

Minnesota River Valley

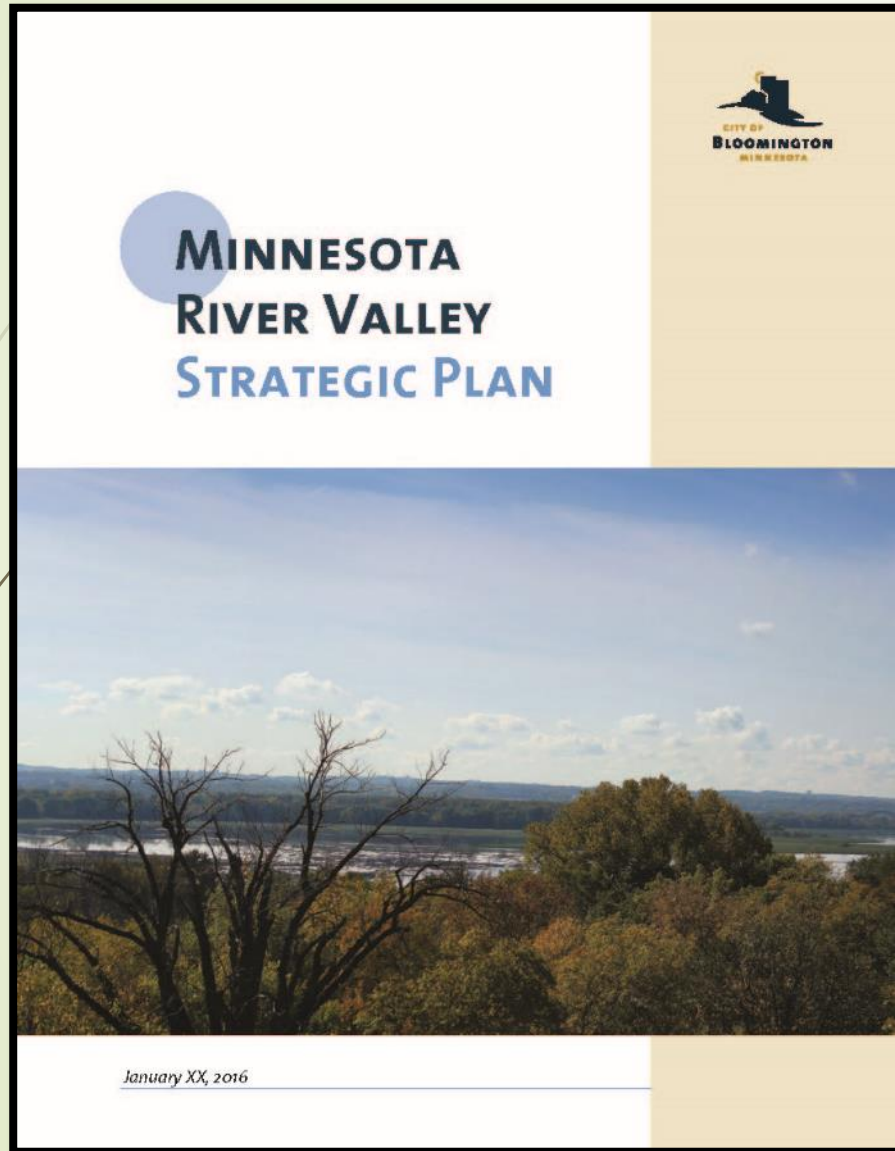


Natural and Cultural Systems Plan



City Council Study Session
May 14, 2018

Background



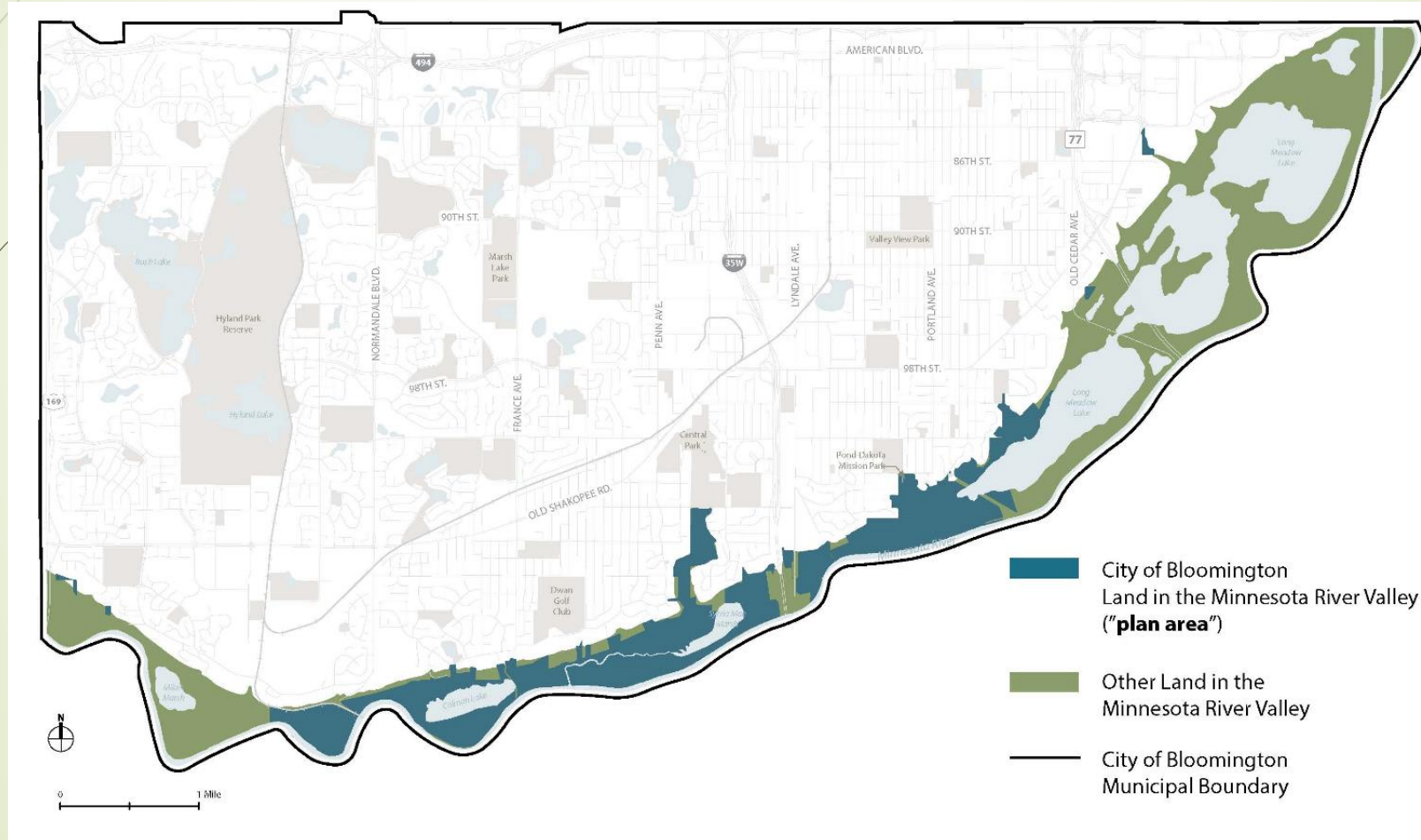
Strategic Plan

Recommended System Plans

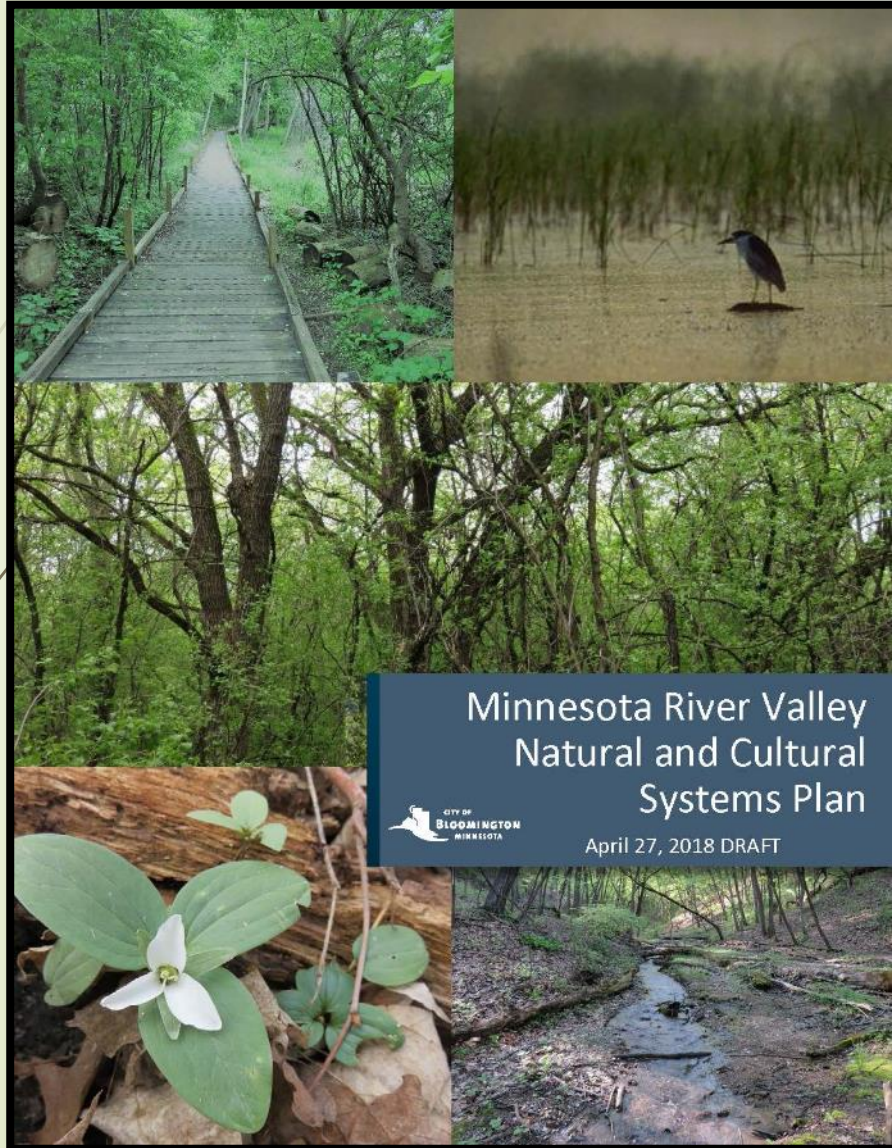
- Natural Resources
- Cultural & Historic Resources
- Signage
- Trails
- Maintenance

Purpose

To identify city-owned areas in the River Valley that are of highest priority for resource enhancement, and to recommend management strategies and priorities



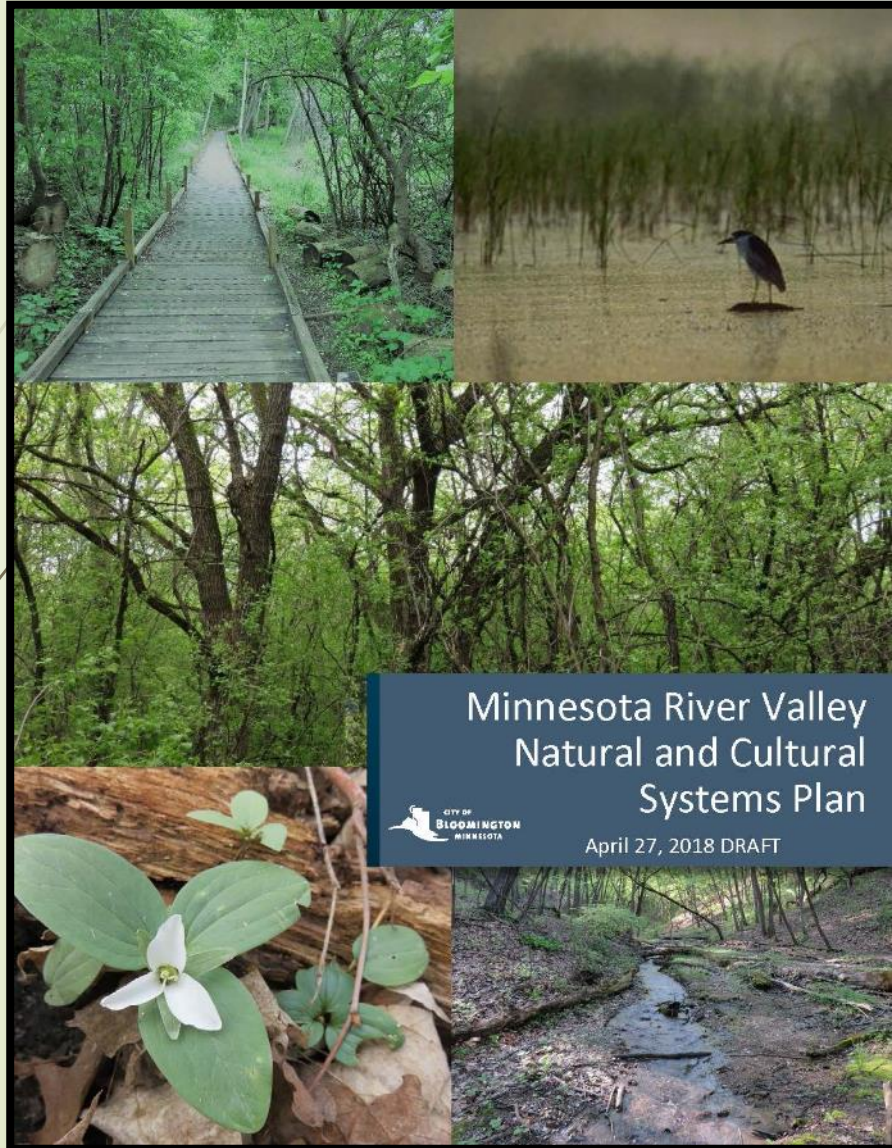
Overview of Plan



Sections

- Purpose
- Historical Perspective
- Current Conditions
- Resource Management
- Education
- Implementation

