a larger wetland located just west of the park boundary north of the large cattail marsh (Unit 8). Although only a small area of the wetland extends within the park, the area is highly visible because a portion of the B loop trail is directly adjacent. The canopy contains green ash and silver maple, while the shrub layer is sparse and consists of buckthorn saplings and gray dogwood. Several sedge species are in the herbaceous layer, in addition to reed canary grass. There is no recommended target native plant community for this unit, as it is part of a larger stormwater infrastructure system and woody vegetation must be limited. As the green ash canopy thins and more sunlight reaches the soil, increasing native plant diversity by planting sedges and forbs is recommended. Management of reed canary grass and buckthorn should be done in coordination with neighbors bordering the wetland.

Unit 7

Sub-Unit 7B: Central

Photo Description: Stormwater pond surrounded by native and non-native vegetation in Unit 7B.

Acres: 0.6 acres

MLCCS Land Cover types: 62140 Grassland with sparse deciduous trees - altered/non-native dominated vegetation

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

General Description: This subunit contains a stormwater pond designed to catch sediment and pollutants from the adjacent development before depositing cleaner water into the cattail marsh (Unit 8) to the west. The canopy surrounding the unit is sparse and contains a few silver maple, green ash, and cottonwood trees. Within the unit, the herbaceous layer is dominated by cattails around the edge of the pond and reed canary grass, crown vetch, grapevine, golden alexanders, and Canada goldenrod in the buffer. This unit is made artificially wet by the stormwater pond and access to the pond and outlet structures must remain clear of woody vegetation for maintenance. As such, there is no recommended target native plant community for this unit. Adding native species diversity and maintaining the current vegetated buffer will improve habitat and water quality.

Unit 7

Sub-Unit 7C: South

Photo Description: Stormwater drainage area directly adjacent to residential property.

Acres: 0.5 acres

MLCCS Land Cover types: 43110 Altered/non-native mixed woodland; 62220 Grassland with sparse conifer or mixed deciduous/coniferous trees – altered/non-native dominated

Ranking: D = Poor condition of natural plant community.

General Description: Unit 7C is a small drainage pond along the northeastern boundary of the southern 1/3 of the park. This wet pond is not recorded on the public waters inventory and is likely a product of runoff from surrounding home development. It is a forested wetland with several large silver maples and green ash comprising the canopy. The understory is almost entirely amur maple creating a monoculture up to the edge of the wetland. The groundcover vegetation is sparse. It includes cattails, reed canary grass, grapevine, Virginia creeper, green ash and buckthorn seedlings. Nearly 90% of the soil surrounding the pond is unvegetated. Since this area is not a wetland and likely receives significant stormwater drainage, there is not an appropriate target native plant community to recommend for restoration. Rather, a buffer of native vegetation including sedges and forbs should be established around the perimeter of the pond to limit soil erosion and improve habitat quality. This should be done after removing the ubiquitous amur maple from this and the surrounding unit (3C), as amur maple is likely to be impacting the soil chemistry and preventing understory plant establishment.

Unit 8

Photo Description: Cattails and reed canary grass dominate the buffer of the emergent marsh in Unit 8.

Acres: 2.1 acres

MLCCS Land Cover types: 93300 Palustrine open water

Ranking (based on MN DNR Natural Heritage's Element Occurrence Ranking Guidelines): C/D = Fair to poor condition of natural plant community.

General Description: Unit 8 is a shallow emergent marsh with open water near the center of the property. It consists of the marsh and the surrounding open canopy buffer. Sandbar and black willow dominate the shrub layer, while the herbaceous community is dominated by reed canary grass in the buffer and cattails in the marsh. Additionally, there are pockets of native forbs including cardinal flower and giant blue hyssop, which benefit pollinators and hummingbirds. Because this unit is hydrologically connected to the stormwater system from the surrounding development via Unit 7, there will likely always be higher concentrations of nutrients (nitrogen and phosphorous) as well as new seed bank impacting this wetland. In general, wetland invasive species are better able to utilize excess nutrients compared to native plants. Total eradication of invasive species may not be possible within this unit. However, establishing some pockets of aggressive native plants may help improve the habitat and create a more diverse overall matrix of vegetation compared to the existing monoculture state.

Recommended Plant Communities: MRn83 Northern Mixed Cattail Marsh

Description: Emergent marsh communities, typically dominated by cattails. Present on floating mats along shorelines in lakes, ponds, and river backwaters or rooted in mineral soil in shallow wetland basins.

Floating-leaved and submergent aquatic plant cover is sparse, with species such as duckweed (*Lemna* spp.) and greater duckweed (*Spirodela polyrhiza*) frequent, and common bladderwort (*Utricularia vulgaris*) and common coontail (*Ceratophyllum demersum*) occasionally present. Seasonally prolific, floating clones of the liverworts Riccia fluitans and Ricciocarpos natans may be present, becoming stranded during watertable drawdown.

Graminoid cover is variable, with lake sedge (*Carex lacustris*) and bristly sedge (*C. comosa*) commonly present. • Forb cover is strongly dominated by cattails (*Typha* spp.), usually with > 50% cover. Other common forbs include emergent species such as broad-leaved arrowhead (*Sagittaria latifolia*), marsh skullcap (*Scutellaria galericulata*), small or three-cleft bedstraw (*Galium tinctorium* or *G. trifidum*), and bur marigold and beggarticks (*Bidens* spp.).

Shrubs are absent or very sparse.

Notes: Vegetation is often composed of dense stands of cattails interspersed with pools of open water. Associated species are highly variable. MRn83 and other shallowwater wetlands throughout much of the state (particularly the agricultural region) have been invaded by dense stands of the non-native species narrow-leaved cattail (*Typha angustifolia*) and hybrid cattail (*T.* x *glauca*). Invasion and dominance of marshes by non-native cattail species is likely related to alterations in wetland hydrology, commonly from drain tiling, ditching, and impoundments; high levels of nutrient-rich runoff from agricultural fields; and salt-containing runoff from roads. Marshes dominated by non-native cattail species are considered to be low-quality or disturbed examples of MRn83. Marshes dominated by the native species broad-leaved cattail (*T. latifolia*) are considered higher-quality examples of MRn83 and are increasingly rare in Minnesota.

Unit 9

Sub-Unit 9A: Mesic-dry

Photo Description: The canopy of Unit 9A consists of Amur maple, box elder, black walnut, and red oaks all in the same age class. There is an herbaceous understory present in this unit, indicating it could be restored to oak savanna after woody removal.

Acres: 16.3 acres

MLCCS Land Cover types: 61220 Medium-tall altered/non-native dominated grassland; 62220 Grassland with sparse conifer or mixed deciduous/coniferous trees – altered/non-native dominated

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

General Description: Unit 9A surrounds the central prairie and mountain biking prairie fire loop C in the south of the property. The canopy is a mix of red oak, pin oak, black walnut, quaking aspen, and box elder trees all of the same age class, with some sparse bur and white oaks present. The shrub layer contains gray dogwood, smooth sumac, nonnative honeysuckle, and Siberian elm. This unit was seeded with a hardwood forest seed mix in the early 2000's after agricultural production ceased. Grassy ground cover is present throughout Unit 9A, and the herbaceous cover has maintained some diversity; round-headed bush clover is present, as are yarrow, Northern bedstraw, and American sloughgrass. Non-native spotted knapweed, Kentucky bluegrass, foxtail, and burdock are present in the ground layer.

Without management, this unit would trend toward an oak woodland over time. However, given that there is consistent herbaceous cover in the understory, the removal of invasive woody and herbaceous species paired with the reintroduction of fire would allow this unit to trend toward savanna. Pockets of red oaks can be maintained to provide woodland pockets within the savanna complex. Savanna habitat is rare and restoration could provide habitat for rare species including the red headed woodpecker.

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 (*Pediomelum 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 (R*osa 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.

Unit 9

Sub-Unit 9B: Mesic-wet

Photo Description: Unit 9B consists of low depressional areas with generally wetter soil compared to Unit 9A. These pockets are dominated by reed canary grass monocultures.

Acres: 0.8 acres

MLCCS Land Cover types: 61220 Medium-tall altered/non-native dominated grassland; 62220 Grassland with sparse conifer or mixed deciduous/coniferous trees – altered/non-native dominated

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

General Description: Unit 9B consists of natural low points with wetter soils and a different native plant community compared to Unit 9A. There is limited tree cover in these units. Instead, the landscape is dominated by reed canary grass and other herbaceous species that can tolerate seasonal inundation and full sunlight. These pockets can be managed similarly to Unit 9A, first targeting invasive species removal followed by seeding and burning. The seed mix should be different in these areas – focusing more on reintroducing species with a wetter soil tolerance, such as mountain mint, obedient plant, and prairie cordgrass.

Recommended Plant Community: 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%). Tallgrass dominate, but several midheight 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. Wooly sedge (*Carex pellita*) is often an important component, and rigid sedge (*C. tetanica*) and flattedned 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. pseudaureus*), 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 10

Photo Description: A white-tailed deer in the non-native cool season grass dominated prairie in Unit 10.

Acres: 6.5 acres

MLCCS Land Cover types: 61220 Medium-tall altered/non-native dominated grassland; 62220 Grassland with sparse conifer or mixed deciduous/coniferous trees – altered/non-native dominated

Ranking: C = Fair condition of natural community.

General Description: Unit 10 is actively being maintained as a prairie. It is within the mountain biking prairie fire loop C and is subject to extensive use, degradation, and erosion along the trail. No canopy cover is present, and shrub cover is sparse and limited to minimal woody encroachment of quaking aspen, smooth sumac, black locust, Siberian elm, prickly ash, and honeysuckle from edges. The ground layer is dominated by non-native cool season grasses including Kentucky bluegrass, smooth brome, and timothy. Spotted knapweed, birds-foot trefoil and crown vetch are prevalent, especially along trails. Some goldenrods, asters, bee balm, and other desirable prairie species are present. Management actions should target cool-season grasses and invasive forbs to open niches and create space where native diversity can repopulate. Warm season grasses should be reintroduced and pockets of early and mid-season flowering plants can be interseeded to provide floral resources for pollinators throughout the entire growing season. Finally, seeding the trail edges with a short grass mix may help stabilize soils and maintain the current usage of the trail.
Recommended Plant Communities: UPs13 Southern Dry Prairie/ UPs13b Dry Sand - Gravel Prairie

Description: Grass-dominated herbaceous communities on level to steeply sloping sites with droughty soils. Moderate growing-season moisture deficits occur most years, and severe moisture deficits are frequent, especially during periodic regional droughts. Historically, fires probably occurred every few years.

Graminoid cover is patchy to continuous (50–100%). Midheight 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 midheight grasses are side-oats grama (*Bouteloua curtipendula*), prairie dropseed (*Sporobolus heterolepis*), porcupine grass (*Stipa spartea*), and plains muhly (*Muhlenbergia cuspidata*). Junegrass (*Koeleria pyramidata*) and hairy grama (*Bouteloua hirsuta*) are common minor grasses. Of the tallgrasses, big bluestem (Andropogon gerardii) is usually important, while Indian grass (*Sorghastrum nutans*) is less frequent, being more strongly associated with more mesic sites within the community.

Forb cover is sparse to patchy (5–50%). 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*) in the southern part of the EBF Province, and narrow-leaved purple coneflower (*Echinacea angustifolia*) in the CGP. Also common but less distinctive of UPs13 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*).

Shrub layer is sparse (< 5% cover) and composed mostly of low (< 20in [50cm]) semishrubs, primarily leadplant (*Amorpha canescens*), with prairie rose (*Rosa arkansana*) and sage wormwood (*Artemisia frigida*) often present. The taller shrub smooth sumac (*Rhus glabra*) 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.

UPs13b Dry Sand - Gravel Prairie (Southern)
Graminoid-dominated, forb-rich herbaceous communities on coarse-textured, usually gravelly soils on gentle or occasionally steep slopes on outwash and ice-contact deposits. Soils are characterized by mollic epipedons. UPs13b shares many species with UPs13c and 13d that are rare in UPs13a; species with this pattern that are most common in UPs13b are side-oats grama, plains muhly, and prairie dropseed. Less common species include needle-and-thread grass (*Stipa comata*), silky aster, bastard toadflax (*Comandra umbellata*), tall cinquefoil (*Potentilla arguta*), stiff goldenrod, and aromatic aster (*Aster oblongifolius*). Species shared with UPs13a but rare in UPs13c and UPs13d are sand reedgrass, sand dropseed, western ragwort, and large-flowered beard tongue (*Penstemon grandiflorus*). Sage wormwood is most common in UPs13b but is sometimes also present in UPs13a. Field chickweed (*Cerastium arvense*) and thread-leaved sedge (*Carex filifolia*) are occasionally present in UPs13b and rare in the other types in this class. Terricolous lichens are sometimes common and are distinctive of UPs13b. UPs13b has been documented at numerous locations in the PPL, MIM, and CGP and at two locations in the southern part of the RRV just outside of the MIM.

Unit 11

Photo Description: An unnatural composition of grassland and conifer species dominates Unit 11 due, in part, to the conifer planting efforts of Boy Scouts in the 1990s.

Acres: 4.6 acres

MLCCS Land Cover types: 61220 Medium-tall altered/non-native dominated grassland

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

General Description: Unit 11 is located in north east corner of the southernmost third of the park. The plant community was highly influenced by the pine planting efforts in the 1990's and currently, an unnatural composition of grassland and conifer species dominate the unit. White pine, red pine, blue spruce, Amur maple, and black walnut dominate the tree canopy, with gray dogwood and smooth sumac present in the shrub layer. There are several openings in the tree canopy consisting of Canada goldenrod, grapevine, Virginia creeper, reed canary grass and Kentucky bluegrass. The existing species composition does not trend toward a historical native plant community in Minnesota. Restoration of this community to a Minnesota native plant community will consist of removing most of the large conifers in the unit. A conifer buffer should be left between the residential lots and the park to the east. Groupings of conifers near the park entrance and adjacent to the bike trails can be left alone, as long as burn breaks could be placed around the grouping of trees. The remainder of the conifers should be removed to allow the unit to be maintained with prescribed fire. Restoration of the understory should

follow similar steps to Unit 9A, where invasive species are removed and the understory is reseeded with a diverse mix of native forbs and grasses. Scattered groupings of bur oak trees should be planted to recreate the tree canopy.

