



Chapter eleven

Green Infrastructure

Introduction and Purpose

Green Infrastructure is one element within the overall Comprehensive Land Use Plan. Green infrastructure can be defined in two primary ways. The term can be used to identify a greener, more environmentally sustainable version of typical gray infrastructure; for example, permeable pavement for parking lots or roadways or a natural bio-swale versus a drainage pipe. In this context, green infrastructure describes products, technologies, and practices that use natural systems that mimic natural processes—to enhance overall environmental quality and provide utility services. In addition to effectively retaining and infiltrating rainfall, these technologies can also filter air pollutants, reduce energy demands, mitigate urban heat islands, and sequester carbon.

Green infrastructure can also be the identification, protection and interconnection of open space, including both natural and human-altered landscapes. The Conservation Fund, an environmental non-profit with a dual charter to pursue both economic development and environmental preservation, defines green infrastructure as “strategically planned and managed networks of natural lands, working landscapes and other open spaces that conserve ecosystem values and functions and provide associated benefits to human populations.” (Benedict, Mark, and Edward McMahon. Green Infrastructure Linking Landscapes and Communities. Washington DC, Island Press, 2006). The foundation of green infrastructure networks is the natural elements—woodlands, wetlands, rivers, grasslands, agricultural lands, trails, recreational area and cultural and historic sites—that work together as a whole to sustain ecological values and functions.

Both of these definitions are necessary to understand the complete green infrastructure vision. It is important to be able to identify the green resources located within the City and how they work together to create a system. Elements within Crystal Lake can be coordinated with the surrounding municipalities to create a regional system.

Implementing Green Infrastructure in Crystal Lake

The City has adopted the Green Infrastructure Vision (GIV), which provides the framework for this Comprehensive Plan element. The GIV provides a background on how Crystal Lake fits into the regional context of green infrastructure. Several organizations in the Chicago Metropolitan Area including CMAP, Chicago Wilderness, McHenry County and others have created regional green infrastructure plans.

The City has incorporated several principles of green planning through a variety of adopted plans, manuals and ordinances.

- * In 2007 the City adopted the Crystal Lake Watershed Design Manual that includes recommendations and design criteria for best management practices to help preserve the water quality and hydrology of its namesake lake.
- * In 2008 the City adopted the Northwest Sub-Area Plan that recommends various sustainable development strategies for potential growth areas in its northwest area. In particular, the plan identifies techniques such as cluster development, stream buffers, transit oriented development, and transfer of development rights. This plan is now incorporated within this 2030 Comprehensive Land Use Plan.
- * In 2009, the City adopted the Unified Development Ordinance, which introduced requirements for conservation development on properties that meet certain environmental triggers. The Ordinance provides alternative standards for roadway and subdivision design that utilize green infrastructure principles.

While these are important accomplishments, additional opportunities exist to strengthen the policy and technical basis for green infrastructure in Crystal Lake. With that goal in mind, the City will utilize this section and the GIV to create and construct new projects.

Mapping a Green Infrastructure Network in Crystal Lake

Crystal Lake has a variety of natural features that are important to its character and livability. An important first step is to systematically catalog and map data and information about these features. The maps used by the City to create a green infrastructure vision were created by other organizations. The features included in the green infrastructure map are:

- * Wetlands (including high quality ADID sites)
- * Hydric soils (i.e., former wetlands that were drained)
- * Lakes, streams, and other bodies of water
- * Oak woodlands
- * Pre-settlement vegetation
- * McHenry County Natural Area (MCNAI) sites
- * Sensitive aquifer recharge areas (SARA)
- * Major field tiles
- * Chicago Wilderness GIV resource protection areas
- * Watershed boundaries
- * McHenry County Conservation District holdings
- * Park District and City open space
- * Major bike paths

Green Infrastructure Elements

It is important that green infrastructure planning and protection incorporate both traditional open space protection and acquisition strategies as well as complementary approaches such as conservation development and conservation easements applicable to private land. The Comprehensive Plan element lists the attributes for each of these resource areas and specific supporting actions and success indicators.

With this direction, a hierarchy of green infrastructure protection and restoration opportunities was identified in the Crystal Lake planning area. These included:

- * **Highly Important Resource Areas:** These are major landscape-scale areas that are resource rich and/or critical to the ecological and environmental health and economic vitality of the City. These areas also help to define Crystal Lake's unique sense of place and community image.
- * **Secondary Resource Areas:** These are areas within or between the major elements or resources that don't create a sense of place but are still important. Secondary elements provide links between the major elements to form a more complete green infrastructure vision.
- * **Neighborhood and Site Strategies:** Neighborhood and Site Strategies are programs and actions that can be undertaken at a local scale for individual property owners that enable the goals and opportunities of the major elements to be fully realized.

The following are the categories of the resource areas and site strategies with their listed elements.

Highly Important Resource Areas

- 11.1 Crystal Lake Watershed
- 11.2 Upper Kishwaukee River Corridor
- 11.3 Sleepy Hollow Creek and Silver Creek Watersheds
- 11.4 Northeast Fen and Oak Stands
- 11.5 Three Oaks Recreational Area
- 11.6 Crystal Creek

Secondary Resource Areas

- 11.7 Wood's Creek
- 11.8 Bike Path
- 11.9 Glacial Potholes
- 11.10 Active Farming
- 11.11 Hydric Soils

11.12 Neighborhood and Site Strategies

- * Bio-Swales
- * Rain Gardens
- * Native Plantings
- * Green Roofs
- * Porous Pavement
- * Water Conservation

Highly Important Resource Area Details, Actions and Indicators

11.1 Crystal Lake Watershed



Goal:

Preserve high quality and quantity water resources within the lake for natural aquatic ecosystems and recreation uses.

The health and vitality of Crystal Lake is largely dependent on the quality and quantity of water from its 3,200 acre watershed which lies primarily north of the lake. Water arrives in the lake via surface runoff, drainage from field tiles and Cove Pond, and primarily from shallow groundwater aquifers. The quality of this water, and the maintenance of healthy groundwater “baseflows,” (versus surface stormwater runoff) are important for habitat and for recreation. Crystal Lake is maintained by both the Crystal Lake Park District and the Village of Lakewood as a main recreational destination in the area. The primary goal for the Crystal Lake Watershed is to ensure the natural aquatic ecosystems are preserved. This can be achieved primarily by best management practices that are incorporated into new site designs or retrofitted into existing neighborhoods and developments. This objective also would benefit by the protection and restoration of natural buffer strips around the margins of the lake and its tributary waterways.

The Crystal Lake Park District and Village of Lakewood use the 1975 Crystal Lake Watershed Resources Management Study, commonly referred to as the Bauer Report. The Report is an analysis of the watershed, the area surrounding the lake and the plant and animal life within the lake. The lake was stocked with large-mouth bass, rock bass, white crappie, northern pike, war-mouth bass, yellow perch, pumpkinseed sunfish, black and yellow bullhead, white sucker, northern brook silver sides, blunt nose minnow, banded killifish, golden shiner and carp. The lake provides excellent habitat for both aquatic species and water fowl.