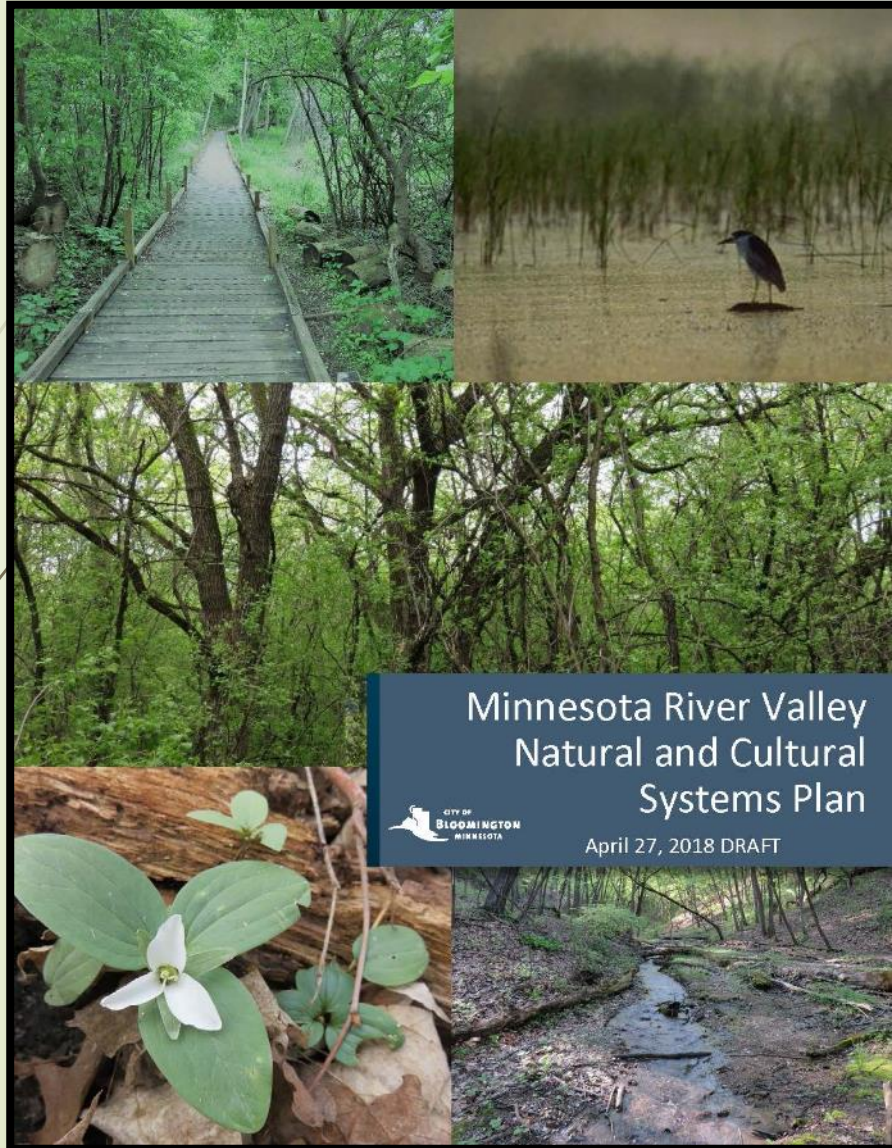
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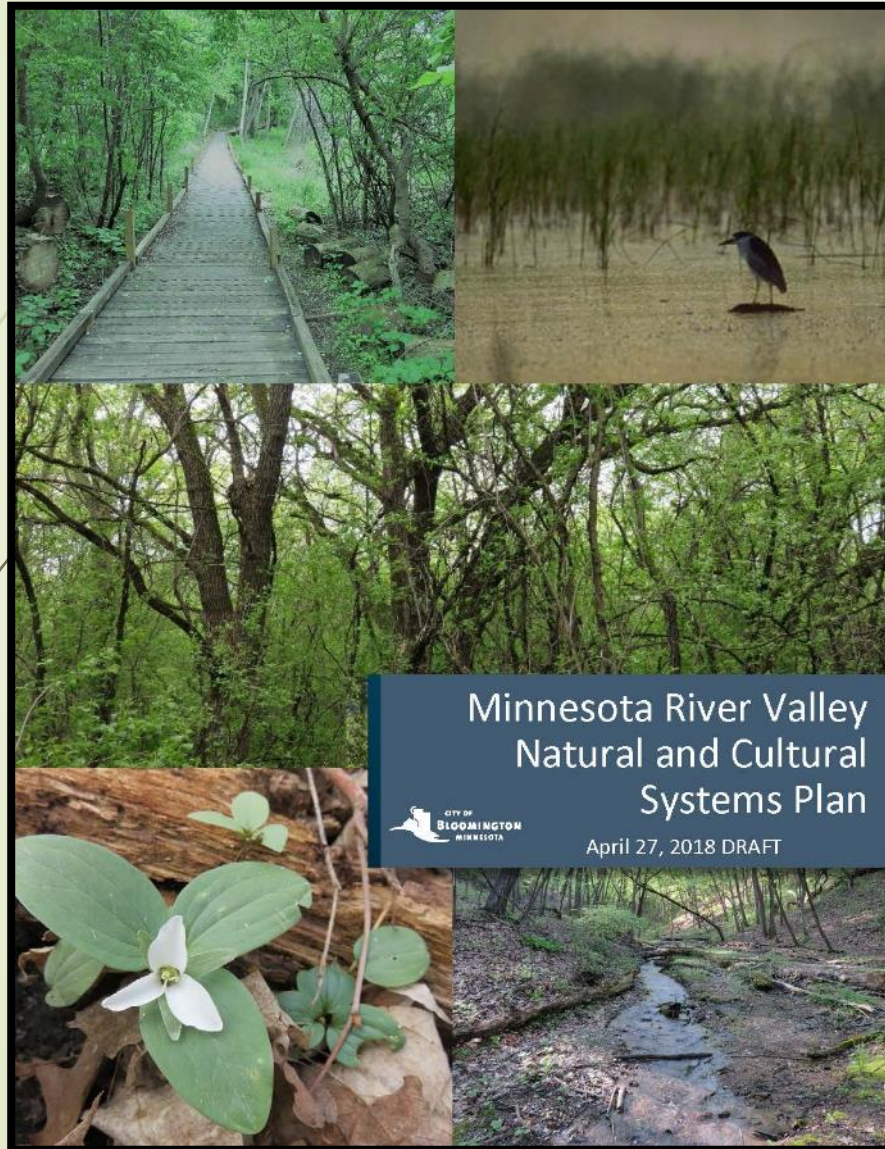
Minnesota River Valley Natural and Cultural Systems Plan