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 (*Pediomelum 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 (R*osa 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 12

Sub-Unit 12A: West

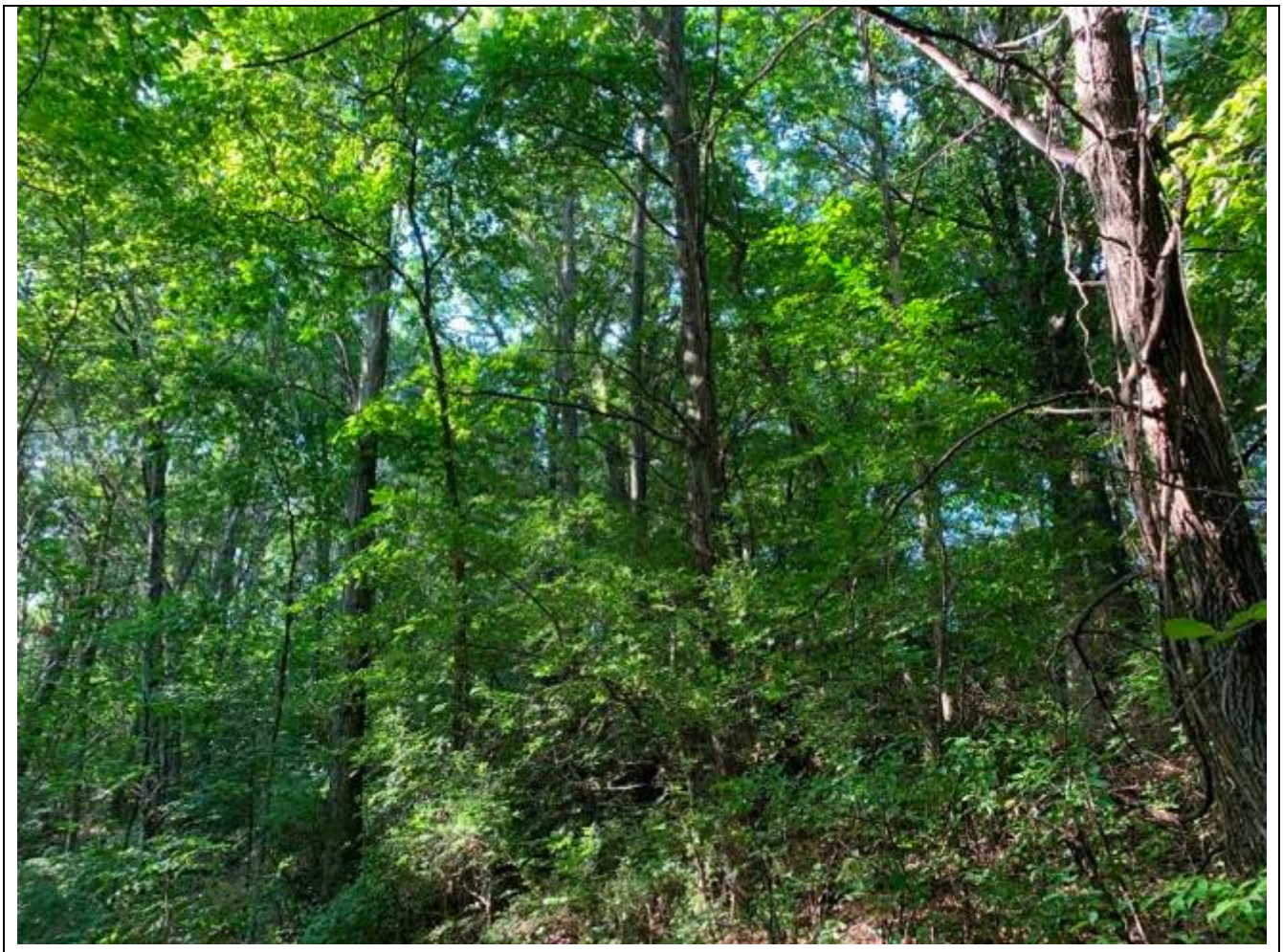


Photo Description: Hardwood forest in Unit 12A.

Acres: 0.4 acres

MLCCS Land Cover types: 32110 Oak forest; 32170 Altered/non-native deciduous forest; 32140 Grassland with sparse deciduous trees - altered/non-native dominated vegetation.

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

General Description: Unit 12A is a small area located along the south-western edge of the property. The ultimate boundaries of this unit depend on amount of clearing performed in the surrounding savanna (Unit 9). Presently, Unit 12A consists of degraded hardwood forest. The canopy consists of green ash, cottonwood, basswood, white oak, black cherry, with some red and white pines. The shrub layer is dominated by mulberry, gooseberry, amur maple, honeysuckle, and smooth sumac along the edges. Ground cover is sparse, consisting of dandelion, wood sorrel, and tree seedlings. Given the relatively small size and adjacency to the mountain bike trail that is constantly reintroducing weed seeds, this unit does not rank high on the priority list. Removal of woody invasive species should be conducted, and the area should be monitored for new invasive species outbreak populations over time.

Recommended Plant Communities: MHs38 Southern Mesic Oak-Basswood Forest/ MHs38b Basswood - Bur Oak - (Green Ash) Forest.

Description: Mesic hardwood or, occasionally, hardwood-conifer forests. Present on wind-deposited silt on bedrock bluffs, on calcareous till on rolling till plains, and, rarely, in association with natural fire breaks in prairie landscapes or on
weakly calcareous till on stagnation moraines.

Ground-layer cover is patchy to interrupted (25–75%); important species include zigzag goldenrod (*Solidago flexicaulis*), large-flowered bellwort (*Uvularia grandiflora*), and Virginia waterleaf (*Hydrophyllum virginianum*). Other common species include Clayton's sweet cicely (*Osmorhiza claytonia*), Virginia creeper (*Parthenocissus* spp.), bloodroot (*Sanguinaria canadensis*), lopseed (*Phryma leptostachya*), common enchanter's nightshade (*Circaea lutetiana*), early meadow-rue (*Thalictrum dioicum),* wild sarsaparilla (*Aralia nudicaulis*), Pennsylvania sedge (*Carex pensylvanica*), and honewort (*Cryptotaenia canadensis*).

Shrub-layer cover is patchy to interrupted (25–75%); common species include sugar maple, ironwood, prickly gooseberry (*Ribes cynosbati*), and chokecherry (*Prunus virginiana*).

Subcanopy cover is interrupted to continuous (50–100%); important species include ironwood, sugar maple, and basswood. American elm, red elm, and bitternut hickory are occasionally present, with blue beech occasional in southeastern and east-central Minnesota.

Canopy cover is interrupted to continuous (50–100%); the most common species are basswood, northern red oak, and sugar maple, with bur oak and green ash replacing northern red oak in importance in western Minnesota, especially in the CGP, and white oak abundant in some stands in eastern Minnesota. On rare occasions a supercanopy with abundant white pine is present.

MHs38b Basswood - Bur Oak - (Green Ash) Forest
Mesic hardwood forests on hummocky topography or near lakes on till plains and stagnation moraines; slopes are generally not steep. Canopy most often is dominated by basswood, bur oak, or green ash, with northern red oak abundant in a few stands. Subcanopy and shrub layer have abundant ironwood with occasional basswood. In general, MHs38b can often be distinguished from the other types in this class by the presence of abundant green ash in the canopy and abundant Virginia waterleaf in the ground layer. It is further distinguished from MHs38c by lower frequency of northern red oak and almost complete lack of sugar maple in the canopy. Additional species that can help to distinguish MHs38b include snowberry or wolfberry (Symphoricarpos albus or S. occidentalis), starry false Solomon's seal (*Smilacina stellata*), and nodding trillium (*Trillium cernuum*). MHs38b has been documented in the MIM, CGP, and RRV.

Unit 12

Sub-Unit 12B: East

Photo Description: Native and non-native trees in the canopy and understory in Unit 12B.

Acres: 6.9 acres

MLCCS Land Cover types: 32110 Oak forest; 32170 Altered/non-native deciduous forest; 32140 Grassland with sparse deciduous trees - altered/non-native dominated vegetation.

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

General Description: Unit 12B is located in the southeastern corner of the park. There are large, remnant bur and white oak trees with open-structured growth indicative of a time when the tree canopy was open. At present day, this unit is completely forested. The tree canopy consists of bur, white and red oak, cottonwood, green ash, black walnut, and basswood. The understory contains amur maple, buckthorn, ironwood, and black cherry. Management of this unit should focus on eliminating invasive species and allowing the native species present to fill in the gaps. Monitoring for invasive species populations next to the mountain bike trail will be necessary to make sure new populations are prevented from establishing.

Recommended Plant Communities: MHs38 Southern Mesic Oak-Basswood Forest/ MHs38b Basswood - Bur Oak - (Green Ash) Forest.

Description: Mesic hardwood or, occasionally, hardwood-conifer forests. Present on wind-deposited silt on bedrock bluffs, on calcareous till on rolling till plains, and, rarely, in association with natural fire breaks in prairie landscapes or on
weakly calcareous till on stagnation moraines.

Ground-layer cover is patchy to interrupted (25–75%); important species include zigzag goldenrod (*Solidago flexicaulis*), large-flowered bellwort (*Uvularia grandiflora*), and Virginia waterleaf (*Hydrophyllum virginianum*). Other common species include Clayton's sweet cicely (*Osmorhiza claytonia*), Virginia creeper (*Parthenocissus* spp.), bloodroot (*Sanguinaria canadensis*), lopseed (*Phryma leptostachya*), common enchanter's nightshade (*Circaea lutetiana*), early meadow-rue (*Thalictrum dioicum),* wild sarsaparilla (*Aralia nudicaulis*), Pennsylvania sedge (*Carex pensylvanica*), and honewort (*Cryptotaenia canadensis*).

Shrub-layer cover is patchy to interrupted (25–75%); common species include sugar maple, ironwood, prickly gooseberry (*Ribes cynosbati*), and chokecherry (*Prunus virginiana*).

Subcanopy cover is interrupted to continuous (50–100%); important species include ironwood, sugar maple, and basswood. American elm, red elm, and bitternut hickory are occasionally present, with blue beech occasional in southeastern and east-central Minnesota.

Canopy cover is interrupted to continuous (50–100%); the most common species are basswood, northern red oak, and sugar maple, with bur oak and green ash replacing northern red oak in importance in western Minnesota, especially in the CGP, and white oak abundant in some stands in eastern Minnesota. On rare occasions a supercanopy with abundant white pine is present.

MHs38b Basswood - Bur Oak - (Green Ash) Forest
Mesic hardwood forests on hummocky topography or near lakes on till plains and stagnation moraines; slopes are generally not steep. Canopy most often is dominated by basswood, bur oak, or green ash, with northern red oak abundant in a few stands. Subcanopy and shrub layer have abundant ironwood with occasional basswood. In general, MHs38b can often be distinguished from the other types in this class by the presence of abundant green ash in the canopy and abundant Virginia waterleaf in the ground layer. It is further distinguished from MHs38c by lower frequency of northern red oak and almost complete lack of sugar maple in the canopy. Additional species that can help to distinguish MHs38b include snowberry or wolfberry (Symphoricarpos albus or S. occidentalis), starry false Solomon's seal (*Smilacina stellata*), and nodding trillium (*Trillium cernuum*). MHs38b has been documented in the MIM, CGP, and RRV.

Unit 12

Sub-Unit 12C: South

Photo Description: A relatively open understory is present in the Unit 12C oak forest.

Acres: 2.7 acres

MLCCS Land Cover types: 32110 Oak forest; 32170 Altered/non-native deciduous forest; 32140 Grassland with sparse deciduous trees - altered/non-native dominated vegetation.

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

General Description: Unit 12C is located south of the prairie in the southern panhandle of the park. There are large, remnant bur and white oak trees with open-structured growth indicative of a time when the tree canopy was open. At present day, this wooded unit is trending toward forest, given the lack of contiguous ground cover and closed canopy. The tree canopy consists of the aforementioned oaks, green ash, black cherry, quaking aspen, and basswood. The understory is relatively open, with some amur maple, nonnative honeysuckle, and green ash seedlings present. Management of this unit should focus on eliminating invasive species and allowing the native species present to fill in the gaps. Monitoring for invasive species populations next to the mountain bike trail will be necessary to make sure new populations are prevented from establishing.

Recommended Plant Communities: MHs38 Southern Mesic Oak-Basswood Forest/ MHs38b Basswood - Bur Oak - (Green Ash) Forest.

Description: Mesic hardwood or, occasionally, hardwood-conifer forests. Present on wind-deposited silt on bedrock bluffs, on calcareous till on rolling till plains, and, rarely, in association with natural fire breaks in prairie landscapes or on
weakly calcareous till on stagnation moraines.

Ground-layer cover is patchy to interrupted (25–75%); important species include zigzag goldenrod (*Solidago flexicaulis*), large-flowered bellwort (*Uvularia grandiflora*), and Virginia waterleaf (*Hydrophyllum virginianum*). Other common species include Clayton's sweet cicely (*Osmorhiza claytonia*), Virginia creeper (*Parthenocissus* spp.), bloodroot (*Sanguinaria canadensis*), lopseed (*Phryma leptostachya*), common enchanter's nightshade (*Circaea lutetiana*), early meadow-rue (*Thalictrum dioicum),* wild sarsaparilla (*Aralia nudicaulis*), Pennsylvania sedge (*Carex pensylvanica*), and honewort (*Cryptotaenia canadensis*).

Shrub-layer cover is patchy to interrupted (25–75%); common species include sugar maple, ironwood, prickly gooseberry (*Ribes cynosbati*), and chokecherry (*Prunus virginiana*).

Subcanopy cover is interrupted to continuous (50–100%); important species include ironwood, sugar maple, and basswood. American elm, red elm, and bitternut hickory are occasionally present, with blue beech occasional in southeastern and east-central Minnesota.

Canopy cover is interrupted to continuous (50–100%); the most common species are basswood, northern red oak, and sugar maple, with bur oak and green ash replacing northern red oak in importance in western Minnesota, especially in the CGP, and white oak abundant in some stands in eastern Minnesota. On rare occasions a supercanopy with abundant white pine is present.

MHs38b Basswood - Bur Oak - (Green Ash) Forest
Mesic hardwood forests on hummocky topography or near lakes on till plains and stagnation moraines; slopes are generally not steep. Canopy most often is dominated by basswood, bur oak, or green ash, with northern red oak abundant in a few stands. Subcanopy and shrub layer have abundant ironwood with occasional basswood. In general, MHs38b can often be distinguished from the other types in this class by the presence of abundant green ash in the canopy and abundant Virginia waterleaf in the ground layer. It is further distinguished from MHs38c by lower frequency of northern red oak and almost complete lack of sugar maple in the canopy. Additional species that can help to distinguish MHs38b include snowberry or wolfberry (Symphoricarpos albus or S. occidentalis), starry false Solomon's seal (*Smilacina stellata*), and nodding trillium (*Trillium cernuum*). MHs38b has been documented in the MIM, CGP, and RRV.

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, or conservation organizations.

Task tables below are grouped by recommended phases.

