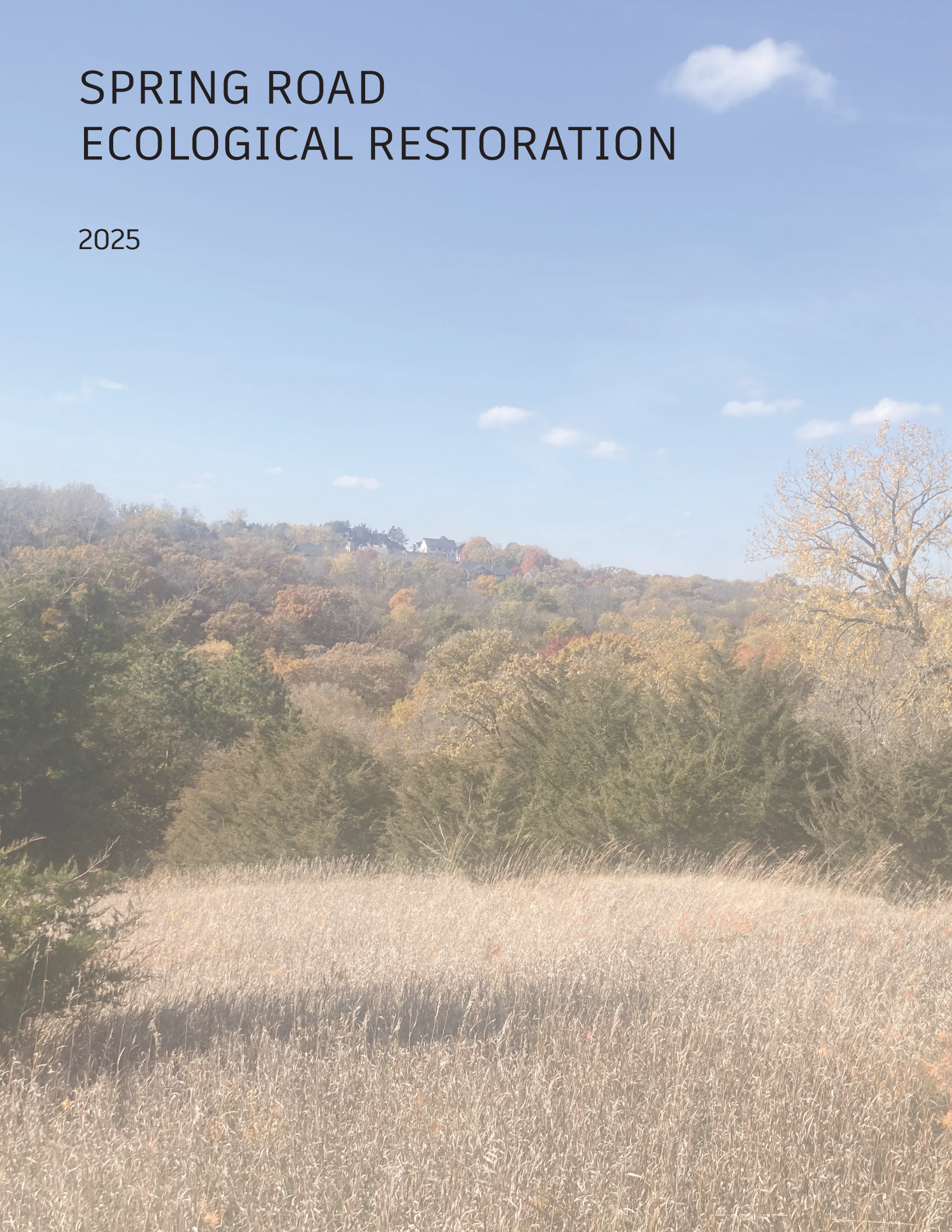


SPRING ROAD ECOLOGICAL RESTORATION

2025



SPRING ROAD PRAIRIE

ECOLOGICAL RESTORATION PLAN

9955 Spring Road, Eden Prairie, MN

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Project Overview

The Spring Road restoration is a 28-acre site located in Hennepin County Minnesota, near the town of Eden Prairie. The site is within the Riley Purgatory Bluff Creek Watershed District (RPBCWD), with a portion of Riley creek running through the site. The site's drainage is directly into Riley creek, then to Grass Lake and into the Minnesota river. This site is an important part of a nearly complete natural corridor of public land that follows Riley creek from Lake Riley to the Minnesota river. The Riley Purgatory Bluff Creek Watershed District is the owner of the site. The site is most prominently divided into three major areas – wooded areas, brome fields and a low-lying riparian area.

This plan has been developed by Margaret Milligan and Dan Shaw as a part of the University of Minnesota's course LA 840I Directed Studies in Landscape Architecture.

Project Goals

- Promote habitat for rare species on site – kittentails and rhombic evening primrose
- Increase diversity and abundance of native plants.
- Improve water quality of Riley Creek & associated watershed.
- Control woody species within the prairie area.
- Increase wildlife and pollinator habitat and food sources.

Project Outcomes

- Diminish species like buckthorn, honeysuckle and leafy spurge to less than 5% cover.
- Increase the number of threatened or rare native plant species.
- Increase water infiltration rates and protect the site from erosion.
- Reduce brome and Kentucky blue grass.
- Increase species diversity within site to be considered “strongly diverse” (50+ species)

Leadership & Partnerships

Project Leadership

Primary project management will likely be from RPBCWD staff, or a contracted organization or individual who specializes in ecological restoration. This project is long-term and its successful management will involve sustained commitment and relationship building across a wide range of stakeholders and partners.

Key Partnerships

- Friends of Eden Prairie Parks
- Spring Valley Friends
- Homeowners in the adjacent housing developments
- Lower Minnesota River Watershed District
- Hennepin County
- City of Eden Prairie (Parks & Recreation)
- Shakopee Community and local Indigenous community
- US Fish and Wildlife

Project Funding & Research

Funding could be obtained from sources such as the [Clean Water Fund](#) (BWSR), [State Cost-Share](#) (BWSR), [Habitat Enhancement Landscape Program](#) (BWSR), [Hennepin County Good Stewards Grant](#), or [Hennepin County Opportunity Grant](#).

Research Opportunities

There are several research opportunities on this site. Most of the research opportunities are connected to: 1. The goals of RPBCWD's focus on water quality 2. The need for non-chemical, slow restoration techniques because of sensitive conditions of the nearby Frederick Miller Spring 3. The location of the site is adjacent to both private housing developments and a conservation area with a remnant prairie.

Potential research or grant topics:

1. Non-chemical restoration strategies with an emphasis on preserving or enhancing water quality. This includes non-chemical invasive species control of Tartarian honeysuckle, reed canary grass, eastern red cedar and aspen.
2. Diverse native plantings affect soil carbon, soil microbes, infiltration and water quality/quantity.
3. On-site plant propagation using remnant prairie patches as a seed source.
4. Effects on plant and animal/insect populations in the site and in the adjacent Bluff

Prairie conservation area before and after conservation implementation of the Spring Road Prairie.