April 27, 2018 DRAFT

Sections

- Purpose
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Overview of Plan



Minnesota River Valley
Natural and Cultural
Systems Plan

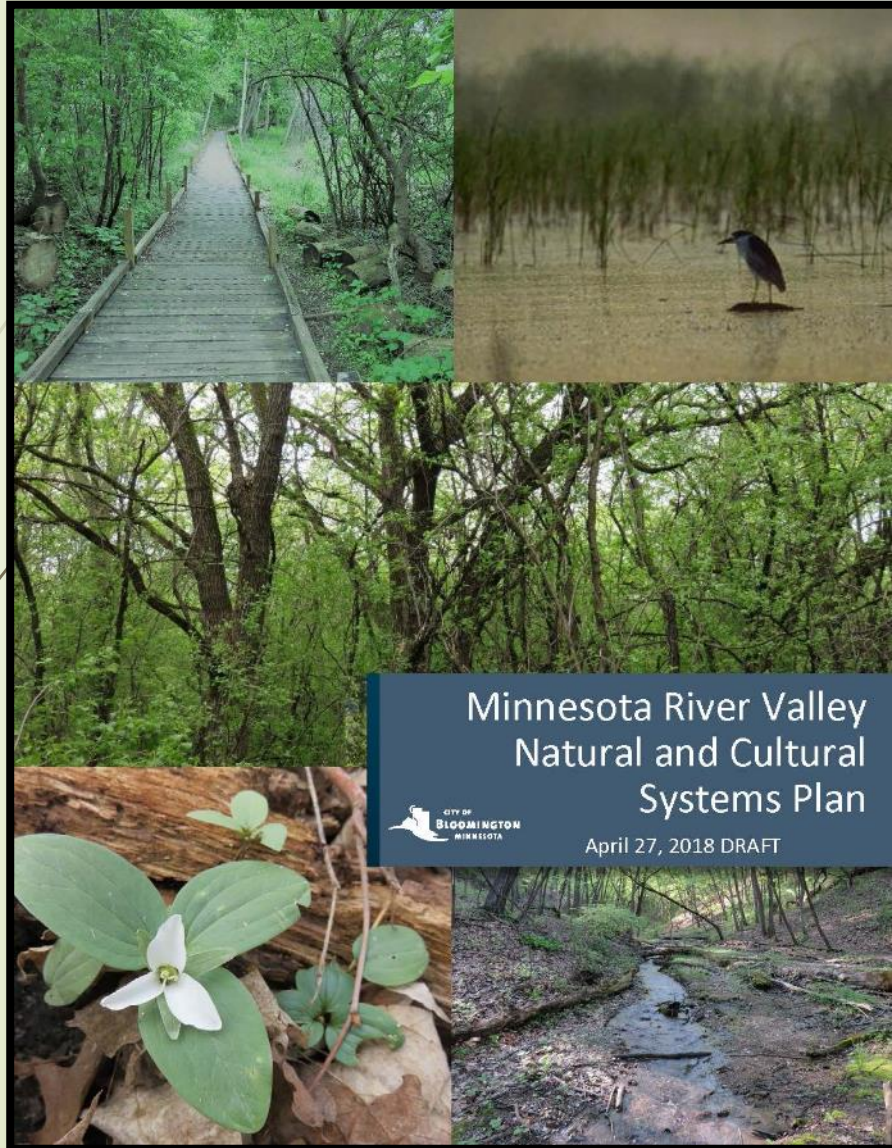


April 27, 2018 DRAFT

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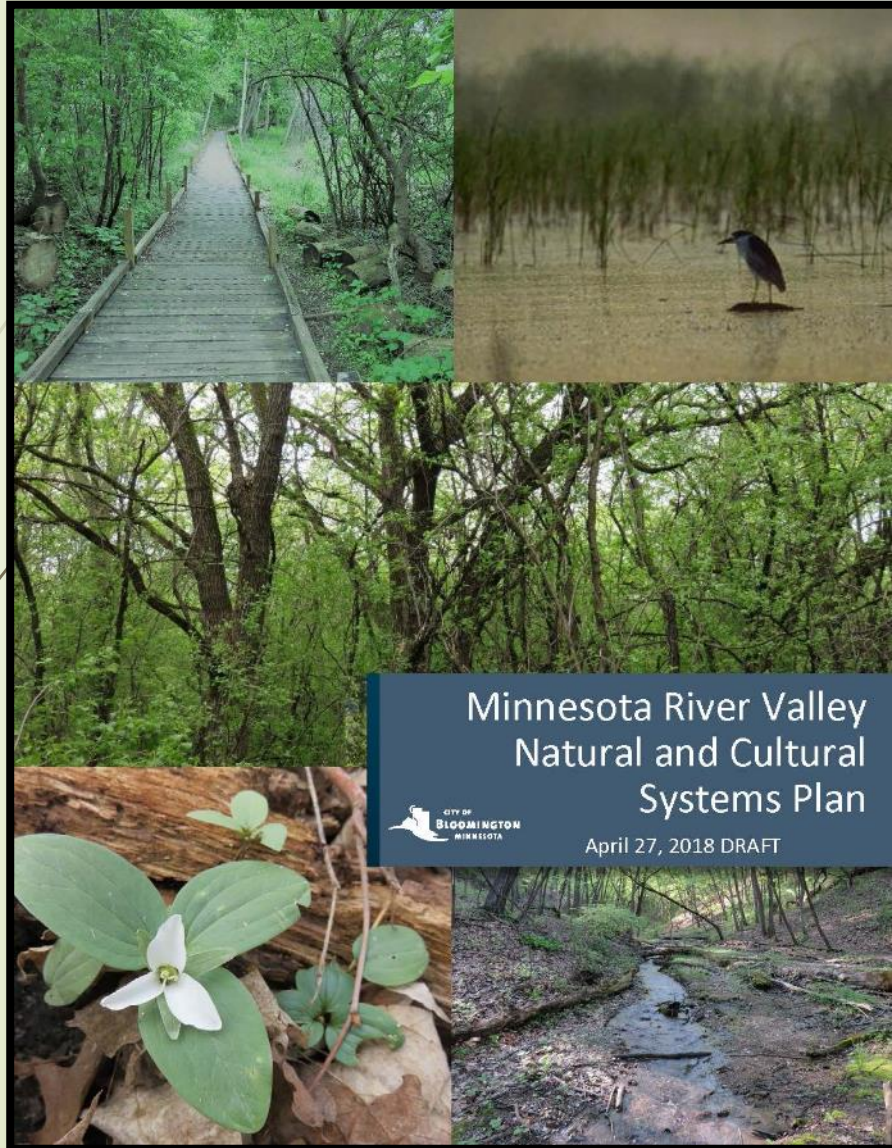
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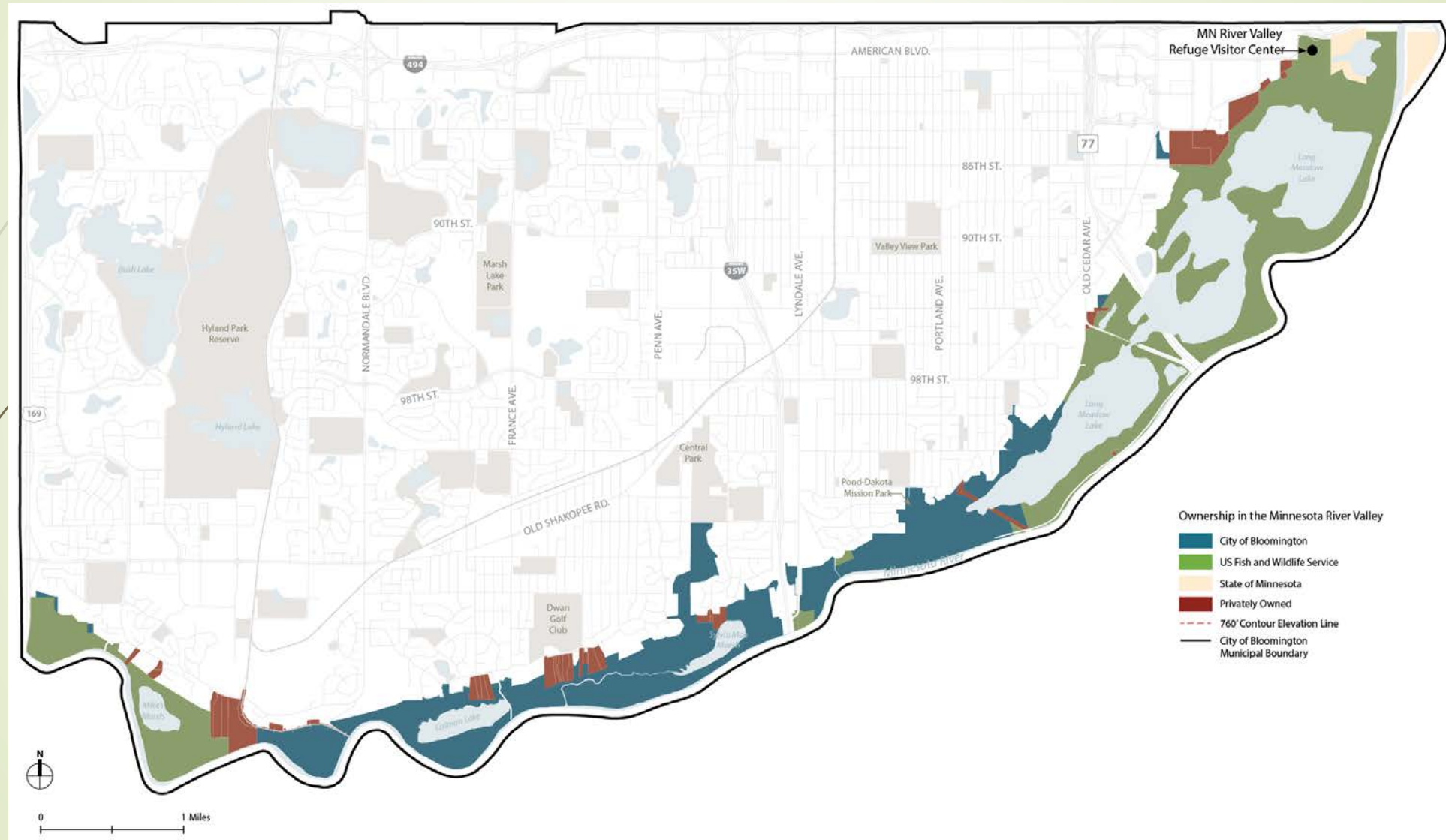
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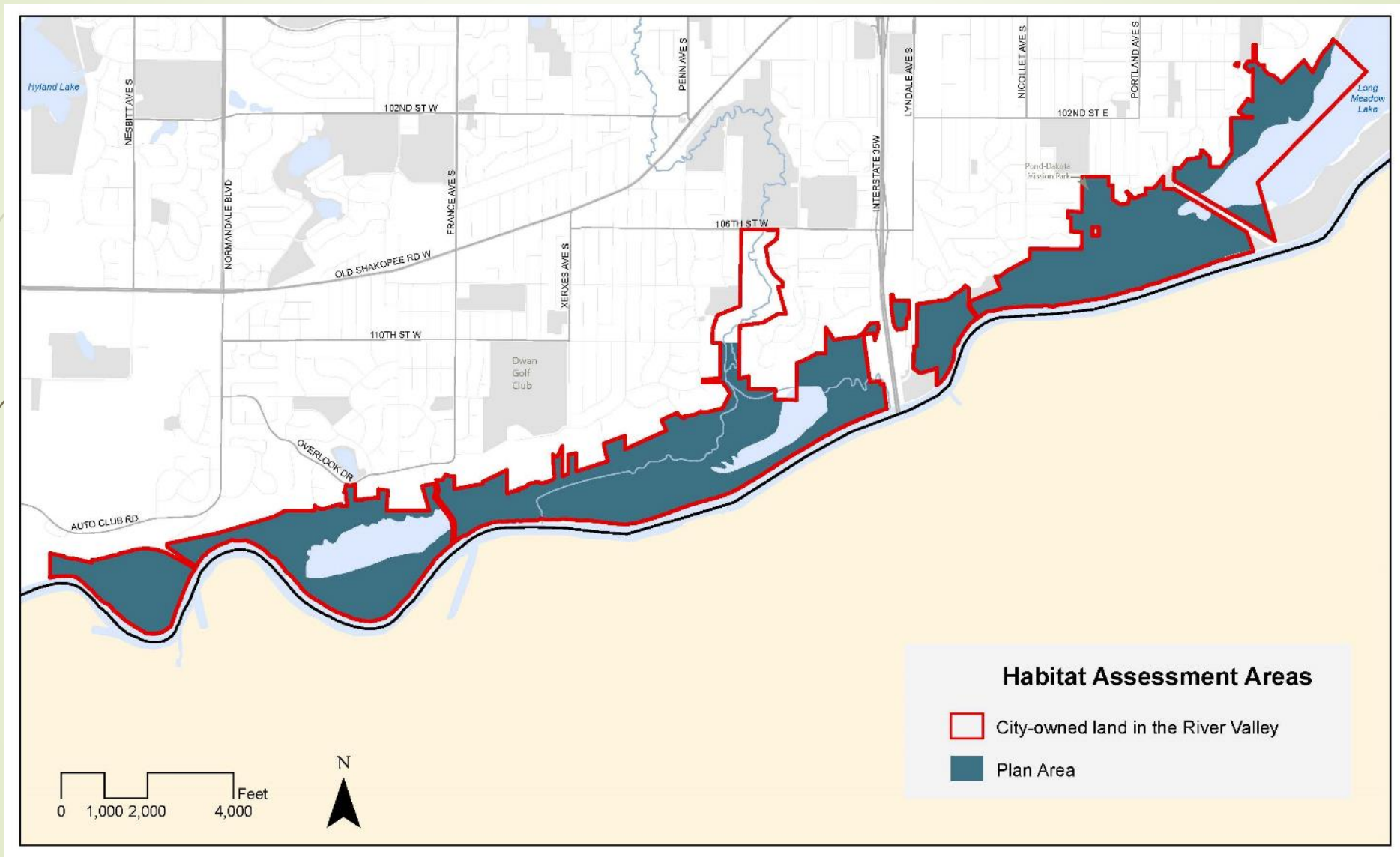
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- Implementation

Current Conditions – Plan Area



Current Conditions – Plan Area



Natural & Cultural Systems



Cultural Resources

Natural Resources

Natural & Cultural Systems



Cultural Resources

- Known & Unknown

Natural Resources

Natural & Cultural Systems



Cultural Resources

- Known & Unknown
- Tangible & Intangible

Natural Resources

Natural & Cultural Systems



Cultural Resources

- Known & Unknown
- Tangible & Intangible

Natural Resources

- Water resources

Natural & Cultural Systems



Cultural Resources

- Known & Unknown
- Tangible & Intangible

Natural Resources

- Water resources
- Fauna

Natural & Cultural Systems



Cultural Resources

- Known & Unknown
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- **Flora**

Natural & Cultural Systems



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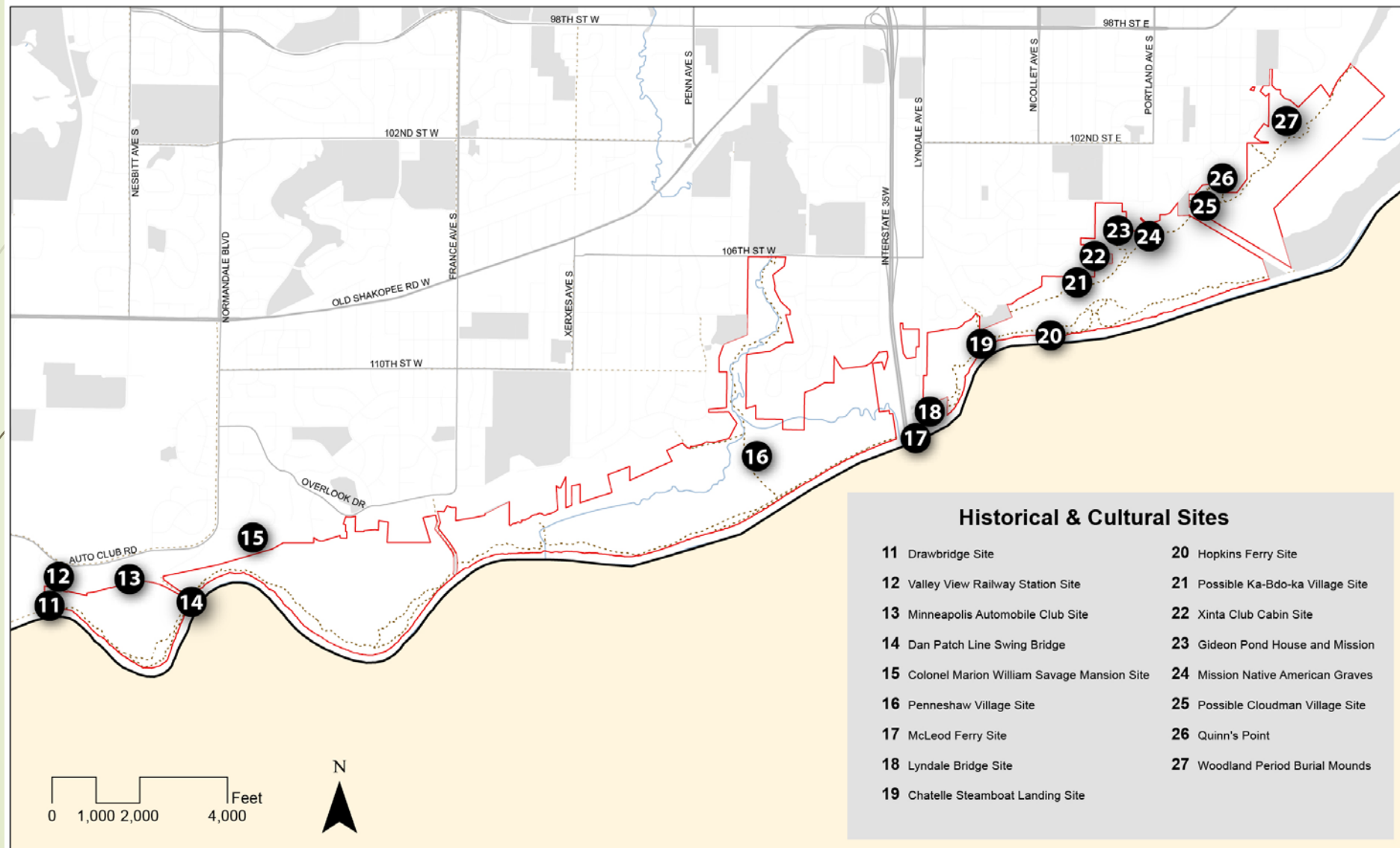
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- **Flora**

