9 Mile Creek Watershed District 2016
Discovery Point Ecological Master Plan

DRAFT
8/9/2016

9 Mile Creek Watershed District Discovery Point Ecological Master Plan

Project conducted by the 9 Mile Creek Watershed District

This report prepared by Barr Engineering Co.

Table Of Contents

Introduction	2
Site History & Existing Conditions	3
Approach	4
Restoration Strategy	5
Phasing Plans	6
Plant Communities	7
Ultimate Plant Communities	8
Plant Community Management	9
Evaluating Progress	10
Expanding the Vision	11

Introduction

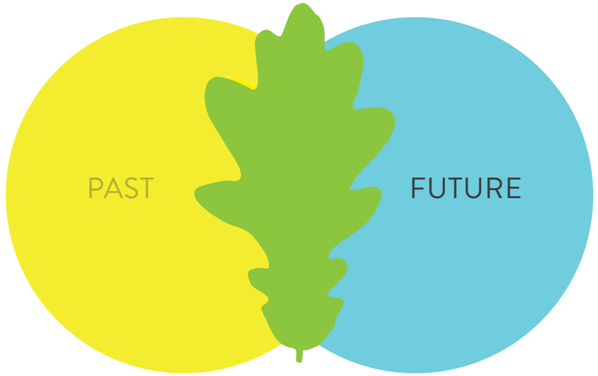
This plan describes our process for regenerating native plant community at Discovery Point. Nine Mile Creek Watershed District sees native plant community regeneration as an important endeavor because of the prevalence of invasive plant species in woodlands throughout the District. Invasive plants negatively impact native groundcover often leaving soils exposed to the erosive force of water and wind which can result in water quality degradation as soil erodes into natural water bodies.

Vision:
To regenerate urban habitat in the face of aggressive invasive plant species to demonstrate for property owners within the District how to stabilize soils and increase plant diversity in urban settings.

Goals of the Discovery Point Landscape:

- To demonstrate the process of invasive species control and native plant establishment
- To be a teaching site for the regeneration of upland native plant communities within the District
- To demonstrate native landscape management process and techniques and expenses

Plant Community Regeneration is a process to establishing a native plant community by emphasizing relationships between ecological systems and the human influences on these systems.

