Chapter 8

NATURAL RESOURCES

Protect, Connect, Restore, and Manage Ecosystems, Plant Communities and Species

Maplewood's quality of life depends on how it manages its natural resources -- the air, minerals, land, water, and biota that form the foundation to life in Maplewood. This Chapter is a guide for managing natural resources in a sustainable way. It will help protect and enhance Maplewood's quality of life for current and future generations by suggesting strategies to protect, connect, restore and manage ecosystems, plant communities, and species.

ACCOMPLISHMENTS OF THE 2030 PLAN

- Conducted land cover inventory using Minnesota Land Cover Classification System
- Completed Report for the Fish Creek Natural Area Greenway
- Acquired the Fish Creek property
- Restored prairie landscape at three preserves
- Educated and informed citizens through quarterly Seasons newsletter insert, improved web pages, and hundreds of programs by Maplewood Nature Center
- Expanded citizen monitoring programs to include Invasive Plant Patrol and Bee Monitoring
- Adopted Living Streets Policy and completed street projects using these guidelines

Purpose

The environmental services provided by natural resources are essential for human life. These include filtering air pollutants, absorbing rain water and controlling flooding, recharging ground water and surface water, providing soil for plants and habitat for pollinators and wildlife.

Natural resources can also provide economic value, recreation, spiritual rejuvenation, and aesthetic beauty. To many, they merit protection and care due to their intrinsic value. Healthy natural resources help ensure that Maplewood has a high quality of life that can be sustained far into the future.

Existing Conditions

The City of Maplewood has been a leader in urban natural resource conservation in Minnesota. From a bonding referendum in 1993 to acquire open space, to a rain garden program for recharging groundwater and filtering runoff to its lakes and streams, Maplewood's citizens and elected leaders quickly adopt new ideas from scientists, businesses, and regulatory agencies.

Maplewood Natural History

Prior to settlement in 1851, most of Maplewood was covered by oak savanna, a plant community with scattered oak trees or oak groves and a groundcover of grasses, sedges, and wildflowers. Hazelnut, chokecherry, juneberry, nannyberry, and wild plum grew in the savanna and at wetland edges. Oak savanna is a fire-dependent landscape and fire – natural or set by Native Americans – was essential for their survival. Low, wet areas contained wet prairies, sedge meadows, and marshes. Forests grew on the Mississippi River bluffs in south Maplewood and in valleys where fires were not severe. Some forests were mainly oak and in others sugar maple and basswood mingled with oaks. Some lakes were smaller at the time, and were later enlarged by excavating wetland vegetation from the shorelines.

After settlement, many changes took place in Maplewood:

- Natural lands were developed with farms, houses, and businesses.
- Large savannas and forests were broken into small, separated parcels.
- Fires were suppressed so savannas became overgrown with trees and shrubs.
- Many wetlands were drained, excavated, and filled.
- Plant life was altered by grazing and the introduction of non-native plants.
- Trees seeded into uplands and wetlands.
- Erosion occurred in streams, at shorelines, and on steep slopes.
- More sediment, phosphorus, and nitrogen reached lakes, streams, and wetlands than historically.
- Some wildlife was eliminated by hunting.
- Some wildlife left or died out because there was not enough habitat to successfully breed.
- More water flowed directly into lakes, streams, and wetlands after rainstorms.

» Water levels in groundwater fell, while water levels in lakes, streams, and wetlands rose and fell more often and more quickly than historically.

One example of what these changes mean is many wildlife species have disappeared or are in decline. Generalist species, such as raccoon and deer, are species that can adapt to different types of habitat, including urban habitats. Many generalist species thrive in Maplewood. But specialist species, such as the loggerhead shrike and Blanding's turtle, are more particular about habitat and often need large, connected habitat to persist. Specialist species have declined, or are in danger of declining locally. Many of the species in Table 8.1 are specialists.

These species are on the Minnesota Department of Natural Resources' list of species in greatest conservation need and are found in the east Twin Cities region. The list is for illustration only and was not checked by field surveys.

Table 8-1. Status of Selected Historical and Current Species in Maplewood.

