



# Boone-Dutch Creek Watershed-based Plan Executive Summary

March 2016



# Acknowledgments

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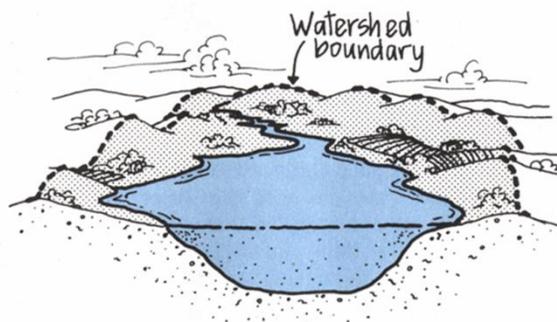
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# Planning to Protect Local Water Resources

Community members in eastern McHenry County began meeting in spring 2014 to participate in a planning opportunity to help protect and restore water quality and watershed health in an area encompassing Boone and Dutch Creeks and several smaller streams that drain to the Upper Fox River. For over a year and a half, more than 50 local residents, community leaders, businesses, local government agencies, and other organizations participated in meetings, identified local water resource goals, and contributed invaluable information on watershed issues. The Chicago Metropolitan Agency for Planning (CMAP), with Clean Water Act funding assistance from the Illinois Environmental Protection Agency (EPA), facilitated these efforts and developed a watershed action plan to help guide local water resource protection activities aimed primarily at reducing nonpoint source pollution.<sup>1</sup> The full Boone-Dutch Creek Watershed-Based Plan can be found on the websites of the Fox River Ecosystem Partnership (<http://foxriverecosystem.org>) and CMAP (<http://www.cmap.illinois.gov/livability/water/water-quality-management/watershed-planning>).

Figure 1. What is a watershed?



**A watershed is the land area from which rainwater and snowmelt drains into a body of water such as a stream or lake. Watershed boundaries are defined by nature and are largely determined by the surrounding topography or "lay of the land."**

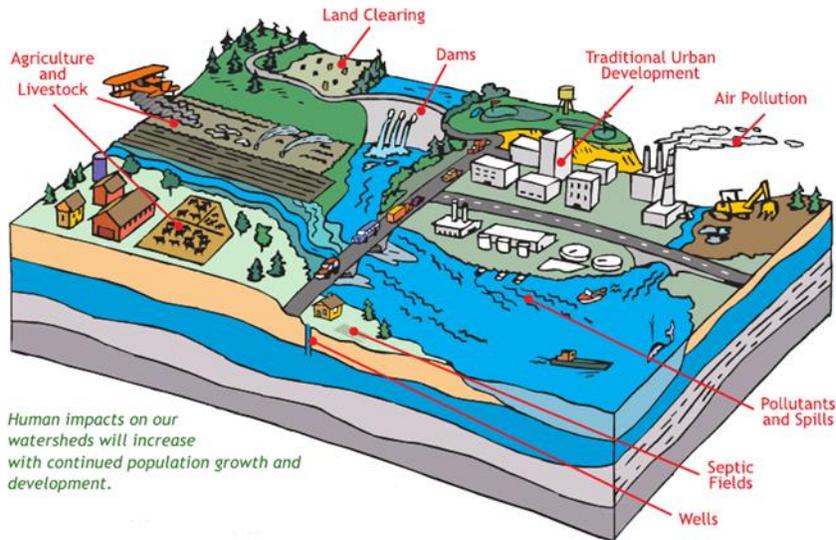
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<sup>1</sup> Nonpoint source (NPS) pollution comes from many diffuse sources. NPS pollution results from rainfall and snowmelt moving over the land and through the ground, picking up and carrying with it natural and human-made pollutants, such as phosphorus, nitrogen, soil, metals, oils, and pesticides. These pollutants ultimately get deposited into streams, rivers, lakes, wetlands, and groundwater.



**Figure 2. Why do watersheds matter?**

**Watershed are important because what we do on the land directly affects the quality of our surface waters, drinking water supply, local economy, wildlife habitat, and recreational resources.**



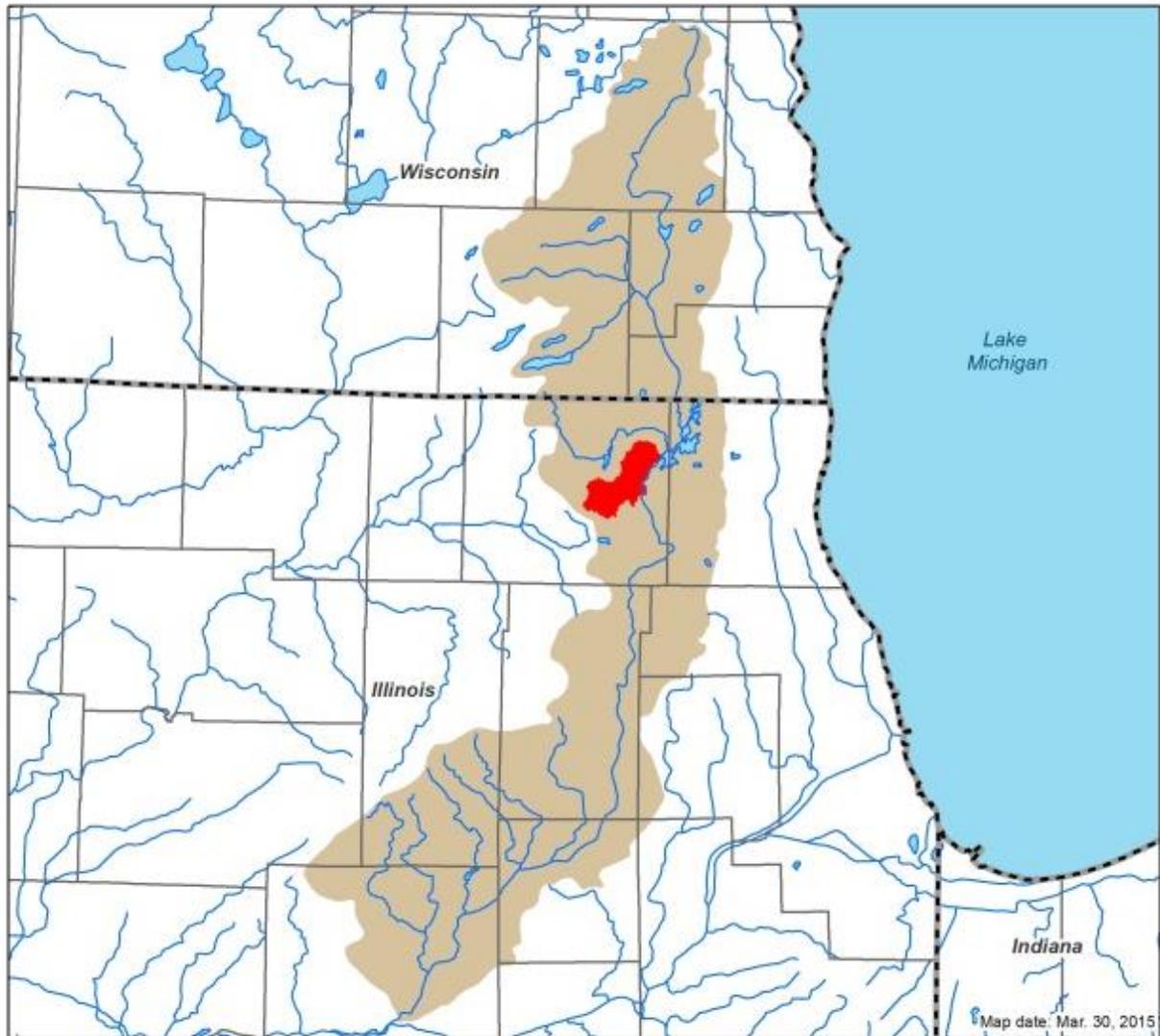
Adapted from *Healthy Watersheds, Healthy People*, Washington Dept. of Ecology, 2008

## **The Boone-Dutch Creek Watershed Planning Area**

The Boone-Dutch Creek Watershed planning area covers 45.3 square miles in eastern McHenry County (Figure 3). The planning area includes Boone and Dutch Creeks and their tributaries, McCullom Lake, numerous smaller lakes and ponds, and several smaller streams that drain directly to the Fox River. For watershed planning purposes, the planning area was subdivided into nine subwatershed study units. Portions of seven municipalities and six townships are included in the planning area (Figure 4).



Figure 3. The Boone-Dutch Creek planning area within the Fox River Basin.