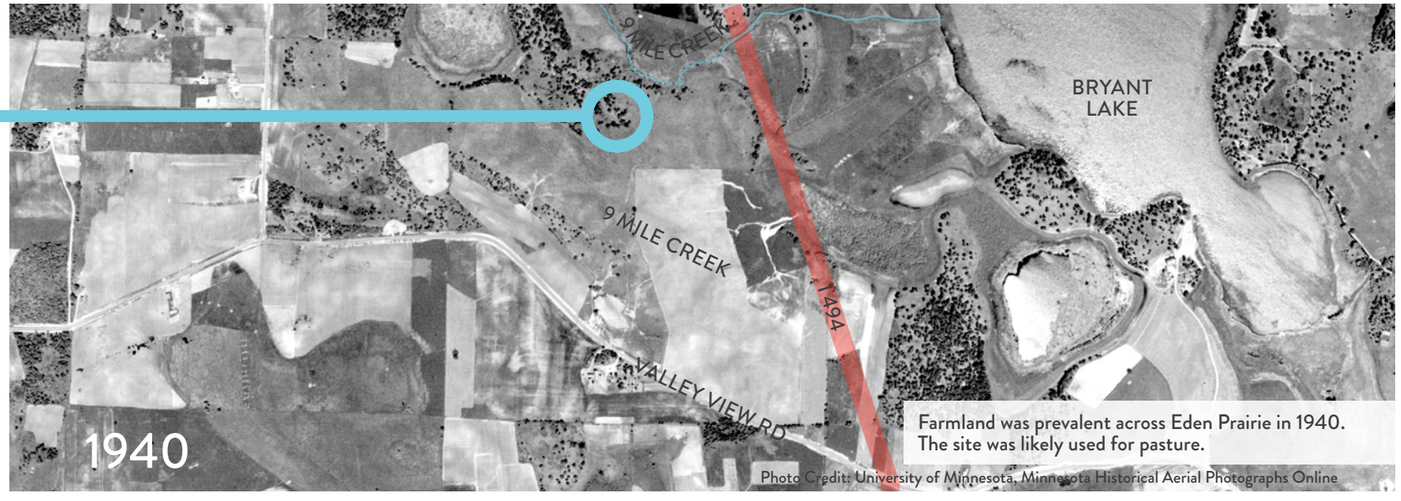


Site History & Existing Conditions

Original land surveys (1847 – 1907) from the US General Land Office records provide valuable detail about how the state looked at the time of European settlement. This data shows that the region of Discovery Point consisted of oak barrens; defined as scattered trees and groves of oaks of scrubby form with some brush and thickets. This community had a great diversity of prairie grasses and wildflowers along with shrubs and a few trees. The landscape was altered by settlers who suppressed fire and introduced agriculture. Extensive clearing and grazing occurred. At Discovery Point farming eliminated many species and degraded the soil. By the time grazing ceased and suburban development began many native species were no longer present and could not re-colonize the site which became vulnerable to invasive species establishment. Today the site is composed of a tree canopy of a few remnant oaks with a variety of weedy trees along with a variety of non-native trees planted by the previous property owner. Invasive species such as common buckthorn, Tartarian buckthorn, garlic mustard and narrowleaf bittercress dominate the site. It is also heavily grazed by deer and rabbits.

A primary motivating factor to implement this program in native plant regeneration for the District is to prevent erosion in woodlands. Sheet erosion occurs in woodlands where invasive species like garlic mustard and buckthorn have out competed native understory plants resulting in exposed soil under the trees. Heavy rain eats away at the topsoil slowly eroding the entire surface and potentially polluting natural water bodies downstream. Earthworms complicate this issue by quickly devouring fallen leaves and eliminate natural duff.

The Helen Allison Savanna Scientific and Natural Area, in East Bethel, MN, is a remnant oak savanna plant community that resembles what would have been present at Discovery Point prior to agricultural development.



Farmland was prevalent across Eden Prairie in 1940. The site was likely used for pasture.

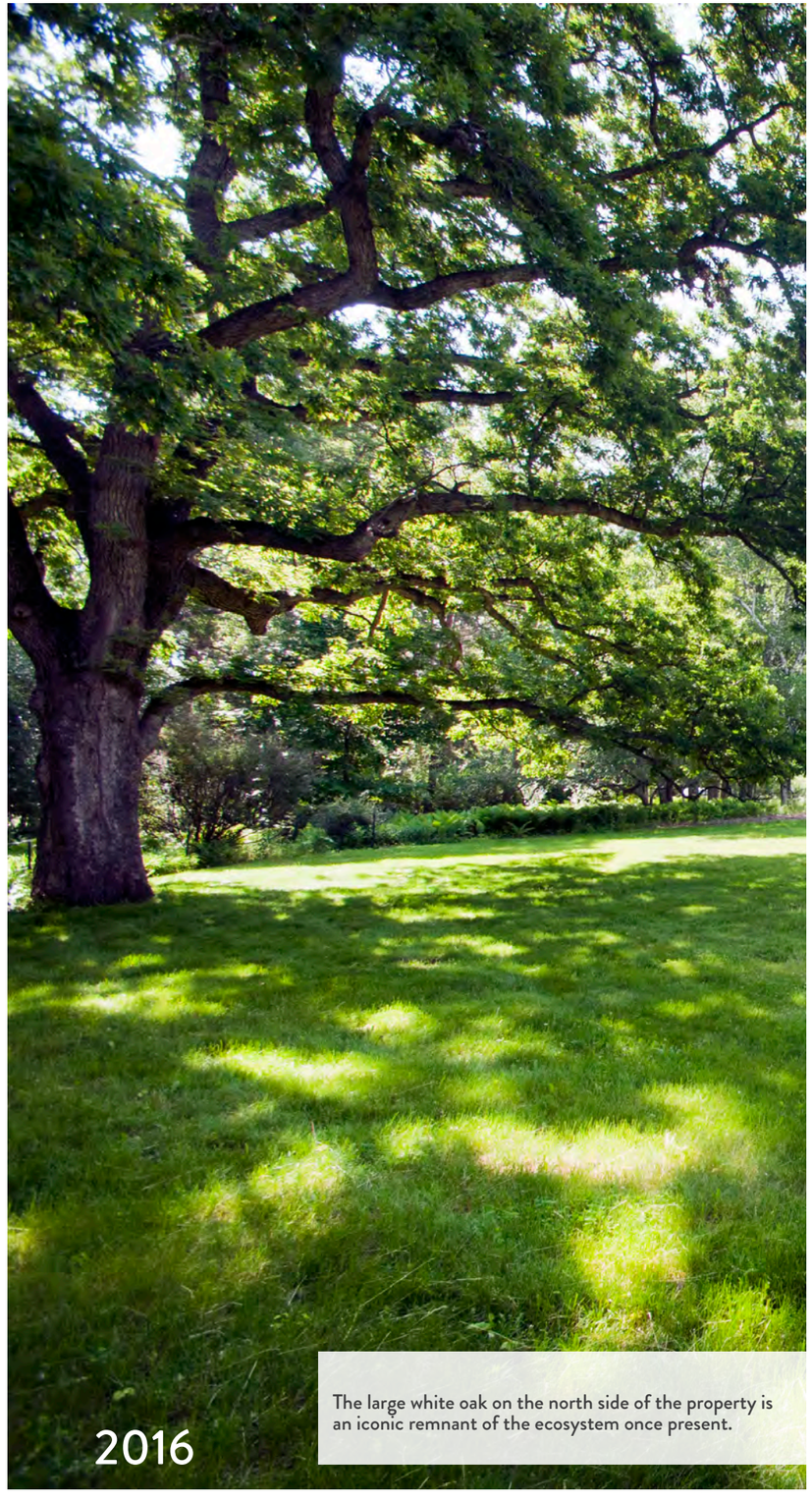
Photo Credit: University of Minnesota, Minnesota Historical Aerial Photographs Online