Once Present, Now Gone	Possibly Present, In Decline?	Species Restored
American Woodcock	Common Mudpuppy	Bald Eagle
Black-crowned Night-heron	Brown Thrasher	Peregrine Falcon
Eastern Meadowlark	Common Nighthawk	
Red-headed Woodpecker	Eastern Wood-pewee	
Red-shouldered Hawk	Field Sparrow	
Sedge Wren	Least Flycatcher	
Trumpeter Swan	Northern Rough-winged Swallow	
Upland Sandpiper	Ovenbird	
Wood Thrush	Rose-breasted Grosbeak	
Persius Duskywing	Swamp Sparrow	
Regal Fritillary	Virginia Rail	
American Badger	Yellow-bellied Sapsucker	
Franklin's Ground Squirrel	American Brook Lamprey	
Prairie Vole	Least Weasel	
Blanding's Turtle	Common Snapping Turtle	
Gopher Snake	Smooth Green Snake	
Western Hognose Snake	Eastern Fox Snake	
	Eastern Hognose Snake	

WHAT WE'VE HEARD

- » Appreciate collaboration between City and watershed on lake improvements
- » Quality of Wakefield Lake a concern
- » Preserves are a great place to walk
- » Is there a better way to market the Nature Center?
- » New Fish Creek Trail a community asset
- » Concern about abundance of deer
- » Concern that preserves and natural areas need to be actively managed or they will degrade over time

Blanding's Turtle, Courtesy of MnDNR

Today, Maplewood is a patchwork of developed land and undeveloped natural areas. Maplewood has several lakes and ponds in the north, fringed by small amounts of wetland vegetation. The urban watershed that feeds the lakes provides poor water quality. There are many wetlands, but aggressive non-native cattails and reed canary-grass cover most.

South Maplewood has large forests. The once large expanses of savanna and prairie no longer exist— remaining grasslands are small and support only a few species. Three streams—Battle Creek, Fish Creek, and Snake Creek—flow from Woodbury through Maplewood and then to the Mississippi River. In places their banks are eroding and water quality is poor because the headwaters are in developed areas. Despite the problems they support a variety of aquatic insect and fish life.

There are few natural areas of high quality in Maplewood. Most have lost plant and animal species because they are small and suffer serious edge effects—invasion by non-native species, for example. However, in several places in the city there are large, continuous habitats well suited to preserving a wide variety of wildlife and plants if restored and managed.

Site Classifications and Natural Resources Issues

Natural areas abound in Maplewood on City and County public lands, as well as on private lands. The City manages natural resources at both the site level and by broad City-wide natural resource issues.

Maplewood Nature Center

Site-based classification of natural areas are defined below.