Program Standards and Guidelines

A thorough survey of plant species will occur to determine the presence and location. If the presence of any threatened or rare species is confirmed, steps will be taken to ensure that they are not disturbed. Because water quality is a top concern, practices that limit erosion and chemical contamination will be implemented site wide.

Restoration practices will not contribute to erosion and sediment transfer. Restoration practices will strive to not use herbicides, fungicides or insecticides. Any potentially harmful contaminant will have a standard operating procedure to mitigate its risk.

Prescribed fire will be used as a management strategy on this site. Because of its proximity to both a road and private housing developments, in-depth burn plans and procedures will be created and all necessary permits will be obtained.

Keys for Project Success

This is a complex, long-term project requiring a high level of coordination and collaboration. While complex, there are many ways to support its success.

- Addressing the cause of invasive species, and prioritizing species to control and target.
- Using local, high-quality seed and plant stock sourced either onsite, or in a very close proximity.
- Ensuring project stability through funding and partner commitment.
- Collecting site assessment so that a baseline can be developed for future monitoring and research needs.
- Keeping project records to evaluate and understand the outcomes of different restoration activities.
- Leveraging the large community of stakeholders passionate about the Fredrick Miller Spring and the surrounding lands.
- Coordinating conservation efforts with Prairie Bluff Conservation area (adjacent), City of Eden Prairie and Hennepin County.
- Recognizing that this project is a long-term commitment, and outcomes will be worth the sustained commitment. Shifting mindsets to long-term conservation efforts.

Project Benefits

The potential benefits of this project are wide ranging and will have a lasting impact on wildlife and pollinator habitat, water quality, and the ecological integrity of the area.

- Increased water infiltration and groundwater recharge.

- Water interception and filtration provide protection for water resources.
- Soil health is promoted by stabilizing soils, adding organic content through root decomposition, and by supporting healthy microorganism populations.
- Food sources for a wide variety of insects that support bird populations
- Shelter and nesting habitat for birds and other animals
- Support of food chains and webs
- Protection of threatened and rare plant species.
- Public natural area that can be enjoyed and appreciated by community

Project Selection

The Spring Road prairie site represents the final chain in a public lands/wildlife corridor/riparian corridor that follows Riley Creek from Lake Riley to the Minnesota River. The site is also adjacent to the 60-acre Prairie Bluff conservation area, as well as the culturally important public Fredrick Miller Spring. Eden Prairie has seen large scale development of private residential homes in the past 20 years, converting agricultural and natural lands to developed urban areas. Development in the area is expected to continue as the metro and suburban areas experience population growth.

Landscape Ecology

The area around the project site has been developed for housing, causing habitat fragmentation to increase. As stated above, the site plays a crucial role in the corridor between Lake Riley and the Minnesota river. The site is surrounded by publicly owned conservation lands as well as private housing developments. The conservation of this site (28 acres), along with the adjacent Prairie Bluff conservation area (60 acres) will create a contiguous 90-acre habitat, decreasing the edge effect.

Precedent & Reference Sites

Precedent Projects

The most valuable and applicable precedent of conservation for the site would be the Prairie Bluff Conservation Area/ Richard T. Anderson Conservation Area adjacent to the Spring Road Prairie site. This 60-acre area was obtained by the City of Eden Prairie in 1994 after residents approved a bond item to raise money for its acquisition and preservation as a public open space. The Prairie Bluff site is said to be a remnant prairie and oak savanna, and the diversity of plant species found there supports that claim. Speaking with and learning from the managers of this land (City of Eden Prairie) will be extremely useful because of its proximity and similar topography, plant communities, and water quality concerns. One can think of the 9955 Road site as an extension of the Prairie Bluff conservation area and it may be useful to coordinate management strategies like burning, seeding and invasive plant

controls with Prairie Bluff. Seed collected from Prairie Bluff remnant prairie will also be valuable to the 9955 Spring Road site, as it contains locally adapted native plant genetics.

Additionally, we can use examples and analysis from farther afield to guide choices in management strategies, such as LCCMR funded "[GARVIN HEIGHTS RESTORATION PROJECT](#)" that is focused on the restoration of a bur oak savanna and dry bluff prairie habitat in Winona, MN. This site is experiencing an increase in buckthorn that is compromising the species make-up of the savanna/prairie. The author of this thesis analyzes different buckthorn management techniques like burning, removal, grazing and chemical applications.

Reference Sites and Plant Communities

As recorded by the Natural Vegetation of Minnesota at the Time of Public Land Survey: 1847-1907, the historic vegetation onsite was listed as Oak Openings and Barrens. The native plant communities areas on site most likely resembled southern dry prairies and savanna (UPs14, Ups13) and southern floodplain and terrace forests (FFs68, FFs59). The Prairie Bluff Conservation area adjacent to the site is a good reference site for the prairie and oak savanna portions of the site, while some floodplain forests in the MN river valley near the site are good examples of FFs68, and FFs59.

This site is also located within 1 mile of the eastern border of a large region of "Big Woods" vegetation, as recorded in the above mentioned Vegetation Survey (1847-1907). There is a possibility of managing some of the woodlands on site towards the plant communities commonly found in the Big Woods - such as Maple-Basswood forests. If that is the case there are remnants of Big Woods vegetation in Eden Prairie, close to the site. For nearby remnant Big Woods sites see Riley Creek Conservation area, Richard T Anderson Conservation area. For larger, more intact Big Woods reference sites see Wolsfeld Woods Scientific and Natural Area (Hennepin county) or Nerstrand Big Woods State Park (Rice county).

Site Preparation

Soil health

Because of its steeply sloping hills, erosion is a concern for the soil health of this site. Transitioning the grasslands from brome to native prairie mix without the use of herbicides, plowing or discing will help reduce the risks to soil health. The remnant prairie is vulnerable to both soil compaction and erosion, and for those reasons large machinery should be avoided as much as possible within this 3-acre area.

Seedbed preparation

Seeding will be primarily done after prescribed burns (seed into ashes) or interseeding into

brome-dominated areas. There are several areas of spruce tree plantations on site. These trees will need to be removed prior to burning and seeding. Because of the potential for erosion, these trees will need to be cut as close to the ground as possible, with their stumps to be left in-ground to decompose. The stumps may pose a challenge to equipment like seed drills, so it is important to map the location of these plantations and possibly use alternative seeding methods like broadcasting.

Invasive species prevention

When working in areas with invasive species present boots and equipment used should be cleaned before moving on to another area to prevent the spread of reed canary grass, buckthorn and honeysuckle. Buckthorn branches can be used for onsite habitat creation, if there are no berries present. If the buckthorn has berries, dispose of it offsite. Reed canary grass that is cut after blooming should be disposed of offsite by burning.