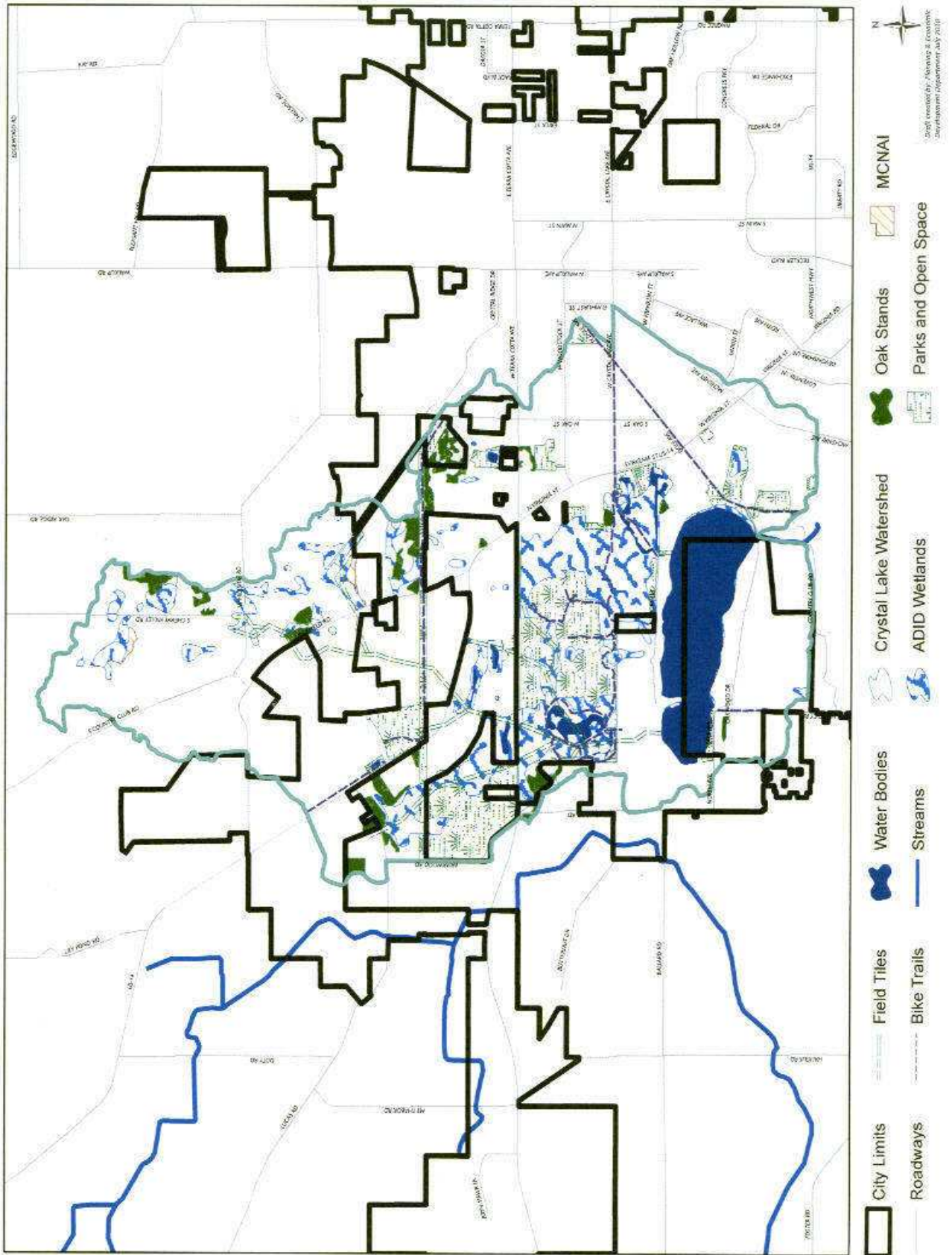


The Crystal Lake Watershed element has four main attributes; recreation, habitat, water resources and community character.

Crystal Lake Watershed	
<i>Attribute</i>	<i>Functions provided</i>
Recreation	<p>Crystal Lake 230 acre lake for boating, swimming, fishing and events</p> <p>Lippold Park 310 acre park area, bike paths, disc golf, 24 ball fields, dog park, hiking, skate park, batting cages and fitness area.</p> <p>Bike Path Trails through Lippold Park to Route 14. Trail along ComEd utility lines from the Railroad line to McHenry County Community College.</p>
Habitat	<p>Crystal Lake Aquatic species (fish and plants) General birds, bats, insects, plants, and mammals.</p> <p>Lippold Park 60 acres of ponds, wetlands, open space and trees.</p> <p>ADID Wetlands Endangered or protected species, native species, general birds, fish, plants, microorganisms and mammals.</p> <p>Oak Stands Shelter and nesting sites for mammals and birds.</p>
Water Resources	<p>Crystal Lake Recreational water. Crystal Lake is one of the best examples of a clear water, sand bottom, groundwater-fed glacially formed lake in northeastern Illinois. BMPs within the watershed to keep the water clean</p> <p>Drain Tiles Dewaters north of the lake</p> <p>ADID Wetlands Water storage and infiltration – clean up the water. Watershed is a critical recharge zone for groundwater aquifers and crystal lake.</p>
Community Character	<p>Crystal Lake The City derives its name from the lake. The lake is an integral part of Crystal Lake’s early existence with ice harvesting in the winter and recreation in the summer. Continued recreational importance today. Cardboard Cup Regatta Summer Camp Summer recreation</p>

	Recommended Actions	Success Indicators
11.1a	Preserve the Crystal Lake Watershed.	Adoption of the Crystal Lake Watershed Storm Water Management Design Manual. Higher quality of water in the lake. Higher quantity of water in the lake.
11.1b	Establish zoning standards requiring the preservation of green infrastructure elements.	The establishment of the W Watershed zoning district. The number of projects developed within the Conservation zoning overlay. The number of projects built that adhere to the Northwest Sub-Area's goals and objectives for buffers and protection of these resources.
11.1c	Require development within the watershed to use logical links to piece together green infrastructure elements within their development designs.	Increase in conservation designed subdivisions. Number of commercial developments that use conservation techniques.
11.1d	Continue to aggressively implement the recommendations and requirements of the Crystal Lake Watershed Design Manual for all development and redevelopment.	The number of new developments with installed BMP's. Reports of Crystal Lake showing an increase in the water quality.
11.1e	Encourage existing residents and business owners around the periphery of the watershed to incorporate site strategies such as rain gardens, permeable paving, and natural landscaping to reduce contaminated stormwater flows entering the lakes.	The number of educational materials created. The number of privately installed BMP's.
11.1.	Identify and implement opportunities to retrofit existing landscapes and infrastructure to reduce and cleanse stormwater runoff throughout the watershed.	The number of restored drained wetlands and hydric soils areas. The amount of green infrastructure created – ex. Lineal miles of bio-swale verses lineal mile of storm sewer.

Crystal Lake Watershed



Highly Important Resource Area Details, Actions and Indicators

11.2 Upper Kishwaukee



CMAP, Upper Kishwaukee River Watershed Plan Technical Report, 2008

Goal:

Restore a healthy aquatic community, expand preservation efforts and ensure the river remains a vital resource to the community.

The Upper Kishwaukee River flows 15 miles beginning from the headwaters at Route 14 to the intersection of Pleasant Valley and McCue Roads. Its watershed, which lies in the western and north-western portion of the Crystal Lake planning area is 27 miles of primarily agricultural land. The Chicago Metropolitan Agency for Planning (CMAP) in conjunction with the Kishwaukee River Ecosystem Partnership (KREP) prepared the Upper Kishwaukee River Watershed Plan in 2008. The plan studies water quality and aquatic habitat problems related to wastewater treatment plant discharges, stormwater runoff and historical channelization. Historical records identified sensitive fish species such as the Iowa Darter and Blacknose Dace that once populated this area. In addition, the upper watershed is dotted with glacial potholes, wetlands, oak groves and savannas that offer great potential for restoration. The main goal for this watershed is to restore a healthy aquatic community and ensure the river remains a vital resource to the neighborhoods surrounding it. The CMAP drafted Upper Kishwaukee River Watershed Plan recommends expanded preservation of the creek corridor and wetlands, habitat restoration and the use of conservation design approaches for new development.

The Upper Kishwaukee River and watershed has three main green infrastructure attributes. Each of these attributes contributes to the river’s ecological and the integration into the City’s green infrastructure system.

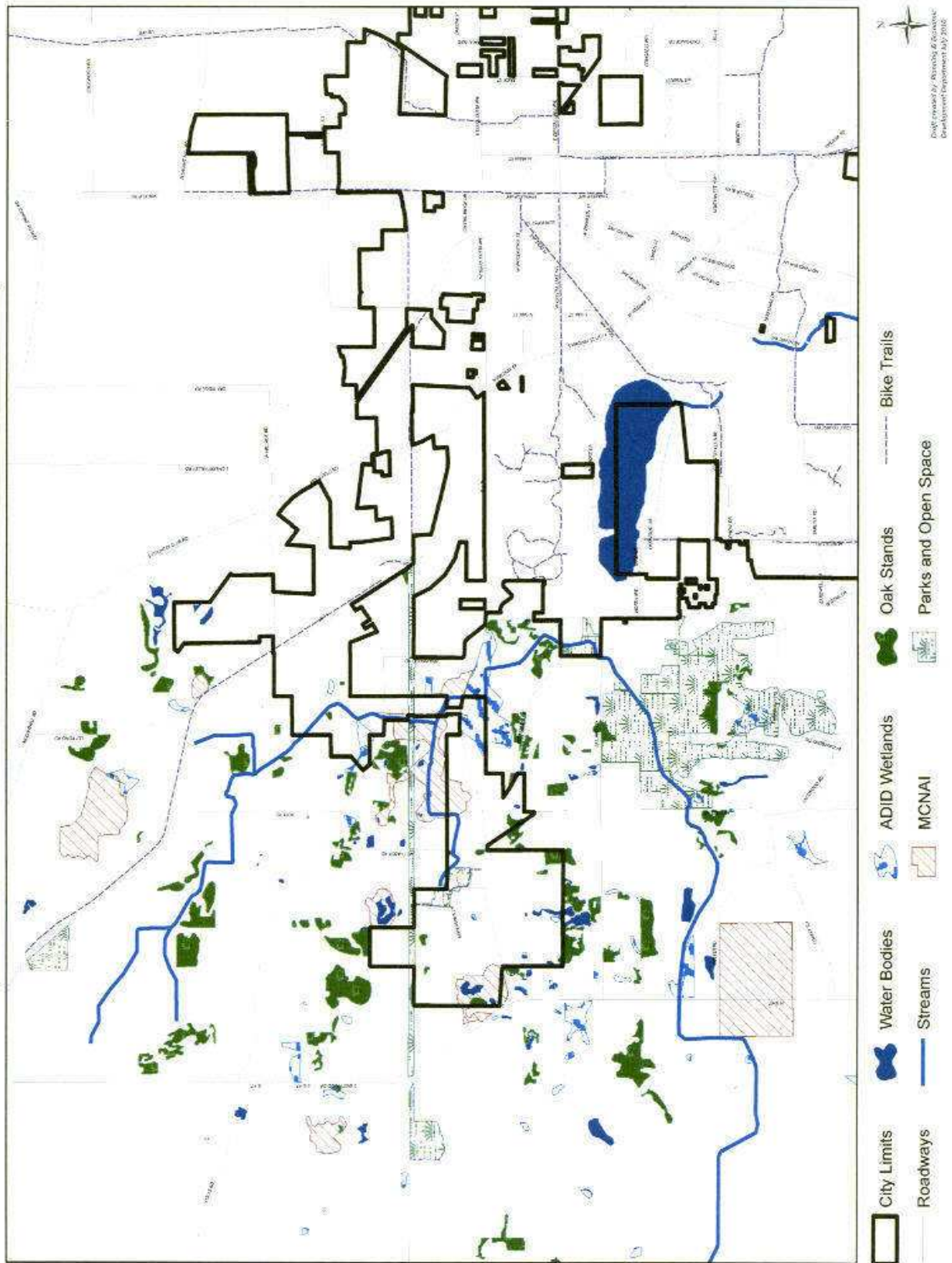
Upper Kishwaukee	
Attribute	Functions provided
Habitat	Kishwaukee River branch Fish, mussels, amphibians, reptiles and birds Historical records identified sensitive fish species such as the Iowa Darter and Blacknose Dace Oak Stands Shelter and nesting sites for mammals and birds ADID Wetlands Endangered or protected species, native species, general birds, fish, plants, microorganisms and mammals.
Recreation	Kishwaukee River branch Fishing Canoe/kayak Bike Path Bike and multi-use trail – east west under the ComEd right-of-way
Water Resources	Kishwaukee River branch Natural water course filtering surface runoff Treatment plant discharge and recharge ADID Wetlands Water storage and infiltration – clean up the water. Watershed is a critical recharge zone for groundwater aquifers