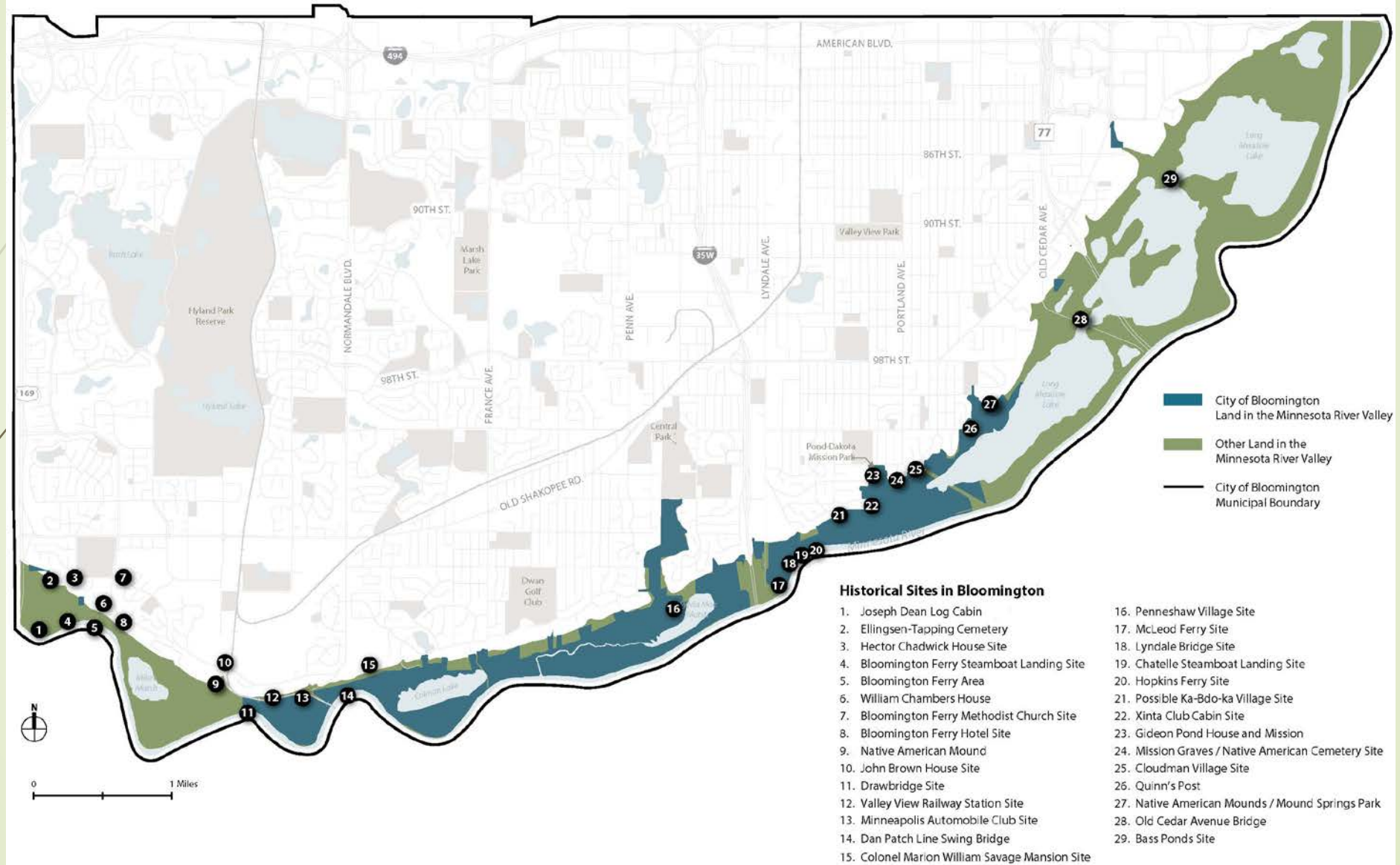
Past Surveys

- **1853** - Public Land Survey
- **1998** to Present – Minnesota Land Cover Classification System (MLCCS)
- **2007** – *Natural Resources Inventory of the City of Bloomington* (NRI) by Hennepin County
- **2017** – Verification of NRI by Great River Greening (GRG)

Current Conditions – Cultural Resources



Current Conditions – Cultural Resources



Current Conditions – Fauna



Current Conditions – Fauna



Current Conditions – Fauna



Current Conditions – Fauna



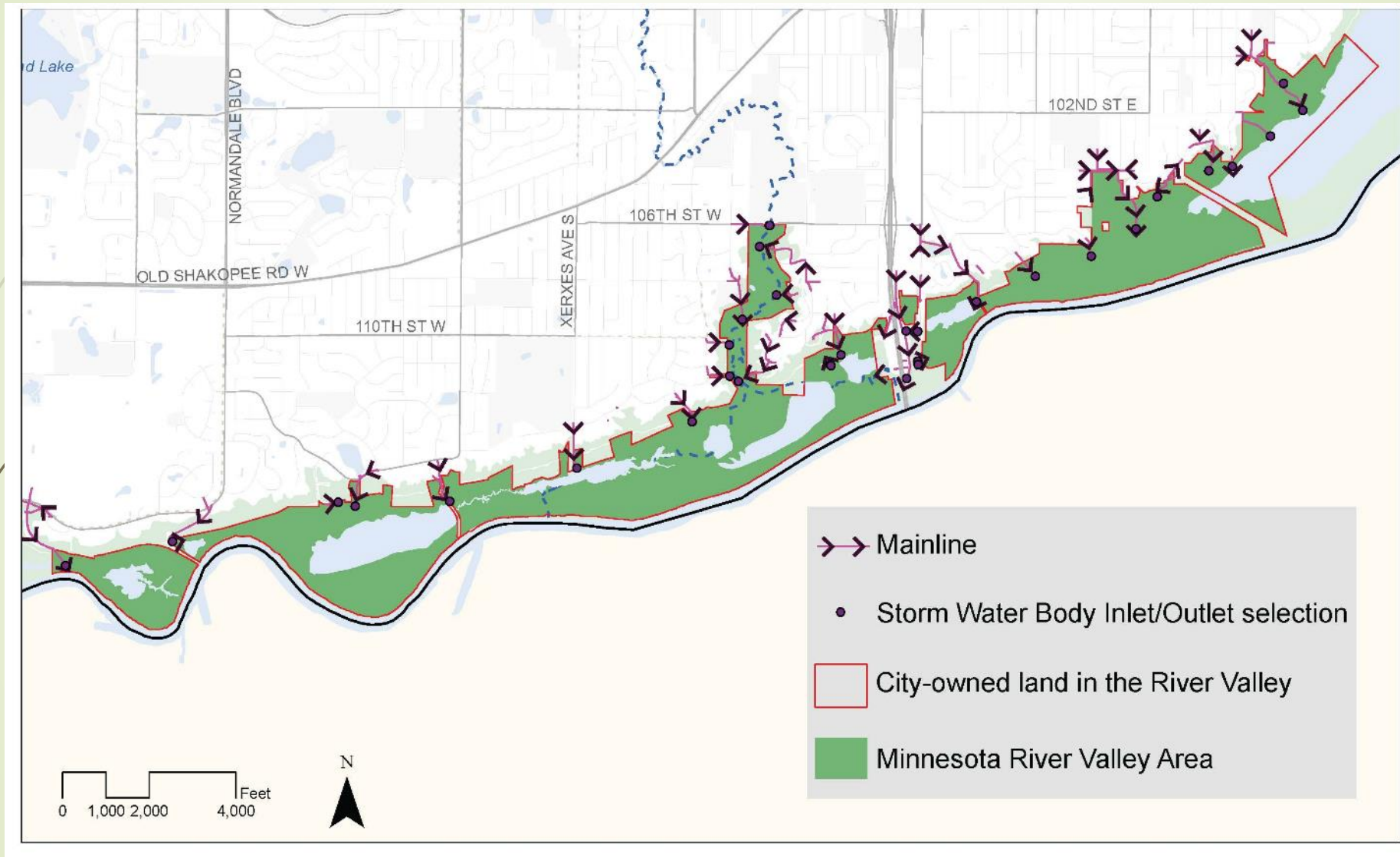
Current Conditions – Fauna

Table 1: Wildlife and Plant Species of Concern to the Minnesota Valley NWR and Wetland Management District

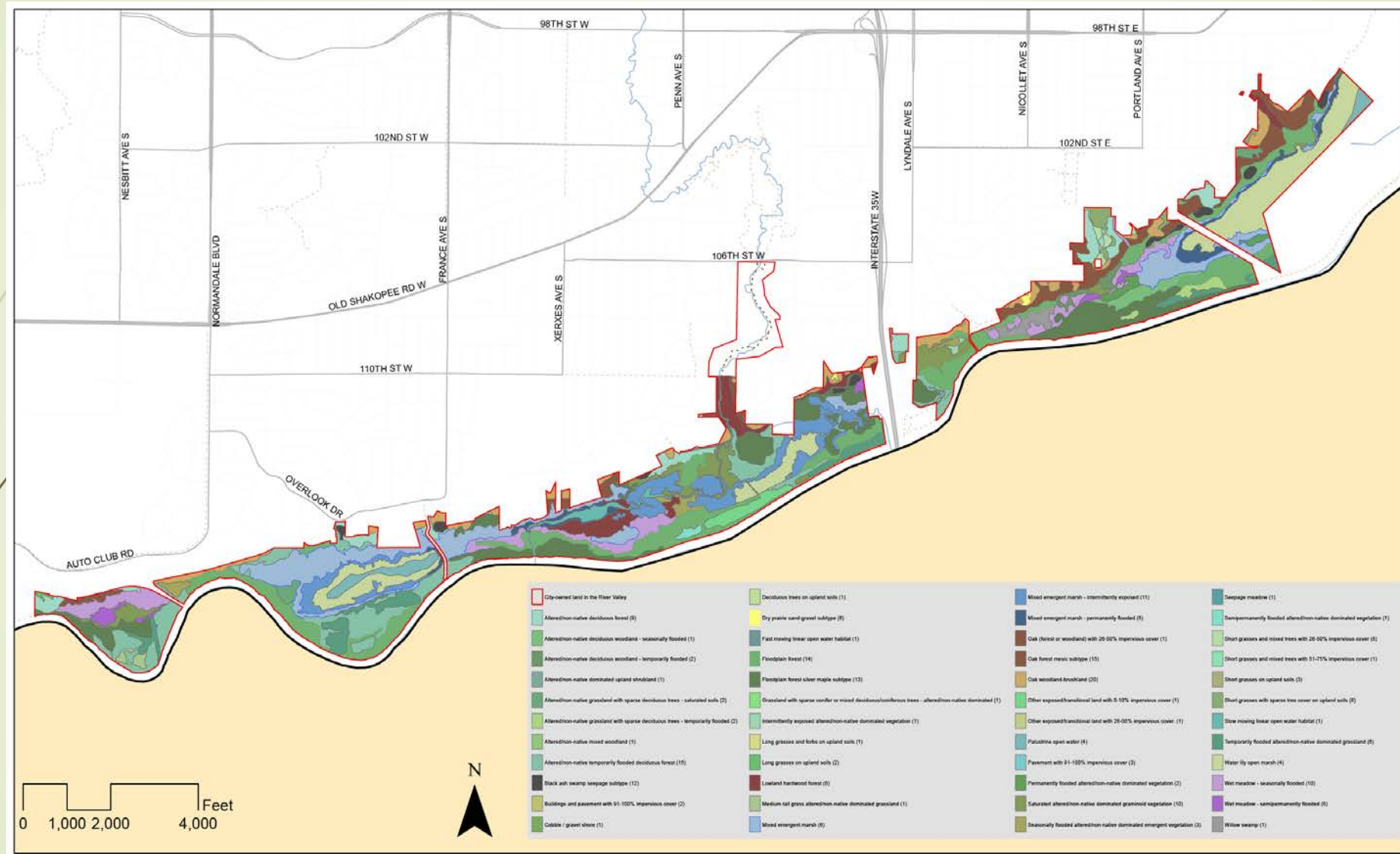
Species (* = managing habitat for these species)	Refuge Status	Monitored on Refuge by Staff or by MnDNR?	Regional/ State Status	Potential Benefit by Habitat Habitat used for Production (P) or Migration (M)				
				Wetlands	Floodplain Forest	Upland Forest	Oak Savanna	Grasslands
White-tailed Deer*	Recreation/economic Common/abundant	Yes			P	P		
Eastern Spotted Skunk	Uncommon	Yes	ST		P			P
Prairie Vole	Rare	No	SSC					P
Least Weasel	Rare	No	SSC	P	P			P
Northern myotis	Rare	No	SSC		P			P
Plains Pocket Mouse	Uncommon	No	SSC				P	P
Eastern pipistrelle	Rare	No	SSC		P			P
Common Loon	Occasional	Yes	R3	M				
Horned Grebe	Rare	Yes	ST	M				
American White Pelican*	Common seasonally	Yes	SSC	M				
Double-crested Cormorant	Common/ increasing	Yes	R3 (nuisance)	M	M,P			