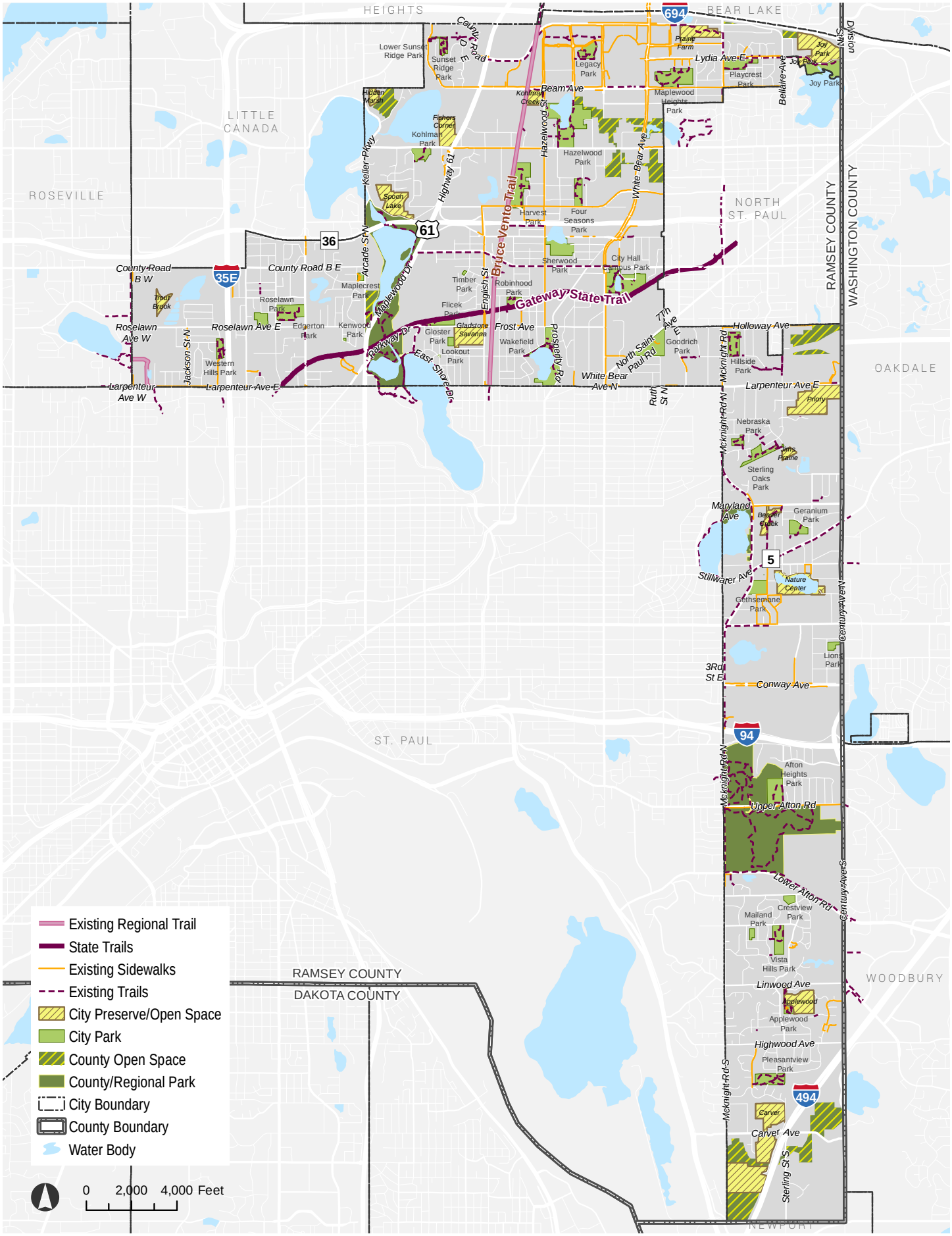
Preserves

Maplewood owns and manages a system of preserves set aside for the protection of natural resources, scenic areas, and landscape buffers. The preserves are open to passive-use activities such as hiking, bird watching, and nature study. These sites are part of the City's Park System. The City has established two types of preserves:

- **Community Preserves** are multi-use areas set aside for preserving natural resources, connecting people to nature, and providing educational programming and historic interpretation. They have amenities such as parking or asphalt trails to provide better access and facilitate programming. There are four community preserves: Maplewood Nature Center, Fish Creek, Gladstone Savanna, and Prairie Farm Preserve.
- **Neighborhood Preserves** are natural areas set aside to preserve habitat and provide places where people can enjoy nature through low-impact activities such as hiking, birdwatching, and nature photography. Some have graded, mowed trails, some have no trails.