Seeding and Planting

Seed Mixes and Other Plant Materials

This property is unique in that it not only *borders*, but *contains* remnant prairie - an incredibly rare, and biologically and genetically important ecosystem. Because of this, care should be taken to minimize the introduction of seed mixes from non-local sources that would impact the genetic diversity of the plants in the remnant prairies.

The best option for prairie seeding would be to use entirely local seed collected from nearby sites (Prairie Bluff Conservation Area, Richard T. Anderson Conservation Area, Fish & Wildlife properties). However, it is likely not possible to use entirely local seed, as the seed source sites are themselves fragile, remnant areas that could be negatively impacted by overharvesting seed.

We suggest using locally collected seed in the small remnant area of the site, as well as in a 'biological buffer' zone in the brome/prairie adjacent to the Prairie Bluff Conservation Area. This 'biological buffer' zone would likely extend from the southern property line, into the site at least 500'. This area would be managed as a part of the larger brome burn area, however when seeding occurs it would receive its own mix of local seed. A mix of locally collected and other seed mixes can be used in the remaining interior portions of the brome/prairie.

Potential BWSR Seed Mixes to use on site:

- [Dry Prairie Southeast](#) (INTERIOR BROME/PRAIRIE)
- [Woodland Edge South and West](#) (WOODED)
- [Wet Meadow South and West](#) (CREEK/MEADOW)
- [Stormwater South and West](#) (CREEK/MEADOW)

Other Seed Mixes:

- [Cover It Up](#) (BUCKTHORN AREAS)
- [Buckthorn Replacement Mix](#) (BUCKTHORN AREAS)

Potted or bare root plant materials like native trees and shrubs should come from local sources, or local plant nurseries who specialize in native plants and trees.

Pesticide drift

The site is well protected from pesticide drift. Adjacent land use is private residential with a large, vegetated buffer separating the site from the development. Confirm that the department of roads does not spray Spring Road.

Planting

Seeding will occur after burning by broadcast method or seed drill. Seeding will also occur when woody species like honeysuckle and buckthorn are removed, by broadcasting, then lightly covering and pressing into the soil. Containerized plants will be installed by using a soil knife to create a hole, then backfilling the hole, compressing the soil and watering the plant in.

Grazing & Browsing

Grazing & browsing will likely occur on some areas of the site for soil and plant benefits as well as removal of buckthorn. Sheep, cattle or goats are possible livestock choices. Grazing and browsing events should be well timed for their intended effects. Having clear goals for grazing/browsing and contracting with a livestock specialist who has experience and knowledge in ecological restoration will be critical for the success of this strategy.

Concept Planning

This site occupies a highly important ecological area and serves as a valuable piece of the Riley Creek and Minnesota River corridor. It also borders Fredrick-Miller Spring, a well-known public water source used by people throughout the metro area. For decades the land has been managed agriculturally as a Christmas tree farm, and restoring it to a diverse, ecologically healthy habitat would provide significant benefits for wildlife, pollinators, water quality, and the broader community.

Restoration efforts should prioritize replacing invasive and non-native plant species with diverse native vegetation suited to the site's soils, conditions, and historical plant communities. Because the site contains a variety of terrain types, soil conditions, and land-use histories, it can be divided into several distinct management zones. Each zone requires a tailored restoration approach.

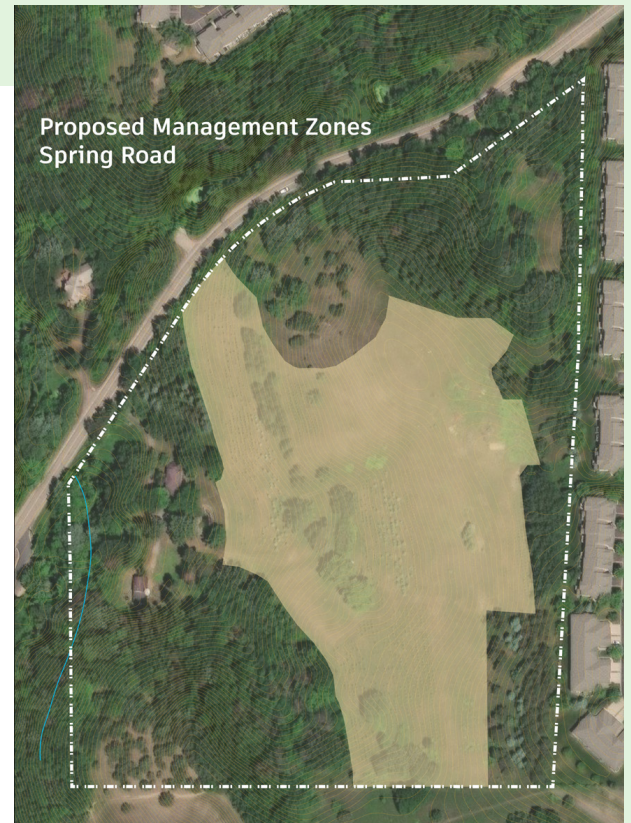
The following pages outline the restoration goals and recommend sequences of activities for each management zone.

BROME FIELDS

Restoration goals

Long-term transition of an area dominated by brome, kentucky bluegrass and conifer trees to a highly diverse upland dry prairie/savanna plant community that supports wildlife, soil stability, soil health and water infiltration.

Management of species such as tartarian honeysuckle, leafy spurgem, aspen and eastern red cedar.



Restoration schedule

YEAR	SEASON	ACTIVITY	NOTES
1	WINTER	REMOVE TREES	xmas trees and mature pines - donate, mill lumber, biochar
		SOURCE SEED	from prairie bluffs area or seed mix
		DEVELOP BURN UNIT	id perimeter, clear burn breaks
	SPRING	BURN & SEED	around May (before brome flowers)
	SUMMER	SURVEY / MONITOR	
			CUT & SMOTHER WOODIES
		FILL HOLES	large holes only, weed free soil, seed native mix onto filled holes.
	FALL	SEED	hand broadcast/interseeding
2	WINTER	BURN UNIT MAINTENANCE	clear burn breaks of stumps, woody material
	SPRING	BURN & SEED	xmas trees and mature pines - donate, mill lumber, biochar
	SUMMER	SURVEY/MONITOR	
	FALL	SEED	hand broadcast/interseeding
3	WINTER	BURN UNIT MAINTENANCE	
	SPRING	BURN & SEED	
	SUMMER	SURVEY/MONITOR	
	FALL	SEED	hand broadcast/interseeding

Ongoing work

- Monitor and manage leafy spurge - possible biocontrols such as Aphthona beetles could be considered.

- Well timed prescribed burns to diminish brome and bluegrass, and encourage prairie plants. Future burns occur every other year in different seasons to promote different species.