- Legend**
-  Boone - Dutch Planning Area
  -  Fox River Basin
  -  State Boundary
  -  Counties
  -  Waterbodies
  -  Streams

0 10 20 Miles

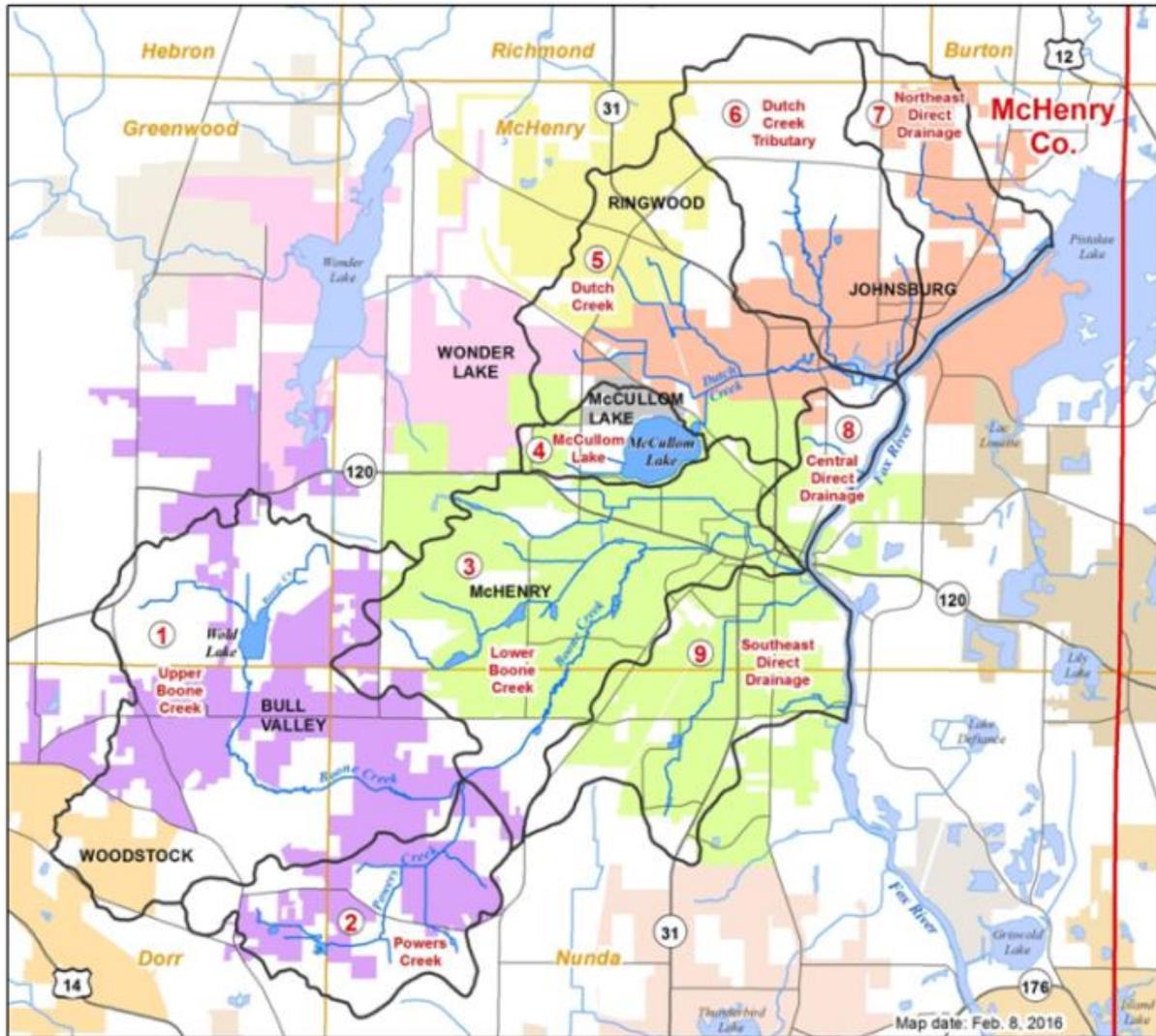


Chicago Metropolitan Agency for Planning



Data Sources: Watershed Planning Area - NRCS Watershed Boundary Dataset (2005) & CMAP (2014); 4 State Watersheds - NRCS (2007); County & State Boundaries - National Atlas (2005); Streams & Waterbodies - National Atlas (2005)

Figure 4. Municipalities, townships, streams, lakes, and study units in the Boone-Dutch Creek planning area.



**Legend**

- Boone - Dutch Planning Area
- Counties
- Townships
- Waterbodies
- Streams
- Major Roads
- Bull Valley
- Johnsburg
- McCullom Lake
- McHenry
- Ringwood
- Wonder Lake
- Woodstock

0 1 2 Miles



Data Sources: Watershed Planning Area - NRCS Watershed Boundary Dataset (2005) & CMAP (2014); County & Township Boundaries (CMAP 2014); Major Roads - IDOT (2014); Streams - National Hydrography Dataset Flowline (USGS 2007); McHenry Co. ADID (NIPC 1999) & CMAP (2015); Waterbodies - CMAP 2005 Land Use (2009); Municipal boundaries - McHenry Co. (2014) & Lake Co. (2015)



## Plan Goals

The Boone-Dutch Creek Watershed-Based Plan provides a roadmap for protecting and improving local water quality and thus the quality of life for those that live, work, and play within the Boone-Dutch Creek Watershed planning area. As a first task in developing this roadmap, stakeholders identified several goals which serve as priorities for guiding watershed protection activities:

- Improve and protect the ecological integrity of surface water resources, including wetlands, to attain or maintain designated uses of aquatic life support and aesthetic quality.
- Build on local partnerships and expertise to enhance intergovernmental coordination for achieving sustainable development.
- Protect the quality and quantity of groundwater.
- Conserve open space – wetland, prairie, and woodland communities – through a coordinated plan and public-private partnerships.
- Reduce flooding and attendant bank erosion risk through initiatives to improve and protect water quality.
- Raise public awareness and increase understanding of the impacts of land use and land/water management decisions on water and habitat quality.



# Key Watershed Resources and Issues Findings

## Land Use and Land Cover

Land use (Figure 5) is primarily agriculture (39 percent) and residential (35 percent). Vacant or under construction (10 percent) and open space (7 percent) land uses are the next most common.



## Impervious Surface

Impervious surface<sup>2</sup> accounts for just over 11 percent of the entire Boone-Dutch Creek planning area, indicating generally “impacted” stream health from the effects of urbanization. Subwatershed study units with more than 25 percent impervious surface and thus “nonsupporting” of healthy stream quality were the Central Direct Drainage and Southeast Direct Drainage study units at 27.5 and 25.5 percent impervious cover, respectively (Figure 6). Headwater areas of the planning area with a smaller percentage of impervious surface such as Upper Boone Creek (2.3 percent = “sensitive”), Powers Creek (3.5 percent = “sensitive”), and Dutch Creek Tributary (5.8 percent = “sensitive/approaching impacted”) warrant special consideration as development proceeds in order to maintain good water quality and the currently small percentage of impervious surface. As development occurs, it is important that low-impact development, principles of conservation design, and site-level green infrastructure practices be implemented at the highest levels possible in these parts of the planning area to protect and maintain sensitive water quality and aquatic habitat conditions. Municipal ordinance and subdivision codes that seek to protect water quality are also important aspects that should be aligned to protect water and habitat quality and decrease water resource degradation.

