

LAND USES AND BEST MANAGEMENT PRACTICES

OPEN SPACE

On a regional scale green infrastructure refers to the interconnected network of open space including natural areas and greenways that help define the character of McHenry County. While “open space” does not have a universally accepted definition, the phrase usually refers to undeveloped or lightly developed areas that are set aside for the protection of natural habitat such as prairie, forest, savanna, or wetland; natural riparian corridors and buffers along rivers and streams; parks or other areas that provide opportunities for outdoor recreation; linear travel corridors for non-motorized transportation; preserved geologic, cultural or historic features; or areas established for stormwater management.

The county’s open spaces include preserved land and water resources where wildlife can thrive and people can commune with nature. Its parks provide opportunities for people to gather and engage in a variety of recreational activities. There are lakes, rivers and streams where people can swim, boat and fish. The growing network of multi-use trails enable people to travel by foot, bike or horse. Much of the public and private open spaces provide upland and wetland habitats for people to hunt a variety of game and waterfowl. The protected natural areas, agricultural fields, and rolling topography provide scenic vistas that can be enjoyed year round. The opportunities to get outside help improve the physical health and peace of mind for McHenry County’s residents and visitors. The quality of life these open spaces provides can attract business and investment.

*** Photo of M CCD Greenwood/Nippersink Creek Property ***

This network of open spaces also provide valuable ecosystem services that play an important role in protecting water resources, such as:

- Recharging the groundwater aquifers that provides the water we drink
- Reducing flooding by storing rainfall so it can infiltrate into the ground or transpire into the air
- Protecting water quality by filtering sediment or pollutants from runoff
- Moderating temperature through evaporative cooling from trees and vegetation
- Regulating air quality by removing pollutants from the atmosphere
- Storing and sequestering carbon in soils and vegetation
- Supporting and maintaining biodiversity of species
- Providing recreational opportunities for improved physical and mental health
- Attracting investment, economic stability and tourism
- Enhancing resilience

The undeveloped land in open spaces, especially on land with trees, native vegetation or hydric soil, helps to reduce flooding by intercepting rainfall; absorbing and transpiring water through the plants; storing rainfall in the soil and root zones; treating and cleaning stormwater runoff; and promoting infiltration that recharges groundwater aquifers and also provides a baseflow of water that is naturally

filtered and cooled to lakes, rivers, streams and wetlands. Open spaces with riparian habitat along rivers or creeks can be restored as greenways that not only act as protective buffers for water resources but also provide physical connections between larger open spaces and serve as travel corridors for people, animals and plants. Some open spaces also include constructed forms of green infrastructure such as raingardens, bioswales, or wetland detention that are specifically designed to manage stormwater.

Open spaces can vary in their size, form or function and what constitutes as an open space may depend in part on its geographic location. For instance a pocket park, community garden, or small natural area can be important open spaces in residential neighborhoods. A narrow linear corridor or pathway for walking or bicycling can be valuable open space even though it may be surrounded by developed areas. Regional parks may include hundreds of acres or more of open space and provide a wide range of recreation and conservation opportunities for residents and tourists. Historic and archeological sites are often associated with open spaces and may be important parts of a community's heritage or character. Such open space areas may be public or private and located on protected or unprotected properties.

The McHenry County 2030 Comprehensive Plan defines open space on public land as those areas whose clear purpose is to protect natural resources and offer opportunities for education and recreation to the broader public in perpetuity. There are approximately 31,393 acres of public open space within McHenry County, comprising approximately 8% of the County's land area. The majority of the County's public open space is owned and managed by the McHenry County Conservation District (MCCD). As of November 2019, MCCD owned or managed 25,598 acres or 73% of all public open space and roughly 6% of the County's land area. The MCCD sites are distributed throughout the County with several sites located in each corner of the County. Many of the MCCD sites are listed in the Illinois Department of Natural Resources Natural Areas Inventory due to their high quality natural habitat. The MCCD properties also include natural features such as geologic formations, wetlands, prairies, and forests as well as opportunities for a wide range of recreational, educational, and volunteer activities.

*** Photo of MCCD Property(s) ***

Another large holder of public land includes the Illinois Department of Natural Resources (IDNR). The IDNR maintains approximately 3,332 acres of public open space in the Chain O' Lakes and Moraine Hills State Parks, the Black Crown Marsh and Volo Bog state natural areas, part of the Lake in the Hills Fen, the Bull Valley State Fish and Wildlife Area , part of the Hackmatack National Wildlife Refuge, and other miscellaneous properties. The IDNR also holds conservation easements for another 1,987 acres of property in the county. The State Parks are large properties that include access to the Fox River and offer a variety of activities including hiking, biking, boating, cross-country skiing, and hunting. The Chain O' Lakes State Park also provides opportunities for camping and access for boating on the Chain O' Lakes.