R3: Conservation Priority R3
 E: Federal Endangered
 T: Federal Threatened
 SE: State Endangered
 ST: State Threatened
 SSC: State Species of Concern

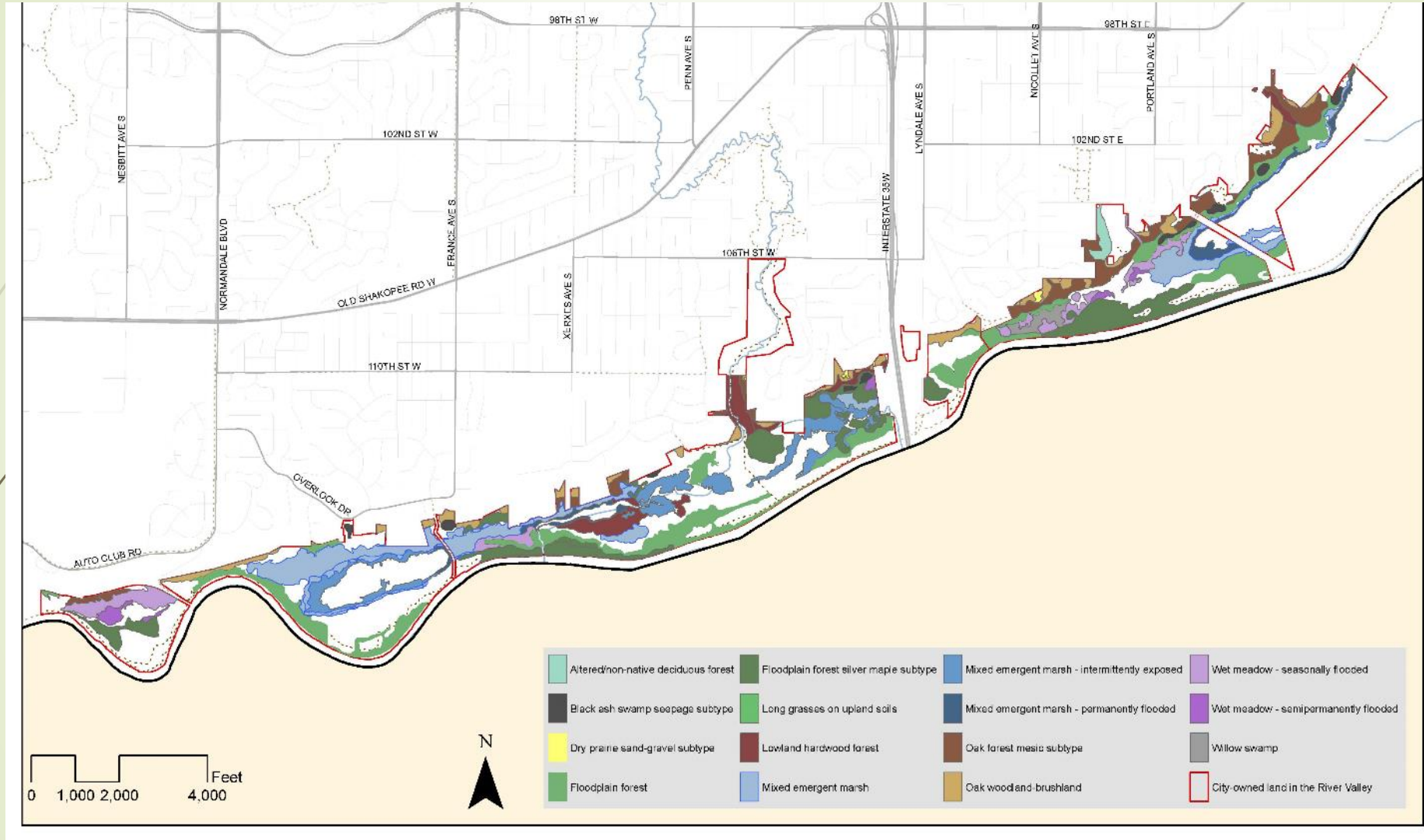
Current Conditions – Water Resources



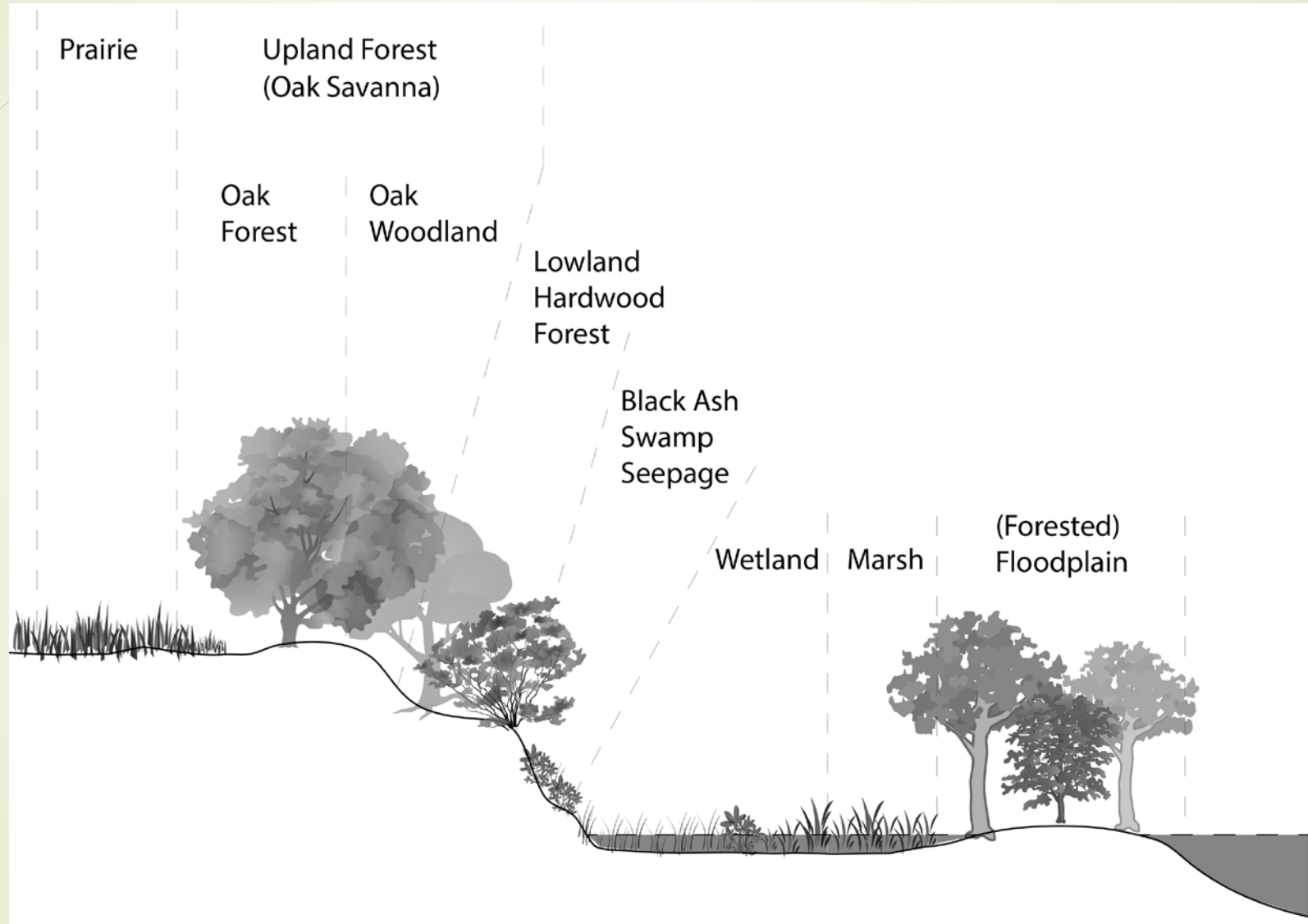
Current Conditions – Flora & Land Cover



Current Conditions – Surveyed Areas



Current Conditions – Surveyed Natural Areas



Oak Savanna



- 25 – 50% Canopy Cover
- 12 mature trees/acre
- Continuous Ground Cover

Oak Savanna



- 25 – 50% Canopy Cover
- 12 mature trees/acre
- Continuous Ground Cover

Historic Perspective



Seth Eastman painting (1847) of River Valley

Aerial Photos

Parker's Picnic Grounds



1957

Aerial Photos

Parker's Picnic Grounds



1975

Aerial Photos

Parker's Picnic Grounds



2015

Resource Threats



- **Climate Change**
- **Flooding**
- Excessive Dead, Fallen Wood
- Overgrown plant populations, bare soils, and erosion
- Undesirable Species
- Dumping
- Human Disturbance

Resource Threats



- Climate Change
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- **Excessive Dead, Fallen Wood**
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Resource Threats



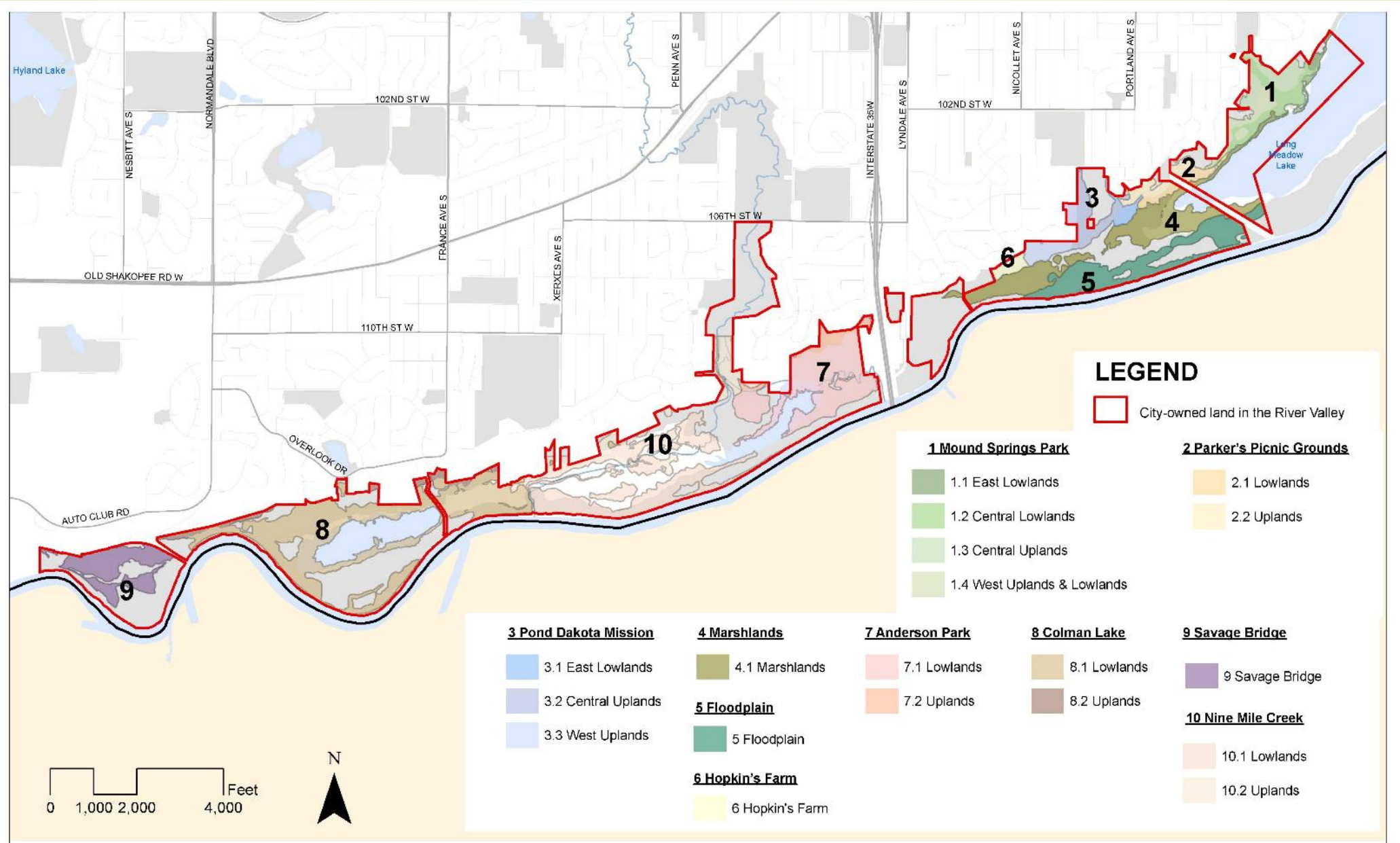
- Climate Change
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Resource Threats