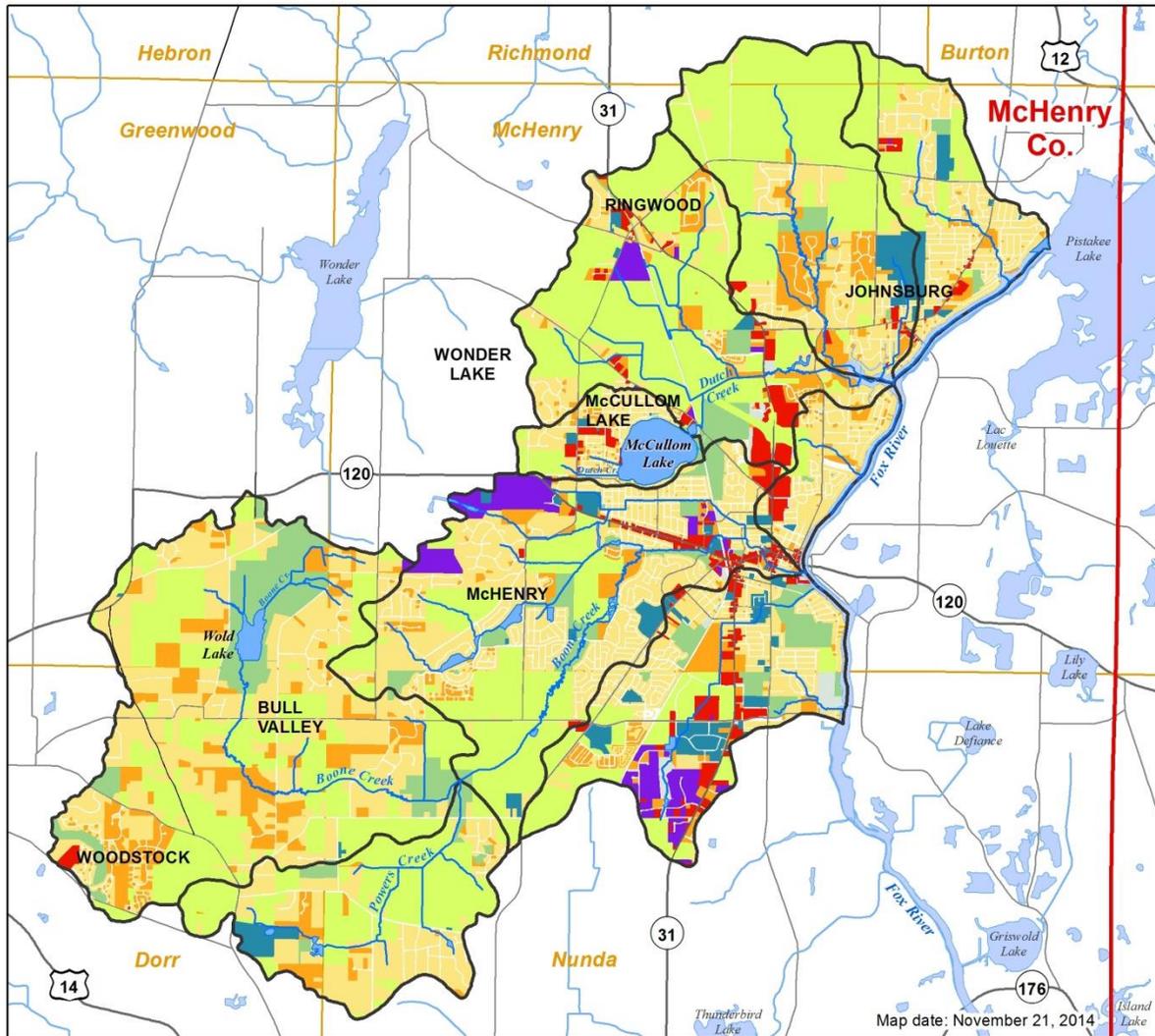


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<sup>2</sup> Impervious surface is that part of the landscape that is paved or covered with nonporous material (e.g., buildings, roads, sidewalks, driveways, parking lots). Impervious surfaces prevent infiltration of rain into the underlying soil and consequently generate runoff and nonpoint source pollution, thereby having a direct effect on water quality, aquatic life, and water quantity in local streams, lakes, wetlands, and groundwater.



Figure 5. Land use in the Boone-Dutch Creek planning area.



**Legend**

- |                             |                           |
|-----------------------------|---------------------------|
| Boone - Dutch Planning Area | Commercial                |
| Counties                    | Vacant/Under Construction |
| Townships                   | Industrial                |
| Streams                     | Institution               |
| Major Roads                 | Open Space                |
| Waterbodies                 | Residential               |
| <b>2010 CMAP Landuse</b>    | T/C/U                     |
| Agriculture                 | Water                     |

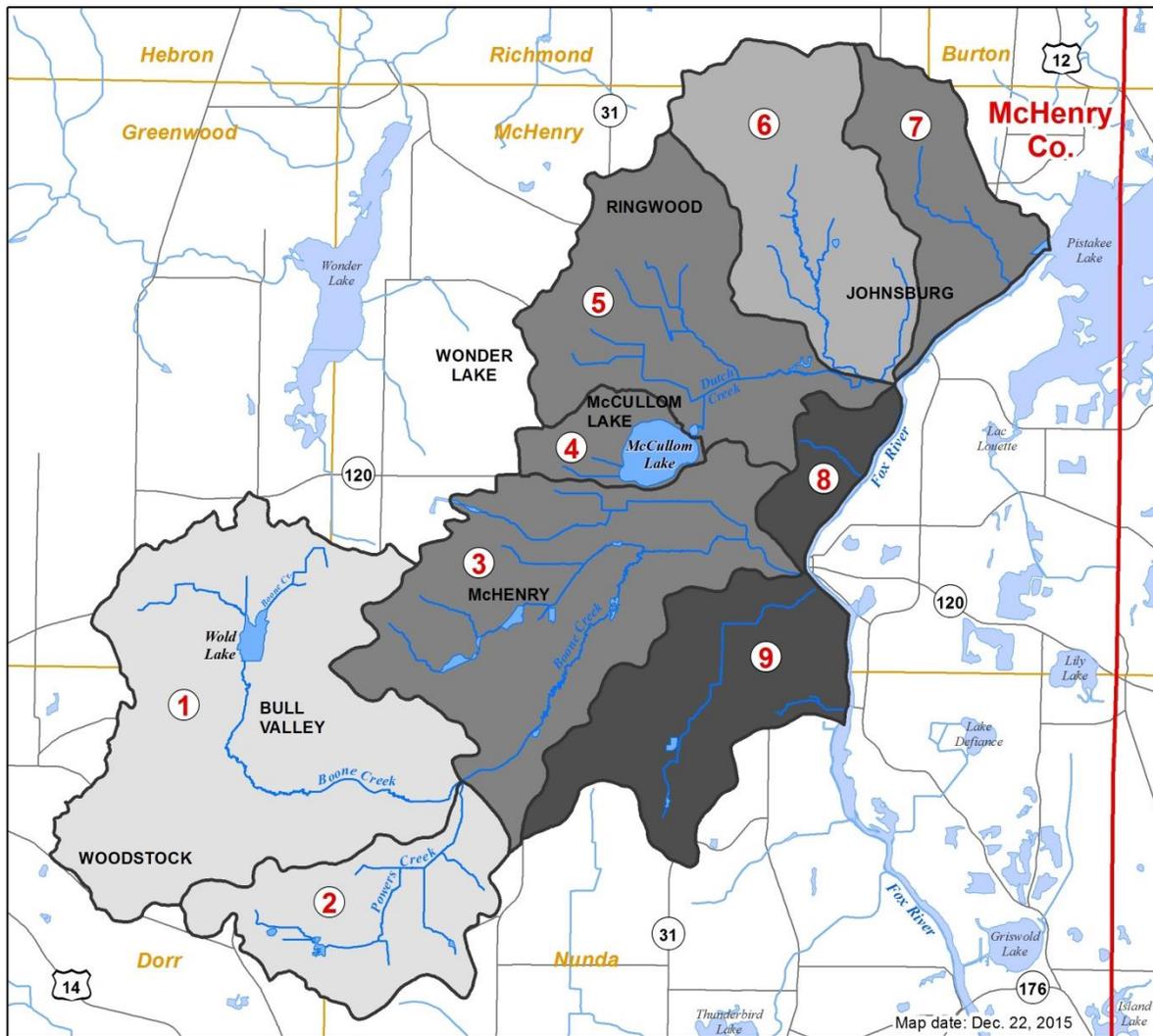
0 1 2 Miles

Chicago Metropolitan Agency for Planning



Data Sources: Watershed Planning Area - NRCS Watershed Boundary Dataset (2005) & CMAP (2014); County & Township Boundaries (CMAP 2014); Major Roads - IDOT (2011); Streams - USGS National Hydrography Dataset Flowline (2007), McHenry Co. ADID (NIPC 1999), & CMAP (2014); Waterbodies - CMAP Land Use (2005); Land Use - CMAP (2014)

Figure 6. Stream health as a function of impervious surface by study unit.



**Legend**

- |                             |                               |
|-----------------------------|-------------------------------|
| Boone - Dutch Planning Area | <b>Stream Health Category</b> |
| Counties                    | sensitive                     |
| Townships                   | sensitive / approach impacted |
| Waterbodies                 | impacted                      |
| Streams                     | non-supporting                |
| Major Roads                 |                               |

0 1 2 Miles



Data Sources: Watershed Planning Area - NRCS Watershed Boundary Dataset (2005) & CMAP (2014); County & Township Boundaries (CMAP 2014); Major Roads - IDOT (2014); Streams - National Hydrography Dataset Flowline (USGS 2007), McHenry Co. ADID (NIPC 1999) & CMAP (2015); Waterbodies - CMAP 2005 Land Use (2009); National Land Cover Database (2011)



## Wetlands, Prairies, and Woodlands

The Boone-Dutch Creek planning area is home to a diversity of native plant communities and the wildlife that depend on them. Prior to European settlement, prairie, wetland, and forest communities blanketed the planning area. Today, wetlands occupy about 12 percent (5.4 sq. mi.) of the planning area, the majority of which are riparian wetlands along the stream corridors (Figure 7).<sup>3</sup> Oak dominated communities (oak barrens, savanna, woodland, or forest) have been reduced from nearly 50 percent in the 1830s to only about 7 percent (3.3 sq. mi.) of the planning area today (Figure 8).