*** Photo of Lake Defiance with canoe and sandhill cranes ***

The newly established Hackmatack National Wildlife Refuge (NWR) will provide natural public open space in McHenry County, Illinois and Kenosha County, Wisconsin that will be protected and managed by the U.S. Fish and Wildlife Service (USFWS). The Hackmatack NWR will use a core and corridor approach for its development, where four large core areas of protected habitat will be connected by natural corridors. The core areas will improve or restore 11,200 acres of drained wetland, historic prairie and forest as new core habitat for the refuge. This new acreage will be in addition to over 23,000 acres of existing protected natural areas that are owned by MCCD, the Land Conservancy of McHenry

County, the IDNR, Openlands, and others. Tributaries to Nippersink Creek and other areas of open space will serve as the corridors to help connect the new core habitat and the existing natural areas. Approximately 85% of the Hackmatack NRW will be in McHenry County, Illinois and 15% will be in Walworth County, Wisconsin. The protected habitat will be restored and managed, in large part, to provide vital habitat for migratory and grassland birds. Development of the Hackmatack NWR will occur over time as land is purchased or acquired by willing sellers. In addition to providing vast new open space for county residents to enjoy, the Hackmatack NWR will promote tourism by providing much-needed opportunities for people from the region to get outdoors and enjoy nature.

***** Include sidebar for Hackmatack NWR with map *****

Municipal governments, including municipal park districts, collectively own approximately 3,397 acres in local parks throughout the County. These can include small community parks nestled into residential neighborhoods to larger city parks featuring many amenities and recreational opportunities.

***** Include photos of small community park and a larger city park *****

Over 90% of the land in McHenry County is privately owned. This includes numerous open space areas that are held in private ownership. These privately held open space areas may include restricted-access recreational areas such as hunt clubs, religious institutions, golf courses, and campgrounds. Other open space areas may be owned by not-for-profit organizations, homeowners associations, individuals, or private companies and serve aesthetic purposes, as a buffer for adjacent natural areas, or as hubs between protected open spaces. These privately held areas can provide many of the same benefits as public open space but may not be protected or preserved.

Some privately owned open spaces in the county have been voluntarily dedicated under what is known as a “conservation easement”. A conservation easement is a voluntary, permanent agreement between a landowner and a qualified organization. The agreement clearly defines future uses and restrictions for the property, while allowing the owner to continue to use and enjoy the land, eventually sell property, or pass it on to their heirs, knowing that the land will remain undeveloped. These conservation easements are usually used to protect and preserve natural areas or farmland in perpetuity. Thus, conservation easements provide a method to preserve natural open space for future generations.

***** Provide photo of property owners with TLC conservation easement and map or photo of their property*****

The Land Conservancy of McHenry County is a not-for-profit organization dedicated to permanently protecting and preserving natural habitats and farmland. They work with property owners to prepare and hold conservation easements or farm easements. The Land Conservancy will also selectively purchase land with high ecological value or accept donations of land. As of January 2020, The Land Conservancy owned over 500 acres of natural area and held conservation easements on roughly 2,200 acres of permanently protected private open space. Much of this land is actively being managed to restore natural habitat and increase biodiversity. The Land Conservancy also works with municipalities to help them restore and manage their natural areas.

***** Sidebar for TLC collaborative work with Woodstock Ryders woods and Westwood Prairie**

Open spaces can contribute to a quality of life that can help drive economic development by attracting tourists, businesses and new residents to McHenry County. When tourists are considering where to visit, the availability of open space with access to the outdoors or recreational opportunities, are often a consideration. When deciding where to locate a new business, access to open space and the quality of life an area provides can be important factors when they are looking for places to help them attract and retain employees. People are often willing to pay more for a home located close to a natural area or park than a comparable home elsewhere.

Open spaces also have the potential to improve people's health. Natural areas, parks and trails provide opportunities for exercise and a healthy lifestyle. Time spent outdoors reduces stress and can improve a people's physiological and psychological well-being. McHenry County's open spaces can also provide opportunities for structured and unstructured educational opportunities for all ages.

***** Photos of people riding on Prairie Path, and class at Lost Valley *****

McHenry County has prepared resources that can be useful for open space planning including the McHenry County Natural Areas Inventory (MCNAI) Map (Attachment ???), the McHenry County Green Infrastructure Plan and the Green Infrastructure Network Map (Attachment ???). The MCNAI Map was prepared by the McHenry County Conservation District (MCCD) and shows sites that were identified to be the best remaining examples of remnant natural communities that retain the pre-settlement conditions. The Green Infrastructure Map provides a broader view of existing or potential open spaces natural areas, and other resources throughout the county including:

- Parks and preserves
- Private open space
- Environmental resource areas (water bodies, inventoried natural areas, oak woodlands, flood zones
- ADID wetlands
- Oak groves
- Class III groundwater protection areas
- Conceptual trail corridors
- Existing regional trails

The Green Infrastructure Plan and Map can be used to help identify priority natural areas that could expand protected habitat, locate optimal connections to adjacent natural areas, and opportunities to create greenway corridors. The Green Infrastructure Network Map is also provided as a GIS layer on the McHenry County PlanDev Viewer online mapping tool at <https://www.mchenrycountygis.org/planning/>