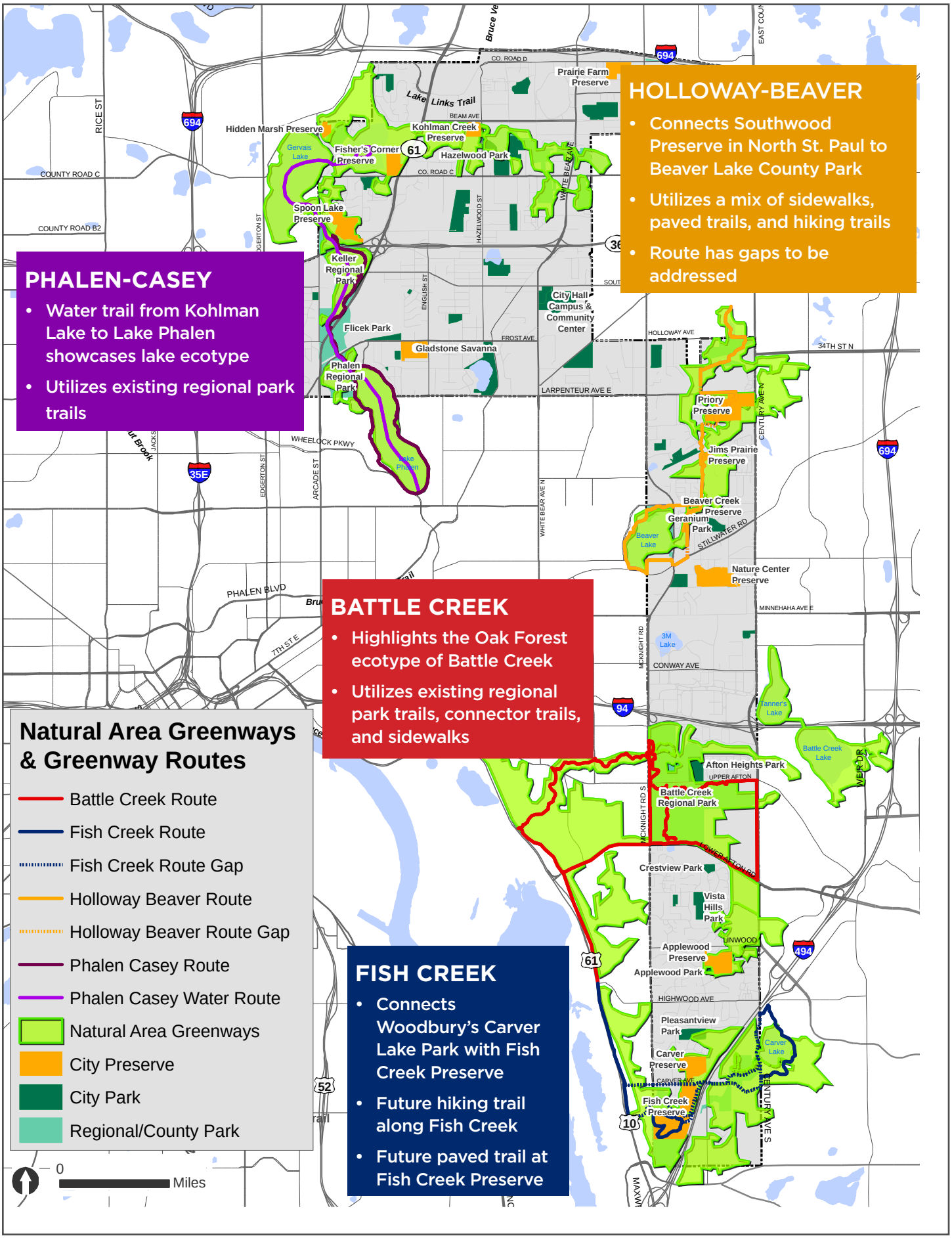
Carver Neighborhood Preserve

Figure 8-1. Maplewood Parks, Trails, and Open Space



NATURAL RESOURCES

Figure 8-2. Natural Area Greenways



Parks and Trails

Many of Maplewood's Neighborhood and Community Parks have areas of woodland or naturalized landscapes. A few of these, such as the woodlands and wetlands at Joy Park, Vista Hills Park, and the oak savanna Wakefield Park, are quite significant and cover several acres. Park natural areas with high ecological quality should be actively managed.

Open Space

There are many other City-owned or County-owned natural areas that are not part of Maplewood's Park System. Many of these contain wetlands or steep slopes. Some have high quality oak woodlands. They provide habitat, natural resource connections, stormwater management, and visual interest. There are typically no trails in these areas. Some open space sites have high ecological quality and should be inventoried and identified on an 'ecological overlay as part of the City GIS mapping and asset inventory. Active management is needed to sustain these high quality resources.

Joy Park, Courtesy of Wayne Rasmussen

Natural Area Greenways

Maplewood's Natural Area Greenways are large, contiguous areas of habitat that encompass both public and private lands. They are essentially a map overlay of the largest concentrations of wildlife habitat in the City. The Greenways were identified to support the protection, connection, and restoration of large scale ecosystems and to provide habitat for species that need large natural areas. Some of the public lands within the Greenway have potential for trails and passive recreation, and tracts of higher ecological quality should be managed to sustain integrity.

- **Phalen-Casey Chain-of-Lakes** This large greenway consists of a chain of lakes stretching from Phalen Lake to Casey Lake, including Round, Keller, Gervais, Kohlman Lakes and Kohlman Creek. This greenway extends into North St. Paul, Little Canada, and St. Paul and includes city and county parkland and open space. Ramsey-Washington Metro Watershed District has published a Water Trial Map for the chain-of-lakes. Trail connections can be enhanced within the greenway but due to open water and numerous wetlands, a continuous land trail through the greenway is not planned.
- **Holloway-Beaver Lake Wetlands** This large, lowland greenway is more or less continuous wetland habitat from the marsh lands north of Holloway Avenue, southwest to wetlands and uplands at Priory Neighborhood Preserve, and continuing southwest along wetlands and Beaver Creek to Beaver Lake. This greenway extends into North St. Paul, Oakdale, and St. Paul. The area includes city and county parkland and open space. There are several trails on public land and some opportunities to connect trail segments. However, a continuous trail through the greenway is not possible without crossing the railroad.
- **Battle Creek Forests** This large, mostly forested greenway includes Battle Creek Regional Park and connects to the Mississippi River bluffs in St. Paul. This greenway includes the Ponds at Battle Creek Golf Course, the forested portion of Highwood neighborhood, and Applewood Neighborhood Preserve. The largest forests are in Battle Creek Regional