- Monitor and manage woody species with non-chemical options like smothering



REMNANT PRAIRIE +

Restoration goals

Protect & encourage threatened plants (kittentails and rhombic evening primrose) and rare habitat (less than 1% of original prairies remain). Revitalization efforts will use prescribed fire to establish healthy, robust seed source to use in the rest of the site. Woody species will be carefully managed to prevent conversion from grassland to successional woods.

Ongoing work

- Burn remnant every 2-4 years at appropriate time to protect kittentails (early spring or late fall)
- During growing season brush mow aspen shoots to control encroachment
- Woody species management

Restoration schedule



	SEASON	ACTIVITY	NOTES
1	WINTER	WOODY CONTROL	honeysuckle, other woody invasives (smother, cut or dig)
	SPRING	ID/SURVEY	ID plants / animals / insects, note potential seed collection
	SUMMER	ID/SURVEY	ID plants / animals / insects, note potential seed collection
		DEVELOP BURN UNIT	ID perimeters, develop & mow/clear burn breaks
		COLLECT SEED	June/July from spring bloomers
	FALL	ID/SURVEY	ID plants / animals / insects, note potential seed collection
		CONTROL SELECT TREES	Aspens to NE
		COLLECT SEED	Sept/Oct from summer bloomers
2	WINTER	REMOVE SELECT TREES	Do not remove cedars with kittentails near them.
		DEVELOP BURN UNIT	Remove trees that may pose hazard for burn, contract with burners
	SPRING	BURN & SEED	early spring - before kittentail emergence. hand broadcast using collect seed.
	SUMMER	COLLECT & SPREAD SEED	hand broadcast/interseeding
	FALL	COLLECT & SPREAD SEED	hand broadcast/interseeding
3	WINTER	SEED	snow seeding
	SPRING	SURVEY/MONITOR/COLLECT SEED	
	SUMMER	SURVEY/MONITOR/COLLECT SEED	
		BURN UNIT MAINTENANCE	mow burn break, remove any fire hazard trees or woody material.
	FALL	SURVEY/MONITOR/COLLECT SEED	

WOODED AREAS

Restoration goals

Restoration focused on non-chemical removal of buckthorn and increasing plant diversity to raise habitat value, and to enhance soil health and stability.

Adaptive management to observe how each woodland is reacts and manage for different types of woodlands/savannas.

Areas of buckthorn are large, removal should be broken down into smaller zones, with management occuring in a focused way in these smaller zones.

* THIS SEQUENCE DESCRIBES A MANAGEMENT STRATEGY FOR A SMALLER ZONE OF BUCKTHORN.

Restoration schedule

YEAR	SEASON	ACTIVITY	NOTES
Pre-Y1		ASSESS AND MAP	flag and map buckthorn (big stands, large individuals, females)
1	WINTER	PRE-GOAT TASKS	
	SPRING	SEED	Buckthorn cover mix where goats will be (right before they arrive)
		GOATS IN HARD TO ACCESS PLACES	*anytime during growing season
		HAND REMOVAL GARLIC MUSTARD	
		BUCKTHORN REMOVAL	critical cutting protocol, weed wench, digging & pulling.
	SUMMER	BUCKTHORN REMOVAL	critical cutting protocol, weed wench, digging & pulling.
	FALL	BUCKTHORN REMOVAL	critical cutting protocol, weed wench, digging & pulling.
2	WINTER	-	
	SPRING	*same sequence as Y1	
	SUMMER	*same sequence as Y1	
	FALL	*same sequence as Y1	
3	WINTER	-	
	SPRING	*same sequence as Y2	
	SUMMER	*same sequence as Y2	
	FALL	*same sequence as Y2	
		Install plants	native shrub or tree species (elderberry...sugar maple) water



Ongoing work

- Once buckthorn is set back, other plants fill in, and fuel is built up, consider a low level woodland burn.

-Adapt management as needed for different woodland areas as some may be suited for oak savanna management practices.

-Buckthorn management will be long-term and will likely need to be addressed with a variety of strategies like **forestry mowing, hand removal, livestock browsing.**



VISUAL BUFFER

Restoration goals

Maintain visual and physical buffer to the road and development while gradually replacing buckthorn with native shrubs, trees and other plants. This area is adjacent to roadways and housing developments so goat browsing is not the best option - should focus on gradual hand removal.

Some areas of the visual buffer are dominated by buckthorn, others are not. Possibly divide area into zones to focus on.

**This sequence shows a 4-year timeline for one zone.

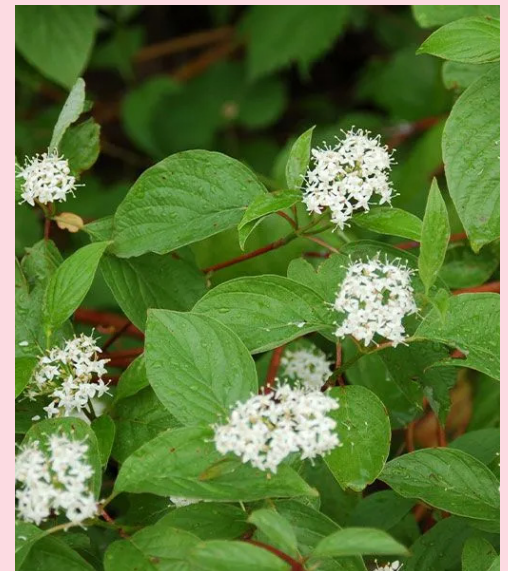
Restoration schedule

YEAR	SEASON	ACTIVITY	NOTES
1	WINTER	ID BUCKTHORN	flag and map buckthorn (big stands, large individuals, females)
	SPRING	BUCKTHORN REMOVAL	Buckthorn/other woody invasives/garlic mustard. Focus on females with berries & small plants. Leave large plants for visual buffer. Critical cutting, weed wrench, digging, pulling.
	SUMMER	BUCKTHORN REMOVAL	*same as above
	FALL	PLANT & SEED	Plant native shrubs and trees in areas where buckthorn was removed. Broadcast buckthorn cover mix.
2	WINTER	-	
	SPRING	BUCKTHORN REMOVAL	*see notes above (focus on females)
	SUMMER	BUCKTHORN REMOVAL	*see notes above (focus on females)
	FALL	PLANT & SEED	* see notes above (plant & seed natives)
3	WINTER	-	
	SPRING	BUCKTHORN REMOVAL	*see notes above (focus on females)
	SUMMER	BUCKTHORN REMOVAL	*see notes above (focus on females)
	FALL	PLANT & SEED	* see notes above (plant & seed natives)
4	WINTER	BUCKTHORN REMOVAL	Start thinning MALE buckthorn as native trees and shrubs get established
	SPRING	BUCKTHORN REMOVAL	Start thinning MALE buckthorn as native trees and shrubs get established



Ongoing work

- Buckthorn and other woody invasive like honeysuckle will need to be monitored and managed as their seedbank is well developed.
- Interseeding a woodland seed mix or buckthorn cover mix may be appropriate for groundlayer diversity.