Open spaces and how they are managed will shape the character and quality of life in McHenry County long into the future. The resources associated with open space include natural areas, parks, greenways and trails, recreation, and tourism:

Natural Areas: *Municipalities, in coordination with conservation organizations and the public, should seek out and identify high quality natural habitats on properties owned by the municipality, or located within the municipal boundaries. Unprotected high quality habitat areas should be assessed for possible acquisition from willing sellers. Habitat on these properties should be considered for restoration, management and protection to maximize benefits from ecosystem services.*

Prior to European settlement, McHenry County was a vast mosaic of prairie, wetland, woodlands, and savanna. These natural habitats absorbed the majority of precipitation where it fell, producing little stormwater that could cause flooding. When regional flooding of streams or rivers did occur, the native vegetation present was adapted to floodplain conditions so the land recovered quickly after floods receded. Over the past century most of these natural habitats have disappeared as land was converted to farmland or paved over for development. The vegetation and soils that once absorbed rain and snowmelt have been replaced by paved surfaces and compacted soils that produce large volumes of stormwater runoff that causes flooding, accelerates erosion, and degrades water quality. Today only small remnants of natural habitats remain intact. These remnant habitats provide a window to the past that shows the diversity of plants and animals that once maintained healthy, balanced ecosystems. The remnants also serve as a blueprint of how to restore habitat that can keep water clean, minimize flooding, and provide life for many species. The remaining remnant habitats cannot be replaced and should be considered valuable community assets to be restored, protected and enjoyed by current and future generations.

***** Photo of Yonder Prairie or other location with high species diversity *****

Organizations like MCCD, the Land Conservancy of McHenry County, some municipalities, and others have sought to acquire remaining unprotected natural areas in the county so they can be restored, protected and preserved. Municipalities, park districts, park departments, and townships should also identify and implement opportunities to acquire and restore quality natural areas in their municipal limits. The remnant natural areas that are not actively being protected and managed are often still under threat due to the expansion of invasive species. Unless properly managed, nearly every wetland, woodland, prairie, or other natural open space can potentially be overrun with invasive, non-native species, including reed canary grass, common reed (Phragmites), garlic mustard, honeysuckle or buckthorn. Invasive species overtake and shade out all other species, thereby preventing them from reproducing and leaving only a monoculture of the invasive species. For instance, an oak forest overtaken by buckthorn will be unable to generate young oaks and therefore as older oaks die off the area will be converted from an oak forest to a dense thicket of buckthorn. The loss of biodiversity can lead to homogenous landscapes that provide relatively few ecosystem services and little habitat for wildlife.

Healthy remnant habitats are the most resilient to invasive species and the most easily restored and managed. Since intact remnant habitats typically have a healthy soil structure, native seed banks in the soils, or features such as mature trees, high species diversity, natural wetlands, or hydric soils, these areas have an increased probability for a successful restoration. The sooner such remnant areas are protected and the restoration process is initiated, the easier and less costly the restoration process is likely to be. For instance, if a site has a number of mature oaks where invasive buckthorn are just beginning to get established, the initial restoration work can focus on removing buckthorn from the vicinity of the trees, thereby removing the immediate threat (this is often referred to as an oak rescue). If the seed bank of native species is still viable, the native vegetation may come back on its own. If not, the next step may be reseeding the area to reestablish native vegetation. Since the invasive species were removed before getting more established, the amount of invasive species seeds in the soil will be

minimal and the process of establishing native species will be simplified. Once the habitat has been restored to a healthy condition, management requirements to maintain it over time for future generations to enjoy should be minimal.

***** Photo of Emricson Park's native flowers under oaks w/garlic mustard& buckthorn encroaching *****

Parks: *Municipalities, institutions or other organizations with parkland should implement green infrastructure/Low Impact Development (LID) practices, including converting turf-to-native species, raingardens, and bioswales to help reduce flooding and improve water quality treatment.*

Parks have been part of the developed landscape in America for centuries. Boston Common was designated as a public open space in 1634 and is considered to be the nation's first city park. From the mid to late 1800's urban parks were largely focused on providing natural settings in developed urban environments. Beginning in the early 1900's parks began to focus more on recreation, particularly for children, in neighborhood parks. The recreation concept continued to expand to include swimming pools, ball fields and indoor facilities. Parks today are vital components in most communities. They provide space for residents to interact, children to play, people of all ages to engage in sports, dogs to run, or individuals to commune with nature.

Parks can be areas of natural or semi-natural spaces set aside for human enjoyment or wildlife habitat; spaces dedicated toward active recreation or sports with supporting infrastructure such as playfields, courts or tracks; playgrounds specifically designed for children to play; or as often is the case, some combination of these uses.

Many parks also play an important role in helping to manage water by reducing the volume of stormwater leaving the site and improving the quality of runoff. Parks with green space allow for rainfall or snowmelt to infiltrate into the ground. Park trees intercept rainfall, absorb and transpire water, and promote infiltration. Nature-based parks with hydric soils and wetlands absorb and retain rainfall for extended periods. Some parks such as Lippold Park in Crystal Lake or Raintree Park in Woodstock are specifically designed to help manage regional stormwater.