As parts of the property were left to naturalize after agricultural activities ceased, this resulted in a low diversity understory dominated by dense stands of buckthorn and garlic mustard (Discovery Point 2016).

2016

2016

Garlic Mustard has established in natural areas throughout the site.

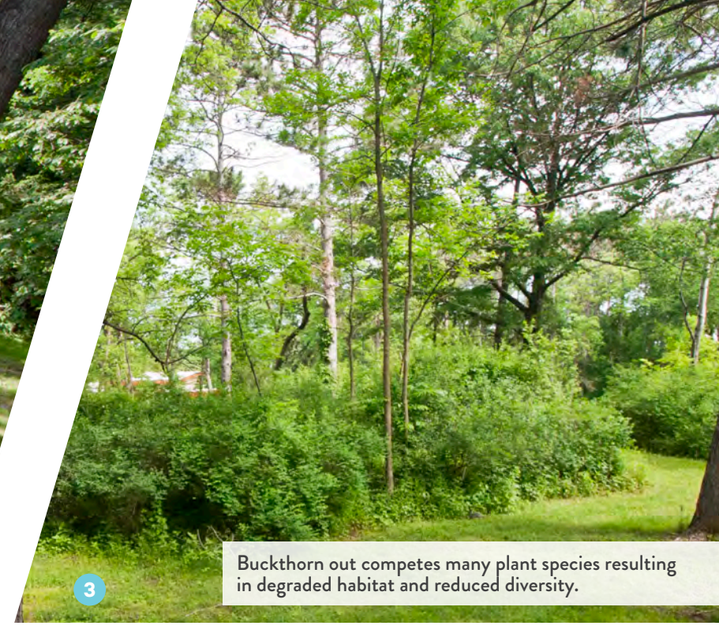


2016

The large white oak on the north side of the property is an iconic remnant of the ecosystem once present.

1 Spring ephemerals and ferns are some of the first plants to emerge in spring (photo 2016).

2 Regeneration begins at specific nodes of existing native vegetation.

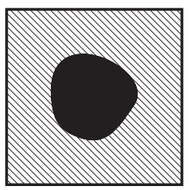


3 Buckthorn out competes many plant species resulting in degraded habitat and reduced diversity.

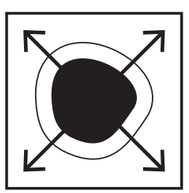
Regeneration Strategy

The goal is to demonstrate how to re-introduce and *maintain* native plant communities on properties within the District in the face of degraded soils, invasive plant species and aggressive wildlife browsing. This can feel like a daunting task!

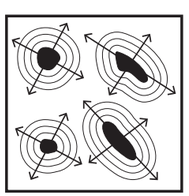
An incremental approach is to be taken at Discovery Point to make the effort affordable and practical. Plant community regeneration begins by protecting remnant colonies of native plans:



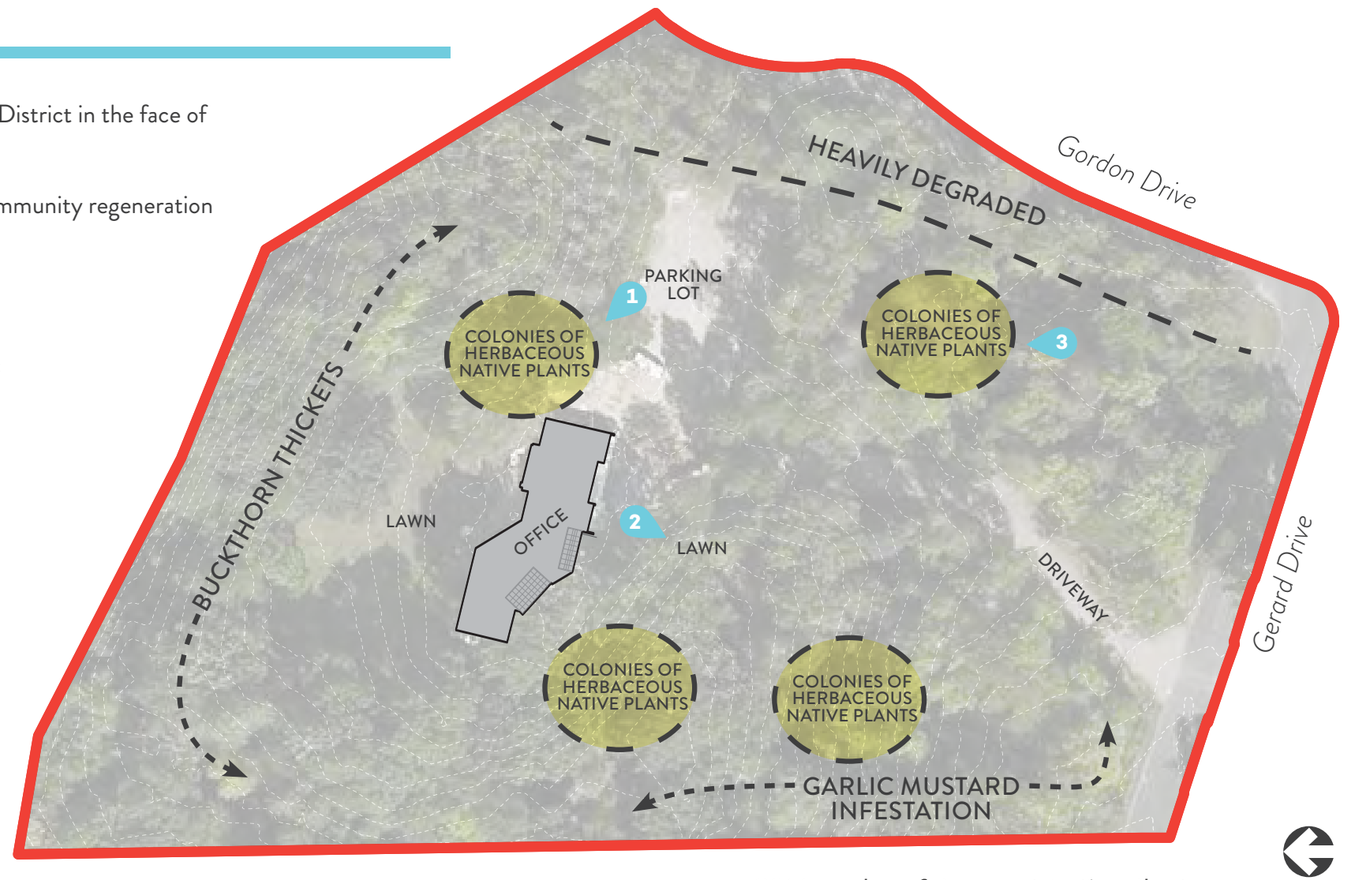
Remnant colonies of herbaceous native plants (nodes) are first identified and protected by carefully eliminating invasive species. Undesirable trees are removed to reduce competition. The idea of starting at the nodes is to protect and rejuvenate these native plants before expanding regeneration efforts out into extensively degraded areas. Over time new native species are introduced within the node to increase diversity.



Around the nodes invasive species will be eliminated and a temporary planting of creeping red fescue will be planted. The purpose of the fescue is to establish a mowable ground cover to prevent erosion. Mowing eliminates invasive plants that germinate from seed stored in the soil. As the nodes become established and as budget allows, the creeping red fescue around the node will be removed and replaced with native plants. The node of native plants slowly expands.



This phased approach to invasive species removal and planting of native species is to occur simultaneously within several nodes on the site. As restoration progresses, high quality nodes become connected.