PINE STAND

Restoration goals

Maintain visual buffer of mature, mostly conifer trees. Increase diversity of understory plants to provide more habitat and food sources for wildlife and insects.



Restoration schedule

YEAR	SEASON	ACTIVITY	NOTES
1	WINTER	-	
	SPRING	ID and map locations of invasive species.	
	SUMMER	MANAGE INVASIVE SPECIES	Non-chemical methods of cutting, digging, pulling and smothering
	FALL	MANAGE INVASIVE SPECIES	*see above
2	WINTER	-	
	SPRING	MANAGE INVASIVE SPECIES	
	SUMMER	MANAGE INVASIVE SPECIES	
	FALL	PLANT & SEED	bare root woodland/forest species, broadcast seed mix such as BWSR's Woodland Edge South & West .
3	WINTER	-	
	SPRING	MANAGE INVASIVE SPECIES	
	SUMMER	MANAGE INVASIVE SPECIES	
	FALL	PLANT & SEED	bare root woodland/forest species, broadcast seed mix such as BWSR's Woodland Edge South & West .
4		* Same sequence as Y3	
5	WINTER	POSSIBLE BURN	

Ongoing work

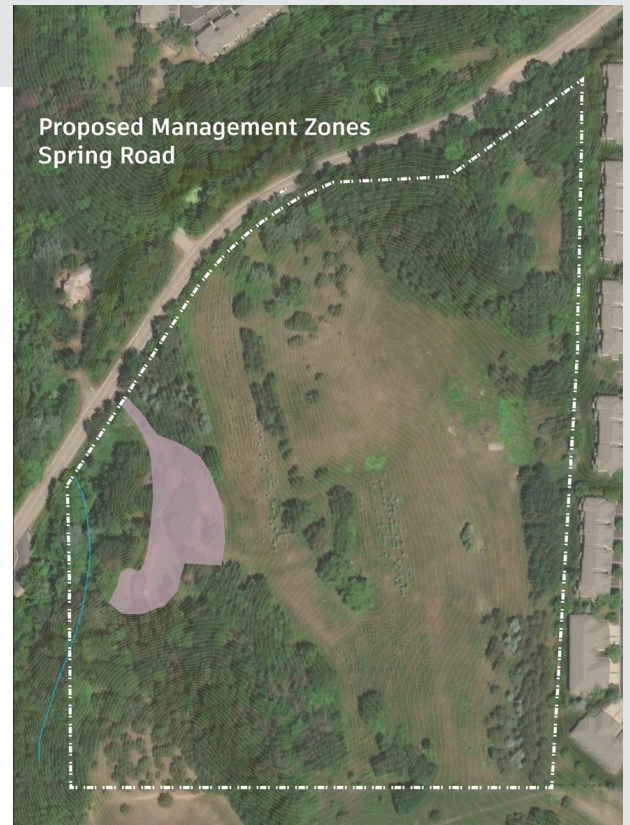
- Monitor and manage buckthorn, honeysuckle, canada thistle and leafy spurge with non-chemical methods
- Slowly transition ground layer that is mostly brome to a more diverse mix - through interseeding and plant installation
- In the future a dormant season, low-level woodland burn could be helpful to clear out thatch and promote native species.



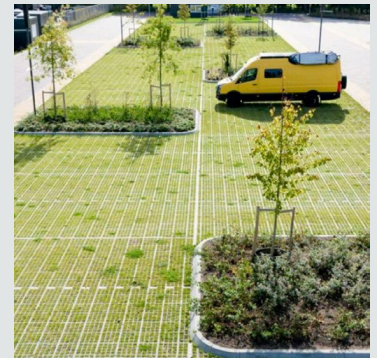
HOUSE & DRIVE

Restoration goals

Efforts around the buildings and driveway of 9955 Spring Road will be focused on increasing native plant species diversity while demonstrating residential scale water-quality and biodiversity designs that residents in RPBCWD can learn from.



Design examples



CREEK & MEADOW

Restoration goals

Engineer a highly diverse bioretention feature with a forebay to capture and filter surface water before it enters Riley Creek. Currently a culvert funnels water from Spring road and the driveway directly into Riley Creek. Management of invasive species along the edges of the management unit and within the bioretention feature will need to be ongoing.



Restoration schedule

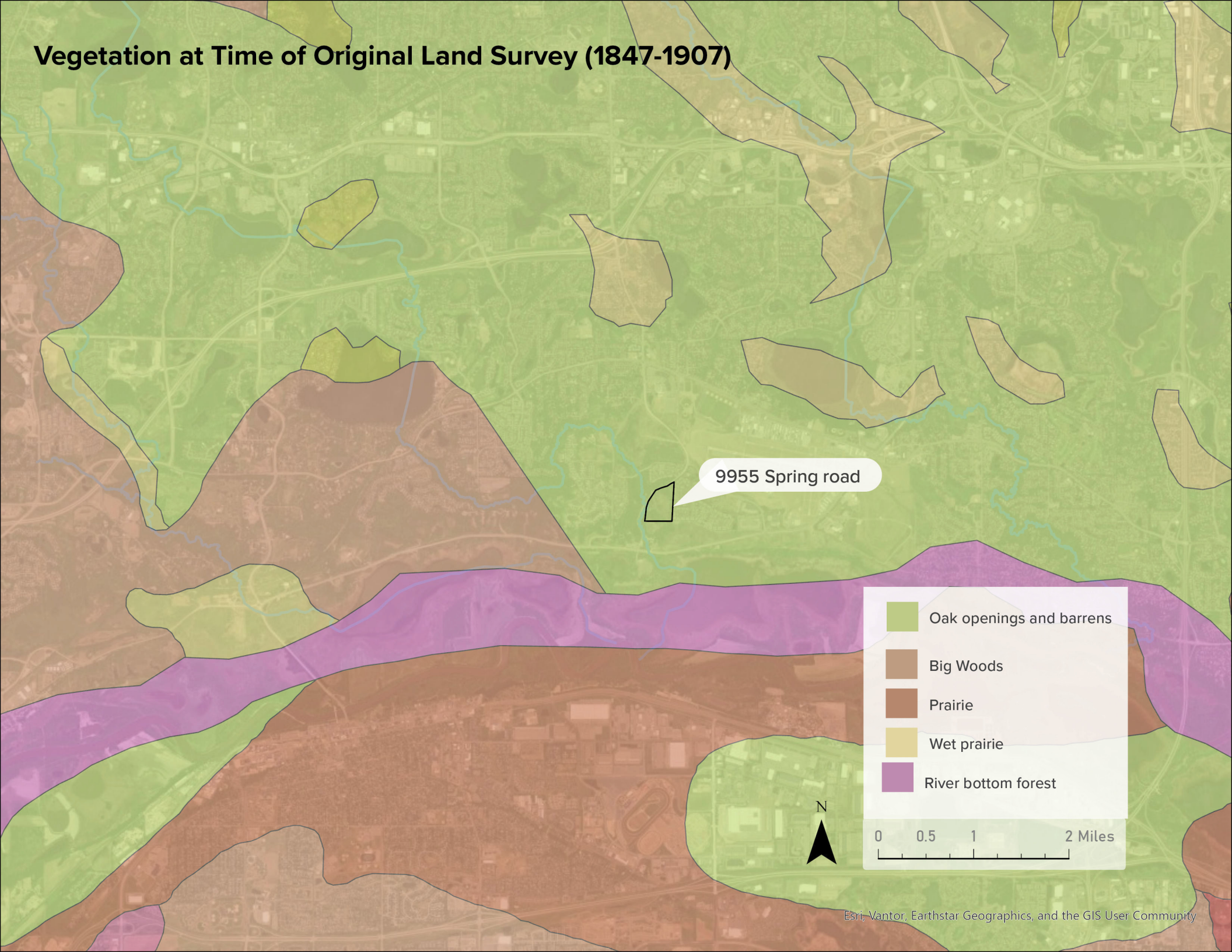
YEAR	SEASON	ACTIVITY	NOTES
1	WINTER	-	
	SPRING	COLLECT SEED	Collect seed from any native plant that may be used elsewhere on site.
	SUMMER	COLLECT SEED	*see above
		INVASIVE CONTROL	Smother larger patches of invasive species on edges of site and trim weeds to prevent seeding
	FALL	INVASIVE CONTROL	Cut invasive shrubs on edges of site and cover with buckthorn baggies
2	WINTER	-	
	SPRING	BIORETENTION & FOREBAY INSTALL	
	SUMMER	INVASIVE CONTROL	Continue management of invasives on edges of management unit with three visits a year
	FALL	INVASIVE CONTROL	*see above
3	WINTER	-	
	SPRING	INVASIVE CONTROL	edges of unit + in bioretention area
	SUMMER	INVASIVE CONTROL	edges of unit + in bioretention area
	FALL	INVASIVE CONTROL	edges of unit + in bioretention area