CMAP, Upper Kishwaukee River Watershed Plan Technical Report, 2008

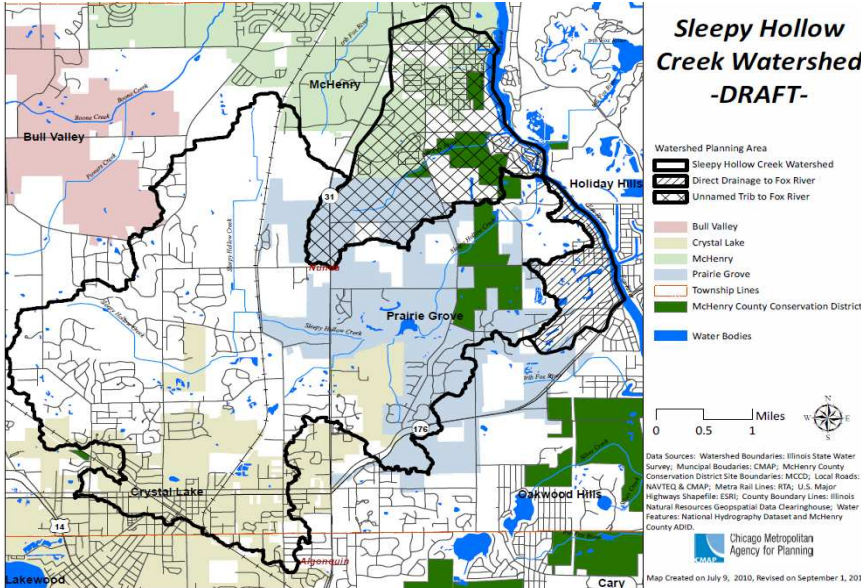
	Recommended Actions	Success Indicators
11.2a	Work with the watershed planning community, adjacent organizations and municipalities to implement the Upper Kishwaukee River Watershed Plan to preserve and enhance this portion of the Kishwaukee.	Support of the Upper Kishwaukee River Watershed Plan by the City. The development of a project utilizing the recommendations within the plan.
11.2b	Implement the policies of the Northwest Sub-Area Plan.	Appropriate buffers from the River are maintained with new developments. The incorporation of the Conservation Overlay standards in new development. Long term stewardship of the River, buffers and open space is established. The recordation of HOA covenants which prohibit the use of phosphorous fertilizers.
11.2c	Implement stormwater BMPs that infiltrate and filter runoff via a runoff reduction hierarchy.	The water quality and hydrology of the creek and associated wetlands are improved. The number of agriculture lands that install BMP's. The number of industrial sites that install BMP's.
11.2d	Restore the habitat and ecosystems as identified in the Upper Kishwaukee River Watershed Plan.	The preservation of the river's riparian corridor from Lucas Road to Route 176. The meandering of the stream and restoration of the wetlands adjacent to Route 176 The clearing of buckthorn and other invasive species along the tributary north of Route 176 and Mt. Tabor Rd.
11.2e	Encourage recreational opportunities along the Kishwaukee River.	Increase in the number of areas accessible to the public for recreation.

Upper Kishwaukee River Watershed



Highly Important Resource Area Details, Actions and Indicators

11.3 Sleepy Hollow and Silver Creek Watersheds



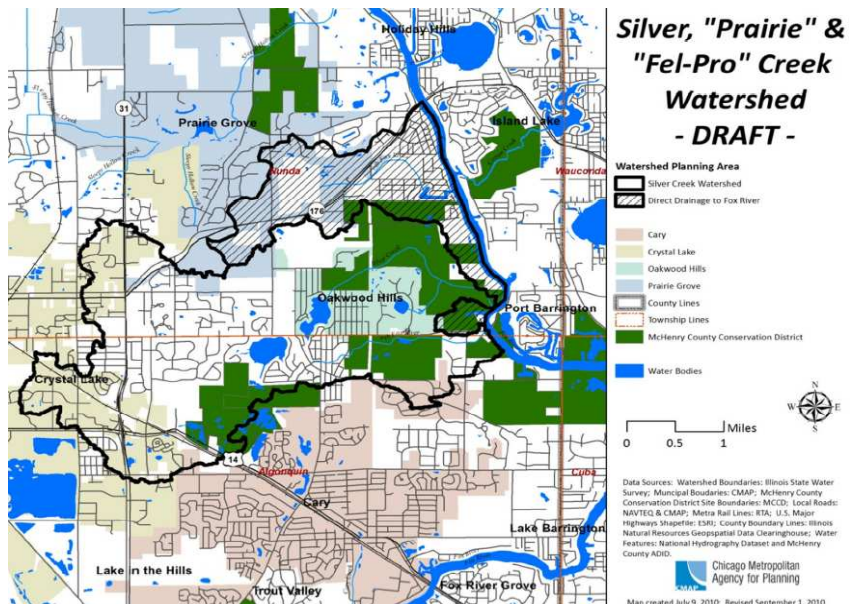
Goal:

Support the watershed plans including implementation of any proposed projects.

Sleepy Hollow Creek runs along the northeast side of the City limits and into the Village of Prairie Grove before entering the Fox River. It has a drainage area of approximately 19.86 square miles. Immediately to the south, Silver Creek flows westerly from Crystal Lake into Oakwood Hills before discharging to the Fox River. The watersheds of these two creeks, with a combined area of roughly 30 square miles, include the northern and eastern parts of the City, including much of the downtown area. CMAP has developed a joint watershed action plan to protect water quality, restore water body impairments and protect groundwater for these two creeks. This watershed plan is in review by the Illinois EPA. After IEPA approval, the plan will be presented to the municipalities for their support.

Protection of the creek corridor and maintaining good water quality and healthy baseflows in the watershed are vital for the health of these creeks. Although no study has been done on the impairment of these creeks, the portion of the Fox River in which they discharge is impaired, creating the need for this plan.

This comprehensive plan section points out the attributes for each creek.