Beaver Lake

Fish Creek

Park. Battle Creek, which is part of this corridor, begins in Tanner's Lake in Landfall, then flows to Battle Creek Lake in Woodbury, and then through a narrow stream valley to Battle Creek Park. There is an extensive system of trails through the Regional Park.

» **Fish Creek Forests.** This large, mostly forested greenway includes four units of Ramsey County's Fish Creek Open Space. It is at the north end of a large, mostly forested greenway that includes forests in Newport, St. Paul, and Cottage Grove. Fish Creek is part of this corridor and begins at Carver Lake in Woodbury, then flows through the Fish Creek Open Space and beneath I-494 and US61 to the Mississippi River. A smaller creek, Snake Creek, begins in the Bailey Nursery grounds and also flows to the Mississippi River. In 2010, Maplewood completed a report Recommendations and Opportunities for the Fish Creek Natural Area Greenway. The City subsequently acquired the 70-acre Fish Creek site and constructed a trail on that site. The recommendations call for a trail from Point Douglas Road to Carver Lake.

City-wide Natural Resource Issues

Invasive Plants

Invasive plants are plants that are not native to our area and have negative effects on health, the environment, and/or the economy. In 2008, Maplewood became a founding member of the Ramsey County Cooperative Weed Management Association (RCCWMA). This group focuses on early detection and rapid response to new invasive plant species that move into Ramsey County. Controlling invasive species before they become widespread is more effective and less costly than managing them after widespread establishment. Maplewood Nature Center oversees a citizen monitoring program to identify locations of new invasive species. In addition, the City has a responsibility to control or eradicate species on the state noxious weed list.

Trees and Urban Forest

Maplewood's urban forest includes boulevard trees, park trees, woodlands, and trees on private property. The City's forestry program includes: 1)Trimming and removal of trees on boulevards and city land, 2) Tree planting on city-owned land, 3) Disease tree inspection for oak wilt and emerald ash borer, 4) Tree Rebate Cost-Share Program for homeowners, 5) Education and outreach. In 2017, emerald ash borer was documented in Maplewood. The City began ash tree removals in December 2017, and will continue for several years. We anticipate we will lose most of our ash trees to this insect pest.

Urban Wildlife Management

Large areas of contiguous habitat are needed for healthy diverse wildlife. The City's wildlife program focuses on providing habitat. While the City does not manage for particular species, it does, on some sites, increase wildflower diversity to try to provide better habitat for pollinators.

Sometimes urban wildlife can become a nuisance damaging gardens, congregating in yards, or creating public safety issues. The City has a deer management program which monitors deer population and uses bowhunt removals at selected sites and occasionally sharpshooting. The City does not have removal programs for geese or turkey and provides residents

with information on how to discourage these species if they are creating a nuisance on private land.

Wetlands

Maplewood has dozens of wetlands. Some are high quality ecologically, some are very degraded. Most are impacted by stormwater runoff, with many receiving direct input from storm pipes. In 2009, Maplewood adopted the wetland classifications used by Ramsey-Washington Metro Watershed District. The City's wetland ordinance regulates activities in wetlands and wetland buffers.

Lake Gervais

Lakes and Streams

There are nine lakes and four streams in Maplewood. These provide habitat for aquatic life, recreation opportunities, and aesthetic interest and enjoyment. All our lakes are impacted by stormwater runoff. In 2016, four lakes and two streams in Maplewood were on the Minnesota Pollution Control Agency's list of impaired waters.