Ongoing work

- Maintenance plan for forebay and basin to ensure clear inflow (sediment removal, litter pickup, weed removal)
- Monitoring and management of invasive species
- Adaptive management of bioretention basin - monitor what plants are succeeding, and which are diminishing, making adjustments to ensure a high diversity of species that effectively filter stormwater.



Vegetation at Time of Original Land Survey (1847-1907)



9955 Spring road

- Oak openings and barrens
- Big Woods
- Prairie
- Wet prairie
- River bottom forest

0 0.5 1 2 Miles



Plant Survey Zones Spring Road

Oak Savanna
near remnant

Wooded Area
Northeast

Remnant

Woods by
House

Brome Fields

Creek/Meadow

Slope above
Creek/meadow

Wooded Island

House & Drive

West side
Creek

Upper Pine
Stand

Wooded Area
Southwest

Plant Survey - September 16, 2025

Area	Common Name	Scientific Name	% Cover	Type
Wooded Area (Southwest)				
	Buckthorn	<i>Rhamnus cathartica</i>	60	Tree*
	Basswood	<i>Tilia americana</i>	25	Tree
	White snakeroot	<i>Ageratina altissima</i>	8	Herbaceous perennial
	Black cherry	<i>Prunus serotina</i>	6	Tree
	Burr oak	<i>Quercus macrocarpa</i>	5	Tree
	Kentucky bluegrass	<i>Poa pratensis</i>	5	Grass
	Northern pin oak	<i>Quercus ellipsoidalis</i>	5	Tree
	Red cedar	<i>Juniperus virginiana</i>	5	Tree
	Moss	-	4	Groundcover
	Pennsylvania sedge	<i>Carex pensylvanica</i>	4	Sedge
	White ash	<i>Fraxinus americana</i>	4	Tree
	Canada goldenrod	<i>Solidago canadensis</i>	3	Herbaceous perennial
	American elm	<i>Ulmus americanus</i>	2	Tree
	Red pine	<i>Pinus resinosa</i>	2	Tree
	Black cap raspberry	<i>Rubus occidentalis</i>	1	Woody perennial
	Clearweed	<i>Pilea pumila</i>	1	Annual
	Cottonwood	<i>Populus deltoides</i>	1	Tree
	Green ash	<i>Fraxinus pennsylvanica</i>	1	Tree
	Hackberry	<i>Celtis occidentalis</i>	1	Tree
	Smooth brome	<i>Bromus inermis</i>	1	Grass
	White vervain	<i>Verbena urticifolia</i>	1	Herbaceous perennial
	Box elder	<i>Acer negundo</i>	<1	Tree
	Burdock	<i>Arctium minus</i>	<1	Herbaceous perennial
	Canada thistle	<i>Cirsium arvense</i>	<1	Herbaceous perennial
	Common milkweed	<i>Asclepias syriaca</i>	<1	Herbaceous perennial
	Creeping charlie	<i>Glechoma hederacea</i>	<1	Herbaceous perennial
	Crown vetch	<i>Securigera varia</i>	<1	Herbaceous perennial
	Gooseberry	<i>Ribes cynosbati</i>	<1	Woody perennial
	Hog peanut	<i>Amphicarpaea bracteata</i>	<1	Herbaceous perennial
	Honey locust	<i>Gleditsia triacanthos</i>	<1	Tree
	Lady fern	<i>Athyrium Filix-femina</i>	<1	Fern
	Leafy spurge	<i>Euphorbia virgata</i>	<1	Herbaceous perennial
	Motherwort	<i>Leonurus cardiaca</i>	<1	Herbaceous perennial
	Prickly ash	<i>Zanthoxylum americanum</i>	<1	Tree
	Riverbank grape	<i>Vitis riparia</i>	<1	Woody perennial
	Sedge (spp.)	<i>Carex spp.</i>	<1	Sedge
	Tartarian honeysuckle	<i>Lonicera tatarica</i>	<1	Shrub
	Violet	<i>Violet spp.</i>	<1	Herbaceous perennial
	Virginia stickseed	<i>Hackelia virginiana</i>	<1	Perennial
	White grass	<i>Leersia virginica</i>	<1	Grass
	Wood sorrel	<i>Oxalis stricta</i>	<1	Herbaceous perennial
	Bare ground			
Wooded Island				
	Basswood	<i>Tilia americana</i>	30	Tree
	Smooth brome	<i>Bromus inermis</i>	30	Grass
	Buckthorn	<i>Rhamnus cathartica</i>	25	Tree
	Burr oak	<i>Quercus macrocarpa</i>	10	Tree
	River birch	<i>Betula nigra</i>	8	Tree
	Crown vetch	<i>Securigera varia</i>	5	Herbaceous perennial