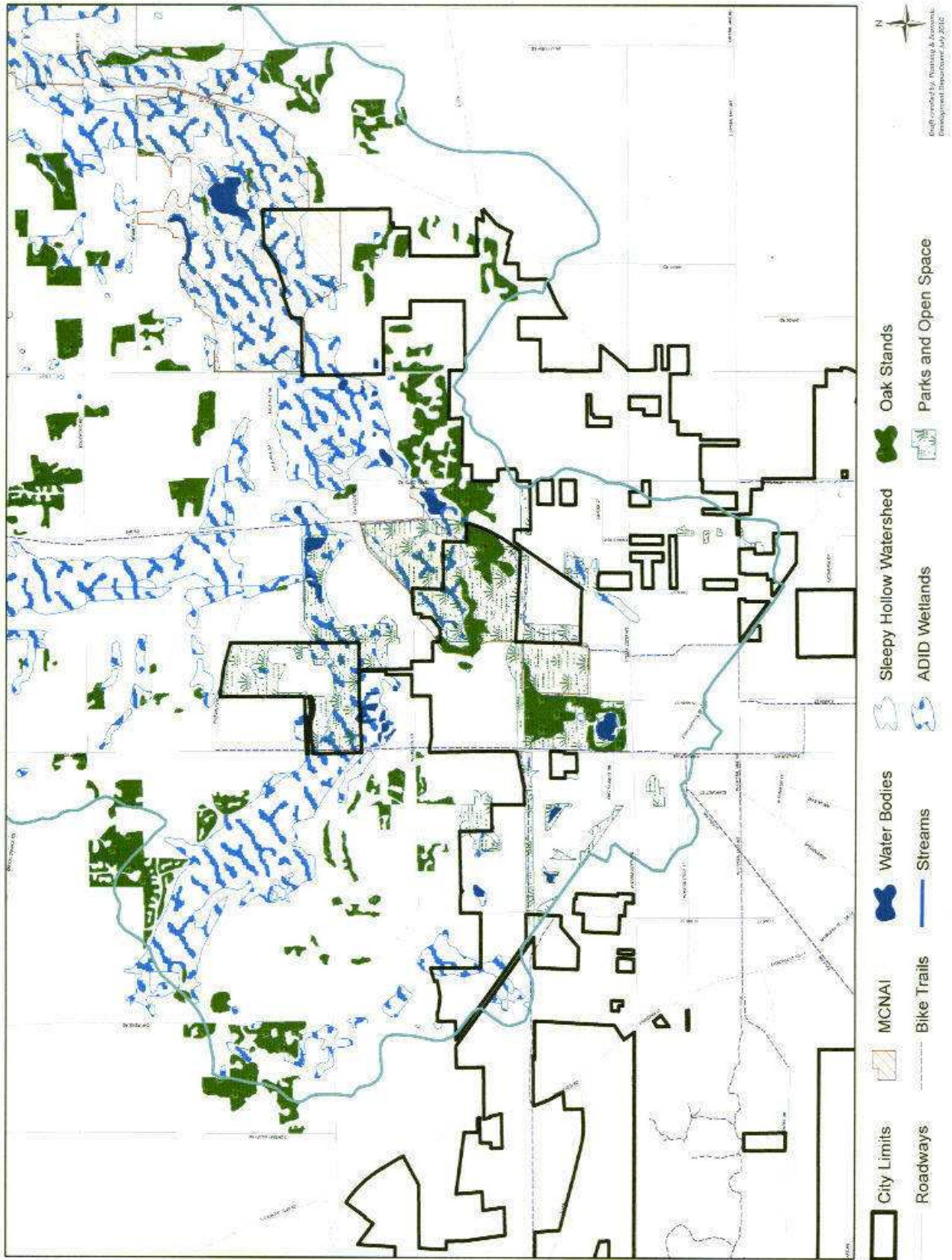


Sleepy Hollow Creek	
<i>Attribute</i>	<i>Functions provided</i>
Water Resources	Headwater, ground-fed stream ADID Wetlands Floodplain Squaw Creek
Recreation	Prairie Ridge Conservation Area Passive recreation Squaw Creek walking trail
Habitat	Prairie Ridge Conservation Area Oaks, ponds, prairie ADID Wetlands Oak Stands Headwater fish spawning and forage opportunities

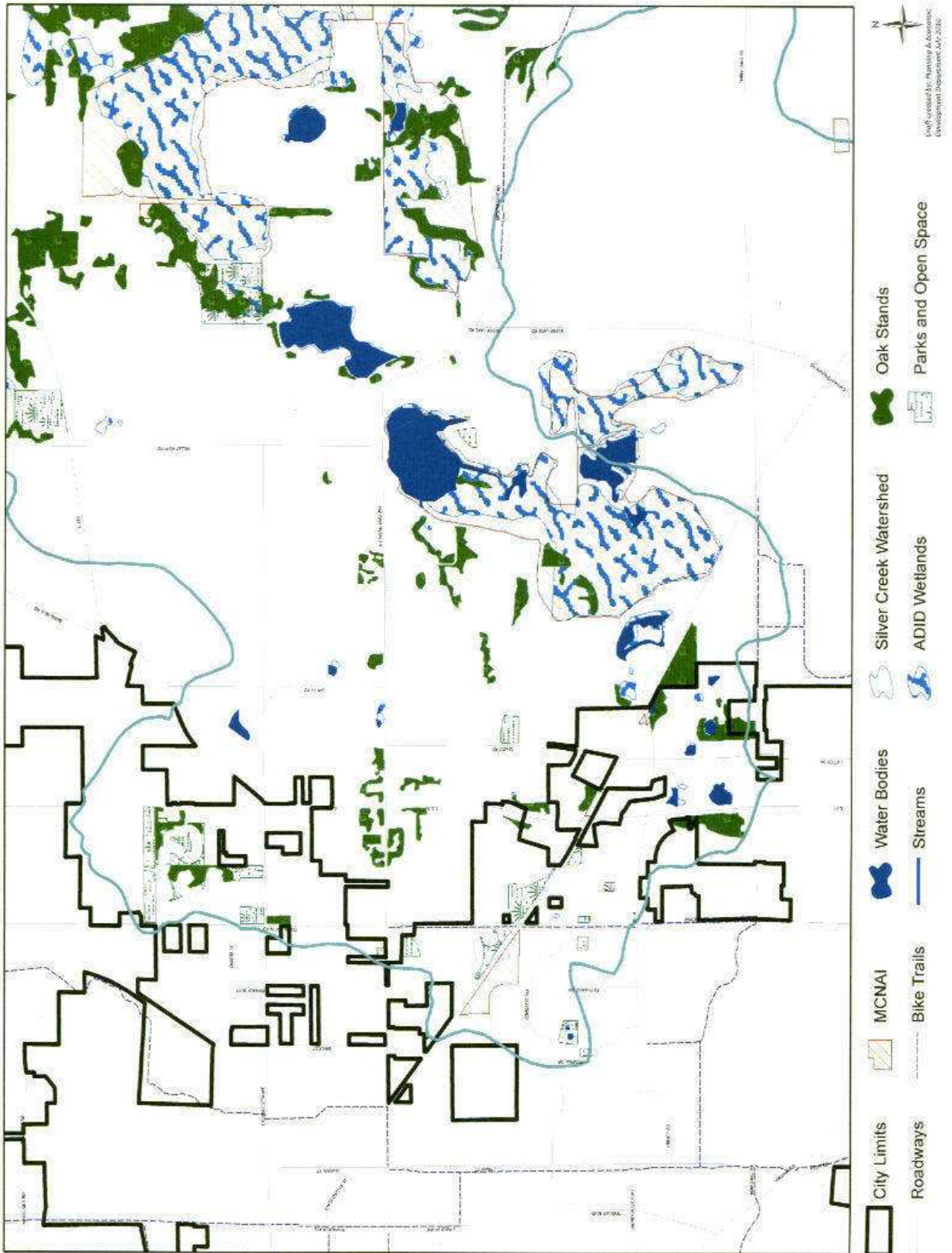
Silver Creek	
<i>Attribute</i>	<i>Functions provided</i>
Water Resources	ADID Wetlands Floodplain Tributary to Fox River – drinking water
Recreation	MCCD Sites Fel-Pro Conservation Area Silver Creek Conservation Area The Hollows Conservation Area
Habitat	ADID Wetlands Oak Stands Aquatic life Conservation Areas

	Recommended Actions	Success Indicators
11.3a	Encourage neighborhood scale retrofits of BMPs to maintain/restore healthy groundwater flows.	Reduced use of phosphorous fertilizers. Cleaner water discharged from properties. Installation of bio-swales, rain gardens, green roofs and porous pavement. Increase in underground aquifer levels.
11.3b	Work with landowners, including the Park district and residents, to continue and expand ecological restoration of woods, savannas, and wetlands.	The removal of invasive species. Sleepy Hollow Creek’s Natural hydrology restored. Silver Creek’s Natural hydrology restored. Water quality and water quantity improved.
11.3c	Educate the property owners and general public of the importance of the watersheds.	The establishment of an active stewardship group founded for long term care of the area. Increased usage of the conservation areas.

Sleepy Hollow



Silver Creek



Highly Important Resource Area Details, Actions and Indicators

11.4 Northeast Fen and Oak Stands



Crystal Lake Park District, www.crystallakeparks.org



Crystal Lake Park District, www.crystallakeparks.org

Goal:

Protection and enhancement of the natural features while allowing passive and active recreation experiences.

Along the northeastern border of the City from Veteran Acres Park to Barreville and Wright Roads is the Northeast Fen and Oak Stands element. This area is unique due to its rolling to hilly landscapes, stands of oak and hickory woods and savannas and rare fen type wetlands. This element contains; two City park sites, Veteran Acres and Sterne's Woods and Fen; a Nature Preserve, Wingate Prairie; and several wetlands. The area of this element, centered around the park sites, is identified in McHenry County's Natural Area Inventory. Sterne's Woods and Wingate Prairie is also identified as a dedicated Illinois Nature Preserve. Extending to the northeast from the protected lands are additional woods and wetlands, some of which are now occupied by low-density residential neighborhoods.