***** Include photos of Lippold and/or Raintree Park *****

Most parks have opportunities to increase the role they can play in managing water by incorporating green infrastructure or low impact development (LID). For instance, parks can incorporate permeable paving systems and bioswales to treat and manage runoff generated from parking lots. Raingardens or constructed wetlands can be designed to collect runoff from rooftops, fields or courts with impervious surfaces. Areas in open fields of turfgrass that are not used for active recreation can be converted to native vegetation to improve absorption and infiltration of rainfall. Low areas prone to frequent ponding or saturation can be revegetated with native plants that are best adapted to the combination of wet and dry conditions. In each of these situations water is being used as an asset that provides multiple benefits to the community including flood control, water quality treatment, attractive landscaping, wildlife habitat and educational opportunities.

***** Photo of permeable paving and native landscaping in Wheaton Park *****

***** Photos of parking lot swales or raingardens at Three Oaks *****

***** Sidebar of butterfly garden next to Main Beach in Crystal Lake *****

Parks: *Municipalities, institutions or other organizations that have parkland bordering lakes, ponds, rivers, streams or wetlands should provide buffers of native vegetation along the shoreline to protect water quality, control erosion and provide wildlife habitat.*

The inter-relationship between water bodies and their shorelines are important. Installing and maintaining a buffer of native vegetation around the shoreline of a water body can help improve water quality, stabilize soil, and provide wildlife habitat as opposed to a shoreline of mowed turfgrass. A vegetated buffer of native plants slows runoff as it moves downslope and helps filter harmful chemicals, nutrients, and sediments before it can reach the water body. The vegetated buffer helps protect the shoreline and prevents erosion from waves, ice, and runoff. Buffers along the shoreline also provide vital habitat for spawning fish and other wildlife.

Buffers of native vegetation can also be effective deterrents for nuisance geese. In addition to being unsightly, the droppings from large numbers of geese are sources of nutrients and bacteria that can cause eutrophication and algal blooms in water. Geese are attracted to large areas of mowed turfgrass because the grass is a food source and it provides excellent visibility for the geese to watch for predators, especially between the water and the mowed grass. On the other hand, buffers with native vegetation deter geese from congregating because it disrupts their line of sight and makes them feel unsafe.

While any width of buffer will provide some benefits, the wider the buffer the more beneficial it will likely be. A minimum buffer width of 25 feet is a general recommendation, but wider widths (e.g. 50' to 100') should be considered for larger or more sensitive water bodies [Q1](#). The actual width should be based on property owner's goals, site conditions, or regulatory requirements. The buffer vegetation should consist of species native to the region, and appropriate for the site conditions they are being planted in. For instance, emergent wetland vegetation is typically planted in the water up to the shoreline, wetland vegetation is planted along the edge of the shoreline, species adapted to moderately wet species are planted above the wetland, and drier species are planted to the outside edge of the buffer. Once the buffer vegetation is well established (typically 1-3 years), maintenance will involve annual mowing or controlled burns to control weeds and maintain species diversity. If certain invasive species need additional control, limited use of herbicide may be needed in localized areas. The use of fertilizer is not needed for native vegetation and should not be used in close proximity to the buffer as this only promotes weed growth. To avoid contributing to the growth of algae, minimize the use of fertilizer on lawns near the buffers and water bodies and only use phosphorus free fertilizer.

***** Need photo or graphic of a native buffer edge, or a compare/contrast of conventional vs native *****

Greenways and Trails: *The County, townships, municipalities, watershed groups, and conservation-based or recreation-based organizations should coordinate to establish greenways that provide connections between natural areas, parks, other open spaces, and communities.*

Greenways are linear corridors of open space that are typically managed for conservation and/or recreation by providing passageways for people, plants, animals, and water. Greenways and trails often follow streams and their riparian corridors, areas of natural land, or utility easements. They can provide important connections between non-contiguous natural areas, parks, municipalities, cultural features or communities. By protecting and restoring riparian land along stream or river corridors, greenways can act as natural buffers helping to provide habitat that improves biodiversity, stabilizes streambanks,

prevents soil erosion, and filters sediments, nutrients and chemicals before they can enter the water. Greenways can also help mitigate flooding when floodplain in greenways is restored to a natural state.

*** NEED Graphic of aerial view depicting greenway connections between parks or natural areas ***

While trails typically provide public access for people, some greenways are specifically intended for wildlife habitat and may or may not provide access for people. Greenways can be publicly or privately owned and sometimes are the result of public and private partnerships. Greenways that include trails promote healthier lifestyles for people by increasing access to open spaces that provide recreational opportunities for regular exercise and safe options for non-motorized transportation or commuting.