	Scots pine	<i>Pinus sylvestris</i>	5	Tree
	Motherwort	<i>Leonurus cardiaca</i>	3	Herbaceous perennial
Upper Pine Stand				
	White pine	<i>Pinus strobus</i>	50	Tree
	Smooth brome	<i>Bromus inermis</i>	20	Grass
	Red pine	<i>Pinus resinosa</i>	15	Tree
	Blue spruce	<i>Picea pungens</i>	5	Tree
	Tartarian honeysuckle	<i>Lonicera tatarica</i>	4	Shrub
	Canada goldenrod	<i>Solidago canadensis</i>	2	Herbaceous perennial
	Scots pine	<i>Pinus sylvestris</i>	2	Tree
	Buckthorn	<i>Rhamnus cathartica</i>	1	Tree
	Crown vetch	<i>Securigera varia</i>	1	Herbaceous perennial
	Green ash	<i>Fraxinus pennsylvanica</i>	1	Tree
	Leafy spurge	<i>Euphorbia virgata</i>	1	Herbaceous perennial
	Red cedar	<i>Juniperus virginiana</i>	1	Tree
	White spruce	<i>Picea glauca</i>	1	Tree
	Canada thistle	<i>Cirsium arvense</i>	<1	Herbaceous perennial
	Virginia creeper	<i>Parthenocissus quinquefolia</i>	<1	Herbaceous perennial
	Wild lettuce	<i>Lactuca spp.</i>	<1	Herbaceous perennial
Brome Fields				
	Smooth brome	<i>Bromus inermis</i>	60	Grass
	Kentucky bluegrass	<i>Poa pratensis</i>	30	Grass
	White spruce	<i>Picea glauca</i>	10	Tree
	Leafy spurge	<i>Euphorbia virgata</i>	5	Herbaceous perennial
	Indian grass	<i>Sorghastrum nutans</i>	3	Grass
	Black cap raspberry	<i>Rubus occidentalis</i>	2	Woody perennial
	Red cedar	<i>Juniperus virginiana</i>	2	Tree
	Canada goldenrod	<i>Solidago canadensis</i>	1	Herbaceous perennial
	Crown vetch	<i>Securigera varia</i>	1	Herbaceous perennial
	Scots pine	<i>Pinus sylvestris</i>	1	Tree
	White mulberry	<i>Morus alba</i>	1	Woody perennial
	Whorled milkweed	<i>Asclepias verticillata</i>	1	Herbaceous perennial
	Common milkweed	<i>Asclepias syriaca</i>	<1	Herbaceous perennial
	Common ragweed	<i>Ambrosia artemisiifolia</i>	<1	Herbaceous perennial
	Mullein	<i>Verbascum thapsus</i>	<1	Herbaceous perennial
	Northern pin oak	<i>Quercus ellipsoidalis</i>	<1	Tree
	Western ragweed	<i>Ambrosia psilostachya</i>	<1	Herbaceous perennial
	Bare ground			
Remnant				
	Smooth brome	<i>Bromus inermis</i>	65	Grass
	Red cedar	<i>Juniperus virginiana</i>	20	Tree
	Kentucky bluegrass	<i>Poa pratensis</i>	8	Grass
	Big bluestem	<i>Andropogon gerardii</i>	7	Grass
	Cottonwood	<i>Populus deltoides</i>	5	Tree
	Crown vetch	<i>Securigera varia</i>	3	Herbaceous perennial
	Indian grass	<i>Sorghastrum nutans</i>	3	Grass
	Ground cherry	<i>Physalis spp.</i>	2	Herbaceous perennial

	Little bluestem	<i>Schizachyrium scoparium</i>	2	Grass
	Side oats grama	<i>Bouteloua curtipendula</i>	2	Grass
	Canada goldenrod	<i>Solidago canadensis</i>	1	Herbaceous perennial
	Kittentails	<i>Besseyia bullii</i>	1	Herbaceous perennial
	Marbleseed	<i>Onosmodium molle</i>	1	Herbaceous perennial
	Porcupine grass	<i>Stipa spartea</i>	1	Grass
	Prairie dropseed	<i>Sporobolus heterolepis</i>	1	Grass
	Aster spp.	<i>Symphyotrichum spp.</i>	<1	Herbaceous perennial
	Birdsfoot violet	<i>Viola pedata</i>	<1	Herbaceous perennial
	Green ash	<i>Fraxinus pennsylvanica</i>	<1	Tree
	Leafy spurge	<i>Euphorbia virgata</i>	<1	Herbaceous perennial
	Gayfeather	<i>Liatris cylindracea or Liatris squarrosa</i>	<1	Herbaceous perennial
	Mullein	<i>Verbascum thapsus</i>	<1	Herbaceous perennial
	Rhombic primrose	<i>Oenothera rhombipetala</i>	<1	Herbaceous perennial
	Purple prairie clover	<i>Dalea purpurea</i>	<1	Herbaceous perennial
	Whorled milkweed	<i>Asclepias verticillata</i>	<1	Herbaceous perennial
	Bare ground		2	
Oak Savanna near remnant				
	Kentucky bluegrass	<i>Poa pratensis</i>	60	Grass
	Burr oak	<i>Quercus macrocarpa</i>	40	Tree
	Buckthorn	<i>Rhamnus cathartica</i>	30	Tree
	Smooth brome	<i>Bromus inermis</i>	20	Grass
	Basswood	<i>Tilia americana</i>	10	Tree
	Prickly ash	<i>Zanthoxylum americanum</i>	10	Tree
	Big bluestem	<i>Andropogon gerardii</i>	<1	Grass
	Mullein	<i>Verbascum thapsus</i>	<1	Herbaceous perennial
	Yarrow	<i>Achillea millefolium</i>	<1	Herbaceous perennial
	Bare ground			
Wooded Area Northeast				
	Buckthorn	<i>Rhamnus cathartica</i>	60	Tree
	Bare ground		50	
	Aspen	<i>Populus tremuloides</i>	30	Tree
	Burr oak	<i>Quercus macrocarpa</i>	15	Tree
	Box elder	<i>Acer negundo</i>	8	Tree
	Hackberry	<i>Celtis occidentalis</i>	8	Tree
	Red cedar	<i>Juniperus virginiana</i>	4	Tree
	Garlic mustard	<i>Alliaria petiolata</i>	3	Herbaceous perennial
	Mullenbergia grass	<i>Muhlenbergia spp.</i>	2	Grass
	Black cherry	<i>Prunus serotina</i>	1	Tree
	Creeping charlie	<i>Glechoma hederacea</i>	1	Herbaceous perennial
	Virginia stickseed	<i>Hackelia virginiana</i>	1	Herbaceous perennial
	Virginia waterleaf	<i>Hydrophyllum virginianum</i>	1	Herbaceous perennial
	White snakeroot	<i>Ageratina altissima</i>	1	Herbaceous perennial
	Osterich fern	<i>Matteuccia struthiopteris</i>	<1	Herbaceous perennial
	Sedges	<i>Carex spp.</i>	<1	Sedge