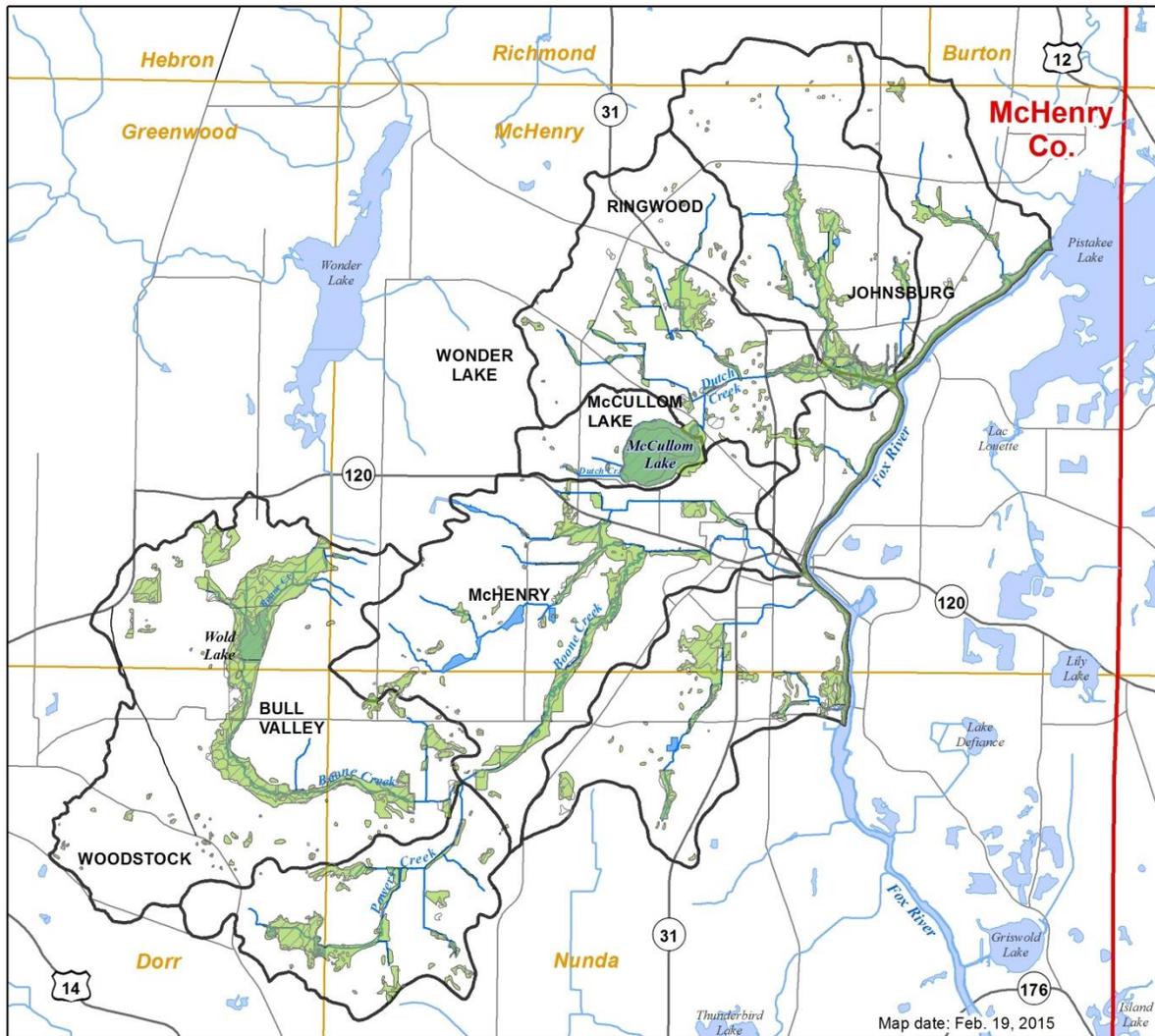


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<sup>3</sup> Farmed wetlands are estimated to occupy about another 1 percent (0.3 sq. mi) of the planning area and represent opportunities for future wetland restoration.



Figure 7. Wetlands in the Boone-Dutch Creek planning area.



**Legend**

- Boone - Dutch Planning Area
- Counties
- Townships
- Waterbodies
- Streams
- Major Roads
- NWI Wetlands
- ADID Wetlands

0 1 2 Miles



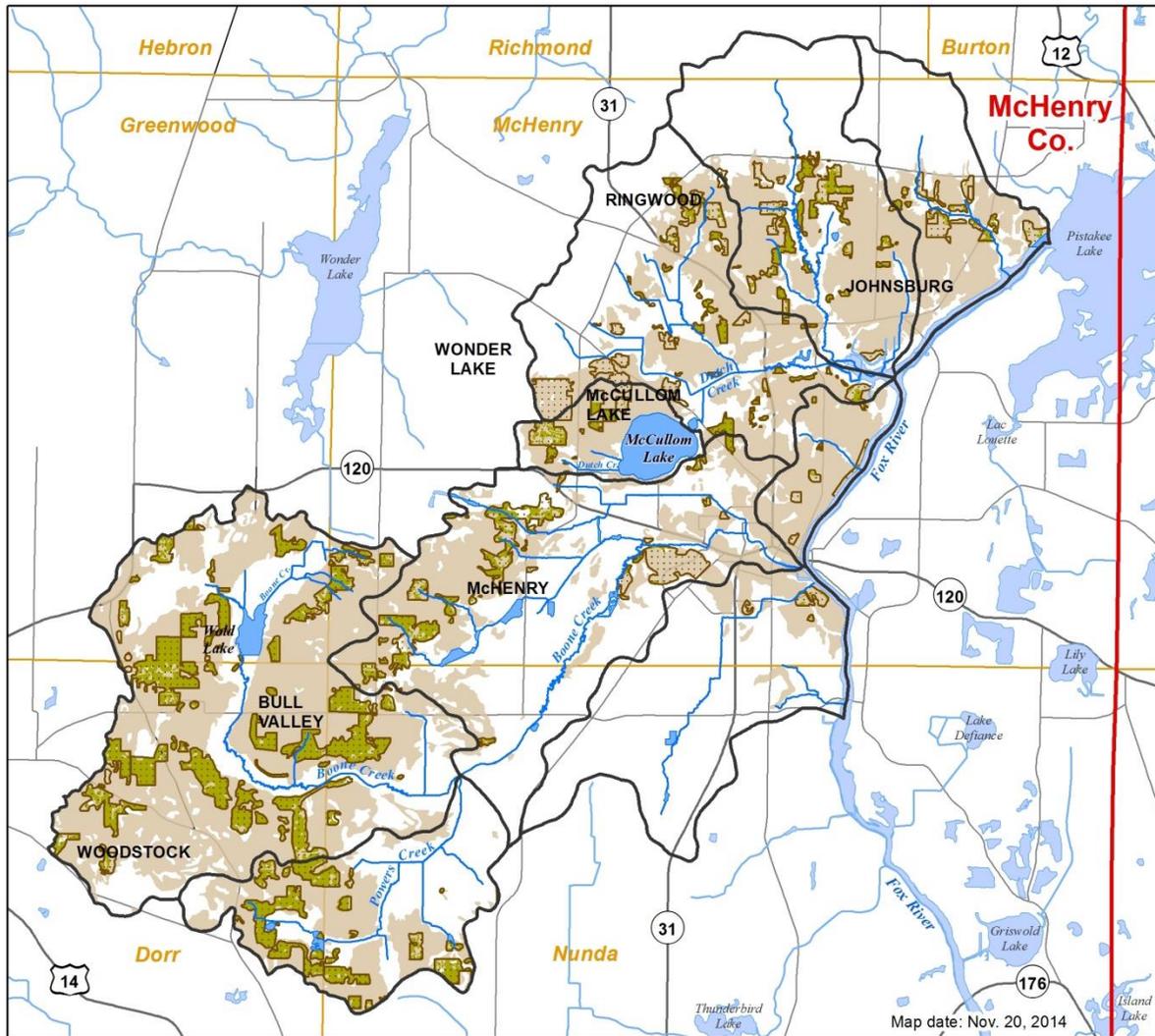
Chicago Metropolitan Agency for Planning



Data Sources: Watershed Planning Area - NRCS Watershed Boundary Dataset (2005) & CMAP (2014); County & Township Boundaries (CMAP 2014); Major Roads - IDOT (2011); Streams - USGS National Hydrography Dataset Flowline (2007), McHenry Co. ADID (NIPC 1999), & CMAP (2014); Streams - NHD Flowline; Waterbodies - CMAP Land Use (2005); Wetlands - USFWS Nat'l Wetland Inventory (1987) & 2005 McHenry Co. ADID (CMAP 2007)



Figure 8. Oak dominated communities in the Boone-Dutch Creek planning area.