Phase 1 - $177,200

UNIT 1A (7.9 Acres) Target: Basswood - Bur Oak (Green Ash) Mesic Forest						
Year	**Season**	**Unit**	**Activity**	**Acres**	**Unit cost**	**Total**
1	Fall	1A	Invasive shrub removal: A combination of forestry mowing and cut and paint removal of non-native, invasive shrubs	7.9	$ 2,000.00	$ 15,800.00
1	Fall	1A	Fell hazard green ash trees infected with EAB.	20 trees	$ 550.00	$ 11,000.00
1	Fall	1A	Hand-broadcast seeding of simple graminoid seed mix (MNL Buckthorn Replacement Mix) to establish herbaceous cover. Contractor supplies seed. (Includes seed cost).	7.9	$ 900.00	$ 7,110.00
2	Spring	1A	Spot spray flowering, second-year garlic mustard prior to seed set. Scout entirety of each unit; assumes garlic mustard is present across 1/3 of each unit.	2.5	$ 950.00	$ 2,375.00
2	Fall	1A	Spot herbicide treatment of resprouted/new germinant buckthorn and honeysuckle.	7.9	$ 600.00	$ 4,740.00
3	Spring	1A	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; assumes garlic mustard is present in 1/3 of each unit.	2.5	$ 800.00	$ 2,000.00
3	Fall	1A	Spot herbicide treatment of resprouted/new germinant buckthorn and honeysuckle.	7.9	$ 500.00	$ 3,950.00
4	Spring	1A	Spot spray flowering, second-year garlic mustard prior to seed set or hold volunteer event to pull and bag flowering garlic mustard; assumes garlic mustard is present in 1/3 of each unit.	2.5	$ 700.00	$ 1,750.00
4	Summer	1A	Plant showy native forbs and grasses near park benches and gathering areas in Unit 1A.	150 plugs	$ 4.00	$ 600.00
5	Fall	1A	Plant 200 bare root native trees and shrubs within buckthorn removal areas. (Basswood, ironwood, red-osier dogwood, red elderberry)	150 trees	$ 8.00	$ 1,200.00

UNIT 1A TOTAL YEARS 1-5 **$50,525**

UNITS 5, 12A, 12B, 12C (14.5 Acres) Target: Basswood - Bur Oak (Green Ash) Mesic Forest						
Year	**Season**	**Unit**	**Activity**	**Acres**	**Unit cost**	**Total**
1	Fall	5, 12A, 12B, 12C	Invasive shrub removal: A combination of forestry mowing and cut and paint removal of non-native, invasive shrubs. Assumes invasive shrubs are present in 1/2 of units.	7.5	$ 2,000.00	$ 15,000.00
1	Fall	5, 12A, 12B, 12C	Hand-broadcast seeding of simple graminoid seed mix (MNL Buckthorn Replacement Mix) to establish herbaceous cover. Contractor supplies seed. (Includes seed cost).	7.5	$ 950.00	$ 7,125.00

1	Fall	5, 12A, 12B, 12C	Fell hazard green ash trees infected with EAB.	15	$ 550.00	$ 8,250.00
1	Fall	5, 12A, 12B, 12C	Invasive tree removal: Cut Siberian elm and amur maple / treat stumps / burn piles.	5	$ 2,500.00	$ 12,500.00
2	Spring	5, 12A, 12B, 12C	Spot spray flowering, second-year garlic mustard prior to seed set. Scout entirety of each unit; assume garlic mustard is present across 1/4 of each unit.	4	$ 900.00	$ 3,600.00
2	Fall	5, 12A, 12B, 12C	Spot herbicide treatment of resprouted/new germinant buckthorn and honeysuckle.	7.5	$ 600.00	$ 4,500.00
3	Spring	5, 12A, 12B, 12C	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 1/4 of each unit.	4	$ 800.00	$ 3,200.00
3	Fall	5, 12A, 12B, 12C	Spot herbicide treatment of resprouted/new germinant buckthorn and honeysuckle.	7.5	$ 600.00	$ 4,500.00
4	Spring	5, 12A, 12B, 12C	Spot spray flowering, second-year garlic mustard prior to seed set or hold volunteer event to pull and bag flowering garlic mustard.	4	$ 700.00	$ 2,800.00
5	Fall	5, 12A, 12B, 12C	Plant 200 bare root native trees and shrubs within buckthorn removal areas. (Black chokeberry, red-osier dogwood, red elderberry, ironwood)	200 trees	$ 8.00	$ 1,600.00

UNITS 5 AND 12 TOTAL YEARS 1-5 **$63,075**

UNIT 2A, 2B (6.2 Acres) Target: Mesic Savanna						
Year	**Season**	**Unit**	**Activity**	**Acres**	**Unit cost**	**Total**
1	Spring-Summer	2A, 2B	Mark save trees	-	**-**	**-**
1	Fall	2A, 2B	Forestry mow shrubs and small trees with DBH less than 6 inches.	6.2	$2,000.00	**$12,400.00**
1	Fall	2A, 2B	Fell trees larger than 6 inch DBH. Cut stump short enough so equipment can drive through later. Paint stumps with herbicide. Chip where feasible, pile larger material in burn piles. Burn in winter.	1.5	$2,500.00	**$3,750.00**
2	Spring	2A, 2B	Hand-broadcast seeding of simple graminoid seed mix (MNL Buckthorn Replacement Mix) to establish herbaceous cover. Contractor supplies seed. (Includes seed cost).	6.2	$950.00	**$5,890.00**
2	Spring	2A, 2B	Spot spray herbaceous weeds (garlic mustard, burdock, canada thistle). Assumes 1/2 of the unit.	3.1	$600.00	**$1,860.00**
2	Fall	2A, 2B	Follow up foliar spray woody re-sprouts, woody seedlings. Assumes 1/2 of the unit.	3.1	$900.00	**$2,790.00**
3	Spring	2A, 2B	Spot seed simple graminoid seed mix (MNL Buckthorn Replacement Mix) to establish herbaceous cover. Contractor supplies seed. (Includes seed cost).	2	$950.00	**$1,900.00**
3	Spring	2A, 2B	Spot spray woody re-sprouts, woody seedlings, and herbaceous perennial weeds (burdock, canada thistle)	3.1	$800.00	**$2,480.00**
3	Summer	2A, 2B	Mow burn breaks	0.5	$400.00	**$200.00**
3	Fall	2A, 2B	Prune ladder fuels / Conifers	10 trees	$250.00	**$2,500.00**
3	Fall	2A, 2B	Rx Fire. Alternate: broadcast spray cool season grasses with herbicide.	6.2	$900.00	**$5,580.00**

3	Late Fall / Winter	2A, 2B	Broadcast seed or snow seed native savanna mix (BWSR 36-211, 35-241 or similar). Contractor supplies seed. (Includes seed cost).	6.2	$1,300.00	**$8,060.00**
4	Spring	2A, 2B	Mow newly seeded areas once in late spring.	6.2	$750.00	**$4,650.00**
4	Summer	2A, 2B	Mow newly seeded areas once in mid-summer.	6.2	$750.00	**$4,650.00**
4	Early Fall	2A, 2B	Mow newly seeded areas once in early-fall	6.2	$750.00	**$4,650.00**
4	Fall	2A, 2B	Plant 200 bare root native trees. (Bur oak, white oak, shagbark hickory).	40	$8.00	**$320.00**
4	Fall	2A, 2B	Spot-spray nonnative cool season grasses as needed. Assumes presence on 1/4 of site.	1.6	$600.00	**$960.00**
5	Fall	2A, 2B	Spot spray herbaceous perennial weeds and cool-season grasses. Assumes presence on 1/4 of unit.	1.6	$600.00	**$960.00**

UNIT 2 TOTAL YEARS 1-5 **$63,600.00**

Phase 2 - $43,750

UNIT 10 (6.5Acre) Target: Dry prairie						
Year	**Season**	**Unit**	**Activity**	**Acres**	**Unit cost**	**Total**
1	Spring	10	Mow or spot spray as needed based on invasive species present, particularly forbs. Assumes presence in 1/2 of unit.	3	$950.00	$2,850.00
1	Summer	10	Mow or spot spray as needed based on invasive species present, particularly forbs. Assumes presence in 1/2 of unit.	3	$950.00	$2,850.00
1	Fall	10	Mow or spot spray as needed based on invasive species present, particularly forbs. Assumes presence in 1/2 of unit.	3	$950.00	$2,850.00
1	Fall	10	Mow burn breaks	1	$400.00	$400.00
2	Spring	10	Conduct prescribed burn on project area to target nonnative cool season grasses & remove thatch.	6.5	$1,200.00	$7,800.00
2	Spring	10	Drill seed upland dry prairie seed mix. Contractor supplies seed. (Includes seed cost).	6.5	$1,400.00	$9,100.00
2	Summer	10	Mow or spot spray as needed based on species present (1 visit) establishing prairie. Assumes presence in 1/2 of unit.	3	$800.00	$2,400.00
2	Summer	10	Spot spray herbaceous perennial weeds (2 visits). Assumes presence in 1/2 of unit.	3	$800.00	$2,400.00
3	Summer	10	Mow or spot spray as needed based on species present (2 visits). Assumes 1/2 of unit.	3	$700.00	$2,100.00
4	Spring	10	Mow or spot spray as needed based on species present (1x). Assumes 1/2 of unit.	3	$600.00	$1,800.00
4	Fall	10	Mow burn breaks	1	$400.00	$400.00
4	Spring	10	Rx burn to target nonnative cool season grasses.	6.5	$1,200.00	$7,800.00
5	Summer	10	Spot spray as needed based on species present (1x). Assumes 1/4 of unit.	2	$500.00	$1,000.00

UNIT 10 TOTAL YEARS 1-5 **$43,750.00**

Phase 3 - $278,475

UNIT 4 (3 Acres) Target: Mesic Savanna						
Year	**Season**	**Unit**	**Activity**	**Acres**	**Unit cost**	**Total**
1	Spring	4	Mow perennial cool-season grass hillside twice before early June	3	$1,000.00	$3,000.00
1	Fall	4	Mow perennial cool-season grass hillside once in early September	3	$500.00	$1,500.00
1	Fall	4	Spot spray perennial cool season grasses in late September.	3	$500.00	$1,500.00
1	Fall	4	Cut buckthorn, invasive honeysuckle, and sumac / treat stumps / burn piles.	3	$2,750.00	$8,250.00
2	Spring	4	Mow perennial cool-season grass hillside twice before early June.	3	$1,000.00	$3,000.00
2	Fall	4	Spot spray perennial cool season grasses in late September. Assumes 1/2 of the unit.	1.5	$500.00	$750.00
2	Fall	4	Spot herbicide treatment of resprouted/new germinant buckthorn and honeysuckle. Assumes 1/2 of the unit.	1.5	$600.00	$900.00
2	Fall/Winter	4	Interseed or snow seed native savanna mix (BWSR 36-211, 35-241 or similar). Contractor supplies seed. (Includes seed cost.)	3	$1,000.00	$3,000.00
3	Summer	4	Mow newly seeded areas twice during growing season to reduce weedy competition.	3	$1,000.00	$3,000.00
4	Summer	4	Prune ladder fuels	10 trees	$250.00	$2,500.00
4	Fall	4	Rx burn	3	$3,000.00	$9,000.00
4	Fall	4	Plant five (5) 1.5" CAL Bur oak and northern pin oak trees. Install browse protection and provide supplemental water to trees before ground freezes.	5 trees	$1,250.00	$6,250.00
5	Spring	4	Repair/replace browse protection on planted trees.	3	$150.00	$450.00
5	Summer	4	Install gator bags or provide supplemental water to trees.	3	$150.00	$450.00

UNIT 4 TOTAL YEARS 1-5 **$43,550**

UNIT 9A, 9B (17.1 Acres) Target: Mesic Savanna						
Year	**Season**	**Unit**	**Activity**	**Acres**	**Unit cost**	**Total**
1	Spring-Summer	9A	Mark save trees	-	-	-
1	Fall	9A, 9B	Forestry mow shrubs and small trees with DBH less than 6 inches.	17.1	$2,000.00	**$34,200.00**
1	Fall	9A	Fell trees larger than 6 inch DBH. Cut stump short enough so equipment can drive through later. Paint stumps with herbicide. Chip where feasible, pile larger material in burn piles. Burn in winter.	3.5	$2,500.00	**$8,750.00**
3	Fall	9A	Prune ladder fuels / Conifers	10 trees	$250.00	**$2,500.00**
2	Spring	9A, 9B	Hand-broadcast seeding of simple graminoid seed mix (MNL Buckthorn Replacement Mix) to establish herbaceous cover. Contractor supplies seed. (Includes seed cost).	17.1	$950.00	**$16,245.00**
2	Spring	9A, 9B	Spot spray woody re-sprouts, woody seedlings, and herbaceous perennial weeds (burdock, canada thistle, reed canary grass). Assumes 2/3 of the unit.	12.3	$600.00	**$7,380.00**
2	Fall	9A, 9B	Spot spray woody re-sprouts, woody seedlings, and herbaceous perennial weeds (burdock, canada thistle, reed canary grass). Assumes 1/2 of the unit.	8.6	$600.00	**$5,160.00**
3	Spring	9A, 9B	Spot seed simple graminoid seed mix (MNL Buckthorn Replacement Mix) to establish herbaceous cover. Contractor supplies seed. (Includes seed cost).	4	$950.00	**$3,800.00**
3	Spring	9A, 9B	Spot spray woody re-sprouts, woody seedlings, and herbaceous perennial weeds (burdock, canada thistle)	8.6	$500.00	**$4,300.00**

3	Summer	9A, 9B	Mow burn breaks	1.5	$400.00	**$600.00**
3	Fall	9A, 9B	Rx Fire. Alternate: broadcast spray cool season grasses with herbicide.	17.1	$900.00	**$15,390.00**
3	Late Fall / Winter	9A	Broadcast seed or snow seed native savanna mix (BWSR 36-211, 35-241 or similar). Contractor supplies seed. (Includes seed cost).	16.3	$1,300.00	**$21,190.00**
3	Late Fall / Winter	9B	Broadcast seed or snow seed native savanna mix (BWSR 34-263 or similar). Contractor supplies seed. (Includes seed cost).	0.8	$1,500.00	**$1,200.00**
4	Spring	9	Mow newly seeded areas once in late spring.	17.1	$750.00	**$12,825.00**
4	Summer	9	Mow newly seeded areas once in mid-summer.	17.1	$750.00	**$12,825.00**
4	Early Fall	9	Mow newly seeded areas once in early-fall	17.1	$750.00	**$12,825.00**
4	Fall	9	Plant 200 bare root native trees. (Bur oak, white oak, shagbark hickory).	160	$8.00	**$1,280.00**
4	Fall	9	Spot-spray nonnative cool season grasses as needed. Assumes presence on 1/4 of site.	4.3	$700.00	**$3,010.00**
5	Fall	9	Spot spray herbaceous perennial weeds and cool-season grasses. Assumes presence on 1/4 of unit.	4.3	$600.00	**$2,580.00**

UNIT 9 TOTAL YEARS 1-5 **$166,060.00**

UNIT 11 (4.6 Acres) Target: Mesic Savanna						
Year	**Season**	**Unit**	**Activity**	**Acres**	**Unit cost**	**Total**
1	Spring-Summer	11	Mark save trees	-	**-**	**-**
1	Early spring, winter	11	Remove mature confiers outside of designated save areas. Fell, treat stump, haul material	50 trees	$550.00	$27,500.00
1	Fall, winter	11	Forestry mow shrubs and small trees with DBH less than 6 inches. Assumes 1/2 of acreage.	2.3	$2,000.00	$4,600.00
1	Fall, winter	11	Cut buckthorn, amur maple, invasive honeysuckle, and sumac in areas inaccessible with forestry mower. Treat stump, pile, and burn.	1	$2,500.00	$2,500.00
2	Spring	11	Mow perennial cool-season grass twice before early June	4.6	$750.00	$3,450.00
2	Fall	11	Mow perennial cool-season grass once in early September	4.6	$750.00	$3,450.00
2	Fall	11	Broadcast spray perennial cool season grasses in late September.	4.6	$300.00	$1,380.00
2	Fall	11	Follow up foliar treatment of resprouted/new germinant buckthorn and honeysuckle. Assumes 1/2 of the unit.	2.3	$600.00	$1,380.00
3	Spring	11	Mow perennial cool-season grass twice before early June.	4.6	$750.00	$3,450.00
3	Fall	11	Spot spray perennial cool season grasses in late September. Assumes 1/2 of the unit.	2.3	$950.00	$2,185.00
3	Fall/Winter	11	Interseed or snow seed native savanna mix (BWSR 36-211, 35-241 or similar). Contractor supplies seed. (Includes seed cost.)	4.6	$1,200.00	$5,520.00
4	Summer	11	Mow newly seeded areas twice during growing season to reduce weedy competition.	4.6	$750.00	$3,450.00
5	Summer	11	Prune ladder fuels	10 trees	$250.00	$2,500.00
5	Late Summer	11	Mow burn breaks around conifer trees	1	$600.00	$600.00
5	Fall	11	Rx burn	4.6	$1,500.00	$6,900.00

UNIT 11 TOTAL YEARS 1-5 **$68,865**

Phase 4 - $58,950

UNITS 1B (4.5 Acres) Target: Basswood - Bur Oak (Green Ash) Mesic Forest						
Year	Season	Unit	Activity	Acres	Unit cost	Total
1	Fall	1B	Invasive shrub removal: A combination of forestry mowing and cut and paint removal of non-native, invasive shrubs	4.5	$ 2,000.00	$ 9,000.00
1	Fall	1B	Fell hazard green ash trees infected with EAB.	5 trees	$ 550.00	$ 2,750.00
1	Fall	1B	Hand-broadcast seeding of simple graminoid seed mix (MNL Buckthorn Replacement Mix) to establish herbaceous cover. Contractor supplies seed. (Includes seed cost).	1.3	$ 900.00	$ 1,170.00
2	Spring	1B	Spot spray flowering, second-year garlic mustard prior to seed set. Scout entirety of each unit; assumes garlic mustard is present across 1/3 of each unit.	4	$ 950.00	$ 3,800.00
2	Fall	1B	Spot herbicide treatment of resprouted/new germinant buckthorn and honeysuckle.	1.3	$ 600.00	$ 780.00
3	Spring	1B	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; assumes garlic mustard is present in 1/3 of each unit.	4	$ 800.00	$ 3,200.00
3	Fall	1B	Spot herbicide treatment of resprouted/new germinant buckthorn and honeysuckle.	1.3	$ 500.00	$ 650.00
4	Spring	1B	Spot spray flowering, second-year garlic mustard prior to seed set or hold volunteer event to pull and bag flowering garlic mustard; assumes garlic mustard is present in 1/3 of each unit.	4	$ 700.00	$ 2,800.00
4	Summer	1B	Plant showy native forbs and grasses near park benches and gathering areas in Unit 1A.	50 plugs	$ 4.00	$ 200.00
5	Fall	1B	Plant 200 bare root native trees and shrubs within buckthorn removal areas. (Basswood, ironwood, red-osier dogwood, red elderberry)	50 trees	$ 8.00	$ 400.00