Woods by house				
	Buckthorn	<i>Rhamnus cathartica</i>	70	Tree
	Burr oak	<i>Quercus macrocarpa</i>	40	Tree
	White/blue spruce	<i>Picea pungens</i>	30	Tree
	White pine	<i>Pinus strobus</i>	10	Tree
	Scots pine	<i>Pinus sylvestris</i>	3	Tree
	White cedar	<i>Thuja occidentalis</i>	1	Tree
	Virginia creeper	<i>Parthenocissus quinquefolia</i>	<1	Herbaceous perennial
	Bare ground			
Creek/meadow				
	Jewelweed	<i>Impatiens capensis</i>	35	Herbaceous perennial
	Reed canary grass	<i>Phalaris arundinacea</i>	15	Grass
	Buckthorn	<i>Rhamnus cathartica</i>	8	Tree
	Honeysuckle (tartarian or marrow's)	<i>Lonicera morrowii</i>	8	Shrub
	Rice cut grass	<i>Leersia oryzoides</i>	8	Grass
	Burr oak	<i>Quercus macrocarpa</i>	6	Tree
	Canada goldenrod	<i>Solidago canadensis</i>	5	Herbaceous perennial
	Canada thistle	<i>Cirsium arvense</i>	5	Herbaceous perennial
	Scots pine	<i>Pinus sylvestris</i>	5	Tree
	Joe pye weed	<i>Eutrochium maculatum</i>	4	Herbaceous perennial
	Red pine	<i>Pinus resinosa</i>	2	Tree
	River birch	<i>Betula nigra</i>	2	Tree
	Black cap raspberry	<i>Rubus occidentalis</i>	1	Woody perennial
	Clearweed	<i>Pilea pumila</i>	1	Annual
	Green ash	<i>Fraxinus pennsylvanica</i>	1	Tree
	Hemp	<i>Cannabis sativa</i>	1	Herbaceous perennial
	Motherwort	<i>Leonurus cardiaca</i>	1	Herbaceous perennial
	Stinging nettle	<i>Urtica dioica</i>	1	Herbaceous perennial
	Hybrid cattail	<i>Typha X glauca</i>	<1	Herbaceous perennial
	Pannicled aster	<i>Symphotrichum lanceolatum</i>	<1	Herbaceous perennial
	Violet	<i>Viola spp.</i>	<1	Herbaceous perennial
	Virginia stickseed	<i>Hackelia virginiana</i>	<1	Herbaceous perennial
	Wild lettuce	<i>Lactuca spp.</i>	<1	Herbaceous perennial
	Willow herb	<i>Epilobium spp.</i>	<1	Herbaceous perennial
	Bare ground			
West side of creek				
	Box elder	<i>Acer negundo</i>	35	Tree
	Buckthorn	<i>Rhamnus cathartica</i>	30	Tree
	Tartarian honeysuckle	<i>Lonicera tatarica</i>	20	Shrub
	American elm	<i>Ulmus americanus</i>	15	Tree
Slope above creek/meadow				
	aster spp.	<i>Symphotrichum spp.</i>		Herbaceous perennial
	Buckthorn	<i>Rhamnus cathartica</i>		Tree
	Canada goldenrod	<i>Solidago canadensis</i>		Herbaceous perennial
	Creeping charlie	<i>Glechoma hederacea</i>		Herbaceous perennial

	green ash	<i>Fraxinus pennsylvanica</i>		Tree
	hemp	<i>Cannabis sativa</i>		Herbaceous perennial
	jewelweed	<i>Impatiens capensis</i>		Herbaceous perennial
	kentucky bluegrass	<i>Poa pratensis</i>		Grass
	Motherwort	<i>Leonurus cardiaca</i>		Herbaceous perennial
	Osterich fern	<i>Matteuccia struthiopteris</i>		Fern
	red fescue	<i>Festuca ruba</i>		Grass
	Virginia stickseed	<i>Hackelia virginiana</i>		Herbaceous perennial
	White snakeroot	<i>Ageratina altissima</i>		Herbaceous perennial
	Wild cucumber	<i>Echinocystis lobata</i>		Herbaceous perennial
	Wood sorrel	<i>Oxalis spp.</i>		Herbaceous perennial

Proposed Management Zones Spring Road

- Remnant+
- House & Drive
- Creek/Meadow
- Wooded Area
- Pine Stand
- Visual Buffer



Non-chemical woody species control protocols

Tartarian Honeysuckle Control	
Solarization Protocol	
For plants with crown of 5-10"	
Year 1	
May/June	Cut all branches/stems at about 1' from the ground. Remove any leaves or shoots. Cover the entire pruned shrub with a contractor-grade black plastic garbage bag or other heavy black plastic. Tie the bag tightly with twine or zip ties around the base of the stem. Spread the loose part of the bag around the base of the crown and staple it to the ground in several places.
September/October	Keep the bag on the plant for 2-3 months. Remove the bag. The plant should be dead. Remove the plant and its roots by rocking it back and forth. ***Immediately seed the area, or plant with containerized plants.

For more information on non-chemical buckthorn removal, please visit:

- Friends of the Mississippi River [Critical Cutting Protocol](#)
- [Buckthorn Baggie](#)

Buckthorn Control	
Critical Cutting Period Protocol	
For plants with stems 2"+ diameter	
Year 1	
May/June	Cut the main stem at about chest height (3-5'), strip the branches and leaves from the main stem.
Mid-late September	Cut off, or "re-strip," any branches and new growth from the tall stump.
Year 2	
May/June	Cut off, or "re-strip," any branches and new growth from the tall stump.
Late September	Cut off, or "re-strip," any branches and new growth from the tall stump. The buckthorn may be dead at this point. If so, rock the stem back and forth to dislodge it. Dead stems can be used for habitat creation in other areas of the site.
Year 3	
*if not dead by end of Y2, repeat stripping for a third growing season	

Buckthorn Control	
Buckthorn Baggie Protocol	*can be used for other woody invasive species
For plants with stems 2"+ diameter	
Any time of year	Cut any buckthorn or plant with loppers or saw leaving 6 inch stump. (any time of the year)
	Place plastic Buckthorn bag over buckthorn stump.
	Zip tie bag at middle of buckthorn stump. (up 3" from ground)
	Make sure bag is touching ground and fanned out at bottom to catch any new buckthorn shoots.
One year later	Return one year later – the buckthorn should be dead. You can remove the stump or leave it to decompose.
	Remove and re-use bag placed last year on last year's buckthorn stump to a freshly cut down buckthorn plant. This product can be re-used from year to year depending on how much sun hits the buckthorn baggie. The will last a full 2 years in full sun.

WOODY MATERIAL REUSE



buckthorn



BIOCHAR



HABITAT ELEMENTS



HOLIDAY TREES



SITE ELEMENTS



SITE FURNISHINGS



conifers / xmas trees



mature trees
removed from brome fields