**Legend**

- Boone - Dutch Planning Area
- Counties
- Townships
- Waterbodies
- Streams
- Major Roads
- Oak ecosystems - 1837
- Oak ecosystems - 1939
- Oak ecosystems - 2005 / 2011

0 1 2 Miles



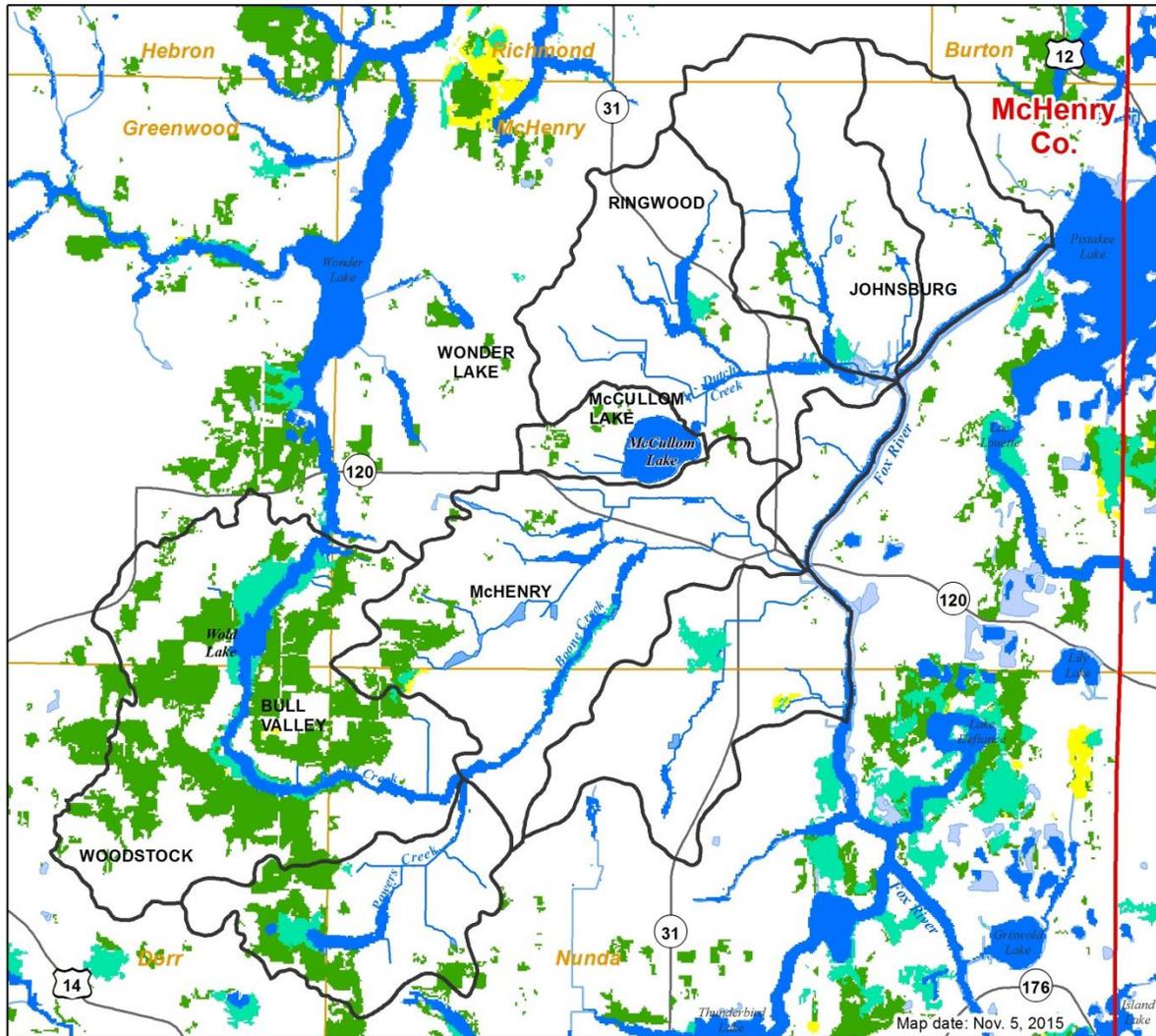
Data Sources: Watershed Planning Area - NRCS Watershed Boundary Dataset (2005) & CMAP (2014); County & Township Boundaries (CMAP 2014); Major Roads - IDOT (2011); Streams - USGS National Hydrography Dataset Flowline (2007), McHenry Co. ADID (NIPC 1999), & CMAP (2014); Waterbodies - CMAP Land Use (2005); Oak ecosystems - MCCD (2013)

The wetlands and woodlands along with the prairies, streams, and lakes in the planning area provide a variety of valuable ecological functions, contributing an estimated \$91.5 million per year from flood control, groundwater recharge, water purification, and carbon storage (Figure 9). However, only a portion of these natural communities occupy lands and waters that are currently protected or conserved such that development will not occur on this land any time in the future – the planning area’s “open space reserve (Figure 10).”

Conservation efforts should be of high implementation priority to protect and restore the Boone-Dutch Creek planning area’s water, wetland, prairie, and forest communities. Expansion of protected open space on both public and private lands within and around the planning area should be of high priority to provide additional links between fragmented habitats as well as increasing ecological and economic benefits.



Figure 9. Core landscapes used in the ecosystem services valuation.



**Legend**

- Boone - Dutch Planning Area
- Counties
- Townships
- Streams

**Core Landscapes**

**Selected Landscape Types**

- Core lakes and streams (stream layer 3)
- Core wetlands (wetland 4a, 4b, 5)
- Core prairies/savannas (pgs 1,2)
- Core woodland/forest (forest 3a, 3b, 4)

0 1 2 Miles



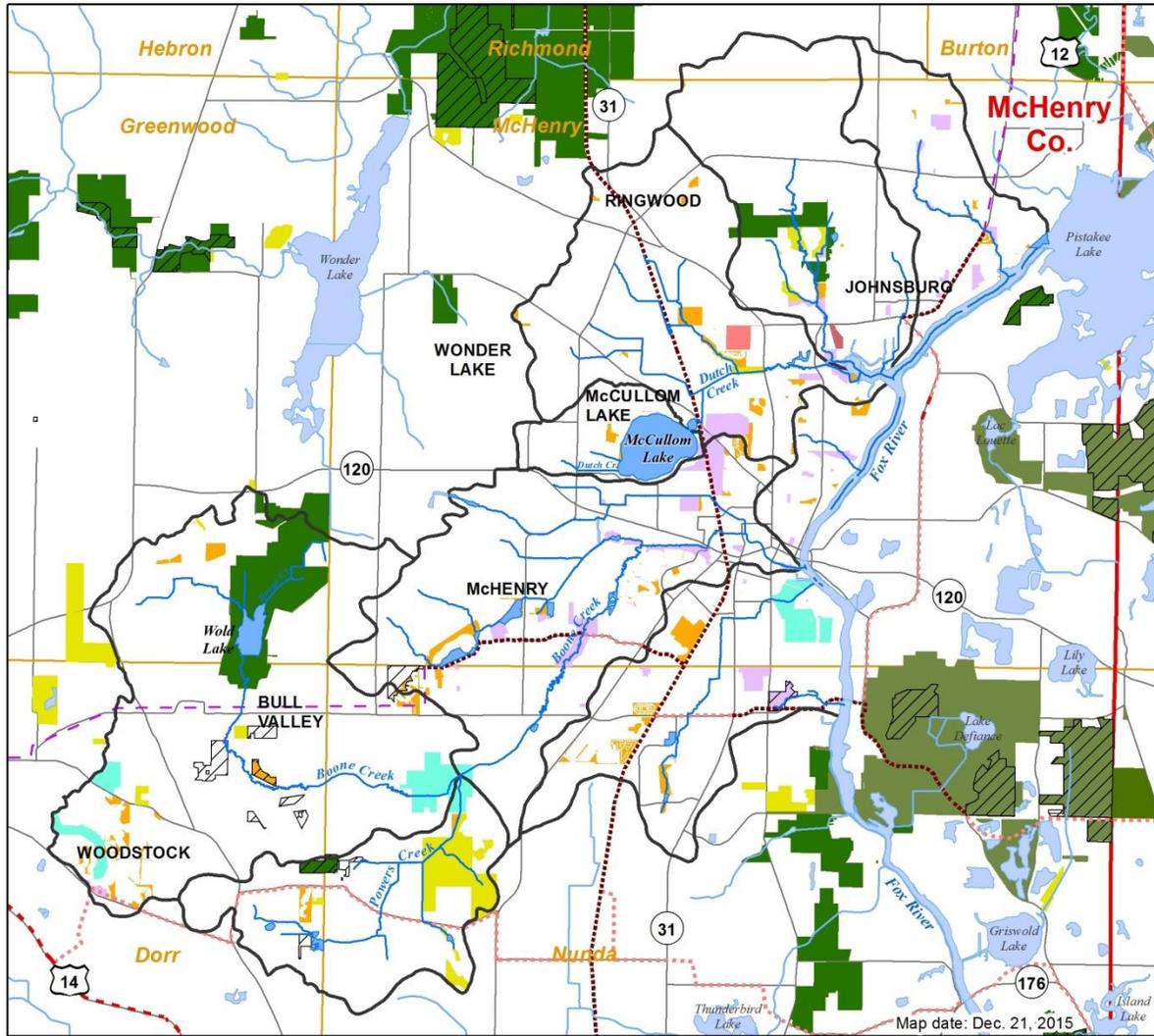
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Data Sources: Watershed Planning Area - NRCS Watershed Boundary Dataset (2005) & CMAP (2014); County & Township Boundaries (CMAP 2014); Major Roads - IDOT (2014); Streams - USGS National Hydrography Dataset Flowline (2007), McHenry Co. ADID (NIPC 1999), & CMAP (2014); Waterbodies - CMAP Land Use (2005); Core Landscapes - GIV 2.2 (CMAP 2015)



Figure 10. Open space reserve in the Boone-Dutch Creek planning area.