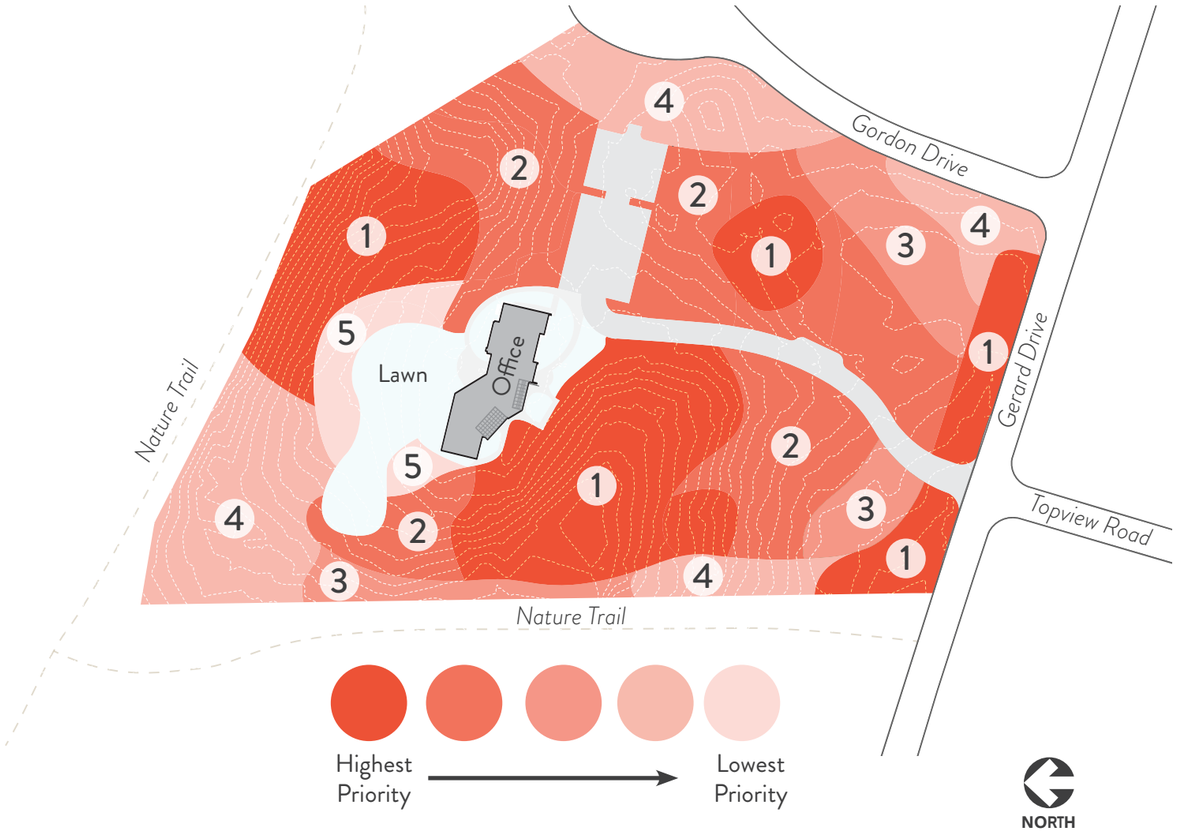


2016 Nodes of Remnant Native Plants

Phasing Plans

There are four primary nodes of existing native plants at Discovery Point Center. Initial regeneration efforts will be to weed out invasive plants and cut down undesirable trees in these nodes. Other native plants will be added over time. This multi-year process will proceed as budget allows.

Phasing of Invasive Plants Removal



Creeping Red Fescue

Creeping red fescue is a typical lawn grass that can be used as an easy to maintain, temporary cover used in extensively degraded areas compete with invasive species. It will stabilize soils and prevent the reproduction of invasive species during the time between initial invasive removal and planting. Fescue plantings will be maintained by mowing and/or spot spraying with a broadleaf herbicide to easily control invasive plants and prevent them from producing seed. It also forms a dense cover that makes invasive species establishment difficult. When it comes time to plant natives the fescues can be sprayed or cut and removed, and replaced with native plants.