Table 8-2. Impaired Waters in Maplewood (2016 MPCA list)

Lake/Stream	Impaired For
Gervais Lake	Aquatic Consumption (mercury in fish)
Kohlman Lake	Aquatic Life, Recreation (chloride, nutrients)
Wakefield Lake	Recreation (nutrients)
Lake Phalen	Aquatic Consumption (mercury in fish)
Battle Creek	Aquatic Life (chloride, poor biotic health)
Fish Creek	Recreation (E Coli)

Ramsey-Washington Metro Watershed District has prepared Total Maximum Daily Load (TMDL) studies for Wakefield Lake and Kohlman Lake. These studies identify sources of pollution to the lakes, set targets for reduction of pollution needed to meet state standards, and suggests strategies to achieve the target goals. The City then works with the Watershed District and other partners to implement projects.

Stormwater

Stormwater Management is handled in a separate chapter, Chapter 12: Surface Water.

Pollinators

Bees and other pollinators are essential for pollination of a wide diversity of human foods and for the ecological functioning of natural areas. They are threatened due to habitat loss, pesticide use, pathogens and parasites. In 2016, Maplewood City Council passed a resolution to protect pollinators and enhance pollinator habitat. Several Maplewood programs and practices that help protect pollinators include preservation of natural areas, enhancing habitat including prairie restoration and use of native plants in gardens and planting, limiting the use of insecticides in the landscape, and providing pollinator education and outreach to the community.

Sustainable Landscaping

Sustainable landscaping encompasses design, installation, and maintenance practices that benefit the environment and reduce negative environmental impacts associated with some types of landscaping. Maplewood uses a sustainable landscaping approach on city-owned property and educates residents on ways to reduce negative environmental impacts. The City's Sustainable Turf Plan calls for reducing lawn areas at parks and restricts high-input lawn maintenance to athletic fields. Many city facilities include some naturalized areas, reducing the amount of maintained lawn. City gardens use primarily hardy, drought-tolerant perennial species, including many native plants.

Issues and Opportunities

- With so much that could be done, it's critical to prioritize projects to protect and manage the most important sites to make the best use of funding and staff time.
- The science of managing natural systems continues to evolve. For some issues, there are not yet effective management strategies.
- The City has strong partnerships with agencies and non-profits and can build on those.
- Maplewood Nature Center has strong programs to educate residents on environmental issues and foster stewardship.
- Grants for enhancing natural areas are available through the state.
- The city's new asset management software will track open space sites, public trees and raingardens. This will provide an opportunity to better manage these resources.

VISION

The City of Maplewood, in order to preserve a beautiful, functional, and varied environment for current and future residents, will protect, connect, restore, and manage its ecosystems, plant communities, and species.

GUIDING PRINCIPLES

- **Use the best science available.**
- **Strive for the highest ecological standards.**
- **Prioritize projects to ensure protection of sites with highest ecological value.**
- **Engage, educate, and empower the community to become stewards of our environment.**

HEALTH

RESILIENCE

EQUITY

AGE-FRIENDLINESS

The Icons above are used to reference the guiding principles, which describe community values that are intended to be achieved through the implementation of the Comprehensive Plan.

See Chapter 3: Guiding Principles for further description of each.

Implementation

The following goals, policies and actions are meant to build on the accomplishments from the 2030 Comprehensive Plan. The Goals, policies, and actions in the Natural Resources Chapter all support sustainability and health.

Goals and Policies

Goals and policies in this chapter will all support the City's guiding principle of Resilience.

1. Protect, connect, and buffer ecosystems—forests, savannas, prairies, lakes, streams, wetlands—and other natural resources.

2. Restore and manage natural areas, wildlife habitat, and other natural resources for high ecological quality and for diversity of plant and animal species.

2.1 Prioritize the management of high quality natural areas over "start-from-scratch" restorations.

2.2 Prioritize sites and projects each year to ensure highest quality sites do not lose their ecological value and degraded sites are improved.

2.3 Monitor new developments in restoration and invasive plant management.

2.4 Monitor tree disease and pest outbreaks and implement control program for oak wilt and emerald ash borer. Expand to include other diseases and pests as they occur.

2.5 Work with partners to monitor and control invasive species and noxious weeds.

2.6 Monitor deer population and address overpopulation as needed.

3. Restore the natural ecological functions involving water by better managing stormwater runoff.

3.1 Sweep streets on annual schedule. Currently the city sweeps most streets two times per year; streets in sensitive areas are swept more often.