- Legend**
- Boone - Dutch Planning Area
  - Counties
  - Townships
  - Waterbodies
  - Streams
  - Major Roads
  - State Park, F&W Area, or Natural Area\_2015
  - McHenry Co Cons Dist\_201412
  - Lake Co Forest Pres\_201504
  - Land Conservancy of McHenry Co\_2015
  - Other conservation easements\_NCED
  - NaturePreserves\_IDNR\_201505
- Local Parks & Golf Courses**
- Subdiv owned
  - Muni owned
  - Twp owned
  - Private
  - Golf Course
- Regional Trails**
- Existing
  - Future
  - Planned
  - Programmed

0 1 2 Miles

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Data Sources: Watershed Planning Area - NRCS Watershed Boundary Dataset (2005) & CMAP (2014); County & Township Boundaries (CMAP 2014); Major Roads - IDOT (2014); Streams - National Hydrography Dataset Flowline (USGS 2007), McHenry Co. ADID (NIPC 1999) & CMAP (2014); Waterbodies - CMAP 2005 Land Use (2009); State Parks, F&W Areas, Natural Areas, & Nature Preserves - IDNR (2015); County conservation district or forest preserve - MCCD (2014) & LCFPD (2015); Conservation easements - NCED (2014) & TLCMC (2015); Local parks, golf courses - McHenry Co P&D (2015); Regional trails - CMAP (2011)

## Streams and Lakes

All streams in the watershed drain to the Fox River, a source of drinking water, community recreation, and home to a variety of aquatic life. Several lakes and ponds dot the landscape; McCullom Lake is the largest publicly-accessible recreational lake in the planning area. Boone Creek, McCullom Lake, and the Fox River have been assessed for water quality impairments by Illinois EPA; Dutch Creek, Powers Creek (a tributary to Boone Creek), and the direct drainage tributaries to the Fox River have not been assessed by Illinois EPA. Table 1 summarizes the designated uses assessed and the causes and sources of impairment as determined by Illinois EPA and presented in their 2014 Integrated Water Quality Report and Section 303(d) List.<sup>4</sup>



**Table 1. Assessment status of waterbodies in the Boone-Dutch Creek planning area.\***

<b>Waterbody Name / ID</b>	<b>Stream Length / Surface Area</b>	<b>Watershed Area</b>	<b>Impaired Designated Use</b>	<b>Causes of Impairment</b>	<b>Sources of Impairment</b>
<b>Boone Creek / IL_DTZT-02</b>	11.81 mi.	15,030 ac. (23.5 sq. mi.)	Aquatic life	pH; Alteration in streamside or littoral vegetative covers; Other flow regime alterations	Loss of riparian habitat; Impacts from hydrostructure flow regulation/modification; Site clearance; Unknown
<b>Dutch Creek / IL_DTN</b>	2.76 mi.	8,168 ac.** (12.8 sq. mi)	Not assessed	n/a	n/a
<b>McCullom Lake / IL_RTZD</b>	245 ac.	873 ac. (1.4 sq. mi.)	Aesthetic quality	Unknown; Aquatic plants (Macrophytes)	Internal nutrient recycling; Waterfowl; Crop production; Urban runoff/storm sewers; Runoff from forest/grassland/parkland
<b>Fox River / DT-23</b>	7.77 mi.	---	Aquatic life; Fish consumption	Alteration in streamside or littoral vegetative covers; Other flow regime alterations; PCBs; Aquatic algae; Unknown	Impacts from hydrostructure flow regulation/modification; Dam or impoundment; Habitat modification other than hydromodification; Unknown

\*As indicated in the Illinois Integrated Water Quality Report and Section 303(d) List, 2014

\*\*Does not include the McCullom Lake watershed

<sup>4</sup> <http://www.epa.illinois.gov/topics/water-quality/watershed-management/tmdls/303d-list/index>



A detailed 2002 stream inventory and assessment of Boone Creek's main stem and field checks conducted in 2015 of Boone, Powers, and Dutch Creeks and several tributaries within the planning area revealed that channelization was common (Figure 11) and some degree of bank erosion (rated as low, moderate, or high) was present in all the assessed stream reaches (Figure 12). While streambank erosion is a natural process, it can be greatly accelerated by changes in stream hydrology associated with agricultural drainage and urbanization. Streambank erosion can contribute a large amount of sediment that then settles in slower moving reaches of the stream, negatively impacting aquatic habitat and overall stream health. Eroding banks also lead to losses of stream corridor habitat.



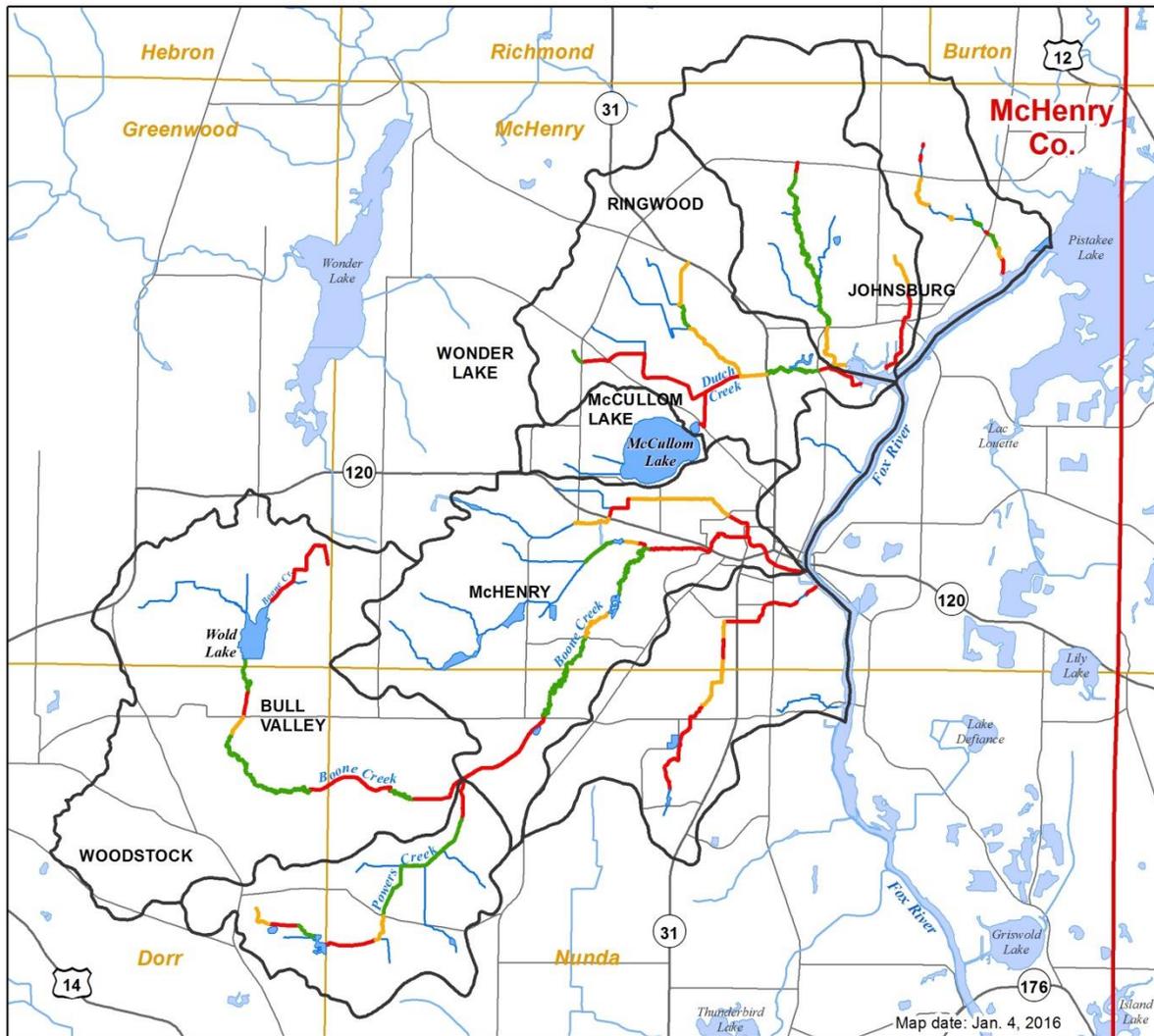
Fish inventories conducted in 25 locations throughout planning area in 2014-15 revealed the presence of several “species of greatest conservation need” as listed in the Illinois Comprehensive Wildlife Conservation Plan & Strategy,<sup>5</sup> including blacknose dace, southern redbelly dace, Iowa darter, central mudminnow, brook stickleback, and mottled sculpin. The Plan includes recommendations that stream habitat enhancement should focus on channelized and shaded stretches where invasive shrubs can be removed, adjoining wetlands can be restored to provide groundwater recharge, pools and riffles can be introduced, and remeandering of channelized sections can be accomplished.