Phasing of Native Plant Species Introduction

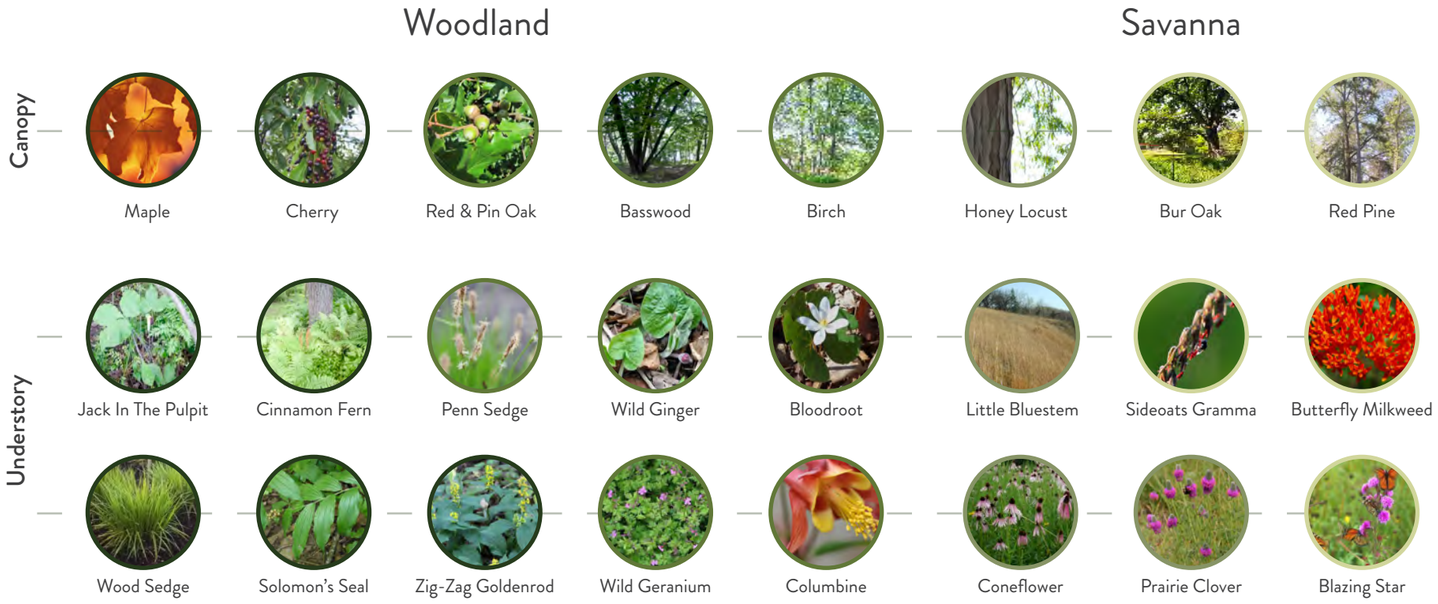
Once invasive species area removed and the fescue has done its job, native woodland species will be planted.

Lightly forested grassland (oak savanna) is was likely historically present prior to settlement.

Plant Community

Native plant species chosen for the restoration are based on their ability to establish and thrive. Because different species require different resources (soil type, light conditions, nutrients, moisture, etc.) selecting plants suited for their planting conditions is essential. The following species are just a sample of what is to be planted at Discovery Point. These resilient species serve as a valuable source of food for local insects and animals in addition to providing cover for them to live.

Plant Community Signature Plant Species:



Deer and Rabbits

Deer and rabbit populations in the metro-area are very high mainly due to lack of predators. These animals are herbivores and have a huge impact on native plants their primary food source. At Discovery Point fenced deer and rabbit exclosures will be built to protect these caged areas from grazing and demonstrate how great these animal impact the plant community.

Ultimate Plant Communities

Plant Community Management

On going plant community management is critical. The metro area today is full of invasive plant species. Canada thistle blows onto our properties in the wind, garlic mustard seed comes in on the feathers of birds, seed stored in the soil germinates, and birds deposit the seed from buckthorn berries in their droppings (along with a packet of fertilizer).

The phasing of plant community regeneration at Discovery Point spreads planting and maintenance costs over time. A fully established native planting is more resistant to invasive species encroachment.

Just like in a traditional landscape where we spend time and money on mowing, fertilizing, irrigating and weeding, resources must be invested into our native landscapes. This is the plan for some invasive species control at Discovery Point.

Buckthorn Removal Strategy:

Removal of buckthorn is accomplished by cutting and carefully treating the stump to prevent regrowth. The phased approach requires targeting of mature fruit bearing individuals first. This reduces ongoing seed production as the restoration process progresses. Following up on previously treated areas will be necessary until the existing seed-bank is depleted.

Garlic Mustard Removal Strategy:

Garlic mustard can be controlled by pulling the plant in early spring prior to it producing seeds. Removal efforts are to begin in areas of dense infestations and progress outward from there. Areas where the plant is able to go to flower prior to removal should be mown down to prevent the plant from going to seed. Adequate budget will be allocated at Discovery Point to maintain the regenerating plant communities. This cost will lower over time as natives establish and dominate the site.