This element has both hard and soft boundaries. The hard boundaries are the specific identified features. The soft boundaries are the adjacent wetlands, tree groves and other open space. The non specifically identified features can be combined with the larger hard boundary features to create green corridors, increased habitat or recreation area or additional conservation property.

This resource area has three main attributes with the most observable being the recreational amenities.

Northeast Fen and Oaks Stands	
<i>Attribute</i>	<i>Functions provided</i>
Recreation	Veteran Acres Active recreation – picnic tables, playground, Nature Center, ball fields, cross-country skiing Wingate Prairie (39 acres Illinois Nature Preserve) walking trails and wooded areas. Stern’s Woods (185 acres Nature Preserve) Wooded trails Cross county skiing Prairie Trail – bike path
Habitat	Wingate Prairie Plants, rare and endangered plant species Animals, mammals, reptiles, amphibians, birds Stern’s Woods Stern’s Fen ADID Wetlands Oak stands
Water Resources	ADID Wetlands Ponds Groundwater fed seeps and fen Critical recharge zone for ground water aquifers

	Recommended Actions	Success Indicators
11.4a	Promote, enhance and preserve the recreational opportunities.	The number of improvements made to facilities by preservation groups, such as the McHenry County Conservation District, Illinois Department of Natural Resources and the Crystal Lake Park District. Increase in the number of users at the recreation areas.
11.4b	Work with nearby residents and the general public to educate them on the resources in the area and practices that harm these resources.	The number of educational materials prepared about harmful practices such as phosphorous fertilizers and cold tar application driveway sealant. Ground water quality reports that show little impairment to water resources in the area.
11.4c	Use zoning to protect the valuable resources of the area.	The establishment of the Conservation Overlay District.
11.4d	Ensure development and related infrastructure does not disrupt the natural ecosystem of the area.	Conversion of gray infrastructure to green infrastructure.

Blank

Highly Important Resource Area Details, Actions and Indicators

11.5 Three Oaks Recreation Area



Goal:

Enhance the recreational features and experience while protecting the natural amenities.

Three Oaks Recreation Area is the newest recreation destination within Crystal Lake. This 500+ acre site includes nearly 350 acres of high quality, groundwater fed lakes that were converted from gravel mines. The complex features a sand beach, spray park, restored natural landscapes and an internal trail system. From a biodiversity perspective, the site is well known by birders for attracting migrating songbirds and waterfowl. A diversity of fish and small mammals also make their homes within and around the lake. Three Oaks is connected to adjacent areas by the regional Prairie Trail and is bordered by a large gravel mining complex to the south. Three Oaks Recreation area contributes to the community character of Crystal Lake and is projected to become a regional destination.

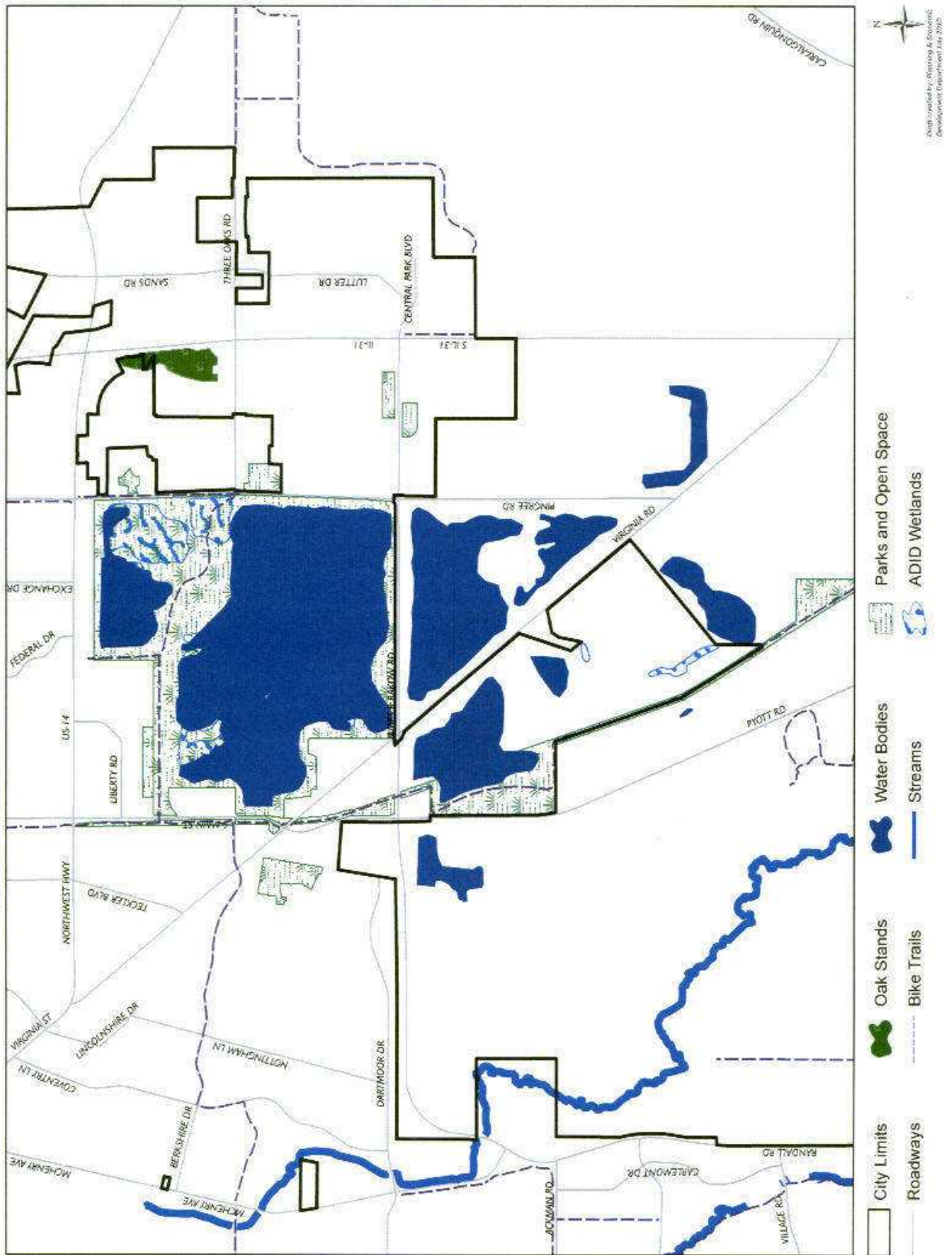
The City's primary goal for this element is to enhance and increase the recreational opportunities. The City is also a good steward of the land and has restored and enhanced several of the natural areas within the park. Fish are stocked within the lake and are catch and release only. The park area is also home to a variety of other birds, mammals and aquatic life.

Three Oaks Recreational Area	
<i>Attribute</i>	<i>Functions provided</i>
Recreation	462 acres - Swimming, spray park, biking, hiking, boating, fishing. Connected to regional Prairie Trail
Community Character	Primary recreational area for City Attract tourist for economic development Commercial – adjacent and future onsite potential
Habitat	Fish, plants wildlife Habitat for migrating birds and waterfowl
Water Resources	Gravel bottom ground water-fed lakes Outstanding water clarity (one of the clearest in northeastern Illinois) Storm water runoff cleaning – BMPs
Economic Development	Revenue generated from development around the periphery. Business location because of City amenities.



	Recommended Actions	Success Indicators
11.5a	Create a recreational destination within Crystal Lake.	The construction and opening of Three Oaks Recreation Area.
11.5b	Preserve and restore shoreline and upland habitat areas within this area.	The retention of existing vegetation around the majority of the lake. Continued prohibition of motorized watercraft. The planting of native prairie, wetland and savanna plant species.
11.5c	Implement stormwater BMPs that infiltrate and filter runoff via a runoff reduction hierarchy for all new development and redevelopment around the periphery of the Three Oaks site.	The number of BMP's installed including permeable paving, filter strips, bio-swales, rain gardens and naturalized detention.
11.5d	Work with existing residents and business owners around the periphery of the site to incorporate rain gardens, permeable paving, and natural landscaping to reduce contaminated stormwater flows entering the lakes.	The number of educational materials created. The increase in rain garden, bio-swale and native planting installations.
11.5e	Promote the economic development benefits of Three Oaks Recreational Area	The preparation of a redevelopment plan for the surrounding properties. Creation of market materials highlighting redevelopment opportunities around Three Oaks Recreation Area.