- Climate Change
- Flooding
- Excessive Dead, Fallen Wood
- Overgrown plant populations, bare soils, and erosion
- **Undesirable Species**
- Dumping
- Human Disturbance

Considerations - Management Areas



Priority Areas - Considerations

Priority Management Objectives & Strategies

1. Enhance/restore to a more open floodplain forest

- Thin trees
- Remove or burn cut woody vegetation

***The ideal state for 46CC is found in this area at the convergence of 46V, 46W, and 46X.**

1. Maintain and enhance existing plant diversity

- Remove dead vegetation, leaf litter, and dead, fallen wood
- Conduct selective tree thinning to sustain 50% sunlight to the ground level
- Remove or burn cut woody vegetation

2. Enhance/restore beaver populations

- Cut old stems of willows and allow resprouts to grow

**Habitat Assessment
(sample)**

Tree Thinning

Cost: \$45,000+ / acre

Tree thinning is a management strategy aimed at achieving the appropriate number of trees and density of tree canopy that will sustain the desired vegetative community from the ground layer up. It entails removing trees by either cutting or girdling, and removing the woody debris. Thinning can be highly effective, but is also one of the most costly management strategies.

Equipment



Chainsaw



Feller-buncher



Wood Chipper

**Management Strategies & Costs
(sample)**

Priority Areas - Criteria

- 1. Improvement and/or Expansion of Existing Efforts
- 2. Quality of Vegetative Community
- 3. Visibility and Public Perception
- 4. Technical Viability of Initial Management
- 5. Technical Viability of Long-term Management
- 6. Presence of Biological Resources of Special Significance

Scoring for Criterion 1	
Existing Restoration Area	2
Adjacent to existing restoration site	1
No existing effort present in the area	0

Priority Areas - Criteria

- 1. Improvement and/or Expansion of Existing Efforts
- 2. **Quality of Vegetative Community**
- 3. Visibility and Public Perception
- 4. Technical Viability of Initial Management
- 5. Technical Viability of Long-term Management
- 6. Presence of Biological Resources of Special Significance

Scoring for Criterion 2	
High/Good Quality (B or C rating)	2
Moderate/Poor Quality (D rating)	1
Altered/non-native community (F or NN rating)	0

Priority Areas - Criteria

- 1. Improvement and/or Expansion of Existing Efforts
- 2. Quality of Vegetative Community
- 3. Visibility and Public Perception**
- 4. Technical Viability of Initial Management
- 5. Technical Viability of Long-term Management
- 6. Presence of Biological Resources of Special Significance

Scoring for Criterion 3	
<i>Visible from parks, trailheads, and highly visited sites</i>	2
<i>Distantly visible from the above sites</i>	1
<i>Not visible from the above sites</i>	0

Priority Areas - Criteria

- 1. Improvement and/or Expansion of Existing Efforts
- 2. Quality of Vegetative Community
- 3. Visibility and Public Perception
- 4. **Technical Viability of Initial Management**
- 5. Technical Viability of Long-term Management
- 6. Presence of Biological Resources of Special Significance

Scoring for Criterion 4	
<i>Large machinery able to access site</i>	2
<i>Only small machinery able to access site.</i>	1
<i>All proposed work must be done by hand</i>	0

Priority Areas - Criteria

- 1. Improvement and/or Expansion of Existing Efforts
- 2. Quality of Vegetative Community
- 3. Visibility and Public Perception
- 4. Technical Viability of Initial Management
- 5. **Technical Viability of Long-term Management**
- 6. Presence of Biological Resources of Special Significance

Scoring for Criterion 5	
<i>Little to no threats to long-term management</i>	2
<i>Some threats to long-term management</i>	1
<i>Many threats to long-term management</i>	0

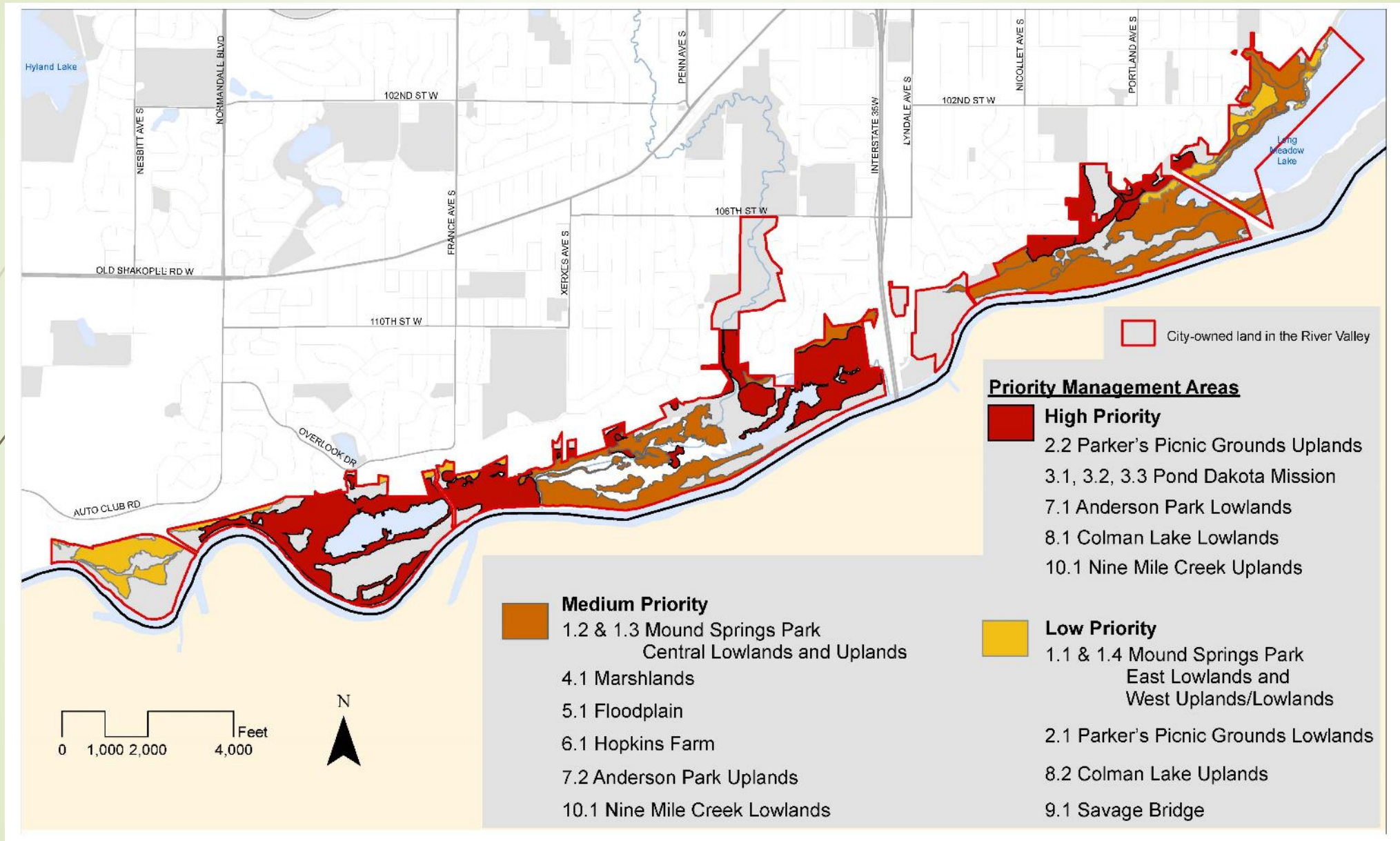
Priority Areas - Criteria

1. Improvement and/or Expansion of Existing Efforts
2. Quality of Vegetative Community
3. Visibility and Public Perception
4. Technical Viability of Initial Management
5. Technical Viability of Long-term Management
6. **Presence of Biological Resources of Special Significance**

Scoring for Criterion 6

<i>Multiple biological assets present on site</i>	2
<i>At least one biological asset present</i>	1
<i>No biological assets present</i>	0

Priority Areas

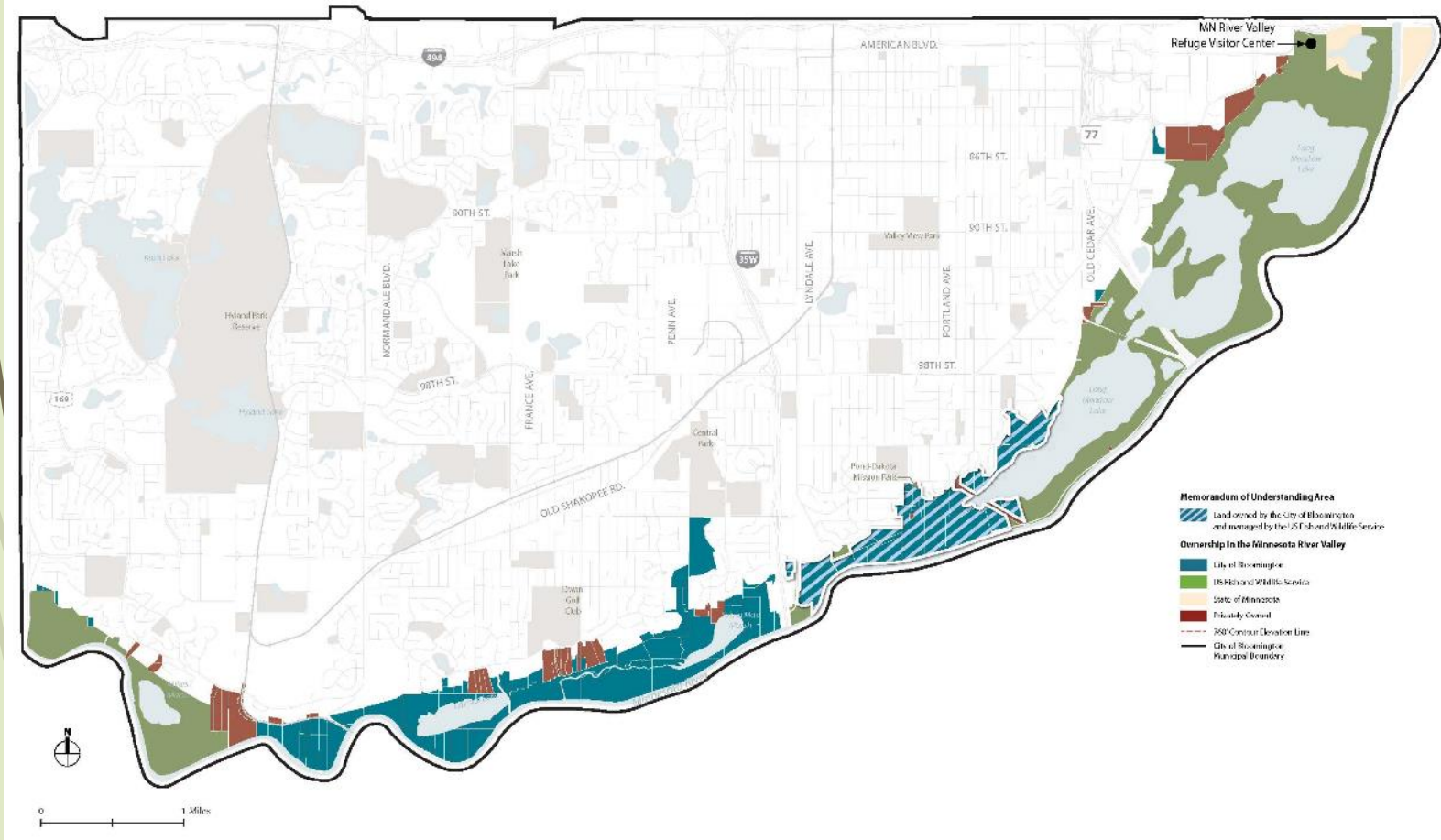


Education

1. Expanding Awareness
2. Sharing Information and Management Goals
3. Creating Stewards



Implementation



1. Strategic Partnerships
2. Review outdated City regulations & guidelines
 - Bluff Report District Plan (1982)
 - Bluff Protection Overlay Districts
 - Prohibited Trees
3. Funding