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<sup>5</sup> <http://www.dnr.illinois.gov/conservation/IWAP/Pages/default.aspx>



Figure 11. Stream channelization in the Boone-Dutch Creek planning area.



**Legend**

- |                             |                       |
|-----------------------------|-----------------------|
| Boone - Dutch Planning Area | <b>Channelization</b> |
| Counties                    | None/Low              |
| Townships                   | Moderate              |
| Waterbodies                 | High                  |
| Major Roads                 | Not Assessed          |
| Streams                     |                       |

0 1 2 Miles



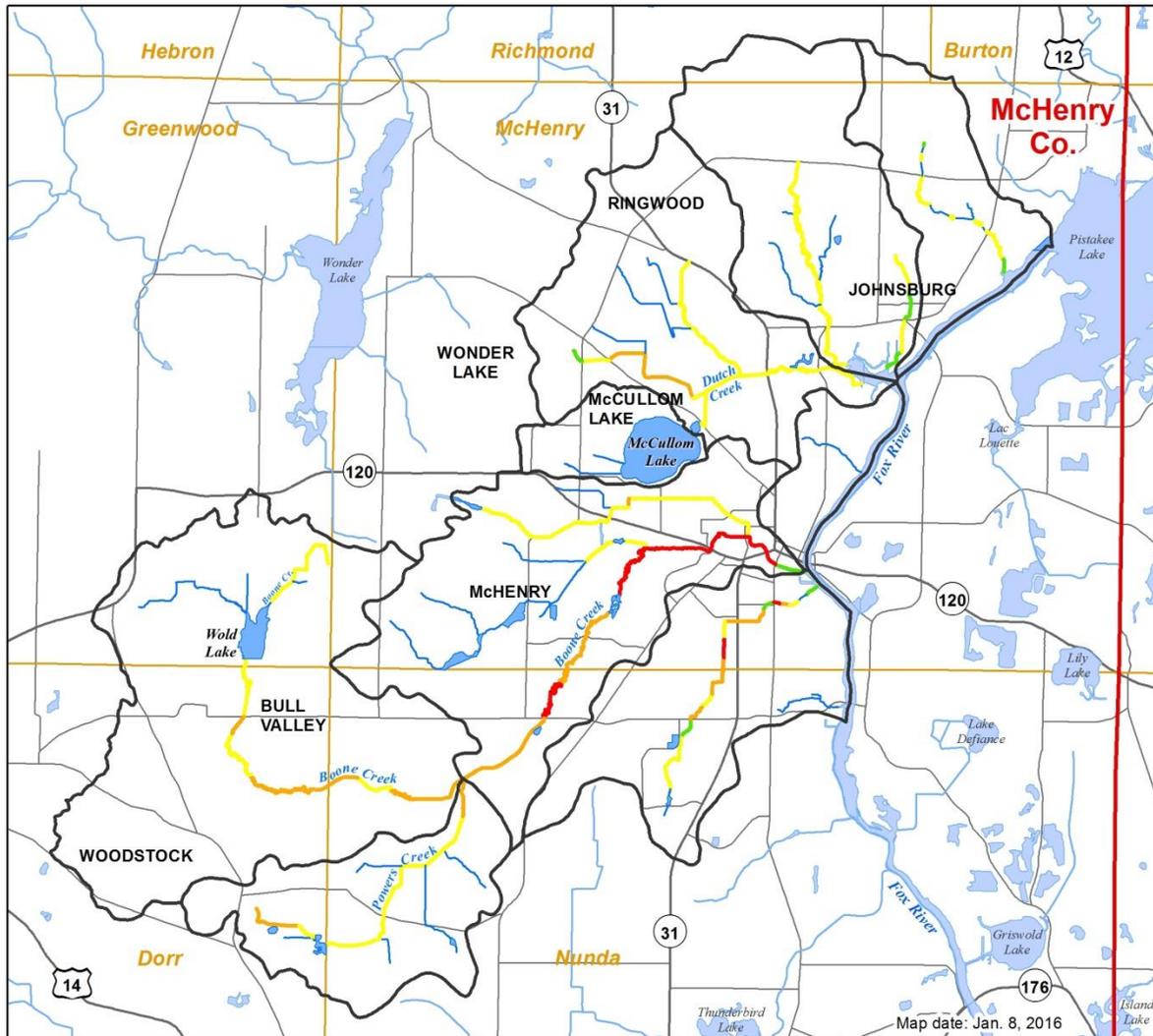
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Data Sources: Watershed Planning Area - NRCS Watershed Boundary Dataset (2005) & CMAP (2014); County & Township Boundaries (CMAP 2014); Major Roads - IDOT (2014); Streams - USGS National Hydrography Dataset Flowline (2007), McHenry Co. ADID (NIPC 1999) & CMAP (2015); Waterbodies - CMAP 2005 Land Use (2009)



Figure 12. Streambank erosion in the Boone-Dutch Creek planning area.



**Legend**

- |                             |                     |
|-----------------------------|---------------------|
| Boone - Dutch Planning Area | <b>Bank Erosion</b> |
| Counties                    | None                |
| Townships                   | Low                 |
| Waterbodies                 | Moderate            |
| Major Roads                 | High                |
| Streams                     | Not Assessed        |

0 1 2 Miles



Chicago Metropolitan Agency for Planning



Data Sources: Watershed Planning Area - NRCS Watershed Boundary Dataset (2005) & CMAP (2014); County & Township Boundaries (CMAP 2014); Major Roads - IDOT (2014); Streams - USGS National Hydrography Dataset Flowline (2007), McHenry Co. ADID (NIPC 1999) & CMAP (2015); Waterbodies - CMAP 2005 Land Use (2009)



## Local Plans and Ordinances

Each of the seven municipalities within the Boone-Dutch Creek planning area, as well as McHenry County, has adopted a comprehensive plan. The plans generally stress the importance of preventing sprawl by pursuing future land use patterns that direct growth into an orderly pattern that preserves community character and open space. For the most part, the plans emphasize restricting development on identified areas of significant resources but have relatively few policies to limit the impact of development that does take place in the rest of the community. In other words, the plans seek to limit the overall impact of development on natural resources by setting aside land for conservation but pay less attention to mitigating the impacts of transportation and parking in developed and developing areas.



Through ordinances and codes, communities implement the vision established in their comprehensive plans by establishing detailed, enforceable regulations. Zoning is the most common ordinance that municipalities and counties use to direct land use, transportation, and development practices, with many also using subdivision, stormwater, water use, and parking ordinances to regulate specific aspects of development. Because the municipalities share a common stormwater ordinance, they are similarly successful in addressing stormwater, soil erosion, and elements of floodplain, stream, and wetland protection. The categories where municipal ordinances generally did not address key topics included natural areas and open space, parking, transportation, pollution prevention, water efficiency, and conservation design and infill. These areas present an opportunity for revised codes to make strides in encouraging compact development patterns, reducing impervious surfaces, and preserving open space.



## Plan Recommendations

The Plan recommends a cohesive set of policy and best management practice (BMP) strategies to protect water quality and watershed health and to address goals of the Plan. These recommendations were developed with input from local planning participants. The support and action of local governments, districts, businesses, organizations, residents, and other community members will be needed to implement recommended policies and projects.

### Planning and Policy

Local governments are encouraged to update comprehensive plans and adopt or expand on ordinances and codes to support the principles of conservation and low impact development throughout the planning area to accomplish overarching community goals. Some examples of recommended policies that will help local governments to further address the Plan's goals follow (*for a comprehensive list of the recommendations, refer to the full Plan*):

- Align local plans and ordinances with best practices.
- Update comprehensive plans every 10–12 years and include watershed protection policies.
- Create and update supplemental subarea and topical plans (e.g. natural resource plans, open space plans, greenways and trails/bike plans).
- Adopt zoning, subdivision, stormwater management, and water conservation ordinances that incentivize practices that protect and promote water resources.
- Jointly advocate for revisions to McHenry County Stormwater Management Ordinance.
- Locally adopt McHenry County Water Resource Action Plan.
- Coordinate efforts to advocate for bike trails and public transportation in and around the planning area.