Three Oaks Recreation Area



Highly Important Resource Area Details, Actions and Indicators

11.6 Crystal Creek



Goal:

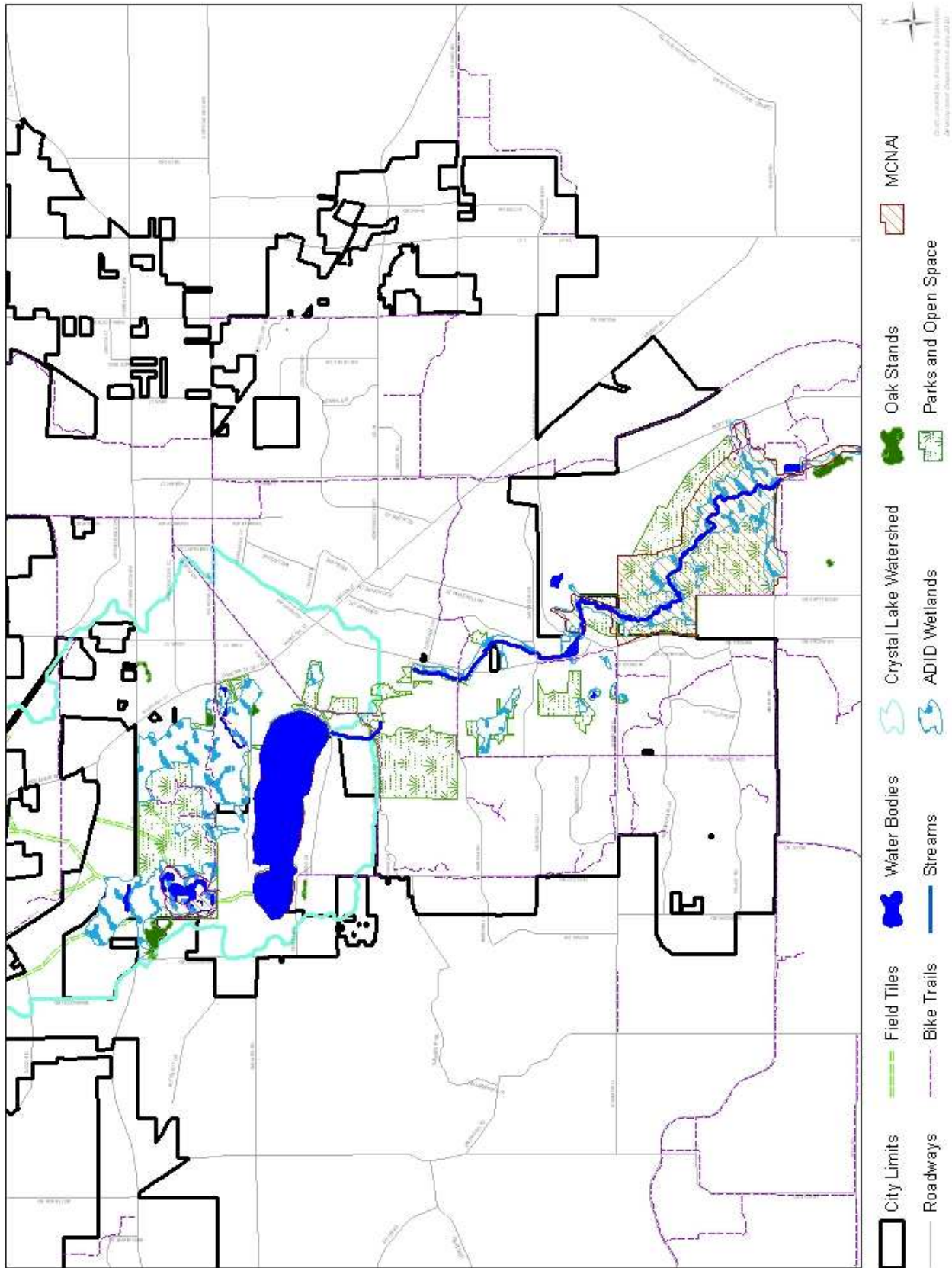
Restore the natural setting of Crystal Creek.

Crystal Creek is the natural discharge from Crystal Lake. It flows southeast through Lake In The Hills Fen Nature Preserve west of Pyott Road, eventually meeting up with the Fox River. The most upstream reaches of the creek have been piped or channelized to allow for development and storm water discharge. The creek flows in a mostly natural, meandering channel east of Randall Road. Restoring the natural conditions of the creek corridor, “daylighting” it from underground culverts, and restoring natural hydrology and improved water quality is a priority for this area.

Crystal Creek	
Attribute	Functions provided
Habitat	Crystal Creek Fen Lake in the Hills Fen
Water Resources	Crystal Creek storm sewer project (future possible) Dewaters area south of the lake. Surface and piped. Watershed Crystal Creek ADID Wetlands
Recreation	Park District Seminary park 4.5 acres – ball fields Cress creek – unpaved bike path Knaack Park – 6 acres playground and ballfield MCCD Rothschild site

	Recommended Actions	Success Indicators
11.6a	Encourage the restoration of Crystal Creek to its historic surface water conditions.	The creek is returned to daylight (above ground and not piped). The completion of projects which restore the creek’s natural conditions.
11.6b	Implement stormwater BMPs that infiltrate and filter runoff via a runoff reduction hierarchy.	The installation of bio-swales, rain gardens and infiltration strips. Education materials created outlining the dangers of pollution in water run-off from washing cars and phosphorous fertilizers.
11.6c	Encourage private property owners to grant access easements to the creek.	The granting of easements.

Crystal Creek



Secondary Resource Area Details, Actions and Indicators

11.7 Woods Creek



All Photos: Crystal Lake Park District, www.crystallakeparks.org

Goal:

Continue to provide a wide range of recreation opportunities.

The Woods Creek area is the combination of several neighborhood parks. The amenities in this area include ball fields, fishing ponds, hiking/biking trails and children’s playgrounds. The Woods Creek system is important because it links several neighborhoods together, creating both a recreation and habitat corridor.

Woods Creek	
Attribute	Functions provided
Recreation	Park District Willows Edge Park – 44 acre natural area Sterling Meadows – 5 acres basketball, playground, bike path Woods Creek Park – 40 acres huge crystal castle playground, ball fields, pond, multi-purpose building and annual events Fetzner Park – 22 acres playground, ball fields Winding Creek Park – bike trail and ponds Fishing
Habitat	Birds, mammals and some aquatic species
Water Resources	Creeks and Ponds

	Recommended Actions	Success Indicators
11.7a	Promote the benefits of outdoor play areas.	An increase in the number of people using the parks. An increase in the number of park area or amenities.
11.7b	Work with surrounding property owners to incorporate green living practices.	The installation of rain gardens. The reduction in the use of phosphorous fertilizers.

Secondary Resource Area Details, Actions and Indicators

11.8 Bike Path



Goal:

Provide biking opportunities throughout the City.

There are over 30 miles of bike trails across McHenry County. The Prairie Trail is a 26 mile trail from the Village of Algonquin to the Wisconsin border, bisecting the City. Additional bike or multi-use trails connect into the Prairie Trail. The City is in the process of adopting a Bicycle Facility Master Plan. This master plan will illustrate a variety of routes around the City utilizing on-street and off-street trails.

Bike Path	
Attribute	Functions provided
Recreation	Prairie Trail On road and multi-use path bike trails
Transportation	Alternative means of transportation
Health	Cycling burns fat, builds muscle, increases the metabolism and improves cardiovascular health

	Recommended Actions	Success Indicators
11.8a	Highlight the various bicycle facilities and encourage their use.	The number of uses along the bike trail. The number of new connections to the Prairie Trail.
11.8b	Enhance the bicycling network in the City for recreational as well as transportation purposes.	Adoption of the Bicycle Facility Master Plan.
11.8c	Support MCCD, the Park District and other organizations efforts to improve the bicycling network in and around the City.	Coordinated plans adopted by the City which reflect regional strategies.

Secondary Resource Area Details, Actions and Indicators

11.9 Glacial Potholes



Douglas C. Harr

Goal:

Preserve the natural environment while providing for economic growth in a smart and conscientious manner.

Formed by the receding glaciers as they moved across the landscape, current glacial potholes are found throughout the region. These potholes create a variety and beauty across the landscape. This glacial landscape, with almost 100% potholes, stretching between Crystal Lake and Woodstock is unique in Illinois. Preservation of this feature for aesthetics, habitat and passive recreation uses is important.

Glacial Potholes	
<i>Attribute</i>	<i>Functions provided</i>
Recreation	Passive Recreation Could be part of a conservation area
Habitat	A variety of wildlife, natural ecosystem
Water Resources	Creeks Small ponds / ADID Wetlands Ground water recharge

	Recommended Actions	Success Indicators
11.9a	Ensure the protection of this natural area.	The number of conservation easements created or amount of land put into a conservation easement. The amount of land donated to an environmental organization.
11.9b	Implement stormwater BMPs that infiltrate and filter runoff via a runoff reduction hierarchy.	The number of bio-swales installed. The measured improvement in water quality, animal species and vegetation adjacent to water resources.

Secondary Resource Area Details, Actions and Indicators

11.10 Agriculture



McHenry County Farm Bureau.
www.mchenrycfb.org

Goal:

Allow for a variety of land uses including agriculture.