Most trails in McHenry County are designed to be multi-use and may use paved surfaces or gravel. Paved surfaces are smoother and provide opportunities for walking, running, biking, and roller blading. Paved surfaces are found most often in more developed areas but can also be useful to prevent scouring and damage in areas that are frequently inundated by flooding, where intermittent flow crosses paths, or on steep slopes. Gravel is most often found on rural trails and is suitable for walking, running, biking and horseback riding. Gravel trails may be favored because of its more natural look but are prone to erosion from heavy stormwater runoff, flooding and on steep slopes. The erosion can lead to costly repairs and cause environmental damage.

Recreation: Residents and visitors to McHenry County use its open space including natural areas, parks, lakes, rivers, streams and wetlands for many different forms of passive or active recreation. Some recreational activities take place directly in or on the water such as swimming, boating, fishing and waterfowl hunting. Other activities benefit from being close to water such as hiking, nature viewing, birding, and game hunting. Each of these activities depend on, or benefit from, good water quality and healthy habitat. Each of these activities also have the potential to cause adverse impacts to water resources.

Swimming – Residents, property owners with water frontage, municipalities, and park districts should manage land use adjacent to swimming areas, and the watersheds around them, to reduce the flow of pathogens, pollutants, and nutrients in waters used for swimming.

Whether it is for survival, recreation, or natural beauty, human beings are naturally drawn to water. There are few things in life as refreshing as going for a swim or few things as fun for a child as splashing around in water. However, in areas used for swimming it is important to keep water safe and healthy. McHenry County has numerous natural and manmade lakes that are used for swimming. Many people swim off of private property along the lakeshore or at public beaches. There are currently 38 licensed public beaches that provide swimming opportunities on 13 lakes in McHenry County. Each public beach is licensed by the Illinois Department of Public Health and inspected by the McHenry County Department of Health (MCDH). Staff from the MCDH collect and analyze beach water samples for bacterial quality at least once every two weeks throughout the summer months.

*** NEED Photo of swimming beach ****

One of the most common problems associated with water used for swimming is elevated levels of E coli bacteria. These bacteria are normally found in sewage or wastewater and can cause illness or rashes for people who swim in water contaminated with E coli. Gastroenteritis type illnesses are the most common for people who inadvertently ingest E coli, with symptoms such as diarrhea, nausea, vomiting,

abdominal pain, headache and low grade fever. Swimmers may also experience skin rashes and earaches.

Elevated bacterial levels at public beaches may result in closure by the MCDH until E coli bacteria reach acceptable levels. When samples exceed 126 colony forming units per 100 milliliter of water, the MCDH will issue a “Beach Advisory” to alert bathers to a potentially higher risk for illness associated with swimming (particularly for bathers who are very young, very old or immunocompromised). The MCDH will issue a “beach closing” when sample levels go above 235 colony forming units per 100 milliliter of water. The beach will remain closed until re-samples confirm E coli bacteria are below acceptable levels.

*** NEED Photo of MCDH (or proxy) sampling at beach ***

Another issue that impacts swimming opportunities and potential health issues are algal blooms, especially blooms of toxic blue-green algae. Exposure to blue-green algae during swimming, wading, and water-skiing can lead to rashes, skin and eye irritation, and effects such as nausea, stomach aches, and tingling in fingers and toes. The conditions that lead to algal blooms are high levels of nutrients and warm temperatures. As such, algal blooms usually occur in the summer or early fall when temperatures are typically the hottest. One of the most common sources of nutrients that contribute to algal blooms is phosphorus from fertilizer that washes into the water. One pound of phosphorus can grow up to 500 pounds of aquatic plants or algae. Other sources of excess nutrients include waste from wild or domestic animals or leaking septic systems.

*** Photo of algal bloom ***

There are a variety of sources that contribute bacteria or excess nutrients to surface water:

- Storm runoff following a rain
- Excess nutrients from fertilizer
- Bacteria or nutrients from wild and domestic animal waste, including geese and gulls
- Bather defecation
- Wastewater
- Agricultural runoff

To eliminate these sources of bacteria and nutrients, ensure that pet waste is consistently collected and disposed of from properties around the water body. Make sure children in diapers have proper swim diapers before entering the water. Good housekeeping measures should be maintained around public beaches including diligently cleaning of potential food or debris to deter geese and gulls from feeding and excreting. Minimize fertilizer use around water bodies and only use phosphorus free fertilizer.

Since geese droppings are potential sources of nutrients and bacteria, they should be deterred from taking up residence around water bodies. Provide ample signs in prominent locations reminding visitors not to feed geese or other birds as this will encourage them to take up residence. The open expanses of mowed turfgrass or sandy beaches that extend down to a water’s edge are inviting habitats for geese

and allow nutrients to flow unfiltered into the water. Geese can best be deterred by establishing buffers of native vegetation along the shoreline, thereby creating a vegetated barrier between the water and lawns. The vegetated buffers deter geese by obstructing their viewshed and reducing their sense of safety from potential threats. The buffers can also provide many additional benefits such as filtering nutrients and pollutants from runoff that flows through the buffer, absorbing and infiltrating water to reduce flooding, stabilizing the shoreline and preventing erosion, providing fish habitat along the shoreline, and providing habitat for pollinators. Deterrents like statues of coyotes or other predators may provide short term benefits, but geese quickly adapt so new strategies need to be frequently implemented. Geese are protected under the Migratory Bird Treaty so only licensed professionals can engage in physical deterrence such as using trained dogs to temporarily drive them away.