UNIT 1B TOTAL YEARS 1-5 **$24,750**

UNITS 3A, 3B, 3C (13.3 Acres) Target: White Pine - Oak Woodland						
Year	Season	Unit	Activity	Acres	Unit cost	Total
1	Summer	3A, 3B, 3C	Mark trees to be removed. Focus should be on trees in poor health and thinning some of the thicker stands of confier species.	-	-	-
1	Fall	3A, 3B, 3C	Invasive shrub removal: A combination of forestry mowing and cut and paint removal of non-native, invasive shrubs	6	$ 2,000.00	$ 12,000.00
1	Fall	3A, 3B, 3C	Hand-broadcast seeding of simple graminoid seed mix (MNL Buckthorn Replacement Mix) to establish herbaceous cover. Contractor supplies seed. (Includes seed cost).	6	$ 950.00	$ 5,700.00
1	Fall	3A, 3B, 3C	Fell marked trees selected to be removed. For invasive woody species (Siberian elm, amur maple), paint stumps with herbicide.	50 trees	$ 550.00	$ 2,750.00
1	Summer	3A, 3B, 3C	Prune ladder fuels	20 trees	$ 250.00	$ 5,000.00
2	Spring	3A, 3B, 3C	Spot spray flowering, second-year garlic mustard prior to seed set. Scout entirety of each unit; assume garlic mustard is present across 1/4 of each unit.	4	$ 950.00	$ 3,800.00

2	Fall	3A, 3B, 3C	Spot herbicide treatment of resprouted/new germinant buckthorn and other invasive woody shrubs.	6	$ 600.00	$ 3,600.00
3	Spring	3A, 3B, 3C	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 1/4 of each unit.	4	$ 800.00	$ 3,200.00
3	Fall	3A, 3B, 3C	Spot herbicide treatment of resprouted/new germinant buckthorn.	6	$ 600.00	$ 3,600.00
4	Spring	3A, 3B, 3C	Spot spray flowering, second-year garlic mustard prior to seed set or hold volunteer event to pull and bag flowering garlic mustard.	4	$ 700.00	$ 2,800.00
4	Spring	3A, 3B, 3C	Rx burn	13.3	$ 1,000.00	$ 13,300.00
4	Fall	3A, 3B, 3C	Plant 200 bare root native deciduous trees in conifer and buckthorn removal areas. (Bur oak, white oak, bitternut hickory)	200 trees	$ 8.00	$ 1,600.00
5	Fall	3A, 3B, 3C	Plant 200 bare root native deciduous trees within conifer and buckthorn removal areas. (Bur oak, white oak, bitternut hickory	200 trees	$ 8.00	$ 1,600.00

UNIT 3 TOTAL YEARS 1-5 $ 58,950.00

Phase 5 - $61,040

UNITS 7A, 7B, 7C (1.4 Acres) Target: Stormwater Infrastructure with increased diversity						
Year	**Season**	**Unit**	**Activity**	**Acres**	**Unit cost**	**Total**
1	Summer or Fall	All 7	Mark Save Trees	-	-	-
1	Fall	All 7	Hand cut invasive trees and shrubs with DBH > 0.5" (Siberian elm, buckthorn, amur maple). Cut stump short enough so equipment can drive through later. Paint stumps with herbicide. Chip where feasible, pile larger material in burn piles. Burn in winter.	1.4	$2,000.00	$2,800.00
1	Winter	All 7	Fell marked trees selected to be removed (DBH >6"). For invasive woody species (Siberian elm, amur maple), paint stumps with herbicide. Chip where feasible, pile and burn larger material.	15 trees	$550.00	$8,250.00
2	Spring and Fall	All 7	Spot treat invasive herbaceous plants with aquatic safe herbicide (reed canary, crown vetch, wild parsnip). Assumes 2/3 of unit, 2 visits.	1	$950.00	$950.00
2	Fall	All 7	Follow up foliar treat invasive woody resprouts and seedlings (buckthorn, Siberian elm, amur maple).	1.4	$600.00	$840.00
2	Winter	All 7	Spot seed simple graminoid seed mix (MNL Buckthorn Replacement Mix) to establish herbaceous cover. Contractor supplies seed. (Includes seed cost).	1	$950.00	$950.00
3	Spring and Fall	All 7	Spot treat invasive herbaceous plants with aquatic safe herbicide (reed canary, crown vetch, wild parsnip). Assumes 2/3 of unit, 2 visits.	1	$950.00	$950.00
3	Fall	All 7	Mow burn breaks	0.5	$400.00	$200.00
4	Spring	All 7	Rx burn or mow units to reduce thatch cover.	1.4	$2,000.00	$2,800.00
4	Spring	All 7	Broadcast native stormwater seed mix (BWSR 33-261 or similar). Contractor supplies seed.	1.4	$1,200.00	$1,680.00
4	Summer	All 7	Establishment mow	1.4	$750.00	$1,050.00

5	Summer	All 7	Spot treat invasive herbaceous plants with aquatic safe herbicide (reed canary, crown vetch, wild parsnip). Assumes 1/4 of unit, 1 visit.	0.4	$800.00	$320.00
5	Summer or Fall	All 7	Shrub removal to keep critical infrastructure clear of woody material. Hand cut, stump treat, stack, burn.	0.4	$1,500.00	$600.00

UNIT 7 TOTAL YEARS 1-5 **$21,390.00**

UNITS 6 and 8 (3 Acres) Target: Sedge Meadow / Emergent Marsh						
Year	**Season**	**Unit**	**Activity**	**Acres**	**Unit cost**	**Total**
1	Late Spring	6, 8	Mow/weed whip reed canary grass, nonnative phragmites, and herbaceous perennial weeds.	3	$950.00	$2,850.00
1	Summer	6, 8	Mow/weed whip reed canary grass, nonnative phragmites, and herbaceous perennial weeds.	3	$950.00	$2,850.00
1	Early Fall	6, 8	Mow/weed whip reed canary grass, nonnative phragmites, and herbaceous perennial weeds.	3	$950.00	$2,850.00
1	Fall	6, 8	Cut/stump treat all woody species including willows, box elder, silver maple, etc. with aquatic safe herbicide	1	$2,000.00	$2,000.00
2	Spring	6, 8	Mow/weed whip reed canary grass, nonnative phragmites, and herbaceous perennial weeds.	3	$950.00	$2,850.00
2	Summer	6, 8	Mow/weed whip reed canary grass, nonnative phragmites, and herbaceous perennial weeds.	3	$950.00	$2,850.00
2	Summer/Fall	6, 8	Spot treat persistent perennial weeds with aquatic safe herbicide.	3	$950.00	$2,850.00
3	Spring	6, 8	Spot treat persistent perennial weeds with aquatic safe herbicide.	3	$950.00	$2,850.00
3	Fall	6, 8	Rx Burn	3	$1,200.00	$3,600.00
3	Fall	6, 8	Broadcast surface sow appropriate native seed mix given projected habitat type (BWSR 34-272, 34-182 or similar). Contractor supplies seed. (Includes seed cost).	3	$1,700.00	$5,100.00
4	Spring	6, 8	Mow newly seeded areas once in late spring.	3	$750.00	$2,250.00
4	Summer	6, 8	Mow newly seeded areas once in mid-summer.	3	$750.00	$2,250.00
5	Spring	6, 8	Mow newly seeded areas once in late spring.	3	$750.00	$2,250
5	Summer	6, 8	Mow newly seeded areas once in mid-summer.	3	$750.00	$2,250

UNITS 6 and 8 TOTAL YEARS 1-5 **$39,650.00**

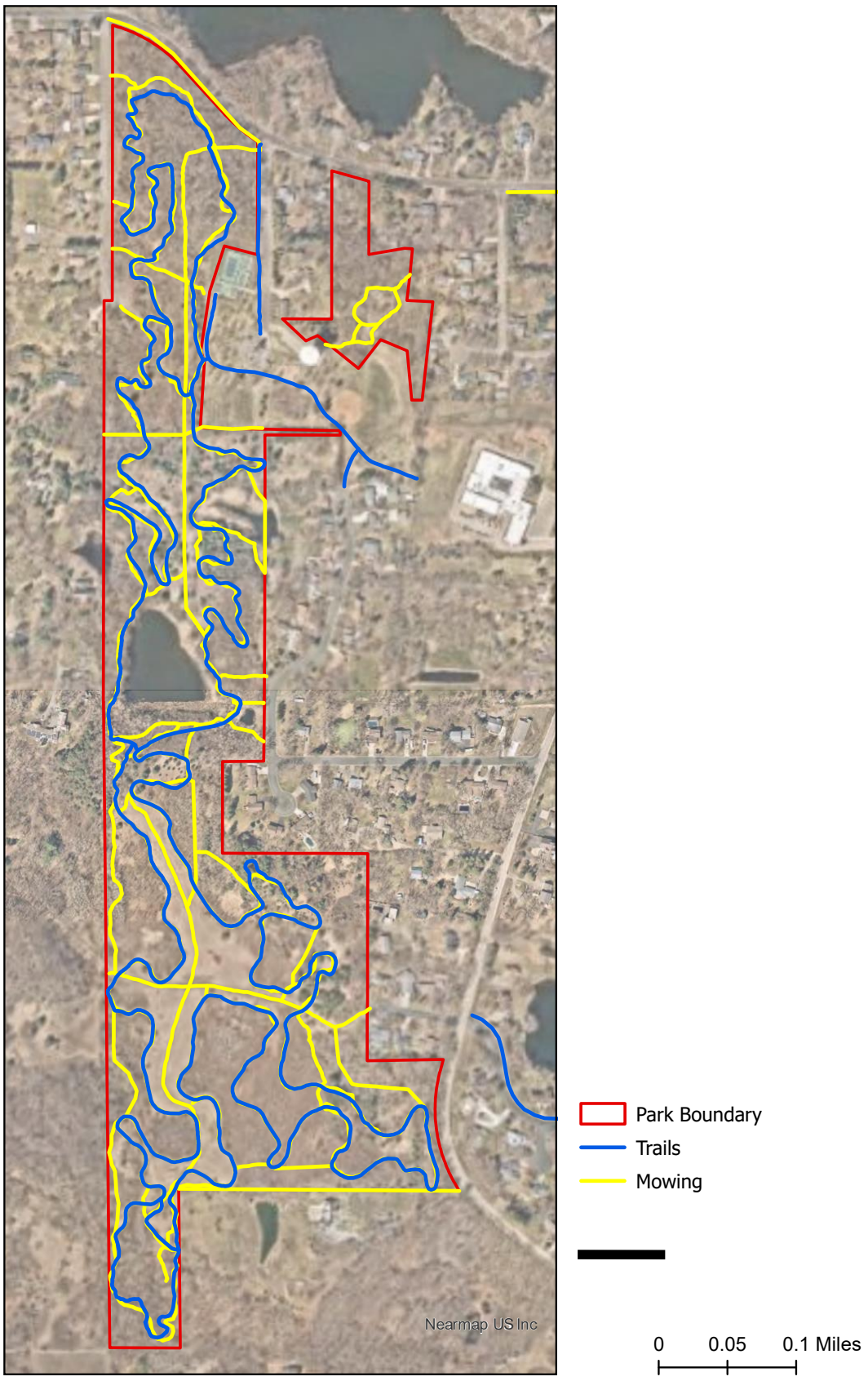
Other Considerations

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: N/A
☐ Alteration of Natural Water Bodies - Comments: N/A
☐ Buildings, Improvements, Small Structures – Comments: N/A
☐ Fences, including adjacent fences – Comments: N/A
☒ Harmful Insects and Invasive or Exotic Species – Comments: There are several invasive species in the park.
☐ Harvesting of Timber, Berries, or Fruit – Comments: N/A
☐ Motorized Vehicles – Comments: N/A
☒ Pesticide and Herbicide Use – Comments: Herbicide is recommended for managing invasive species.
☒ Recreational Activities – Comments: Seed dispersal via mountain bike trails is rampant.
☐ Recreational Horseback Riding - Comments: N/A
☐ Residential, Commercial, or Industrial Activities – Comments: N/A
☒ Signs – Comments: Signage will need to be updated to reflect future plant community targets
☒ Storm-water Conveyance, including from Adjacent Properties – Comments: Some areas of the park are impacted by stormwater conveyance and treatment structures.
☒ Trails – Comments: Hiking and mountain biking trail network within the park.
☒ Utilities and Septic Systems, Roads, Parking Areas, Paths, and Trails – Comments: N/A
☐ Waste Sites – Comments: N/A

Trails

Harmon and Salem Hills Park Multi-Use Trails and Mowing Corridc



Appendices

Appendix A: Observed Plant Species

The following plant species were identified at the Property for each land management unit, on Click here to select option. by Dakota County Soil and Water Conservation District. 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 status	Type	Common Name	Scientific Name	% Cover
1	Native	Canopy/subcanopy	Black walnut	*Juglans nigra*	2
1	Native	Canopy/subcanopy	Box elder	*Acer negundo*	2
1	Native	Canopy/subcanopy	Bur oak	*Quercus macrocarpa*	2
1	Native	Canopy/subcanopy	Cottonwood	*Populus deltoides*	2
1	Native	Canopy/subcanopy	Green ash	*Fraxinus pennsylvanica*	4
1	Native	Canopy/subcanopy	Northern pin oak	*Quercus ellipsoidalis*	1
1	Native	Canopy/subcanopy	Quaking aspen	*Populus tremuloides*	1
1	Native	Canopy/subcanopy	Silver maple	*Acer saccharinum*	4
1	Native	Canopy/subcanopy	Unknown spruce	*Picea spp.*	1
1	Native	Canopy/subcanopy	White cedar	*Thuja occidentalis*	1
1	Native	Canopy/subcanopy	White pine	*Pinus strobus*	1
1	Non-native	Understory/shrub	Common buckthorn	*Rhamnus cathartica*	4
1	Native	Understory/shrub	Green ash	*Fraxinus pennsylvanica*	3
1	Native	Understory/shrub	Silver maple	*Acer saccharinum*	2
1	Non-native	Groundcover	Common buckthorn	*Rhamnus cathartica*	4
1	Native	Groundcover	Daisy fleabane	*Erigeron annuus*	1
1	Native	Groundcover	Early meadow rue	*Thalictrum dioicum*	+
1	Native	Groundcover	Green ash	*Fraxinus pennsylvanica*	3
1	Native	Groundcover	Prickly gooseberry	*Ribes cynosbati*	2
1	Native	Groundcover	Riverbank grape	*Vitis riparia*	1
1	Native	Groundcover	Silver maple	*Acer saccharinum*	2
1	Native	Groundcover	Virginia creeper	*Parthenocissus quinqufolia*	1
1	Native	Groundcover	Virginia stickseed	*Hackelia virginiana*	2
1	Native	Groundcover	White snakeroot	*Ageratina altissima*	2
1	Native	Groundcover	Wild ginger	*Asarum canadense*	+
2,4	Native	Canopy/subcanopy	American elm	*Ulmus americana*	3
2,4	Non-native	Canopy/subcanopy	Amur maple	*Acer ginnala*	4
2,4	Native	Canopy/subcanopy	Black cherry	*Prunus serotina*	2
2,4	Native	Canopy/subcanopy	Blue spruce	*Picea pungens*	2
2,4	Native	Canopy/subcanopy	Box elder	*Acer negundo*	3
2,4	Native	Canopy/subcanopy	Bur oak	*Quercus macrocarpa*	1
2,4	Non-native	Canopy/subcanopy	Crabapple	*Malus spp.*	3