Funding Sources

- **Capital Improvement Plan**

Funds allocated to natural resource restoration city-wide

- 2019 - \$65,000
- 2021 - \$70,000
- 2024 - \$75,000
- 2025 - \$65,000
- 2026 - \$65,000
- 2027 - \$65,000

- **State Resources**

- Environment and Natural Resources Trust Fund
- Legacy Funds

- **Regional Resources**

- **Federal Resources**

Next Steps

Outreach

Update project webpage

May 2018

Stakeholder focus groups

mid June 2018

Public Open House

end of June 2018

Formal Review

Timeframe

Review & Recommendation

*Sustainability Commission
July 10, 2018*

Review & Recommendation

*PARC
July 11, 2018*

Public Hearing & Recommendation

*Planning Commission
July 12, 2018*

Public Hearing & Final Action

*City Council
July 23, 2018*

Discussion & Questions

Extra Slides

Management Goals



- Maintain and Enhance Existing Accomplishments
- Foster the Growth of Desirable, Native Species
- Establish Continuous Ground-Level Vegetation
- Reintroduce Natural Disturbances
- Strengthen Potential for Biodiversity
- Provide Educational Opportunities

Management Goals



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Management Goals



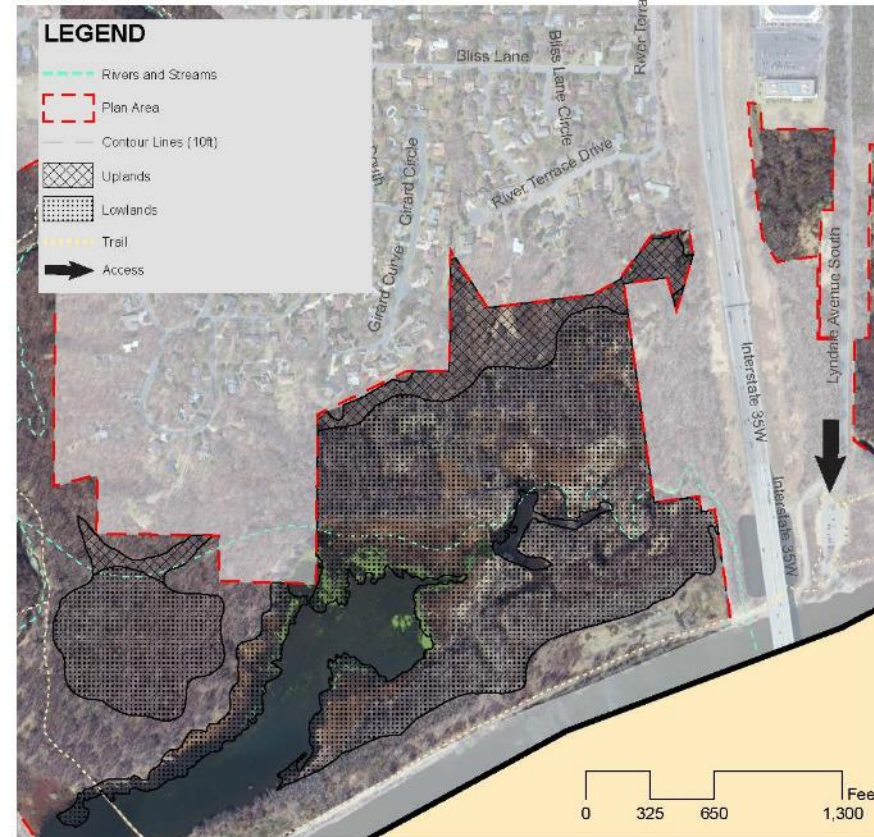
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Habitat Assessment (page 1)

- Site Overview
- Accessibility

Area 7. ANDERSON PARK

Context: The Anderson Park Zone is located west of I-35 and stretches to the Nine Mile Creek trail crossing Wildwood Lake. This zone is broken down into uplands and lowlands. The uplands include Upland Forests, Oak Woodlands, and Prairies that were part of an Oak Savanna environment. The lowlands are made up of Floodplain Forests, Wetlands, and Marshes/Meadows.



Site Size: 84.27 acres (74.08 acres lowlands, 10.19 acres uplands)

Site Access: Floodplain access from Lyndale Ave trailhead. Upland access more difficult due to steep slopes and lack of access from uphill.

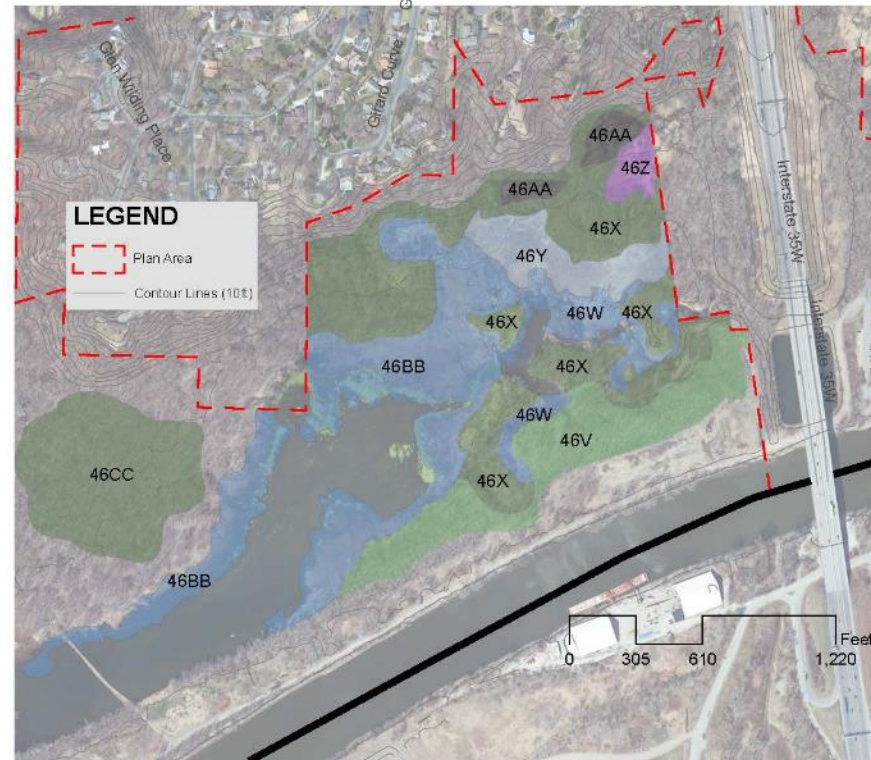
Machine Accessibility: The floodplain is easily accessed from the Lyndale Ave trailhead. Machine access to the seeps is difficult, and operation in muck soils is not recommended.

Habitat Assessment (page 2)

Site 7.1 Anderson Park - Lowlands

Restoration & Management Priority:

The lowlands in Anderson Park are high priority. The site can be easily accessed, is visible due to the nearby trailhead and confluence of river valley and Nine Mile Creek trails, and the site offers existing high quality ecosystems. The biggest threat is the overgrowth of woody species and excessive dead, fallen wood.



Survey Dates:
8/2/2006 &
5/25/2017

* **Bold**
rows show
areas of
significant
change

	Ecological Community Description	2007 Quality Ranking	2017 Quality Ranking
46V	Floodplain forest	C	F
46X	Floodplain forest silver maple subtype	B	B
46CC	Floodplain forest silver maple subtype	D	D
46Y	Mixed emergent marsh	B	B
46Z	Wet meadow	B	C
46W	Mixed emergent marsh - intermittent	B	B
46BB	Mixed emergent marsh - intermittent	B	B
46AA	Black ash swamp seepage subtype	C	C

- Priority Rating
- Ecological Community Description
- Habitat Quality Ranking (2007 & 2017)

Habitat Assessment (page 3)

- Current Conditions
- Main Objectives & Strategies

Current State:

Forested Floodplain



The floodplain, 46V, is similar to other floodplain forests in the Minnesota River Valley. Open growth trees are subsumed by straight, spindly trees. Soils are often bare due to lack of sunlight. The excessive dead wood leaches nutrients into surface soils and waters.

46CC is a large, wooded floodplain forest that contains old, open growth silver maple trees. This site is overgrown, with little vegetation at the ground level.

Marsh/Meadow & Wetland



The wetlands and marshlands are dominated by native plants and are fed mostly by calcareous seeps that help maintain unique plant assemblages. The water quality in the wetlands along the base of the bluffs is excellent, but woody plant encroachment threatens the ecosystem's diversity and functionality. The seeps in this zone drain into the wetlands and marshlands of 46Y, 46W, 46X, and 46BB, where vegetation is dominated by river bulrush, arrowhead and smartweed species.



*Restoration Target

The convergence of floodplain, wetland, and marshland (46V, 46W, 46X) provides an excellent model to help plan floodplain management throughout the valley. The floodplain itself exhibits excessive dead, fallen wood, but the adjacent lowland polygons feature open landscapes with widely spaced, open growth trees with continuous grass cover. The understory is cool and breezy, and the stench of rotting wood and mud is minimal.

Priority Management Objectives & Strategies

1. Enhance/restore to a more open floodplain forest
 - Thin trees
 - Remove or burn cut woody vegetation

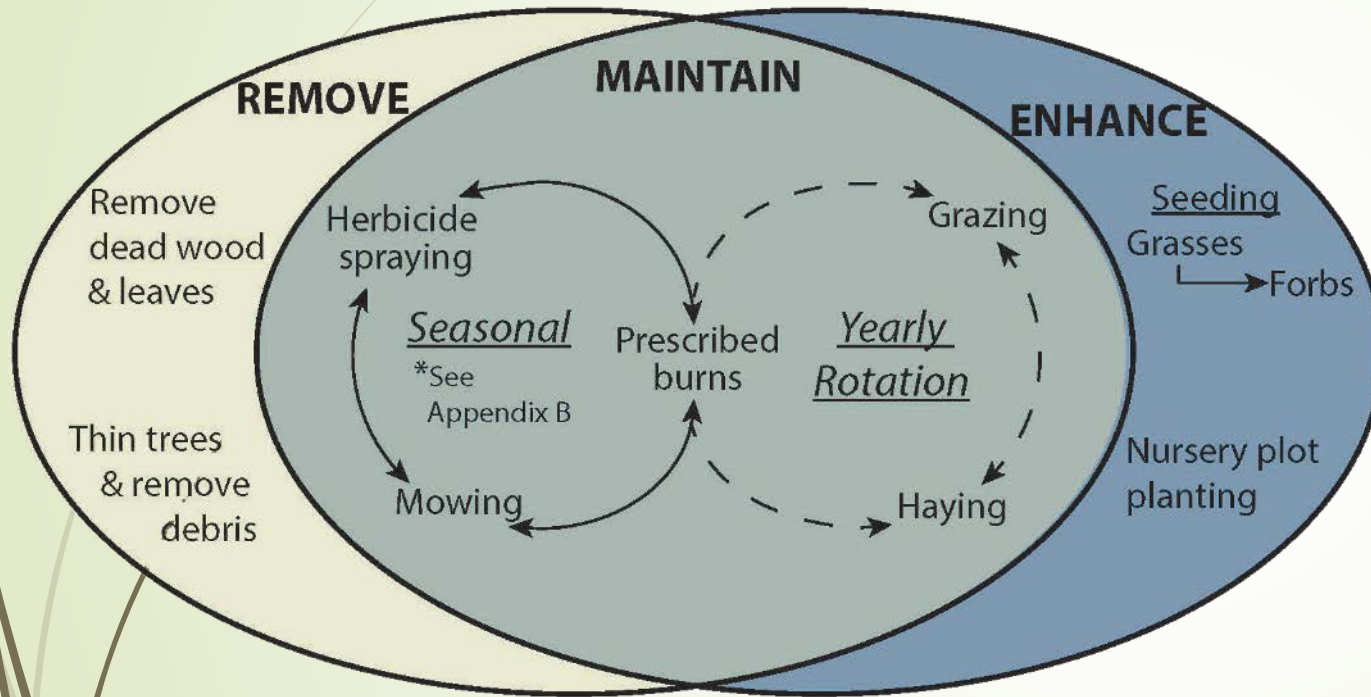
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1. Maintain and enhance existing plant diversity
 - Remove dead vegetation, leaf litter, and dead, fallen wood
 - Conduct selective tree thinning to sustain 50% sunlight to the ground level
 - Remove or burn cut woody vegetation