*** Photo of coyote statue with geese feeding nonchalantly ***

Lakes and ponds with aeration that maintains open water in winter may attract large numbers of geese. Unless it would cause a fish kill, lake managers should consider shutting aerators off at some point in winter to let the lake freeze over for a month to deter geese.

Boating – Boating is an important recreational activity for residents and visitors of McHenry County. Boating can be a source of great enjoyment for those out on the water, and an important economic driver for businesses directly associated with boating, those businesses who rely on the boating and fishing community to buy goods and services, and municipalities that benefit from the tax revenue generated from boating activities.

*** Photos illustrating different forms of boating (Paddling Kanes, NEED Motor boat & Sailboat) ***

Boating may include power boating on the Fox River or the Chain O'Lakes, meandering down the Kishwaukee River in a canoe, sailing on Crystal Lake, paddling kayaks down Nippersink Creek or paddle boarding at the Three Oaks Recreation Center. Each of these activities can provide great recreational opportunities, but they also have the potential to harm the water resources that make the activity possible. The potential issues include contamination from boat use or maintenance, pollution from cleaning boats or equipment, and the spread of invasive species.

(Boating and Water Pollution) Residents or visitors who use boats on lakes, rivers, streams, or other water bodies should take actions to avoid or minimize pollution to the waterways.

Boating has the potential to pollute water in many ways including metals and chemicals from the use of motors, spills of fuel or oil while refueling or performing maintenance, toxins from motors churning up sediments on the bottom of lakes or rivers, chemicals from cleaning, or dust from sanding. Even if boats are not in the water, if any of these materials are on the ground they can be picked up and transported to water bodies by stormwater.

Actions that can be taken to protect water quality include:

- Replace older two-stroke engines, that can emit 25-30% of their unburned gas and oil mixture into the water, with four-stroke engines that emit 97% less air and water pollution
- Keep engines well-tuned so they run more efficiently and pollute less

- Perform hull, bilge, and engine maintenance in a controlled environment (e.g., indoors) and away from surface water
- Use non-toxic cleaning products on boats to minimize discharge of pollutants
- Properly dispose of debris and residual byproducts (e.g., paints, solvents, etc.) associated with hull and engine maintenance as well as oil and oil absorbent materials
- Avoid the use of soaps and detergents to clean boats or equipment in or near the water
- If possible, wash boats and equipment over lawns instead of driveways or parking areas so the grime and soap can seep into the ground rather than flow into waterways or storm sewers
- Marinas that conduct maintenance activities outdoors should consider installing filter strips to capture runoff, and any pollutants it is carrying, before entering the waterways

(Invasive Species) Boaters should take recommended actions to prevent spreading invasive species between water bodies.

Invasive species are non-native plants, animals, or pathogens that cause harm to natural areas and water resources. The harm invasive species cause can impact both our economy and the environment. Their environmental impacts can affect outdoor activities such as boating, fishing, hiking, and birding. Aquatic invaders like zebra mussels, quagga mussels, Eurasian watermilfoil, and the fish disease viral hemorrhagic septicemia (VHS) are non-native species that cause damage to watercraft and equipment, and can interfere with our enjoyment of water recreation. Diligence against invasive species is necessary because new invasive species are a constant threat. These organisms also harm native plants and animals, reduce habitat for wildlife, change natural ecosystems, create health risks for humans, and result in negative economic impacts.

Easily overlooked, the main way that these aquatic invaders spread between waterways is by hitching rides on boats, trailers, and gear used by anglers, boaters, and other recreationists. When transplanted into new waters, these organisms proliferate, displacing native species and damaging the water resource. Anyone who leaves a water access site without taking precautions, may be transporting these harmful organisms from one body of water to another.

Taking precautions to prevent the spread of invasive species is the law in Illinois. Effective January 1, 2013, Illinois' Boat Registration and Safety Act (625 ILCS 45/5-23) has been amended to prevent the spread of invasive aquatic plants and animals by boats, trailers, and vehicles. It is illegal to enter OR leave a water body with aquatic plants or animals attached to your boat or trailer, and travel on Illinois highways with aquatic plants or animals attached is prohibited.