Unit #	Native Status	Type	Common Name	Scientific Name	% Cover
2,4	Native	Canopy/subcanopy	Eastern cottonwood	*Populus deltoides*	3
2,4	Native	Canopy/subcanopy	Eastern red cedar	*Juniperus virginiana*	3
2,4	Native	Canopy/subcanopy	Green ash	*Fraxinus pennsylvanica*	3
2,4	Native	Canopy/subcanopy	Northern pin oak	*Quercus ellipsoidalis*	2
2,4	Native	Canopy/subcanopy	Paper birch	*Betula papyrifera*	1
2,4	Native	Canopy/subcanopy	Quaking aspen	*Populus tremuloides*	3
2,4	Native	Canopy/subcanopy	Red pine	*Pinus resinosa*	2
2,4	Native	Canopy/subcanopy	Silver maple	*Acer saccharinum*	3
2,4	Native	Canopy/subcanopy	Unknown ash	*Fraxinus spp.*	2
2,4	Native	Canopy/subcanopy	White pine	*Pinus strobus*	2
2,4	Native	Canopy/subcanopy	White spruce	*Picea glauca*	1
2,4	Native	Understory/shrub	American elm	*Ulmus americana*	2
2,4	Non-native	Understory/shrub	Amur maple	*Acer ginnala*	4
2,4	Native	Understory/shrub	Black cherry	*Prunus serotina*	2
2,4	Native	Understory/shrub	Black walnut	*Juglans nigra*	2
2,4	Native	Understory/shrub	Box elder	*Acer negundo*	2
2,4	Non-native	Understory/shrub	Common buckthorn	*Rhamnus cathartica*	4
2,4	Non-native	Understory/shrub	Crabapple	*Malus spp.*	2
2,4	Native	Understory/shrub	Eastern red cedar	*Juniperus virginiana*	1
2,4	Native	Understory/shrub	Gray dogwood	*Cornus racemosa*	4
2,4	Native	Understory/shrub	Green ash	*Fraxinus pennsylvanica*	3
2,4	Native	Understory/shrub	Northern pin oak	*Quercus ellipsoidalis*	1
2,4	Native	Understory/shrub	Quaking aspen	*Populus tremuloides*	2
2,4	Native	Understory/shrub	Red oak	*Quercus rubra*	1
2,4	Native	Understory/shrub	Red pine	*Pinus resinosa*	1
2,4	Non-native	Understory/shrub	Siberian elm	*Ulmus pumila*	2
2,4	Native	Understory/shrub	Smooth sumac	*Rhus glabra*	2
2,4	Non-native	Understory/shrub	Unknown honeysuckle	*Lonicera spp.*	3
2,4	Non-native	Groundcover	Amur maple	*Acer ginnala*	4
2,4	Non-native	Groundcover	Autumn olive	*Elaeagnus umbellata*	1
2,4	Native	Groundcover	Awl aster	*Symphyotrichum pilosum*	1
2,4	Non-native	Groundcover	Bittersweet	*Celastrus orbiculatus*	1
2,4	Native	Groundcover	Black cherry	*Prunus serotina*	1
2,4	Native	Groundcover	Canada goldenrod	*Solidago canadensis*	3
2,4	Native	Groundcover	Common blackberry	*Rubus allegheniensis*	2
2,4	Non-native	Groundcover	Common buckthorn	*Rhamnus cathartica*	4
2,4	Non-native	Groundcover	Common burdock	*Arctium minus*	3
2,4	Non-native	Groundcover	Common dandelion	*Taraxacum officinale*	2
2,4	Native	Groundcover	Common yarrow	*Achillea millefolium*	2
2,4	Native	Groundcover	Daisy fleabane	*Erigeron annuus*	2
2,4	Native	Groundcover	Field thistle	*Cirsium discolor*	3
2,4	Native	Groundcover	Giant goldenrod	*Solidago gigantea*	2

Unit #	Native Status	Type	Common Name	Scientific Name	% Cover
2,4	Native	Groundcover	Gray dogwood	*Cornus racemosa*	3
2,4	Native	Groundcover	Green ash	*Fraxinus pennsylvanica*	3
2,4	Non-native	Groundcover	Kentucky bluegrass	*Poa pratensis*	2
2,4	Native	Groundcover	New England Aster	*Symphyotrichum novae-angliae*	1
2,4	Non-native	Groundcover	Oregano	*Origanum vulgare*	1
2,4	Native	Groundcover	Poison ivy	*Toxicodendron radicans*	3
2,4	Native	Groundcover	Prickly ash	*Zanthoxylum americanum*	2
2,4	Non-native	Groundcover	Red clover	*Trifolium pratense*	1
2,4	Native	Groundcover	Red oak	*Quercus rubra*	2
2,4	Non-native	Groundcover	Reed canary grass	*Phalaris arundinacea*	1
2,4	Native	Groundcover	Riverbank grape	*Vitis riparia*	4
2,4	Native	Groundcover	Showy goldenrod	*Solidago speciosa*	2
2,4	Native	Groundcover	Sky-blue aster	*Symphyotrichum oolentangiense*	1
2,4	Native	Groundcover	Smooth sumac	*Rhus glabra*	2
2,4	Non-native	Groundcover	Spotted knapweed	*Centaurea stoebe*	1
2,4	Native	Groundcover	Stiff goldenrod	*Solidago rigida*	1
2,4	Native	Groundcover	Tall agrimony	*Agrimonia gryposepala*	1
2,4	Native	Groundcover	Unknown bedstraw	*Galium spp.*	2
2,4	Native	Groundcover	Unknown coneflower	*Rudbeckia spp.*	1
2,4	Non-native	Groundcover	Unknown honeysuckle	*Lonicera spp.*	2
2,4	Native	Groundcover	Virginia creeper	*Parthenocissus quinquefolia*	3
2,4	Native	Groundcover	Virginia stickseed	*Hackelia virginiana*	1
2,4	Native	Groundcover	White pine	*Pinus strobus*	1
2,4	Native	Groundcover	White snakeroot	*Ageratina altissima*	3
2,4	Native	Groundcover	Wild strawberry	*Fragaria spp.*	1
3	Native	Canopy/subcanopy	Black cherry	*Prunus serotina*	1
3	Native	Canopy/subcanopy	Black walnut	*Juglans nigra*	2
3	Native	Canopy/subcanopy	Box elder	*Acer negundo*	2
3	Native	Canopy/subcanopy	Bur oak	*Quercus macrocarpa*	1
3	Native	Canopy/subcanopy	Cottonwood	*Populus deltoides*	2
3	Native	Canopy/subcanopy	Eastern red cedar	*Juniperus virginiana*	2
3	Native	Canopy/subcanopy	Green ash	*Fraxinus pennsylvanica*	2
3	Native	Canopy/subcanopy	Pin oak	*Quercus palustris*	1
3	Native	Canopy/subcanopy	Quaking aspen	*Populus tremuloides*	1
3	Native	Canopy/subcanopy	Red oak	*Quercus rubra*	2
3	Native	Canopy/subcanopy	Red pine	*Pinus resinosa*	2
3	Native	Canopy/subcanopy	Red pine	*Pinus resinosa*	2
3	Non-native	Canopy/subcanopy	Scots Pine	*Pinus sylvestris*	2
3	Non-native	Canopy/subcanopy	Siberian elm	*Ulmus pumila*	2
3	Native	Canopy/subcanopy	Silver maple	*Acer saccharinum*	2
3	Native	Canopy/subcanopy	White pine	*Pinus strobus*	2
3	Native	Canopy/subcanopy	White spruce	*Picea glauca*	1

Unit #	Native Status	Type	Common Name	Scientific Name	% Cover
3	Non-native	Understory/shrub	Amur maple	*Acer ginnala*	3
3	Native	Understory/shrub	Bitternut Hickory	*Carya cordiformis*	1
3	Native	Understory/shrub	Black cherry	*Prunus serotina*	2
3	Native	Understory/shrub	Black walnut	*Juglans nigra*	2
3	Native	Understory/shrub	Bur oak	*Quercus macrocarpa*	2
3	Non-native	Understory/shrub	Common buckthorn	*Rhamnus cathartica*	3
3	Native	Understory/shrub	Green ash	*Fraxinus pennsylvanica*	2
3	Native	Understory/shrub	Pin oak	*Quercus palustris*	1
3	Native	Understory/shrub	*Prunus serotina*	Black cherry	1
3	Native	Understory/shrub	Red oak	*Quercus rubra*	1
3	Native	Understory/shrub	Red-berried elder	*Sambucus racemosa*	2
3	Native	Understory/shrub	Silver maple	*Acer saccharinum*	2
3	Native	Understory/shrub	Smooth sumac	*Rhus glabra*	1
3	Native	Understory/shrub	Unknown ash	*Fraxinus spp.*	1
3	Native	Understory/shrub	Unknown dogwood	*Cornus spp.*	2
3	Non-native	Understory/shrub	Unknown honeysuckle	*Lonicera spp.*	1
3	Native	Groundcover	American mountain ash	*Sorbus americana*	1
3	Native	Groundcover	Awl aster	*Symphyotrichum pilosum*	1
3	Native	Groundcover	Canada goldenrod	*Solidago canadensis*	2
3	Non-native	Groundcover	Common burdock	*Arctium minus*	2
3	Non-native	Groundcover	Common dandelion	*Taraxacum officinale*	1
3	Non-native	Groundcover	Common mullein	*Verbascum thapsus*	1
3	Non-native	Groundcover	Crown vetch	*Securigera varia*	1
3	Non-native	Groundcover	Foxtail	*Setaria spp.*	1
3	Non-native	Groundcover	Kentucky bluegrass	*Poa pratensis*	1
3	Native	Groundcover	New England Aster	*Symphyotrichum novae-angliae*	1
3	Native	Groundcover	Ostrich fern	*Matteuccia struthiopteris*	2
3	Native	Groundcover	*Parthenocissus quinquefolia*	Virginia creeper	1
3	Non-native	Groundcover	Red clover	*Trifolium pratense*	1
3	Native	Groundcover	Red-berried elder	*Sambucus racemosa*	1
3	Non-native	Groundcover	Reed canary grass	*Phalaris arundinacea*	2
3	Native	Groundcover	Riverbank grape	*Vitis riparia*	2
3	Native	Groundcover	Sensitive fern	*Onoclea sensibilis*	1
3	Native	Groundcover	Showy goldenrod	*Solidago speciosa*	1
3	Native	Groundcover	Silver maple	*Acer saccharinum*	1
3	Non-native	Groundcover	Spotted knapweed	*Centaurea stoebe*	2
3	Native	Groundcover	Unknown dogwood	*Cornus spp.*	1
3	Native	Groundcover	Unknown fern	*Dryopteris spp.*	1
3	Native	Groundcover	Virginia stickseed	*Hackelia virginiana*	1
3	Native	Groundcover	White snakeroot	*Ageratina altissima*	2
5	Native	Canopy/subcanopy	American elm	*Ulmus americana*	2
5	Non-native	Canopy/subcanopy	Amur maple	*Acer ginnala*	2

Unit #	Native Status	Type	Common Name	Scientific Name	% Cover
5	Native	Canopy/subcanopy	Black cherry	*Prunus serotina*	1
5	Native	Canopy/subcanopy	Box elder	*Acer negundo*	2
5	Native	Canopy/subcanopy	Bur oak	*Quercus macrocarpa*	2
5	Non-native	Canopy/subcanopy	Common buckthorn	*Rhamnus cathartica*	2
5	Native	Canopy/subcanopy	Cottonwood	*Populus deltoides*	3
5	Native	Canopy/subcanopy	Green ash	*Fraxinus pennsylvanica*	2
5	Native	Canopy/subcanopy	Northern pin oak	*Quercus ellipsoidalis*	1
5	Native	Canopy/subcanopy	Pin oak	*Quercus palustris*	1
5	Native	Canopy/subcanopy	Quaking aspen	*Populus tremuloides*	3
5	Native	Canopy/subcanopy	Red oak	*Quercus rubra*	2
5	Non-native	Canopy/subcanopy	Siberian elm	*Ulmus pumila*	2
5	Native	Canopy/subcanopy	Silver maple	*Acer saccharinum*	2
5	Native	Canopy/subcanopy	Swamp white oak	*Quercus bicolor*	2
5	Non-native	Canopy/subcanopy	White mulberry	*Morus alba*	1
5	Native	Canopy/subcanopy	White pine	*Pinus strobus*	1
5	Native	Canopy/subcanopy	White spruce	*Picea glauca*	1
5	Non-native	Understory/shrub	Amur maple	*Acer ginnala*	2
5	Native	Understory/shrub	Black walnut	*Juglans nigra*	2
5	Native	Understory/shrub	Bur oak	*Quercus macrocarpa*	2
5	Non-native	Understory/shrub	Common buckthorn	*Rhamnus cathartica*	2
5	Native	Understory/shrub	Gray dogwood	*Cornus racemosa*	2
5	Native	Understory/shrub	Green ash	*Fraxinus pennsylvanica*	2
5	Native	Understory/shrub	Norway maple	*Acer platanoides*	2
5	Native	Understory/shrub	Pin oak	*Quercus palustris*	1
5	Native	Understory/shrub	Red-berried elder	*Sambucus racemosa*	2
5	Native	Understory/shrub	Silver maple	*Acer saccharinum*	2
5	Native	Understory/shrub	Swamp white oak	*Quercus bicolor*	2
5	Native	Understory/shrub	Unknown ash	*Fraxinus spp.*	1
5	Non-native	Understory/shrub	Unknown honeysuckle	*Lonicera spp.*	2
5	Native	Groundcover	American mountain ash	*Sorbus americana*	1
5	Native	Groundcover	Awl aster	*Symphyotrichum pilosum*	1
5	Non-native	Groundcover	Black locust	*Robinia pseudoacacia*	2
5	Native	Groundcover	Black raspberry	*Rubus occidentalis*	2
5	Non-native	Groundcover	Bull thistle	*Cirsium vulgare*	1
5	Native	Groundcover	Canada goldenrod	*Solidago canadensis*	2
5	Non-native	Groundcover	Canada thistle	*Cirsium arvense*	1
5	Non-native	Groundcover	Common buckthorn	*Rhamnus cathartica*	2
5	Non-native	Groundcover	Common burdock	*Arctium minus*	2
5	Non-native	Groundcover	Common dandelion	*Taraxacum officinale*	1
5	Non-native	Groundcover	Common mullein	*Verbascum thapsus*	1
5	Native	Groundcover	Daisy fleabane	*Erigeron annuus*	2
5	Native	Groundcover	Early meadow rue	*Thalictrium dioicum*	1