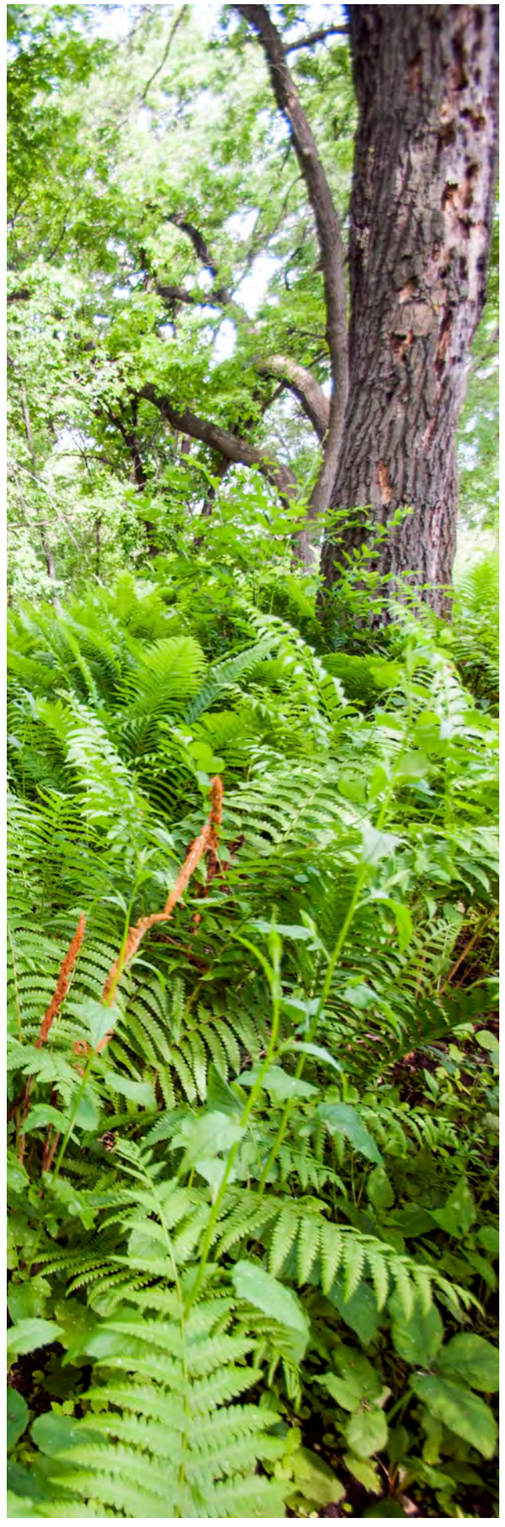
Thistle

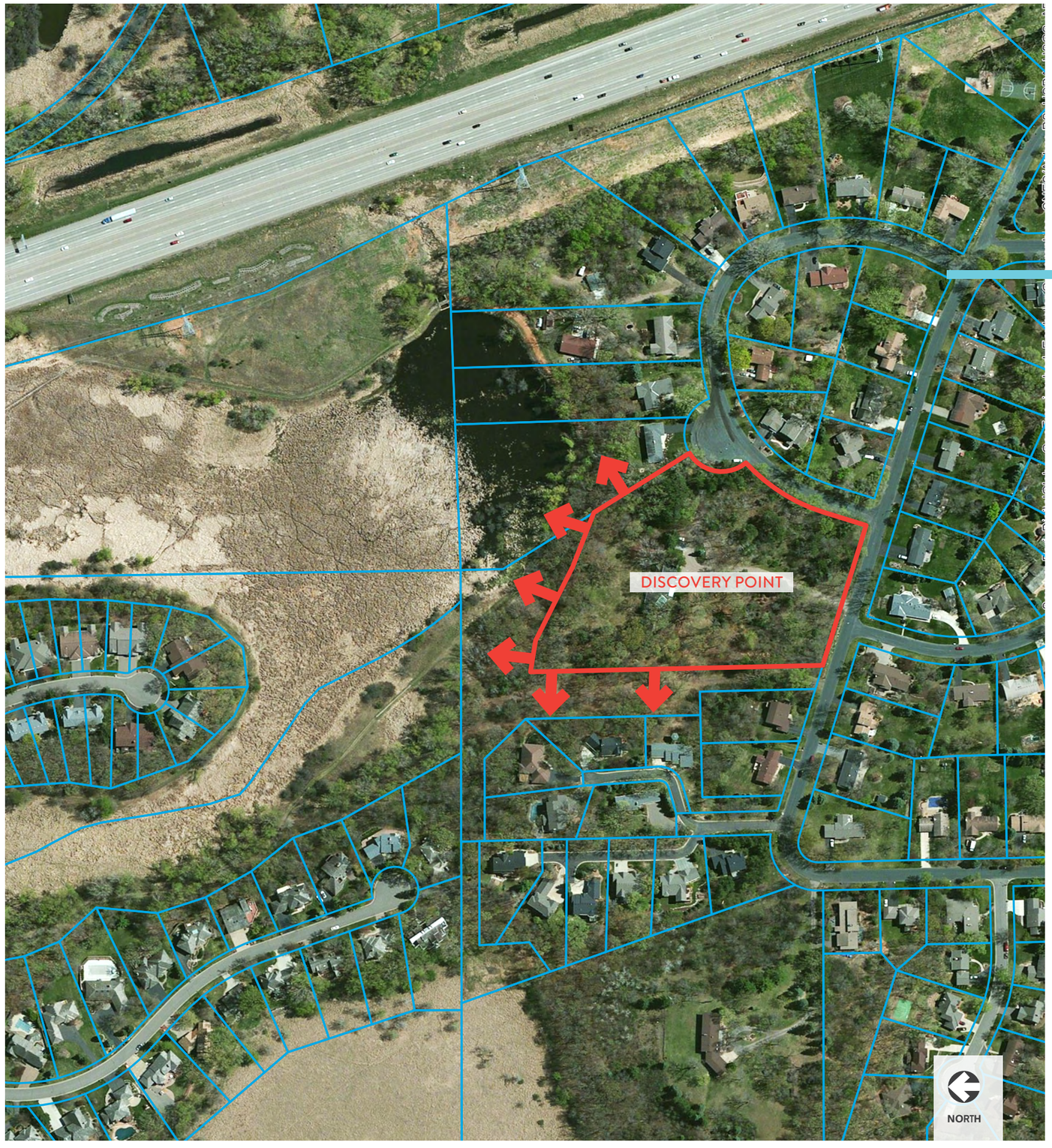
Once established, thistle can spread quickly through rhizomatous roots (10-12” in one season). Repeated mowing and hand pulling to prevent flowering is essential for controlling infestations. Spot application with a herbicide is necessary to fully eliminate thistle.

This is why we plant fescue. To maintain a ground cover via mowing. This will allow for the exhaustion of the seed bank.

Evaluating Progress

Year	1 2016 -2017	2 2017 -2018	3 2018 -2019	Long-Term Management +2019
Site Analysis and Planning	Identify areas (including neighboring properties) to protect and develop invasive species removal strategy going forward			
Site Preparation	Removal of woody vegetation Removal of herbaceous invasive species			
Establishment		Seed and Plant native vegetation in previously prepared areas	Increase plant diversity on site	
Management		Control invasive species Continued buckthorn removal		
Landscape Manifestation	**Noticeable change in canopy density:** Select trees are removed to open canopy for native regeneration. The site will look more exposed when buckthorn and weed trees are removed.	**Plant establishment:** Red fescue and other native plants will begin sprouting up within weeks of seeding. Seeded plants will remain small in the first year because they are focusing energy on establishing root systems. Larger trees and shrubs will be installed to create screening.	**Continued invasive species management:** In year three major removal of large canopy trees and buckthorn is complete. Management of re-sprouting invasive species is to be continued throughout the site. Based on the establishment success throughout the site, additional diversity, such as adding forbes to native grass areas can be created.	**Maturation of plant community** With prolonged management, native plantings will continue to grow larger, fill in, and establish. Woody plant species will continue to encroach. Without continued maintenance the savanna areas may turn back into woodland.





Expanding The Vision

The complete extents of this project is still yet to be determined. Additional investigation is needed to prioritize work expanding off the Discovery Point site. Working with interested neighboring property owners, including city property, to survey existing plant communities, areas for expanded invasive species removal and native planting are to be identified. The management strategies set in place now will help us develope an approach for partnering funding and regenerating these adjacent lands.

Beginning in fall 2016, education and outreach will begin to the owners of the neighboring properties. If partners are identified, invasive removal and regeneration may be possible after the initial site work on Discovery Point has begun.

This resource is meant to be a living document and to be updated as the restoration process progresses. Documenting the key elements of the process, including costs, plant list, maintenance activities, and photos would serve as a valuable resource for the District and landowners. As the project progresses these elements should be added to this document.

Photo: Pennsilvania Sedge

9 MILE CREEK WATERSHED DISTRICT