Boaters should take the following precautions to prevent spreading invasive species:

- Inspect boats, trailers, and equipment
- Remove any attached aquatic plants or animals (before launching, after loading, and before transporting on a public highway)
- Empty and drain all bait buckets, livewells, baitwells, bilges, or any other compartment capable of holding natural water when leaving a body of water

- Drain all water from boats, motors and all equipment before you transport the boat, trailer, or equipment away from that body of water or its shore
- Remove the boat's drain plug and keep it out during transport
- Dry everything thoroughly with a towel including the boat, trailer, and other equipment. This not only leaves gear clean, but also removes any aquatic invaders.
- Let the boat, trailer and gear remain dry for at least five days before putting into another water body
- Dispose of unwanted bait in the trash
- Never transport live fish between water bodies

*****NEED Photos of weeds on trailer, motor etc., and of people wiping down boats at launch *****

(Invasive Species) Marinas, the McHenry County Conservation District, municipalities, park districts, park departments and other open space organizations who manage boat launches should provide proper signage and dedicated inspection areas to help boaters prevent the spread of invasive species from boating activities.

As discussed above, boats can be a major factor in the spread of invasive species as they travel from one lake to another. Therefore, genuine efforts should be made to inform boaters at launch sites about invasive species, the damage they cause to waterways and aquatic life, the laws governing the transport of invasive species, and the actions that will help prevent invasive species from being spread between water bodies. People are most likely to follow guidelines and participate in conservation efforts like preventing the spread of invasive species if the directions are clearly posted, easy to read, and intuitive to follow. Therefore, permanent signs with this information should be posted in prominent locations at boat launches. Guidance can be obtained from the Illinois-Indiana Sea Grant that have a program called "Be a Hero Transport Zero", the Minnesota Department of Natural Resources that has a "Clean In Clean Out" program, and many other organizations that have information about preventing the spread of invasive species and useful messaging for signs.

***** Be a Hero Transport Zero logo *****

Fishing and Hunting - Fishing can be enjoyed on lakes, rivers, creeks, and ponds across the county. Hunting for waterfowl, deer, small game and furbearers can be done on numerous public and private open spaces throughout the county. Public open space that provides opportunities for fishing and hunting include numerous properties owned by the McHenry County Conservation District (MCCD) and on land owned by the Illinois Department of Natural Resources including the Chain o' Lakes State Park, Moraine Hills State Park, and the Black Crown Marsh State Natural Area. Once it is established, the newly authorized Hackmatack National Wildlife Refuge will provide additional opportunities for hunting and fishing on public lands. Opportunities to hunt or fish on other private land in the county is typically dependent on personal relationships with property owners. The opportunity for hunting and fishing in the county are due in part by the support of its residents to maintain open space, public land, natural areas and rural character.

While fishing and water fowl hunting are directly dependent on water resources, hunting on upland areas also plays an important role in protecting water resources. The upland areas that provide habitat

for hunting also provide ecosystem services that allow for water to infiltrate into the ground, recharge groundwater aquifers and provide base flows to lakes, rivers and streams. The upland areas also capture and store stormwater runoff, thereby reducing flooding and purifying water by filtering sediment and pollutants. In this context, open space in McHenry County is not only vital for fishing and hunting, but also for protecting water resources.

Along with the benefits, fishing and hunting can be the source of environmental problems including creating hazards for fish and wildlife and causing lead poisoning in fish, wildlife and people:

(Fishing line) Marinas, the McHenry County Conservation District, municipalities, park districts, parks departments and other open space organizations who manage fishing opportunities should provide and maintain proper collection systems for the disposal and recycling of monofilament fishing line at sites that offer fishing.

Unspooled or tangled fishing line can be unwieldy to work with and often ends up discarded on the shoreline or in the water. Unfortunately, when not properly disposed of, discarded monofilament fishing line is extremely dangerous to wildlife and routinely entangles and kills birds, fish, turtles, frogs and small mammals. The littered fishing line also hurts marine recreation by wreaking havoc on boat propellers or endangering skiers, tubers or others engaged in recreational activities. All used fishing line should be disposed of and recycled rather than discarded outdoors. Fishing line is a high density plastic that requires a special recycling process and cannot go into regular household recycling bins. To ensure fishing line gets disposed of and recycled properly, open space managers who offer fishing should provide, and maintain, monofilament fishing line recycling bins at trailheads, entrances, boat docks and other designated locations where fishing occurs.

***** Photos of a bundle of fishing line, fishing line harming wildlife, and recycling containers *****

(Fishing) Individuals in the fishing community should voluntarily use lead free fishing sinkers and lures to prevent contaminating or harming fish and wildlife.

Lead is a toxic metal that, in sufficient quantities, has adverse effects on the nervous and reproductive systems of mammals and birds. Found in most fishing jigs and sinkers, this metal is poisoning wildlife including water birds such as ducks, swans, and loons, and scavengers such as hawks and eagles. When lead fishing sinkers are lost through broken line or other means, fish or birds can inadvertently eat them. Water birds often swallow the lead when they scoop up pebbles from the bottom of a lake or river to help grind and digest their food. Eagles ingest lead by eating fish which have themselves swallowed sinkers. A bird with lead poisoning will have physical and behavioral changes, including loss of balance, gasping, tremors, and impaired ability to fly. The weakened bird is more vulnerable to predators, or it may have trouble feeding, mating, nesting, and caring for its young. It becomes emaciated and often dies within two to three weeks after eating the lead [Q2](#).