Unit #	Native Status	Type	Common Name	Scientific Name	% Cover
5	Native	Groundcover	False rue anenome	*Enemion biternatum*	1
5	Native	Groundcover	False Solomon's seal	*Maianthemum racemosum*	2
5	Non-native	Groundcover	Foxtail	*Setaria spp.*	3
5	Non-native	Groundcover	Garlic mustard	*Alliaria petiolata*	3
5	Native	Groundcover	Gray dogwood	*Cornus racemosa*	1
5	Native	Groundcover	Green ash	*Fraxinus pennsylvanica*	4
5	Non-native	Groundcover	Kentucky bluegrass	*Poa pratensis*	1
5	Native	Groundcover	New England Aster	*Symphyotrichum novae-angliae*	1
5	Native	Groundcover	Poison ivy	*Toxicodendron radicans*	1
5	Native	Groundcover	Prickly ash	*Zanthoxylum americanum*	1
5	Native	Groundcover	Prickly gooseberry	*Ribes cynosbati*	2
5	Non-native	Groundcover	Red clover	*Trifolium pratense*	1
5	Native	Groundcover	Red-berried elder	*Sambucus racemosa*	2
5	Native	Groundcover	Riverbank grape	*Vitis riparia*	3
5	Native	Groundcover	Sensitive fern	*Onoclea sensibilis*	1
5	Native	Groundcover	Showy goldenrod	*Solidago speciosa*	1
5	Native	Groundcover	Silver maple	*Acer saccharinum*	1
5	Native	Groundcover	Smooth sumac	*Rhus glabra*	1
5	Non-native	Groundcover	Spotted knapweed	*Centaurea stoebe*	1
5	Native	Groundcover	Unknown bedstraw	*Galium spp.*	1
5	Native	Groundcover	Unknown fern	*Dryopteris spp.*	1
5	Native	Groundcover	Unknown sedge 1	*Carex sp. 1*	1
5	Native	Groundcover	Unknown sedge 2	*Carex sp. 2*	1
5	Native	Groundcover	Virginia creeper	*Parthenocissus quinqufolia*	3
5	Native	Groundcover	Virginia stickseed	*Hackelia virginiana*	3
5	Non-native	Groundcover	White mulberry	*Morus alba*	2
5	Native	Groundcover	White snakeroot	*Ageratina altissima*	2
5	Native	Groundcover	Wild geranium	*Geranium maculatum*	2
5	Native	Groundcover	Wild ginger	*Asarum canadense*	2
6	Native	Understory/shrub	Black walnut	*Juglans nigra*	+
6	Native	Understory/shrub	Gray dogwood	*Cornus racemosa*	2
6	Native	Groundcover	Cardinal flower	*Lobelia cardinalis*	1
6	Native	Groundcover	Common blackberry	*Rubus allegheniensis*	1
6	Native	Groundcover	Common ragweed	*Ambrosia artemisiifolia*	2
6	Non-native	Groundcover	Common Reed	*Phragmites australis*	1
6	Non-native	Groundcover	Crown vetch	*Securigera varia*	1
6	Native	Groundcover	Gray dogwood	*Cornus racemosa*	2
6	Non-native	Groundcover	Orchard grass	*Dactylis glomerata*	3
6	Native	Groundcover	Ostrich fern	*Matteuccia struthiopteris*	2
6	Native	Groundcover	Red-berried elder	*Sambucus racemosa*	1
6	Non-native	Groundcover	Reed canary grass	*Phalaris arundinacea*	5
6	Native	Groundcover	Riverbank grape	*Vitus riparia*	1

Unit #	Native Status	Type	Common Name	Scientific Name	% Cover
6	Non-native	Groundcover	Spotted knapweed	*Centaurea stoebe*	1
6	Native	Groundcover	Sulphur cinquefoil	*Potentilla recta*	1
6	Non-native	Groundcover	Tatarian honeysuckle	*Lonicera tatarica*	1
6	Native	Groundcover	Virginia creeper	*Parthenocissus quinquefolia*	1
6	Native	Groundcover	Wood sorrel	*Oxalis spp.*	1
7	Native	Canopy/subcanopy	Box elder	*Acer negundo*	2
7	Native	Canopy/subcanopy	Bur oak	*Quercus macrocarpa*	1
7	Native	Canopy/subcanopy	Green ash	*Fraxinus pennsylvanica*	2
7	Native	Canopy/subcanopy	Pin oak	*Quercus palustris*	1
7	Native	Canopy/subcanopy	Quaking aspen	*Populus tremuloides*	1
7	Non-native	Canopy/subcanopy	Siberian elm	*Ulmus pumila*	2
7	Native	Canopy/subcanopy	Silver maple	*Acer saccharinum*	2
7	Native	Canopy/subcanopy	White pine	*Pinus strobus*	1
7	Native	Canopy/subcanopy	White spruce	*Picea glauca*	1
7	Non-native	Understory/shrub	Amur maple	*Acer ginnala*	3
7	Native	Understory/shrub	Black walnut	*Juglans nigra*	2
7	Native	Understory/shrub	Bur oak	*Quercus macrocarpa*	2
7	Non-native	Understory/shrub	Common buckthorn	*Rhamnus cathartica*	1
7	Native	Understory/shrub	Gray dogwood	*Cornus racemosa*	2
7	Native	Understory/shrub	Green ash	*Fraxinus pennsylvanica*	2
7	Native	Understory/shrub	Pin oak	*Quercus palustris*	1
7	Native	Understory/shrub	Red-berried elder	*Sambucus racemosa*	2
7	Native	Understory/shrub	Silver maple	*Acer saccharinum*	2
7	Native	Understory/shrub	Smooth sumac	*Rhus glabra*	1
7	Non-native	Understory/shrub	Unknown honeysuckle	*Lonicera spp.*	1
7	Native	Groundcover	American mountain ash	*Sorbus americana*	1
7	Native	Groundcover	Awl aster	*Symphyotrichum pilosum*	1
7	Non-native	Groundcover	Burdock	*Arctium minus*	1
7	Native	Groundcover	Canada goldenrod	*Solidago canadensis*	2
7	Non-native	Groundcover	Common burdock	*Arctium minus*	2
7	Non-native	Groundcover	Common dandelion	*Taraxacum officinale*	1
7	Non-native	Groundcover	Common mullein	*Verbascum thapsus*	1
7	Non-native	Groundcover	Crown vetch	*Securigera varia*	2
7	Native	Groundcover	Golden alexanders	*Zizia aurea*	1
7	Native	Groundcover	Gray dogwood	*Cornus racemosa*	1
7	Non-native	Groundcover	Kentucky bluegrass	*Poa pratensis*	1
7	Non-native	Groundcover	Narrow leaf cattail	*Typha angustifolia*	3
7	Native	Groundcover	New England Aster	*Symphyotrichum novae-angliae*	1
7	Non-native	Groundcover	Red clover	*Trifolium pratense*	1
7	Non-native	Groundcover	Reed canary grass	*Phalaris arundinacea*	3
7	Native	Groundcover	Riverbank grape	*Vitis riparia*	2
7	Native	Groundcover	Sensitive fern	*Onoclea sensibilis*	1

Unit #	Native Status	Type	Common Name	Scientific Name	% Cover
7	Native	Groundcover	Showy goldenrod	*Solidago speciosa*	1
7	Native	Groundcover	Silver maple	*Acer saccharinum*	1
7	Non-native	Groundcover	Spotted knapweed	*Centaurea stoebe*	1
7	Native	Groundcover	Unknown fern	*Dryopteris spp.*	1
7	Native	Groundcover	White snakeroot	*Ageratina altissima*	2
8	Native	Canopy/subcanopy	American elm	*Ulmus americana*	1
8	Non-native	Canopy/subcanopy	Amur maple	*Acer ginnala*	2
8	Native	Canopy/subcanopy	Black walnut	*Juglans nigra*	1
8	Native	Canopy/subcanopy	Box elder	*Acer negundo*	2
8	Non-native	Canopy/subcanopy	Common buckthorn	*Rhamnus cathartica*	1
8	Native	Canopy/subcanopy	Eastern cottonwood	*Populus deltoides*	2
8	Native	Canopy/subcanopy	Green ash	*Fraxinus pennsylvanica*	1
8	Native	Canopy/subcanopy	Paper birch	*Betula papyrifera*	1
8	Native	Canopy/subcanopy	Quaking aspen	*Populus tremuloides*	1
8	Native	Canopy/subcanopy	Silver maple	*Acer saccharinum*	1
8	Non-native	Understory/shrub	Amur maple	*Acer ginnala*	1
8	Native	Understory/shrub	Black willow	*Salix nigra*	2
8	Non-native	Understory/shrub	Common buckthorn	*Rhamnus cathartica*	1
8	Native	Understory/shrub	Red-berried elder	*Sambucus racemosa*	2
8	Native	Understory/shrub	Sandbar willow	*Salix interior*	2
8	Non-native	Understory/shrub	Unknown honeysuckle	*Lonicera spp.*	2
8	Native	Understory/shrub	Virginia creeper	*Parthenocissus quinquefolia*	1
8	Non-native	Groundcover	Canada thistle	*Circium arvense*	1
8	Native	Groundcover	Cardinal flower	*Lobelia cardinalis*	1
8	Non-native	Groundcover	Common buckthorn	*Rhamnus cathartica*	1
8	Native	Groundcover	Giant blue hyssop	*Agastache foeniculum*	1
8	Native	Groundcover	Gray dogwood	*Cornus racemosa*	2
8	Native	Groundcover	Green ash	*Fraxinus pennsylvanica*	1
8	Native	Groundcover	Lady fern	*Athyrium felix-femina*	1
8	Non-native	Groundcover	Narrow leaf cattail	*Typha angustifolia*	5
8	Non-native	Groundcover	Red clover	*Trifolium pratense*	1
8	Non-native	Groundcover	Reed canary grass	*Phalaris arundinacea*	5
8	Native	Groundcover	Riverbank grape	*Vitis riparia*	1
8	Native	Groundcover	Unknown bedstraw	*Galium spp.*	1
8	Native	Groundcover	White snakeroot	*Ageratina altissima*	2
9	Native	Canopy/subcanopy	Black walnut	*Juglans nigra*	1
9	Native	Canopy/subcanopy	Box elder	*Acer negundo*	2
9	Native	Canopy/subcanopy	Bur oak	*Quercus macrocarpa*	1
9	Native	Canopy/subcanopy	Green ash	*Fraxinus pennsylvanica*	2
9	Native	Canopy/subcanopy	Pin oak	*Quercus palustris*	2
9	Native	Canopy/subcanopy	Quaking aspen	*Populus tremuloides*	2
9	Native	Canopy/subcanopy	Red oak	*Quercus rubra*	2

Unit #	Native Status	Type	Common Name	Scientific Name	% Cover
9	Non-native	Canopy/subcanopy	Siberian elm	*Ulmus pumila*	2
9	Native	Canopy/subcanopy	Silver maple	*Acer saccharinum*	2
9	Native	Canopy/subcanopy	White pine	*Pinus strobus*	1
9	Native	Canopy/subcanopy	White spruce	*Picea glauca*	1
9	Non-native	Understory/shrub	Amur maple	*Acer ginnala*	3
9	Native	Understory/shrub	Black walnut	*Juglans nigra*	2
9	Native	Understory/shrub	Bur oak	*Quercus macrocarpa*	2
9	Non-native	Understory/shrub	Common buckthorn	*Rhamnus cathartica*	3
9	Native	Understory/shrub	Gray dogwood	*Cornus racemosa*	2
9	Native	Understory/shrub	Green ash	*Fraxinus pennsylvanica*	2
9	Native	Understory/shrub	Pin oak	*Quercus palustris*	1
9	Native	Understory/shrub	Red oak	*Quercus rubra*	1
9	Native	Understory/shrub	Red-berried elder	*Sambucus racemosa*	2
9	Native	Understory/shrub	Silver maple	*Acer saccharinum*	2
9	Native	Understory/shrub	Smooth sumac	*Rhus glabra*	2
9	Native	Understory/shrub	Unknown ash	*Fraxinus spp.*	1
9	Non-native	Understory/shrub	Unknown honeysuckle	*Lonicera spp.*	1
9	Native	Groundcover	American mountain ash	*Sorbus americana*	1
9	Native	Groundcover	American slough grass	*Beckmannia syzigachne*	2
9	Native	Groundcover	Awl aster	*Symphyotrichum pilosum*	1
9	Native	Groundcover	Canada goldenrod	*Solidago canadensis*	2
9	Non-native	Groundcover	Common burdock	*Arctium minus*	2
9	Non-native	Groundcover	Common dandelion	*Taraxacum officinale*	1
9	Non-native	Groundcover	Common mullein	*Verbascum thapsus*	1
9	Native	Groundcover	Common yarrow	*Achillea millefolium*	1
9	Non-native	Groundcover	Foxtail species	*Setaria sp.*	2
9	Native	Groundcover	Gray dogwood	*Cornus racemosa*	1
9	Non-native	Groundcover	Kentucky bluegrass	*Poa pratensis*	2
9	Native	Groundcover	New England Aster	*Symphyotrichum novae-angliae*	1
9	Native	Groundcover	Northern bedstraw	*Galium boreale*	1
9	Non-native	Groundcover	Red clover	*Trifolium pratense*	1
9	Non-native	Groundcover	Reed canary grass	Phalaris arundinacea	1
9	Native	Groundcover	Riverbank grape	*Vitis riparia*	2
9	Native	Groundcover	Round-headed bush clover	*Lespedeza capitata*	1
9	Native	Groundcover	Sensitive fern	*Onoclea sensibilis*	1
9	Native	Groundcover	Showy goldenrod	*Solidago speciosa*	1
9	Native	Groundcover	Silver maple	*Acer saccharinum*	1
9	Non-native	Groundcover	Spotted knapweed	*Centaurea stoebe*	2
9	Native	Groundcover	Unknown fern	*Dryopteris spp.*	1
9	Native	Groundcover	White snakeroot	*Ageratina altissima*	2
10	Non-native	Understory/shrub	Amur maple	*Acer ginnala*	1
10	Native	Understory/shrub	Bitternut Hickory	*Carya cordiformis*	2

Unit #	Native Status	Type	Common Name	Scientific Name	% Cover
10	Non-native	Understory/shrub	Black locust	*Robinia pseudoacacia*	1
10	Native	Understory/shrub	Black walnut	*Juglans nigra*	+
10	Native	Understory/shrub	Common blackberry	*Rubus allegheniensis*	1
10	Native	Understory/shrub	Gray dogwood	*Cornus racemosa*	1
10	Native	Understory/shrub	Green ash	*Fraxinus pennsylvanica*	1
10	Native	Understory/shrub	Prickly ash	*Zanthoxylum americanum*	1
10	Native	Understory/shrub	Quaking aspen	*Populus tremuloides*	1
10	Native	Understory/shrub	Red-berried elder	*Sambucus racemosa*	1
10	Non-native	Understory/shrub	Siberian elm	*Ulmus pumila*	1
10	Non-native	Understory/shrub	Siberian peashrub	*Caragana arborescens*	2
10	Native	Understory/shrub	Smooth sumac	*Rhus glabra*	1
10	Native	Understory/shrub	Swamp white oak	*Quercus bicolor*	1
10	Non-native	Understory/shrub	Unknown honeysuckle	*Lonicera spp.*	+
10	Native	Understory/shrub	Virginia creeper	*Parthenocissus quinquefolia*	1
10	Native	Groundcover	American sloughgrass	*Beckmannia syzigachne*	+
10	Native	Groundcover	Bee balm	*Monarda fistulosa*	1
10	Non-native	Groundcover	Birdsfoot trefoil	*Lotus corniculatus*	2
10	Non-native	Groundcover	Bittersweet	*Celastrus orbiculatus*	1
10	Native	Groundcover	Bittersweet nightshade	*Solanum dulcamara*	1
10	Native	Groundcover	Black raspberry	*Rubus occidentalis*	1
10	Non-native	Groundcover	Butter and eggs	*Linaria vulgaris*	1
10	Native	Groundcover	Calico aster	*Symphyotrichum lateriflorum*	2
10	Native	Groundcover	Canada goldenrod	*Solidago canadensis*	2
10	Non-native	Groundcover	Catmint	*Nepeta cataria*	2
10	Non-native	Groundcover	Chickweed	*Stellaria media*	1
10	Non-native	Groundcover	Common mullein	*Verbascum thapsus*	1
10	Native	Groundcover	Common ragweed	*Ambrosia artemisiifolia*	2
10	Native	Groundcover	Common yarrow	*Achillea millefolium*	2
10	Non-native	Groundcover	Crown vetch	*Securigera varia*	2
10	Native	Groundcover	Downy yellow violet	*Viola pubescens*	2
10	Non-native	Groundcover	Foxtail	*Setaria spp.*	3
10	Native	Groundcover	Giant goldenrod	*Solidago gigantea*	1
10	Native	Groundcover	Golden alexanders	*Zizia aurea*	+
10	Native	Groundcover	Gray dogwood	*Cornus racemosa*	2
10	Native	Groundcover	Heath aster	*Symphyotrichum ericoides*	1
10	Native	Groundcover	Indian grass	*Sorghastrum nutans*	1
10	Non-native	Groundcover	Kentucky bluegrass	*Poa pratensis*	3
10	Native	Groundcover	Lance leaf coreopsis	*Coreopsis lanceolata*	+
10	Native	Groundcover	Leadplant	*Amorpha canescens*	+
10	Non-native	Groundcover	Leafy spurge	*Euphorbia virgata*	1
10	Native	Groundcover	New England Aster	*Symphyotrichum novae-angliae*	1
10	Native	Groundcover	Northern bedstraw	*Galium boreale*	1