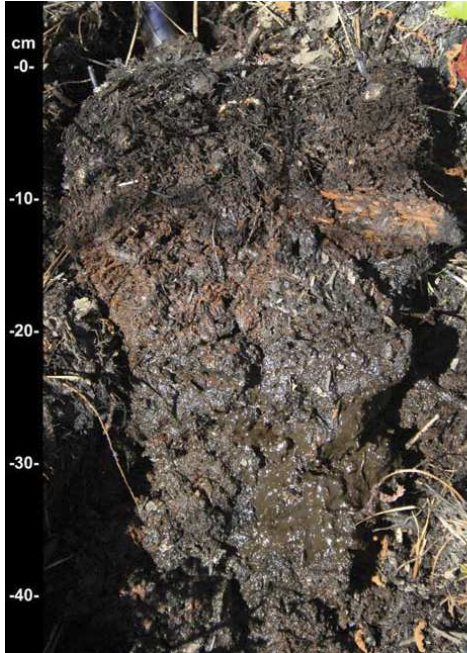
Agriculture is a prominent land use in McHenry County, with the McHenry County Farm Bureau reporting 1,035 farms and approximately 215,584 acres being actively farmed. Agriculture is important for local food products, maintaining a rural character, economic development with agri-tourism and providing jobs. The preservation and enhancement of agriculture activities is important.

Active Agriculture	
Attribute	Functions provided
Recreation	Agri-tourism
Habitat	People Local food products Domestic Animals Glacial wetlands, Bird habitat. Aquatic habitat for amphibians and reptiles.
Water Resources	Critical water storage and groundwater recharge
Economic Development	Agri-tourism

	Recommended Actions	Success Indicators
11.10a	Preserve the agricultural way of life.	The area of farmland remaining in the City. The number of organic farms established. An increase in the number of participants in the 4H program.
11.10b	Promote Agri-tourism.	The number of Farmer's Markets or farm stands in the City. Increased attendance at Farmer's Markets. Approval of alternative uses on farms, such as special events or corn mazes.
11.10c	Promote economic development agricultural activities.	The number of agriculture related businesses created or maintained.

Secondary Resource Area Details, Actions and Indicators

11.11 Hydric Soils



Goal:

Limit development on hydric soils and educate the public on their unique characteristics.

Hydric soils are formed under conditions of saturation, flooding or ponding for long periods during the growing season. They develop anaerobic conditions which stop air from mixing well with the soil. Field indicators to look for are wet or moist soil, organic compounds in the soil, deep colors and the presence of muck. Hydric soils are the underlying support of a variety of ecosystems.

USDA, ftp-fc.sc.egov.usda.gov/NSSC/Hydric_Soils/FieldIndicators_v7

Hydric Soils	
Attribute	Functions provided
Habitat	Supports certain ecosystems Wetland plants Vernal pool
Water Resources	High ground water Possible wetland
Property Protection	Avoidance of construction in these soils minimizes expensive public and private mitigation efforts in the future due to water seepage and settling of hard infrastructure (roads, foundations, utility pipes, etc.)

	Recommended Actions	Success Indicators
11.11a	Educate the public and property owners about hydric soils.	The number of educational brochures distributed. The amount of hydric soil areas voluntary preserved. The restoration of hydric soil areas.
11.11b	Retain hydric soil areas to create habitat links between green infrastructure elements.	The creation of a Green Infrastructure map that illustrates links between other green infrastructure elements. The number of preservation easements created over hydric soils to create links between green infrastructure elements.

11.12 Neighborhood and Site Strategies

The City encourages property owners to take advantage of green techniques that enhance the neighborhood, improve habitat, improve water quality and add to the green infrastructure system.

Common green infrastructure strategies that individual property owners can install are:

- * Bio-Swales
- * Rain Garden
- * Native Prairie Flowers
- * Green Roofs
- * Porous Pavement
- * Water Conservation

Bio-swales are swales planted with native vegetation used for water drainage. Vegetated swales are a better alternative than storm sewers, since they transport water more slowly and allow for filtering, settling, infiltration, evapotranspiration and soil-water contact.



Rain gardens are appropriate around a runoff source of water such as a depression in the curb or a gutter downspout. They are slightly depressed and planted with native plantings. Native plantings typically have deep root systems that help infiltrate the water back into the ground. Runoff from roofs, driveways, sidewalks and roadways can all be captured in a rain garden rather than washed away through storm sewers. The water will also be better treated as it slowly infiltrates into the ground.



City of Burnsville, MN and Barr Engineering Co.

Native prairie flowers are more adapted to the local climate than turf grass, so do not require extra fertilization or watering. Recognized as one of the biggest obstacles to planting wildflowers on your property is the zoning ordinance. The City is working to ensure that properties with documented wildflowers are not given tickets for weeds. Native prairie flowers also attract native bird, butterfly and insect species.



All photos from the Wildflower Preservation & Propagation Committee;
<http://thewppc.org>



Green roofs may not be practical for homeowners but can be implemented in business or manufacturing buildings. There are two types of green roof systems, extensive and intensive. Extensive are more common as they use plants with shallow root systems requiring less soil and creating less weight on the structural roof system. Intensive systems utilize deep rooted plants requiring more soil. The benefits of the intensive system is the plant variety that can be achieved, water filtration capability and wildlife habitat.



www.treehugger.com
Apple Store on Michigan Avenue in Chicago

Porous pavement allows for water to percolate through the material back into the ground. Water runoff into storm sewer systems is nearly eliminated.



Water conservation is the most important method to preserving clean drinking water. The less water pumped out of the ground the more that remains for future uses and habitat. Water comes from underground aquifer sources or surface water such as lakes and rivers. Water is treated to drinking water quality standards. Although water used is not for drinking purposes. Exterior uses like landscape watering, car washes, power spraying siding or decks, use a lot of water. Interior uses such as sinks, toilets, showers, dishwashers and laundry also make up a large portion of water usage. There are ways to conserve water (1) use less, (2) capture rain water, (3) reuse gray water, and (4) alter current practices (yard watering, hydrant flushing, showers and sinks). Reduction in water use is encouraged for residential, commercial and civic properties.