Lead is also a potent neurotoxin for humans, and is especially harmful to the brains of developing children. Lead can be transferred to people who eat fish or birds that consumed lead weights, tackle or shot. In humans, lead poisoning can cause kidney damage, blood pressure increases, anemia, reduced fertility, and childhood neurological or neurochemical issues.

Fortunately, there are alternatives to traditional lead tackle. Anglers can use sinkers and jigs made from non-poisonous materials such as tin, bismuth, steel, and tungsten-nickel alloy. These alternatives are

becoming more widely available and can be found at established sporting goods retailers and on the Internet.

(Hunting) To avoid polluting the environment and harming wildlife, hunters should comply with the U.S. Fish and Wildlife Service (USFWS) 1991 ban on the use of lead shot for waterfowl hunting and voluntarily choose lead free alternatives for upland game hunting.

As discussed above, lead is a toxic metal that can harm wildlife and people. Before the USFWS banned the use of lead shot in 1991, an estimated two million duck and geese died of lead poisoning every year Q3. It is also known that upland birds can, and do, consume spent ammunition Q4. A common counterpoint to this concern is that the chance of spent ammunition being consumed in a remote dense forest is low. McHenry County, however, is not remote and the same locations are used year after year, often by many individuals or groups. This is especially true in areas that are used for target practice or recreational shooting. Over time the amount of lead in concentrated areas can be significant, which increases the potential for poisoning of wildlife and people. Once in the environment, lead will likely persist for a long time. Lead may oxidize when exposed to air and dissolve when exposed to acidic water. Once dissolved however, lead can migrate through soils to groundwater Q5. In most developed countries lead has been removed from gasoline, paints, other household items, and the U.S. is now faced with the daunting task of removing lead piping in homes, schools and businesses. By using non-toxic alternatives, the hunting community will help reduce the risk of poisoning moving forward and leave a legacy other than lead pollution.

Tourism: *The County, municipalities, townships, businesses and other organizations should restore, enhance and preserve its open spaces and waterways to attract and support eco-tourism while improving the ecosystem services that the open space and water resources provide.*

By practicing good stewardship of its land and water resources, McHenry County can be recognized as an attractive eco-tourism destination rich with healthy natural open space, scenic vistas, clean water, and ample recreational opportunities. Eco-tourism can benefit communities financially by serving as an economic driver that provides fresh revenue for businesses from visitor's who spend money on goods and services during their visits. Eco-tourism can also support the ongoing protection, restoration and maintenance of the land and water resources that not only provides the tourism opportunities, but also supports the ecosystem services that maintain the health of the county including groundwater recharge, infiltration, flood mitigation and water quality treatment.

As indicated in the 2030 and Beyond Plan, preserving land and water resources to support eco-tourism will require a concerted effort among stakeholders to limit incompatible development that might obstruct recreational opportunities. For instance, development that would impede critical trail connections or greenways. To avoid conflicts, the 2030 and Beyond Plan suggests that most new growth in the county should occur in its municipalities to protect resources and maintain the rural character that makes the county a unique and attractive destination. With this in mind, communication between the county, municipalities, townships and businesses will be critical to effectively implement eco-tourism, and agri-tourism, in the county.

At the request of local communities the Chicago Metropolitan Agency for Planning (CMAP) has completed plans for two segments of the Fox River corridor that pass through McHenry County. The Plans recognizes the value of eco-tourism and the unmet demand for non-motorized recreation, such as paddling, in the northeast Illinois Region. The McHenry County Conservation District (MCCD) currently

provides four canoe launches to support opportunities for visitors to paddle up to 15.5 miles down the Nippersink Creek, the largest tributary to the Fox River. A National Water Trail is also proposed for the full length of the Fox River that will require new infrastructure and support for the section passing through McHenry County. A new water trail is also under way for the Kishwaukee River that will also need infrastructure, signage, restoration work, and support to complete. These paddling opportunities are examples of eco-tourism that can serve as an economic driver and a means to support restoration, and management of natural resources and open space. There is also a regional need to expand opportunities for a range of outdoor activities such as hiking, biking, camping, birdwatching, cross-country skiing, snowshoeing. Each of these areas require healthy open spaces that can also provide ecosystem services.

With a concentrated effort to expand and connect the network of open spaces and water resources, McHenry County and its communities can be a regional eco-tourism destination for northern Illinois. To accomplish this the County, municipalities, townships, businesses and other organizations should work collaboratively to improve open space areas and greenways and to avoid incompatible development that could conflict with successful eco-tourism development.

- Q1 <http://www.epa.state.il.us/water/conservation/lake-notes/shoreline-buffer.pdf>
- Q2 <https://www.pca.state.mn.us/living-green/nontoxic-tackle-lets-get-lead-out>
- Q3 <https://www.fws.gov/midwest/refuges/Review%20and%20Assessment%20paper.pdf>
- Q4 <https://projectupland.com/shotguns-and-shooting/the-science-behind-lead-shot-and-upland-birds/>
- Q5 https://www.epa.gov/sites/production/files/documents/epa_bmp.pdf