Unit #	Native Status	Type	Common Name	Scientific Name	% Cover
10	Native	Groundcover	Panicled aster	*Symphyotrichum lanceolatum*	1
10	Native	Groundcover	Prairie clover species	*Dalea spp.*	+
10	Non-native	Groundcover	Red-seeded dandelion	*Taraxacum erythrospermum*	3
10	Native	Groundcover	Round headed bush clover	*Lespedeza capitata*	+
10	Native	Groundcover	Showy goldenrod	*Solidago speciosa*	1
10	Non-native	Groundcover	Siberian elm	*Ulmus pumila*	2
10	Non-native	Groundcover	Smooth brome	*Bromus inermis*	3
10	Non-native	Groundcover	Spotted knapweed	*Centaurea stoebe*	2
10	Native	Groundcover	Stiff goldenrod	*Solidago rigida*	1
10	Native	Groundcover	Stinging nettle	*Urtica dioica*	1
10	Native	Groundcover	Summer grape	*Vitis aestivalis*	1
10	Non-native	Groundcover	Timothy	*Phleum pratense*	3
10	Non-native	Groundcover	White mulberry	*Morus alba*	1
10	Native	Groundcover	White vervain	*Verbena urticifolia*	1
10	Native	Groundcover	White wild indigo	*Baptisia alba*	1
10	Native	Groundcover	Wood sorrel	*Oxalis spp.*	2
10	Native	Groundcover	Woodbine	*Parthenocissus inserta*	1
11	Non-native	Canopy/subcanopy	Amur maple	*Acer ginnala*	2
11	Native	Canopy/subcanopy	Black walnut	*Juglans nigra*	1
11	Non-native	Canopy/subcanopy	Blue spruce	*Picea pungens*	2
11	Native	Canopy/subcanopy	Red pine	*Pinus resinosa*	2
11	Native	Canopy/subcanopy	White pine	*Pinus strobus*	2
11	Native	Understory/shrub	Gray dogwood	*Cornus racemosa*	3
11	Native	Understory/shrub	Smooth sumac	*Rhus glabra*	1
11	Native	Groundcover	Canada goldenrod	*Solidago canadensis*	2
11	Non-native	Groundcover	Kentucky bluegrass	*Poa pratense*	4
11	Non-native	Groundcover	Reed canary grass	*Phalaris arundinacea*	2
11	Native	Groundcover	Riverbank grape	*Vitis riparia*	1
11	Native	Groundcover	Virginia creeper	*Parthenocissus quinquefolia*	1
12	Native	Canopy/subcanopy	Black cherry	*Prunus serotina*	1
12	Native	Canopy/subcanopy	Black walnut	*Juglans nigra*	2
12	Native	Canopy/subcanopy	Bur oak	*Quercus macrocarpa*	3
12	Native	Canopy/subcanopy	Eastern cottonwood	*Populus deltoides*	2
12	Native	Canopy/subcanopy	Green ash	*Fraxinus pennsylvanica*	2
12	Native	Canopy/subcanopy	Quaking aspen	*Populus tremuloides*	2
12	Native	Canopy/subcanopy	Red oak	*Quercus rubra*	1
12	Native	Canopy/subcanopy	White oak	*Quercus alba*	3
12	Non-native	Understory/shrub	Amur maple	*Acer ginnala*	2
12	Native	Understory/shrub	Bitternut Hickory	*Carya cordiformis*	2
12	Native	Understory/shrub	Black cherry	*Prunus serotina*	1
12	Non-native	Understory/shrub	Black locust	*Robinia pseudoacacia*	1
12	Non-native	Understory/shrub	Common buckthorn	*Rhamnus cathartica*	2

Unit #	Native Status	Type	Common Name	Scientific Name	% Cover
12	Native	Understory/shrub	Gray dogwood	*Cornus racemosa*	1
12	Native	Understory/shrub	Green ash	*Fraxinus pennsylvanica*	2
12	Native	Understory/shrub	Ironwood	*Ostrya virginiana*	2
12	Native	Understory/shrub	Missouri gooseberry	*Ribes missouriensis*	2
12	Native	Understory/shrub	Rock elm	*Ulmus thomasii*	1
12	Native	Understory/shrub	Smooth sumac	*Rhus glabra*	2
12	Non-native	Understory/shrub	Tatarian honeysuckle	*Lonicera tatarica*	1
12	Native	Understory/shrub	Virginia creeper	*Parthenocissus quinquefolia*	3
12	Native	Groundcover	American basswood	*Tilia americana*	1
12	Native	Groundcover	Black cherry	*Prunus serotina*	1
12	Non-native	Groundcover	Catnip	*Nepeta cataria*	2
12	Non-native	Groundcover	Common dandelion	*Taraxacum officinale*	2
12	Non-native	Groundcover	Crabapple	*Malus spp.*	1
12	Non-native	Groundcover	Foxtail	*Setaria spp.*	1
12	Non-native	Groundcover	Kentucky bluegrass	*Poa pratensis*	1
12	Native	Groundcover	Poison ivy	*Toxicodendron radicans*	1
12	Non-native	Groundcover	Red clover	*Trifolium pratense*	2
12	Native	Groundcover	Red-berried elder	*Sambucus racemosa*	1
12	Native	Groundcover	Rock elm	*Ulmus thomasii*	2
12	Native	Groundcover	Sensitive fern	*Onoclea sensibilis*	1
12	Native	Groundcover	Sideoats grama	*Bouteloua curtipendula*	1
12	Native	Groundcover	Smooth sumac	*Rhus glabra*	2
12	Non-native	Groundcover	Spotted knapweed	*Centaurea stoebe*	1
12	Non-native	Groundcover	Unknown clover	*Trifolium spp.*	1
12	Native	Groundcover	Virginia creeper	*Parthenocissus quinquefolia*	1
12	Non-native	Groundcover	White mulberry	*Morus alba*	4
12	Non-native	Groundcover	White sweet clover	*Melilotus alba*	1
12	Native	Groundcover	Wood sorrel	*Oxalis spp.*	2

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)

Forests

Southern-Mesic Oak-Basswood Forest (MHs38)			
Forbs			
Scientific Name	**Common Name**	**Scientific Name**	**Common Name**
Actaea rubra	Red Baneberry	*Allium tricoccum*	Wild leek
Amphicarpaea bracteata	Hog-peanut	*Anemone quinquefolia*	Wood anemone
Anemone acutilobe	Sharp-lobed hepatica	*Anemone americana*	Round-leaved hepatica
Aplectrum hyemale	Putty-root	*Apocynum androsaemfolium*	Spreading dogbane
Aquilegia canadensis	Columbine	*Aralia nudicaulis*	Wild sarsaparilla
Aralia racemosa	American spikenard	*Arisaema triphyllum*	Jack-in the-pulpit
Asarum canadense	Wild Ginger	*Asclepias exaltata*	Poke Milkweed
Aster cordifolius	Heart-leaved Aster	*Aster macrophylius*	Large-leaved aster
Aster lateriflorus	Side-flowering Aster	*Aster sagittifolus*	Tall-leaved aster
Campanula americana	Tall bellflower	*Campanula rotundifolia*	Harebell
Cardamine concatenata	Cut-leaved toothwort	*Caulophyllum thalictroides*	Blue Cohosh
Cryptotaenia canadensis	Honewort	*Desmodium glutinosum*	pointed-leaved tick-trefoil
Dicentra cucullania	Dutchman's Breeches	*Dioscorea vilosa*	Wild Yam
Eupatorium rugosum	Common Snakeroot	*Fragaria virginiari*	Common Strawberry
Galium boreale	Northern bedstraw	*Geranium maculatum*	Wild Geranium
Helianthus pauciflorus	Stiff sunflower	*Lilium michiganense*	Michigan lily
Maianthemum canadense	Canada mayflower	*Orchis spectabilis*	Showy orchis
Osmorhiza claytonii	Clayton's sweet cicely	*Pedicularis canadnesis*	Wood betony
Phlox divancata	Blue Phlox	*Phryma leptostachya*	lopseed
Polygonatum biflorum	Giant Solomon's Seal	*Pyrola elliptica*	Common pyrola

Rudbeckia lacinata	Goldenglow	*Sanguinaria canadensis*	Bloodroot
Smilacina racemosa	False Solomon's seal	*Solidago flexicaulis*	Zig-zag goldenrod
Strophostyles helvola	Wild bean	*Thalictrum dioicum*	Early Meadow-rue
Thalictrum thalictroides	Rue-anemone	*Trillium cernuum*	Nodding trillium
Trillium grandiflorum	Large-flowered trillium	*Uvularia grandifloria*	Large-flowered bellwort
Uvularia sessilifolia	Pale bellwort	*Uvularia virginicum*	Culver's root
Grasses and Sedges			
Scientific Name	**Common Name**	**Scientific Name**	**Common Name**
Carex pedunculata	Long-stalked sedge	*Carex pensylvanica*	Pennsylvania sedge
Carex blanda	Charming Sedge	*Carex gracilima*	Graceful sedge
Carex deweyana	Dewey's Sedge	*Carex sprengelli*	Sprengel's Sedge
Carex radiata	Stellate Sedge	*Carex rosea*	Rolled-up sedge
Elymus hystrix	Bottlebrush grass	*Elymus virginicus*	Virginia Wild Rye
Festuca subverticullata	Nodding fescue	*Leersia virginica*	White grass
Cryzopsis racemosa	Black-fruited rice-grass	*Cryzopsis asperfolia*	Mountain rice-grass
Schizachne purpurascens	False Melic grass		
Ferns			
Scientific Name	**Common Name**	**Scientific Name**	**Common Name**
Athyrium filix-femina	Lady fern	*Adiantum pedatum*	Maidenhair fern
Cismunda claytonia	Interrupted Fern		
Vines			
Scientific Name	**Common Name**	**Scientific Name**	**Common Name**
Celastrus scadens	Climbing bittersweet	*Lonicera prolifera*	Grape honeysckle
Shrubs			
Scientific Name	**Common Name**	**Scientific Name**	**Common Name**
Amelanchier cmx.	Juneberry	*Cornus alternifolia*	Pagoda dogwood
Cornus racemosa	Gray dogwood	*Corylus cornuta*	Beaked Hazelnut
Corylus americana	American Hazelnut	*Diervilla lonicera*	Bush honeysuckle
Lonicera dioica	Wild honeysuckle	*Prunus virginiana*	Chokecherry
Sambucus canadensis	Common Elder	*Sambucus racemosa*	Red-berried elder

Staphylea trifolia	Bladdernut	*Symphoricarpos cmx*	Snowberry
Vibernum rafinesquianum	Downy arrow-wood	*Vibernum lentago*	Nannyberry
Vibernum opolus	High-bush cranberry	*Zanthoxylum americanum*	Prickly Ash
Trees			
Scientific Name	**Common Name**	**Scientific Name**	**Common Name**
Acer saccharum	Sugar Maple	*Betula papyrifera*	Paper birch
Carpimus caroiniaria	Blue Beech	*Carya cordiformes*	Bitternut hickory
Celtis occidentalis	Hackberry	*Ostrya virginiana*	Ironwood
Populus tremuloides	Quaking Aspen	*Populus grandidentata*	Big-tooth Aspen
Prunus serotina	Black cherry	*Quercus rubra*	Northern red oak
Quercus alba	White oak	*Quercus macrocarpa*	Bur oak
Tillia Americana	American Basswood		

Southern Dry-Mesic Pine-Oak Woodland (FDs27)			
Forbs			
Scientific Name	**Common Name**	**Scientific Name**	**Common Name**
Amphicarpaea bracteata	Hog-peanut	*Circaea lutetiana*	Enchanter's nightshade
Antenaria spp.	Pussytoes	*Desmodium glutinosum*	Pointed-leaved tick-trefoil
Anemone americana	Round-lobed hepatica	*Eupatorium rugosum*	White snakeroot
Aquilegia canadensis	Columbine	*Euphoriba corollate*	Flowering spurge
Aralia nudicaulis	Wild sarsaparilla	*Fragaria virginiana*	Wild strawberry
Aster cordifolius	Heart-leaved aster	*Galium boreale*	Northern bedstraw
Athyrium filix-femina	Lady fern	*Galium triflorum*	Three-flowered bedstraw
Campanula rotundifolia	Harebell	*Geranium maculatum*	Wild geranium
Carex pennsylvanica	Pennsylvania sedge	*Geum canadense*	White avens
Shrubs			
Scientific Name	**Common Name**	**Scientific Name**	**Common Name**
Cornus alternifolia	Pagoda dogwood	*Prunus virginiana*	Chokecherry
Cornus racemose	Gray dogwood	*Prunus pennsylvanica*	Pincherry

Corylus americana	American hazelnut		
Canopy Trees			
Scientific Name	**Common Name**	**Scientific Name**	**Common Name**
Betula papyrifera	Paper birch	*Prunus serotina*	Black cherry
Carya cordiformes	Bitternut hickory	*Quercus alba*	White oak
Celtis occidentalis	Hackberry	*Quercus macrocarpa*	Bur oak
Ostrya virginiana	Ironwood	*Quercus rubra*	Northern red oak

Savanna

Southern Mesic Savanna (Ups24)			
Forbs			
Scientific Name	**Common Name**	**Scientific Name**	**Common Name**
Allium stellatum	Prairie wild onion	*Helianthus pauciflorus*	Stiff sunflower
Allium canadense	Wild garlic	*Heliopsis helianthoides*	Ox-eye
Anemone clyndrica	Long-headed thimbleweed	*Heuchera richardsonii*	Alumroot
Anemone virginiana	Virginia thimbleweed	*Lespedeza capitata*	Round-headed bush-clover
Anemone canadensis	Canada enemone	*Liatris aspera*	Rough blazingstar
Antennaria spp.	Pussytoes	*Liatris ligulistylis*	Northern plains. Blazing star
Apocynum androsaemilolium	Spreading dogbane	*Liatris pycnostachya*	Gayfeather
Artemisia frigida	Prairie sagewort	*Lilium philadelphicum*	Wood lily
Asclepias tuberosa	Butterfly weed	*Lobelia spicata*	Rough-spiked lobelia
Asclepias syriaca	Common milkweed	*Mirabilis hirsute*	Hairy four-o'clock
Aster oolentangiensis	Sky-blue aster	*Monarda fistulosa*	Wild bergamot
Aster ericoides	Heath aster	*Oenothera biennis*	Common evening-primrose
Aster lanceolatus	Panicled aster	*Pedicularis canadensis*	Wood betony
Aster novae-angilae	New England aster	*Phlox Pilosa*	Prairie phlox
Aster laevis	Smooth aster	*Physalis heterophylla*	Clammy ground-cherry