3.2 Continue to investigate alternative road de-icing options that reduce impacts to soil and water.

4. Fund natural resource programs to achieve the vision and goals.

4.1 Seek partnerships and grants to help implement natural resource goals.

5. Incorporate the vision and goals for natural resources in the city's comprehensive plan, ordinances, policies, development standards, and zoning.

5.1 Encourage and promote use of conservation design.

5.2 Improve compliance and understanding of environmental regulations and requirements by providing educational materials explaining issues, including identifying locations of potential rare species and plant communities based on the Natural Heritage Information System (NHIS) and encouraging regular review as part of development and redevelopment projects.

6. Enhance public understanding of nature, natural systems, and environmental issues by providing programs, information, and interpretive facilities.

6.1 Educate adults, families, schools, groups, and staff.

6.2 Use diverse methods of education and outreach including programs, field trips, brochures, exhibits, signage, articles, website, video, service learning, etc.

6.3 Provide opportunities to learn through volunteer service, including citizen science monitoring.

7. Promote a culture of stewardship on public and private land through access to natural areas and education and volunteer opportunities in natural areas restoration and management.

7.1 Provide stewardship training to residents.

7.2 Provide programs to support residents in their stewardship efforts, such as city's curb-side buckthorn pick-up and tree cost-share rebate programs.

Actions

Actions in this chapter will all support the City's guiding principle of Resilience.

Natural Resources Management Plans

1. Develop a general natural resources management plan for City natural areas and site-specific management plans for the highest quality areas.
2. Develop natural resources plan for City-wide issues including deer management and invasive species.
3. Develop and implement a Maplewood Tree Plan to cover boulevard trees, park trees, woodlots and forests.
4. Review and update the sustainable turf plan.

Protection and Restoration

5. Establish priorities for sites and management activities and update these annually.
6. Create ecological overlays identifying City-owned land at parks and open space that have high ecological quality (areas that are not a Neighborhood or Community Preserve).
7. Identify areas in active parks that could be restored to natural habitat or non-turf vegetation.
8. Improve process for review and inspection of native planting and rain gardens on development projects to increase successful establishment.
9. Overlay the MBS Native Plant Communities and Sites of Biodiversity to identify whether there are sites not known.

Education, Outreach, and Access

10. Review and update existing materials used for natural resources education.
11. Expand audience via use of video and social media.

12. Develop materials (printed or video) to teach property owners environmentally friendly practices they can do on their property, including but not limited to: sustainable lawn care, native plant gardens, drought-tolerant landscaping, rain gardens, what to do with yard waste.
13. Evaluate and enhance current citizen monitoring programs – frogs, bluebirds, bee, and preserves.
14. Provide training on natural resources management for staff, including emerald ash borer training and noxious weed training.
15. Improve maps and information regarding access to preserves and natural areas.
16. Work with partners to create the Fish Creek Trail from Point Douglas Road to Carver Lake.
17. Add information to city policies and guidance about the importance of taking wildlife movement into consideration, particularly in the Nature Area Greenways. Consider referencing the MnDNR's Best Practices for the Protection of Species and the Roadways and Turtles Flyer.

City-wide Natural Resources Issues

18. Update the 2010 tree inventory and begin tracking tree planting and removals through Cartegraph.
19. Implement the Emerald Ash Borer Plan conducting removals, replanting, and community education.
20. Develop an invasive plant and noxious weed management program that covers, parks, trails, open space, boulevards, and city facilities. This shall include prioritizing sites and species and developing a system to better track complaints.
21. Evaluate and update the invasive plant monitoring program.
22. Develop policy statements for management of deer, geese, and turkey.
23. Improve system for tracking nuisance wildlife calls.
24. Work with partners to implement projects in the Wakefield Subwatershed and other areas that reduce stormwater pollution to local lakes.
25. Work with partners to monitor aquatic weeds, set realistic goals for aquatic vegetation, and educate lakeshore owners and other residents.
26. Identify areas on City-owned land that do not have adequate wetland or shoreline buffers and implement projects to establish buffers.
27. Update city's planning, development review, zoning and ordinances to be consistent with guidelines for the Mississippi River Critical Area.
28. Consider reclassifying some natural areas. The Preserve system includes 15 sites. A few of these sites may be better classified as open space and there may be some open space sites that could be part of the Preserve system.
29. Evaluate pollinator corridor connectivity in the City and make recommendations for improvement.
30. Reduce the amount of conventionally maintained turf on both city-owned property and private property through education and programs to support the transition to other types of vegetation.