### Best Management Practices

This Plan recommends a number of BMPs to adopt or expand on in the near future. Many of the recommended BMPs focus on retrofit opportunities that address pollutants of concern in the watershed.

#### **Urban Retrofit BMPs**

The Plan focuses on several primary retrofit practices to manage stormwater that largely use plants and soil to filter, absorb, and cleanse runoff. These BMPs also were selected based on costs and how effectively they enhanced community aesthetics, and include bioretention/ biofiltration areas (e.g., rain gardens) that remove pollutants through a



physical, biological or chemical treatment process; vegetated swale retrofits that collect and convey stormwater runoff to downstream discharge points; detention basin retrofits which treat stormwater runoff as part of its unit process; building retrofits including green roofs and blue roofs that collect stormwater; and permeable pavement. “Watershed-wide” scenarios were modeled for each of these BMP types to estimate the potential pollutant load reductions and implementation costs.

Other examples of urban BMPs include routine replacement of traditional infrastructure in the watershed with green infrastructure. Public facilities with high visibility (e.g. libraries, public works facilities) provide good opportunities to incorporate and publically display green infrastructure approaches. Business and institutional campuses also provide plentiful opportunities to incorporate green infrastructure. Example green infrastructure opportunities that may be



integrated into projects include: improving catch basins during roadway resurfacings; directing parking lot runoff to filter strips and bio-infiltration areas versus the storm sewer system; replacing conventional pavement with permeable or porous pavements; and improving detention basin functions to improve water quality.

### ***Farmed Wetland Restoration***

The Plan recommends restoring farmed wetlands which currently comprise about 164 acres around the planning area. Typically, farmed wetlands are wetlands that were partially drained to improve crop production. Farmed wetland restoration not only improves water quality, it also improves groundwater quality since it seeks to trap and break down pollutants that eventually runoff or percolate into the groundwater table.

### ***Chloride Reduction Strategies***

Typical BMPs are limited in their ability to remove chloride. Thus, the Plan recommends addressing chloride loading within the watershed through source reduction. Recommendations include implementing alternative snow and ice management practices to reduce chloride loadings from roadway and parking lot deicing activities. A number of practical source reduction recommendations are addressed in McHenry County’s “Sensible Salting Workshop and Certification” program which should be promoted throughout the watershed. Additionally, alternative technologies are encouraged to reduce residential, institutional, and commercial rock salt consumption for water softening.



### **Site-specific BMPs**

Also identified were more than 100 site-specific BMPs throughout the planning area. Agricultural BMPs include filter strips/riparian buffers, grassed waterways, water and sediment control basins, and livestock access control. Urban BMPs included filter strips, riparian buffers, vegetated swales/bioswales, bioinfiltration and bioretention facilities, oil and grit separators, permeable pavement, education and outreach, and water softener regeneration effluent capture and reuse. Hydrologic BMPs included streambank and shoreline protection, stream channel restoration (re-meandering, daylighting), and wetland restoration.

Table 2 presents the aggregate pollutant loads estimated from land use, streambank erosion, and shoreline erosion, plus the aggregate pollutant load reduction estimates if all the BMPs identified in the Plan, valued at more than \$203 million, were implemented. This suggests that nonpoint source pollution will be difficult to mitigate entirely, more so for certain pollutants than others, and especially in a 10 year implementation timeframe for which this Plan was developed.

**Table 2. Pollutant load and BMP pollutant reduction estimates.**

	<b>Nitrogen (lb/yr)</b>	<b>Phosphorus (lb/yr)</b>	<b>Sediment (ton/yr)</b>	<b>BOD (lb/yr)</b>	<b>Chloride (ton/yr)</b>
Pollutant load	361,080	30,514	10,299	406,746	5,749
BMP load reduction	54,917	13,047	10,881	103,333	3,272
Percent reduction	15.2	42.8	105.7	25.4	56.9

### **Outreach and Education**

Implementation of outreach and education activities to support Plan goals will be an on-going effort among local organizations, agencies, governments, homeowners associations, and other groups that are active in the watershed. Some recommended outreach and education programs that support each of the Plan goals include increasing citizen knowledge of water quality issues; promoting U.S. EPA's Water Sense Efficiency Program; promoting programs offered by the Land Conservancy of McHenry County to conserve sensitive natural areas; and utilizing local government and organizational websites and social media to educate the public on various water resource and watershed protection topics.



## How You Can Help

There are many ways you can help protect the streams, lakes, woods, and wetlands in the Boone- Dutch Creek Watershed Planning Area as well as the Fox River itself. Actions that are good for watersheds and water quality will support healthy communities and habitats, and can save you time and money as well.

- Participate in the Boone-Dutch Creek Watershed Alliance (<http://www.boonecreekwatershed.org/>).
- Landscape using native plants to increase water infiltration, decrease water use, and reduce lawn maintenance.
- Minimize use of lawn fertilizers, herbicides, and pesticides.
- Never pour toxic chemicals, paint, or pharmaceuticals down sink drains or storm sewers. Bring unused materials to a hazardous waste collection event.
- Minimize salt use on driveways and sidewalks.
- Minimize water softener salt use by setting your system to recharge based on water use rather than on a set time schedule.
- Pick up and dispose of pet waste properly.
- Maintain septic systems.
- Keep streambanks and shorelines vegetated with native plants.
- Help keep water where it falls. Use rain barrels to collect rainwater for lawn and garden watering. Plant a rain garden. Plant trees.
- Take shorter showers, fix leaks, and turn off the water while brushing your teeth.
- Support conservation efforts in your community to help preserve environmental resources throughout the watershed. The Plan presents, for example, the benefits of greenways as riparian habitat, filtration buffers for water quality protection, and opportunities to boost connectivity of conservation lands.



The Chicago Metropolitan Agency for Planning (CMAP) is our region's official comprehensive planning organization. The agency and its partners are developing ON TO 2050, a new comprehensive regional plan to help the seven counties and 284 communities of northeastern Illinois implement strategies that address transportation, housing, economic development, open space, the environment, and other quality-of-life issues. See [www.cmap.illinois.gov](http://www.cmap.illinois.gov) for more information.

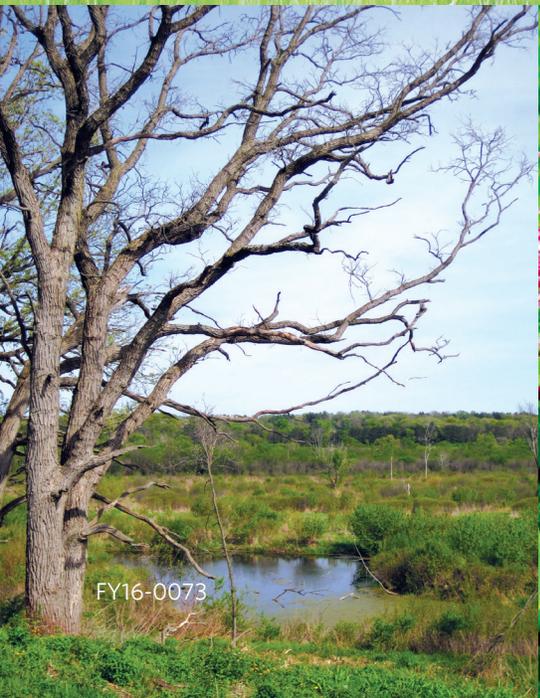
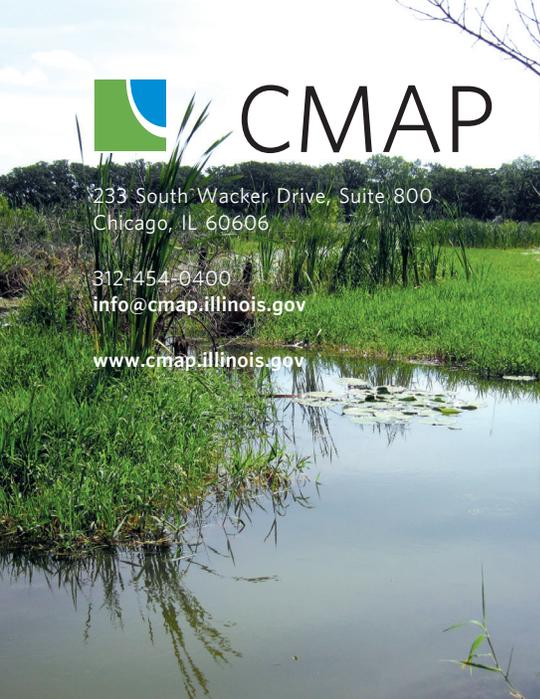


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