2. Enhance/restore beaver populations
 - Cut old stems of willows and allow resprouts to grow

3. Restore perennial graminoid/herbaceous ground layer vegetation
 - Monitor & continue the strategies from objectives 1 & 2.
 - Plant wetland grasses, sedges, and forbs that are semi-shade tolerant

Management Strategies



1. Remove Undesired Plants & Material

- Thin Trees
- Mow
- Herbicide Spray

2. Continued Maintenance

- Mow
- Herbicide Spray
- Prescribed Burn
- Haying
- Grazing

3. Site Enhancement

- Seed native grasses & forbs
- Nursery plot planting

4. Continued Monitoring

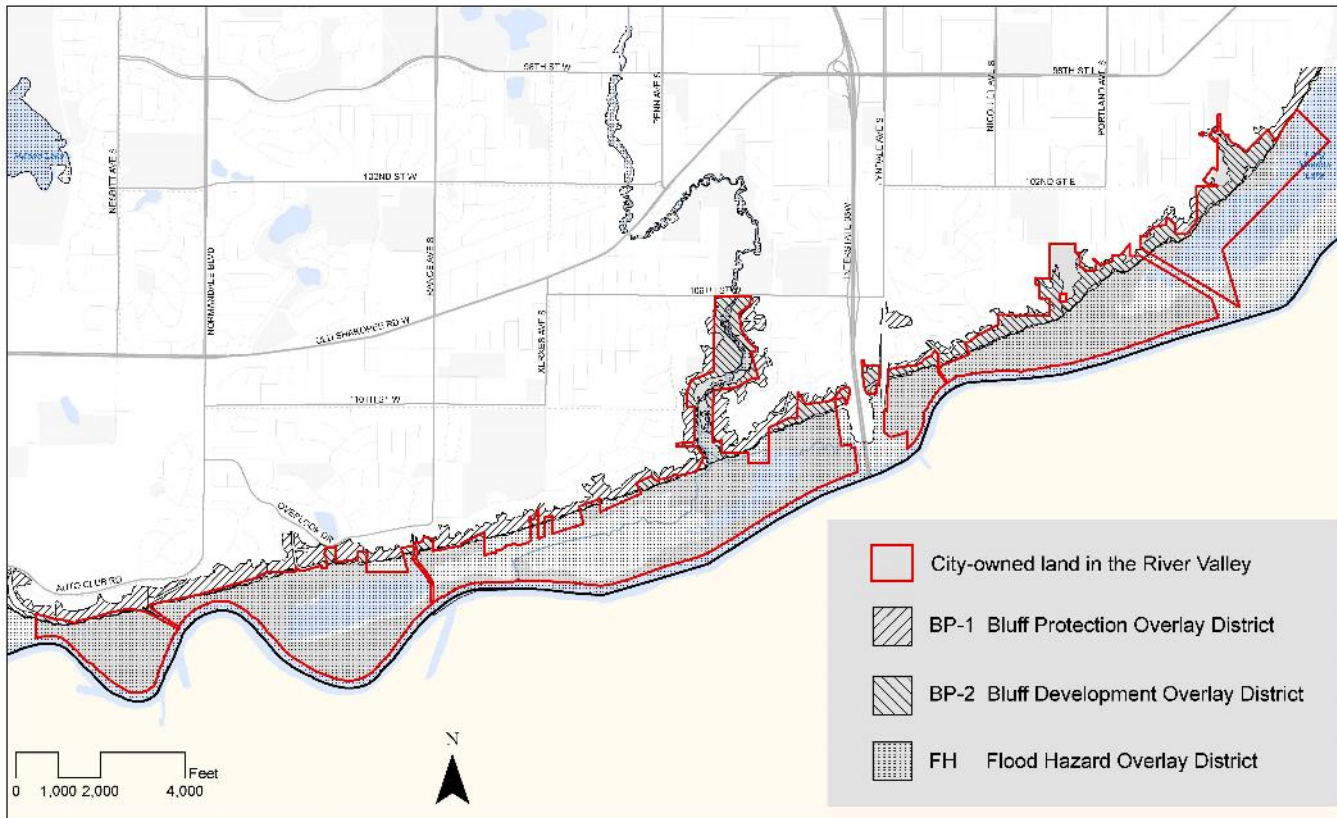
Management Costs Table

Activity	Cost	Notes
Mechanical		
Tree thinning	\$45,000*+	Cost dependent on quantity and end use of material. With mobilization and access there is an economy of scale related to timber stand thinning.
Flail mowing	\$125 - \$200 / acre* / occurrence	
Forestry mowing	\$650 - \$850 / acre* / occurrence	Cost dependent on amount of material needing to be mowed
Spot mowing		
Haying		
Hand pulling/ digging		
Forb Seeding	\$1,000-\$3,000 / acre / occurrence	Cost dependent on mix and species
Graminoid Seeding	\$600 -\$1,000 / acre / occurrence	

Activity	Cost	Notes
Chemical		
Cut, treat, and stack woody undesirable species	\$1,000 -\$2,500 / acre / occurrence	Cost dependant on size of infestation, equipment accessibility, and terrain
Non-woody undesirable species management (mow & spray)	\$250 - \$750 / acre / occurrence	Cost dependent on size of infestation
Natural Disturbances		
Prescribed Burn	\$3,000 - \$9,000 / occurrence	There is an economy of scale in relation to ease of mobilization, complexity of burn units, and access
Grazing	\$1,200 - \$1,800 / acre	
Biological Control Agents		

Regulatory Considerations

Figure X.X - Overlay Districts



Federal & State Species Protections

- Endangered & Threatened Species lists
- National Historic Preservation Act

City Regulations

- Bluff Protection Overlay Districts
- Flood Hazard Overlay District
- Designated Burial Grounds, Class I, and Class II Historic Sites

Appendices

- **Management Strategies**
 - Species Quality Index
 - Undesirable Species Management Protocols
 - Recommended Species

Existing Conditions

- Flora Species List
- Fauna Species List
- Known Cultural Resources

Tree Thinning

Cost: \$45,000+ / acre

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Equipment



Chainsaw



Feller-buncher



Wood Chipper

When

Tree thinning is typically the first step to restoring a site. Thinning can be conducted in any season, but most often occurs in the winter.

Where

In the River Valley, tree thinning is needed almost everywhere. However, it can be most effective in areas where desirable oaks and other species are overgrown by weedy trees.

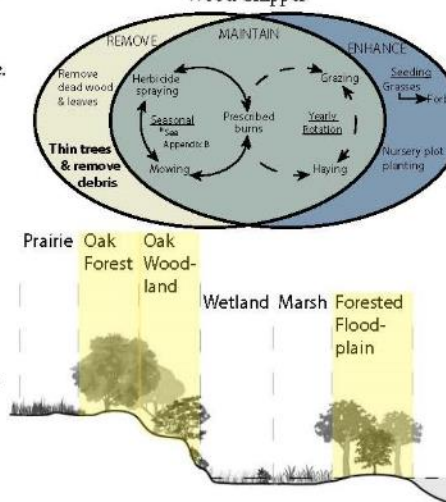
Tree removal may also be desirable to enhance visitor experience and open scenic views of the valley. Thinning can open up patches of sunlight to encourage ground layer vegetation, while maintaining enough shade to keep trail users cool.

Notes:

Not all tree species are appropriate for every habitat. The land type, restoration objectives, and tree quality should be considered when determining the appropriate number, density, and type of trees desired. Tree quality can be determined based on the Species Quality Index (SQI) provided in Appendix D.

All cut wood should be removed, stacked, or burned on site. Burning the cut woody vegetation will help reduce nitrogen build up in the soil. Removal is significantly more resource intensive, requiring trucks and potentially multiple trips to haul the woody material off-site. This would even further reduce undesirable nutrient inputs on site.

Tree thinning should occur strategically to facilitate short and long-term management. Thinning can create corridors for machinery to carry out tasks such as mowing, dead, fallen wood removal, and selective cutting. Terrain aspect also needs to be considered. For instance, on the west aspect fewer trees need to be cut due to the stronger intensity of sunlight.



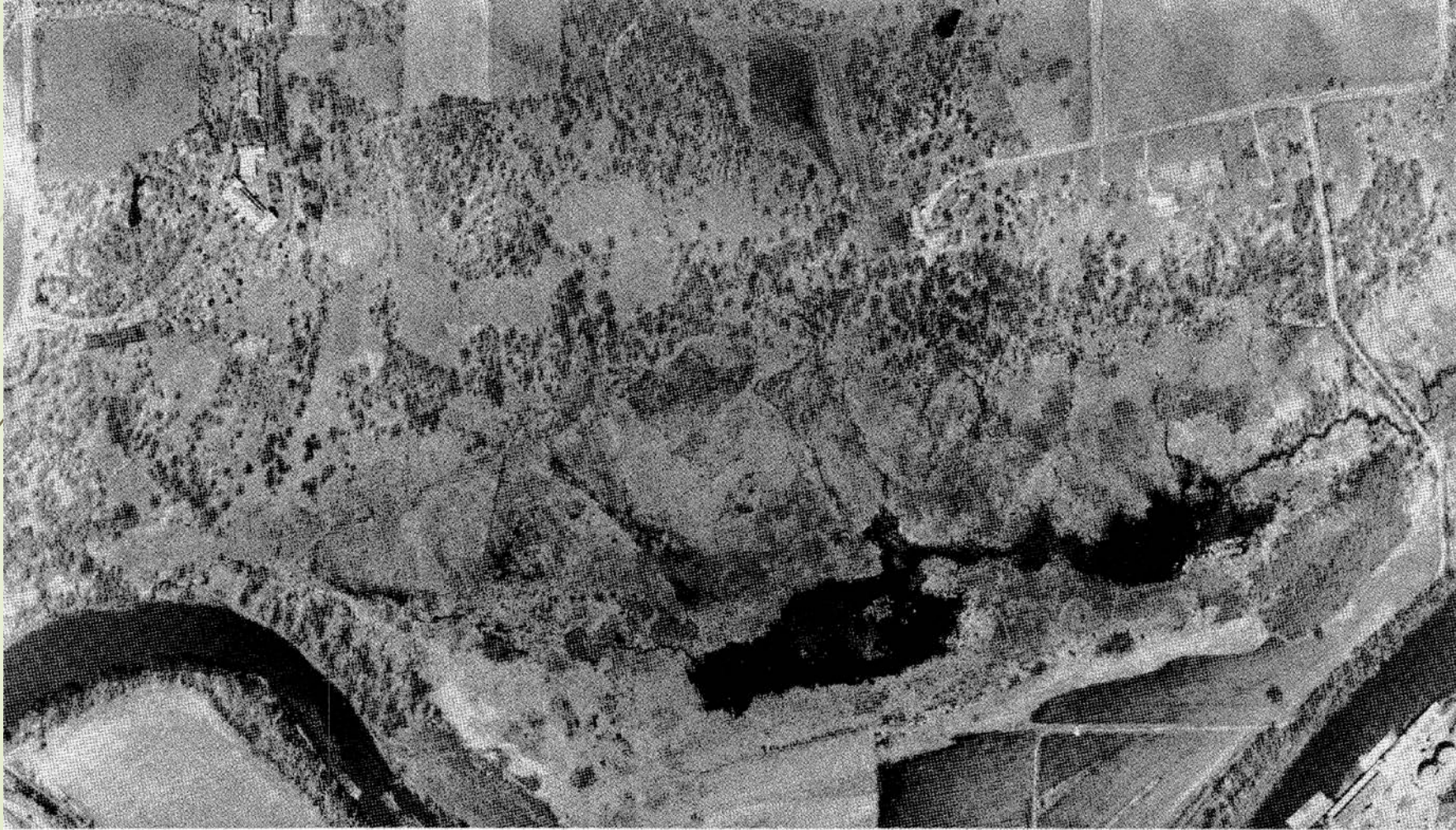
Historic Perspective



Seth Eastman painting (1847) of River Valley

Aerial Photos

Colman Lake



1957

Aerial Photos

Colman Lake



1972

Aerial Photos

Colman Lake



1985

Aerial Photos

Colman Lake



2015