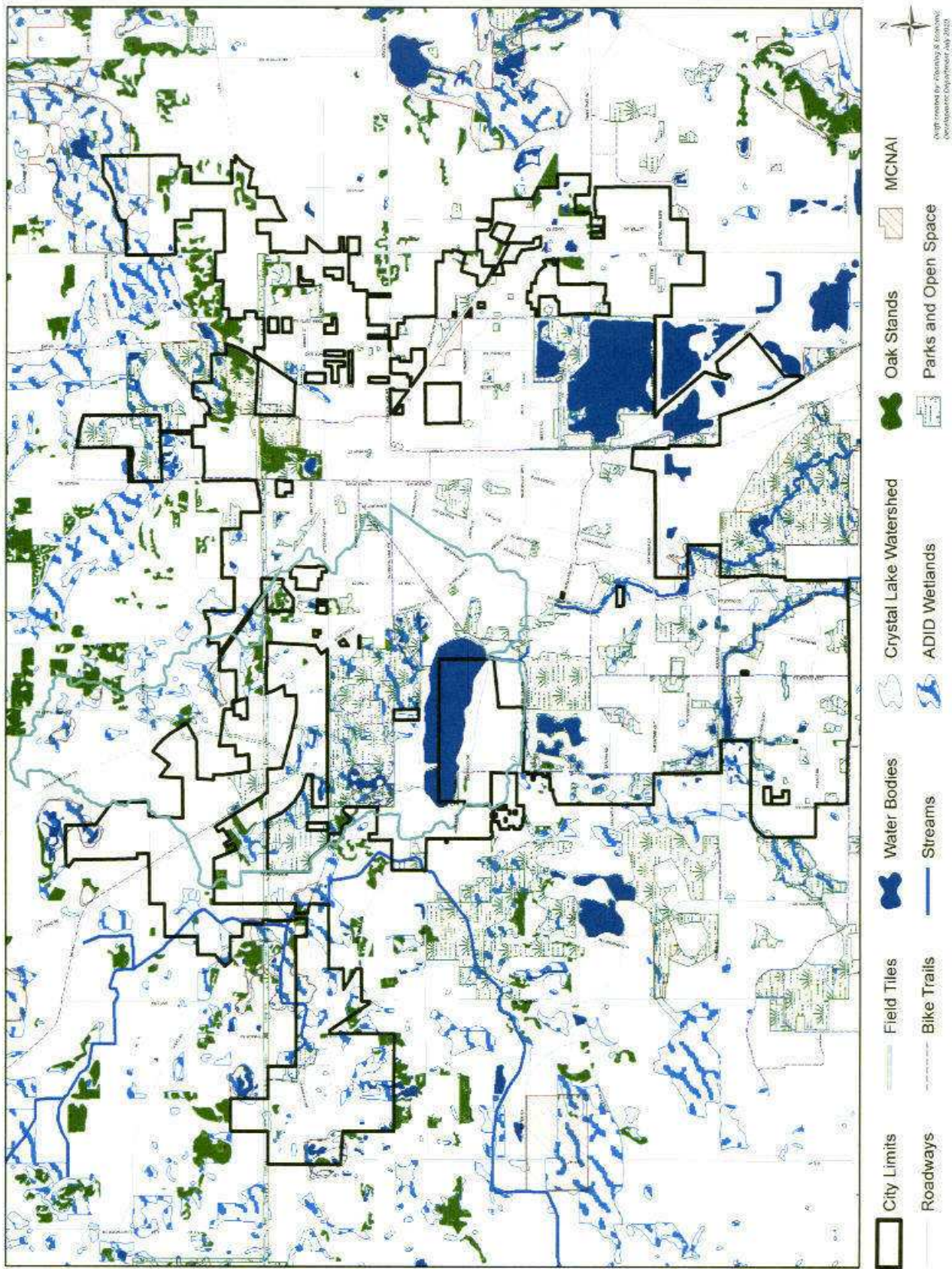


Experiments in sustainable Urban Living, www.lid-stormwater.net

	Recommended Actions	Success Indicators
11.12a	Encourage the installation of BMP’s and alternative methods of water run off treatment.	The increase in the number of rain gardens, living fences, perennial gardens and bio-swales installed. The installation of “green street” practices.
11.12b	Encourage native planting to reduce fertilizer use, conserve water and increase aesthetic value of properties.	The number of educational materials created showing benefits of natural grasses, flowers, shrubs and trees. Increase in properties that utilize native plantings. Reduced use of phosphorous fertilizers.
11.12c	Allow for the installation of green roofs in the UDO as well as the building codes.	The installation of green roofs on commercial buildings.
11.12d	Promote water conservation practices throughout the City.	The adoption of water conservation requirements for residential, business and civic properties. Adoption of water and sewer fees that accurately represent water supply and treatment costs.

Exhibit 1

Green Infrastructure



Conclusion

This chapter in the Comprehensive Plan identifies the existing green infrastructure elements located within and near the City. This plan element is an extension of the City's overall Green Infrastructure Vision. It establishes the overall goal of utilizing alternatives to traditional gray infrastructure. Whereas the Comprehensive Plan establishes the policy framework, the regulatory Ordinances including the Unified Development Ordinance Conservation Overlay District, the Watershed Design Manual and Design Manual Implementation Plan, and the City's Subdivision Standards Article in the UDO set the development standards.

The attached Overall Green Infrastructure Map, Exhibit 1, illustrates the mapped areas. These areas include wetlands, MCCD sites, park sites, nature preserves, MCNAI sites, oak stands, bike paths, bodies of water, and field tiles. This map was used as the base map for the proposed green infrastructure system future connections.

There are two green infrastructure system maps, one for active recreation that connects public open spaces together and one for habitat connections. Exhibit 2, the Green Infrastructure System Map for Active Recreation shows areas for future connections, between the parks. These could most likely be bike trails, walking paths or lineal parks. Eight future connections are shown:

1. Connect the bike trail along the Commonwealth Edison power line easement to Lippold Park using Briarwood.
2. Connect fragmented bike path along Crystal Creek.
3. Connect Three Oaks Recreational Area to Crystal Creek along Dartmoor Drive and existing bike paths.
4. Park connections along Barlina, Alexandra and golf Course Roads. Several parks can be connected together by trails or open space.
5. Provide a link that helps loop the bike trail along Miller Road.
6. Complete the bike path connection along the railroad.
7. Connect Three Oaks Recreational Area to bike paths to the east along Three Oaks Road.

The Green Infrastructure System Map for Habitat Connections, Exhibit 3, illustrates some links between habitat areas. These links are suggested between large natural areas to assist in animal migration between the areas. Five possible areas are shown on the map and described below.

1. Link between the Lussy Parcel (MCCD Site) along the Kishwaukee River through several oak stands to Lippold Park. Additional oak trees can be planted to fill in this area as well as restoring the riparian corridor along the Kishwaukee River.
2. Crystal Creek starting at Crystal Lake and going to the Rothschild Parcel (MCCD site). This could be the restoration of the Crystal Creek riparian corridor.
3. The land above the drain tiles can also be preserved and used for wildlife trails and passive recreation uses.
4. Utilize the Route 176 buffer to link natural features.

Conclusion

5. Along the northeast fen and oak stands area are several fragmented natural features. Preservation and enhancement of these features can create a linked habitat area.

Also identified are two areas where the City should explore safe wildlife crossing areas. The first is along Route 176 between Mt. Thabor Road and US Route 14. Lippold Park and several other natural areas span both sides of the roadway. The second area is along James R. Rakow Road between Pyott Road and Pingree Road. The gravel mining operations have left natural lakes on either side of the roadway. Safe crossing areas can be delineated with signage.

This land use Element will guide the City in protecting, preserving and enhancing the natural areas and green infrastructure through the City.

Exhibit 2

Green Infrastructure - Active Recreation

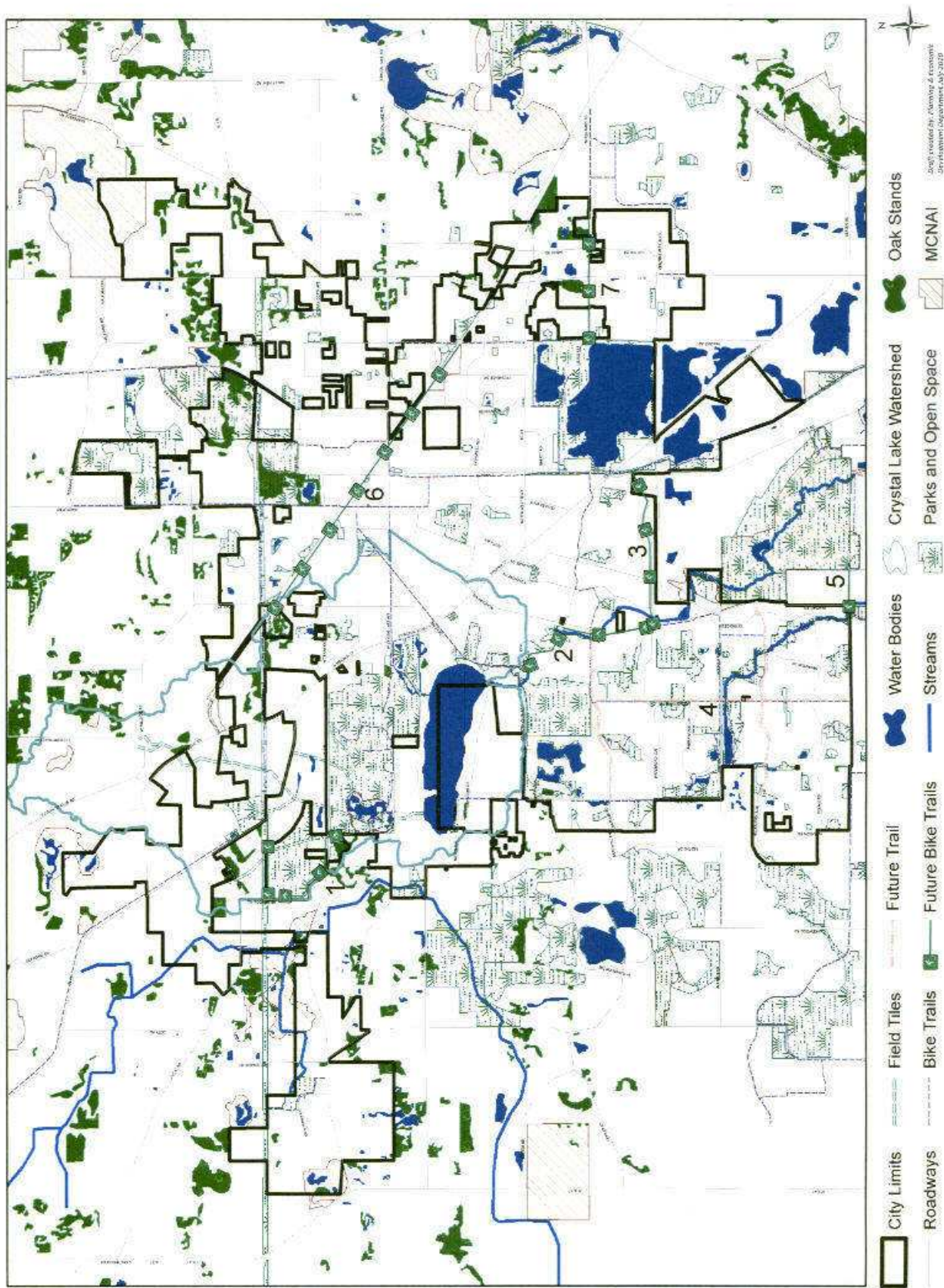


Exhibit 3

Green Infrastructure - Habitat Connections