Astragalus canadensis	Canada milk-vetch	*Polygala polygama*	Racemed milkwort
Campanula rotundifolia	Harebell	*Potentilla arguta*	Tall cinquefoil
Chrysopsis villosa	Prairie golden aster	*Pycanthemum virginianum*	Virginia mountain-mint
Comandra umbellate	Bastard toad-flax	*Ratibida pinnata*	Gray-headed coneflower
Coreopsis palmata	Stiff tickseed	*Rudbeckia hirta*	Black eyed susan
Dalea purpurea	Purple prairie clover	*Solidago nemoralis*	Gray goldenrod
Dalea candida	White prairie lcover	*Solidago ptamicoides*	Upland white aster
Desmodium canadense	Canada ticktrefoil	*Solidago speciosa*	Showy goldenrod
Euphoriba corollate	Flowering spurge	*Thalictrum dasycarpum*	Tall meadow-rue
Euthamia graminifolia	Grass-leaved goldenrod	*Tradescantia bracteate*	Bracted spiderwort
Fragaria virginiana	Common strawberry	*Veronicastrum virginicum*	Culver's root
Galium boreale	Northern bedstraw	*Viola americana*	Americanvetch
Gentiana andrewsii	Bottle gentian	*Viola pedatifida*	Prairie bird-foot violet
Geum trifolrum	Prairie smoke	*Zizia aurea*	Golden Alexanders
Helenium autumnale	Sneezeweed		
Grasses and Sedges			
Scientific Name	**Common Name**	**Scientific Name**	**Common Name**
Andropogon gerardii	Big bluestem	*Eragrostis spectabilis*	Purple lovegrass
Bromus kalmia	Kalm's brome	*Panicum oligosantheses*	Few-flowered panic grass
Carex bicknellii	Bicknell's sedge	*Panicum virgatum*	Switchgrass
Carex muhlenbergii	Muhlenberg's sedge	*Schizachyrium scoparium*	Little bluestem
Carex meadii	Mead's sedge	*Sorghastrum nutans*	Indian grass
Carex tenera	Marsh-straw sedge	*Sporobolus heterolepis*	Prairie dropseed
Elymus canadensis	Canada wild rye	*Stipa spartea*	Porcupine-grass
Elymus trachycaulus	Slender wheatgrass		
Shrubs			
Scientific Name	**Common Name**	**Scientific Name**	**Common Name**
Amorpha canescens	Leadplant	*Rosa arkansana*	Prairie rose
Amorpha nana	Fragrant false indigo	*Rosa cmx.*	Smooth wild rose

Canopy Trees			
Scientific Name	**Common Name**	**Scientific Name**	**Common Name**
Quercus alba	White oak	*Quercus macrocarpa*	Bur oak

Prairie

Southern Dry Prairie (UPs13)			
Forbs			
Scientific Name	**Common Name**	**Scientific Name**	**Common Name**
Anemone cylindrica	Long-headed thimbleweed	*Liatris punctata*	Dotted blazing star
Antennaria spp.	Pussytoes	*Liatris cylindracea*	Cylindric blazing star
Aquilegia canadensis	Columbine	*Linum sulcatum*	Grooved yellow flax
Asclepias verticillata	Whorled milkweed	*Lobelia spicata*	Rough-spiked Lobelia
Asclepias tuberosa	Butterfly-weed	*Lysimachia ciliate*	Fringed loosestrife
Asclepias viridiflora	Green milkweed	*Mirabilis hirsute*	Hairy four-o'clock
Asclepias syriaca	Common milkweed	*Monad fistulas*	Wild bergamot
Aster sericeus	Silky aster	*Another biennia*	Common evening-primrose
Aster Oolentan-giensis	Sky-blue aster	*Oenothera clelandii*	Cleland's evening-primrose
Aster ericoides	Heath aster	*Oxalis violacea*	Violet wood-sorrel
Aster laevis	Smooth aster	*Pediomelum esculentum*	Prairie-turnip
Astragalus Crassi-carpus	Buffalo-bean	*Pediomelum argophyllum*	Silvery scurf-pea
Calylophus serrulata	Toothed evening primrose	*Penstemon grandiflorus*	Large-flowered beard-tongue
Campanula rotundifolia	Harebell	*Physalis virginiana*	Ground-cherry
Coreopsis palmata	Stiff tickseed	*Potentilla arguta*	Tall cinquefoil
Dalea purpurea	Purple prairie-clover	*Pycnanthemum virginianum*	Virginia mountain-mint
Dalea candida	White prairie-clover	*Scutellaria leonardi*	Leonard's skullcap
Delphinium carolini-anum	Prairie larkspur	*Senecio plattensis*	Prairie ragwort
Desmodium illinoense	Illinois tick-trefoil	*Silene antirrhina*	Sleepy catchfly

Euphorbia corollata	Flowering spurge	*Sisyrinchium campestre*	Field blue-eyed grass
Gnaphalium Obtuse-folium	Sweet everlasting	*Solidago nemoralis*	Gray goldenrod
Helianthemum bicknellii	Hoary frostweed	*Solidago rigida*	Stiff goldenrod
Helianthus pauciflorus	Stiff sunflower	*Solidago speciosa*	Showy goldenrod
Heuchera richardsonii	Alum-root	*Tradescantia occidentalis*	Western spiderwort
Hypericum perforatum	Common St. John's-wort	*Viola pedatifida*	Prairie bird-foot violet
Kuhnia eupato-roides	False boneset	*Viola pedata*	Bird-foot violet
Lespedeza capitata	Round-headed bush-clover	*Zizia aptera*	Heart-leaved alexanders
Liatris aspera	Rough blazing star	*Liatris cylindracea*	Cylindric blazing star
Grasses and Sedges			
Scientific Name	**Common Name**	**Scientific Name**	**Common Name**
Andropogon gerardii	Big bluestem	*Panicum oligosanthes*	Few-flowered panic grass
Bouteloua curtipendula	Side-oats grama	*Panicum wilcoxianum*	Wilcox's panic grass
Bouteloua hirsuta	Hairy grama	*Panicum perlongum*	Long-leaved panic grass
Calamovilfa longifolia	Sand reed-grass	*Panicum linearifolium*	Linnear-leaved panic grass
Carex pensylvanica	Sunshine sedge	*Panicum leibergii*	Leiberg's panic grass
Cyperus schweinitzii	Schweinitz' cyperus	*Schizachyrium scoparium*	Little bluestem
Cyperus lupulinus	Hop-like cyperus	*Sorghastrum nutans*	Indian grass
Elymus wiegandii	Canada wild rye	*Sporobolus heterolepis*	Prairie dropseed
Eragrostis spectabilis	Purple lovegrass	*Sporobolus asper*	Rough dropseed
Muhlenbergia cuspidata	Plains muhly	*Stipa spartea*	Porcupine-grass
Shrubs			
Scientific Name	**Common Name**	**Scientific Name**	**Common Name**
Rosa cmx	Smooth wild rose	*Amorpha canescens*	Lead-plant

Southern Wet Prairie (WPs54)			
Forbs			
Scientific Name	**Common Name**	**Scientific Name**	**Common Name**

Anemone canadensis	Canada anemone	*Helianthus nuttallii*	Nuttall's sunflower
Apocynum sibiricum	Clasping dogbane	*Lathyrus palustris*	Marsh vetchling
Asclepias incarnata	Swamp milkweed	*Lathyrus venosus*	Veiny pea
Aster ericoides	Heath aster	*Liatris pycnostachya*	Gayfeather
Aster lanceolatus	Panicled aster	*Lobelia siphilitica*	Great lobelia
Aster novae-angilae	New England aster	*Lobelia spicata*	Rough-spiked lobelia
Aster oolentangiensis	Sky blue aster	*Lycopus americanus*	Cut-leaved bugleweed
Aster umbellatus	Flat-topped aster	*Lycopus asper*	Rough bugleweed
Dalea purpurea	Purple prairie clover	*Pedicularis lanceolata*	Swamp lousewort
Desmodium canadense	Canada tick trefoil	*Phlox Pilosa*	Prairie phlox
Euthamia graminifolia	Grass-leaved goldenrod	*Pycanthemum virginianum*	Virginia mountain-mint
Equisetum arvense	Field horsetail	*Ratibida pinnata*	Gray-headed coneflower
Equesitum laevigatum	Smooth scouring rush	*Silphium perfoliatum*	Cup plant
Fragaria virginiana	Common strawberry	*Solidago riddellii*	Riddell's goldenrod
Galium boreale	Northern bedstraw	*Solidago rigida*	Stiff goldenrod
Gentiana andrewsii	Bottle gentian	*Thalictrum dasycarpum*	Tall meadow-rue
Helenium autumnale	Sneezeweed	*Veronicastrum virginicum*	Culver's root
Helianthus giganteus	Giant sunflower	*Viola nephrophylla*	Northern bog wiolet
Helianthus grosseserratus	Sawtooth sunflower	*Zizia aptera*	Heart-leaved alexanders
Helianthus maximiliani	Maximilian's sunflower	*Zizia aurea*	Golden Alexanders
Grasses and Sedges			
Scientific Name	**Common Name**	**Scientific Name**	**Common Name**
Andropogon gerardii	Big bluestem	*Juncus arcticus*	Baltic rush
Calamagrostis canadensis	Bluejoint	*Muhlenbergia richardsonis*	Mat muhly grass
Carex pellita	Wooly sedge	*Panicum virgatum*	Switchgrass
Carex tetanica	Rigid sedge	*Sorghastrum nutans*	Indian grass
Carex stricta	Tussock sedge	*Spartina pectinate*	Prairie cordgrass
Eleocharis compressa	Flattened spikerush	*Sporobolus heterolepis*	Prairie dropseed
Glyceria striata	Fowl manna grass		

Shrubs			
Scientific Name	**Common Name**	**Scientific Name**	**Common Name**
Cornus sericea	Red-osier dogwood	*Salix discolor*	Pussy willow
Rosa arkansana	Prairie rose		

Wetland

Northern wet meadow / Carr (MWn82)			
Forbs			
Scientific Name	**Common Name**	**Scientific Name**	**Common Name**
Asclepias incarnata	Swamp milkweed	*Lycopus uniflorus*	Northern bugleweed
Aster borealis	Bog aster	*Lysimachia thyrsiflora*	Tufted loosestrife
Aster lanceolatus	Eastern panicled aster	*Mentha arvensis*	Common mint
Aster puniceus	Red-stemmed aster	*Onoclea sensibilis*	Sensitive fern
Aster umbellatus	Flat-topped aster	*Pedicularis lanceolata*	Swamp lousewort
Caltha palustris	Common marsh marigold	*Pilea spp.*	Clearweed
Campanula aparinoides	Marsh bellflower	*Polygonum amphibium*	Water smartweed
Chelone glabra	White turtlehead	*Pycnanthemum virginianum*	Virginia mountain mint
Cicuta bulbifera	Bulb-bearing water hemlock	*Rubus pubescens*	Dwarf raspberry
Cicuta maculata	Spotted water hemlock	*Rumex orbiculatus*	Great water dock
Cirsium muticum	Swamp thistle	*Scutellaria galericulata*	Marsh skullcap
Epilobium sp.	Linear-leaved, Marsh, or Downy willow-herb*	*Smilacina stellata*	Starry false Solomon's seal
Epilobium sp.	American, Purple-leaved, or Northern willow-herb	*Solidago canadensis*	Canada goldenrod
Eupatorium maculatum	Spotted Joe pye weed	*Solidago gigantea*	Giant goldenrod
Eupatorium perfoliatum	Common boneset	*Stachys palustris*	Woundwort
Galium labradoricum	Labrador bedstraw	*Thalictrum dasycarpum*	Tall meadow-rue
Helianthus giganteus, H. grosseserratus, or H. nuttallii	Sunflower	*Thelypteris palustris*	Northern marsh fern
Impatiens spp.	Touch-me-not	*Typha latifolia*	Broad-leaved cattail
Lathyrus palustris	Marsh vetchling	*Verbena hastata*	Blue vervain

Lycopus americanus	Cut-leaved bugleweed	*Viola nephrophylla*	Northern bog violet
Lycopus asper	Rough bugleweed		
Grasses/Rushes/Sedges			
Scientific Name	**Common Name**	**Scientific Name**	**Common Name**
Agrostis stolonifera	Redtop	*Carex sartwellii*	Sartwell's sedge
Bromus ciliatus	Fringed brome	*Carex stipata*	Awl-fruited sedge
Calamagrostis canadensis	Bluejoint	*Carex stricta*	Tussock sedge
Calamagrostis stricta	Narrow reedgrass	*Eleocharis palustris*	Red-stalked spikerush
Carex aquatilis	Aquatic sedge	*Glyceria striata*	Fowl manna grass
Carex hystericina	Porcupine sedge	*Muhlenbergia glomerata*	Clustered muhly grass
Carex interior	Interior sedge	*Poa palustris*	Fowl bluegrass
Carex lacustris	Lake sedge	*Scirpus atrovirens or S. pallidus*	Dark green or Pale bulrush
Carex pellita	Woolly sedge	*Spartina pectinata*	Prairie cordgrass
Carex prairea	Prairie sedge		
Shrubs			
Scientific Name	**Common Name**	**Scientific Name**	**Common Name**
Cornus sericea	Red-osier dogwood	*Salix candida*	Sage-leaved willow
Salix discolor	Pussy willow	*Betula pumila*	Bog birch
Salix petiolaris	Slender willow	*Salix eriocephala*	Heart-leaved willow
Salix bebbiana	Bebb's willow		

UNIT 8: Northern Mixed Cattail Marsh (MRn83)			
Forbs			
Scientific Name	**Common Name**	**Scientific Name**	**Common Name**
Acorus calamus	Sweet flag	*Lycopus americanus*	Cut-leaved bugleweed
Alisma triviale	Common water plantain	*Lycopus uniflorus*	Northern bugleweed
Asclepias incarnata	Swamp milkweed	*Pilea spp.*	Clearweed
Bidens spp.	Bur marigold and Beggarticks	*Polygonum lapathifolium*	Nodding smartweed
Campanula aparinoides	Marsh bellflower	*Polygonum persicaria*	Lady's thumb

Cicuta bulbifera	Bulb-bearing water hemlock	*Polygonum punctatum*	Dotted smartweed
Cicuta maculata	Spotted water hemlock	*Potentilla palustris*	Marsh cinquefoil
Equisetum palustre	Marsh horsetail	*Rumex orbiculatus*	Great water dock
Eupatorium maculatum	Spotted Joe pye weed	*Scutellaria galericulata*	Marsh skullcap
Galium trificum	Three-cleft bedstraw	*Thelypteris palustris*	Northern marsh fern
Impatiens spp.	Touch-me-not	*Typha latifolia*	Broad-leaved cattail
Mentha arvensis	Common mint	*Urtica dioica*	Stinging nettle
Grasses and Sedges			
Scientific Name	**Common Name**	**Scientific Name**	**Common Name**
Calamagrostis canadensis	Bluejoint	*Carex utriculate*	Beaked sedge
Carex aquatilis	Aquatic sedge	*Cyperus odoratus*	Fragrant cyperus
Carex comosa	Bristly sedge	*Eleocharis ovata*	Ovoid spikerush
Carex diandra	Lesser-panicled sedge	*Eleocharis palustris*	Red-stalked spikerush
Carex hystericina	Porcupine sedge	*Glyceria grandis*	Tall manna grass
Carex lacustris	Lake sedge	*Leersia oryzoides*	Rice cut grass
Carex lasiocarpa	Fen wiregrass sedge	*Scirpus cyperinus*	Woolgrass
Carex pseudocyperus	Cyperus sedge	*Scirpus fluviatilis*	River bulrush
Carex stricta	Tussock sedge	*Scirpus validus*	Soft stem bulrush
Shrubs			
Scientific Name	**Common Name**	**Scientific Name**	**Common Name**
Cornus sericea	Red osier dogwood		