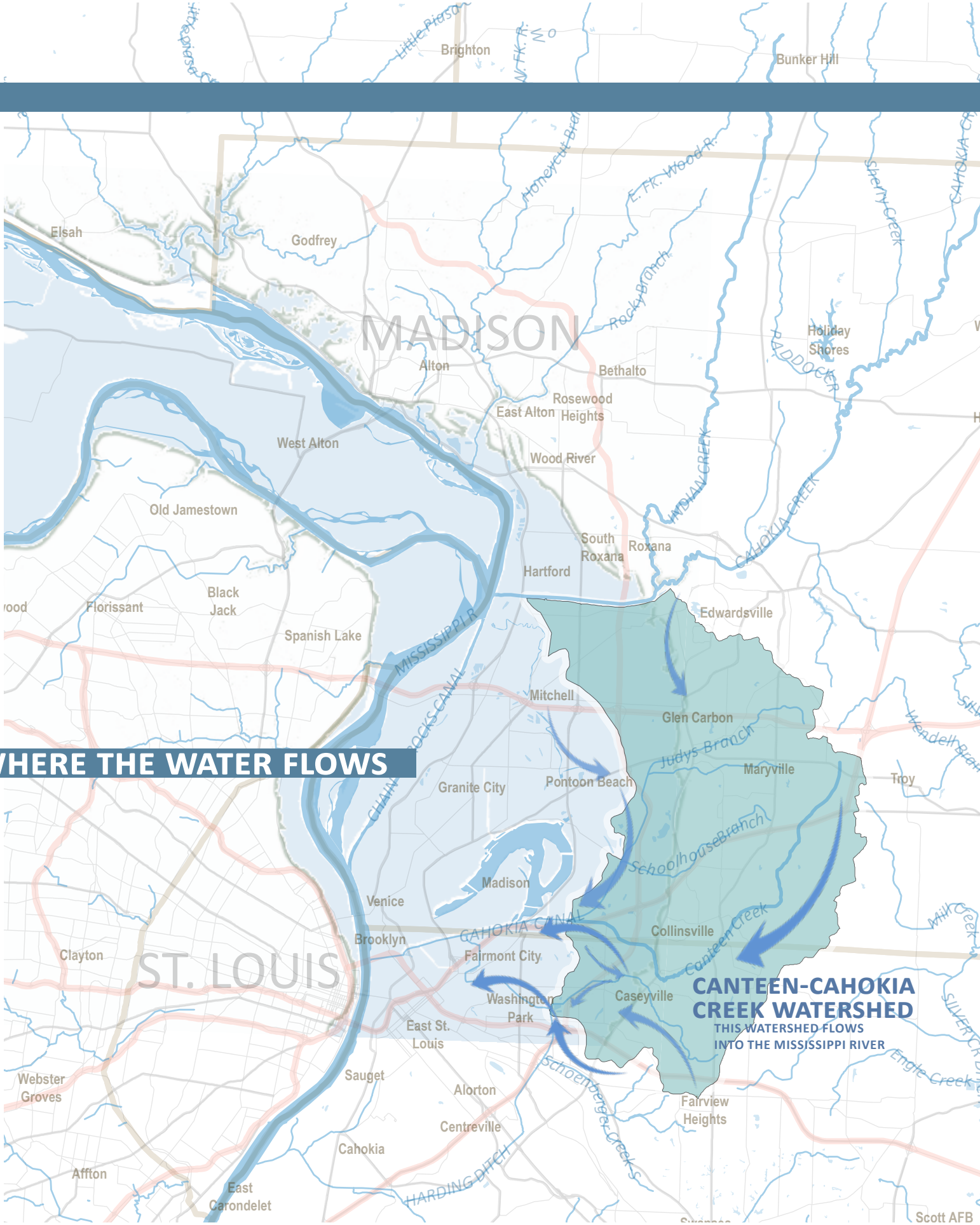
A Guide to the Canteen-Cahokia Creek Watershed

MADISON COUNTY, ILLINOIS

WHERE THE WATER FLOWS



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WHAT IS A WATERSHED?

A watershed is an area of land that drains into a common waterbody, such as a creek. Think of it like a bathtub: when a drop of water hits anywhere in the tub, it eventually finds its way to the drain (the lowest point). The rim of the bathtub is like the watershed boundary—any drop falling inside it will eventually reach the main drain, a creek or river.

Healthy watersheds mean that people have clean drinking water, flooding in appropriate locations, thriving wildlife, and recreation opportunities.

THE CANTEEN-CAHOKIA CREEK WATERSHED & THE PLAN

Water in the Canteen-Cahokia Creek Watershed generally flows east to west and south to north. Water flow starts from the top of the bluffs and drains into the Cahokia Diversion Channel before emptying intothe Mississippi River.

The Madison County Stormwater Management Plan sets county-wide policies to address drainage, and provides recommendations for each watershed in the County based on individual watershed plans. The Canteen-Cahokia Creek Watershed Plan was commissioned by Madison County in 2015 to promote a healthy, functioning watershed.

The planning process involved surveys, public meetings, technical analysis, and recommendations formed by a technical advisory committee and a stakeholder committee. The plan is a voluntary document that provides guidance to governments and residents on flood reduction and water quality in the Canteen-Cahokia Creek Watershed. The document can be found the Madison County Planning and Development webpage.

Goals of the plan are:

- Reduce flooding and mitigate flood damage
- Improve surface water quality
- Promote environmentally sensitive development
- Support healthy wildlife habitat
- Develop organizational frameworks
- Conduct education and outreach

See page 30 of the watershed plan.

WATERSHED PLANNING PROCESS

Early on and throughout the planning process, Madison County and the planning team sought guidance from more than 600 people and more than 90 entities. Interviews were conducted with townships, municipalities, the Madison County Farm Bureau, and County Board members. Small group meetings allowed attendees to provide locations of floods and other issues on large paper maps, and give detailed input on stormwater issues in the watershed. Five Open House events were held to gather input and get feedback from the general public. Madison County and HeartLands also gave presentations at regularly scheduled meetings of organizations such as the Edwardsville Rotary and the East-West Gateway Council of Government's Water Resources Committee, so as to inform larger groups efficiently.

Stakeholder input was of crucial importance in the planning process. Feedback from key stakeholders and the public was used in identifying issues, selecting Critical Area locations and specific project locations, and exploring opportunities for further outreach and education.

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HISTORICAL CANTEEN-CAHOKIA CREEK WATERSHED ECOSYSTEM

In 1799, David Bagley passed through southwestern Illinois approximately one mile southwest of modern day Glen Carbon, at the point where Judy's Creek emerges from the bluffs into the American Bottom on its way to the Mississippi River. Bagley determined this land—with its expanses and luxuriant vegetation, rivers, and open prairie—was only comparable to the biblical "Land of Goshen."

The land Bagley spoke of is the Canteen-Cahokia Creek Watershed in Madison County. The watershed is rich in cultural heritage, topography, water, and vegetation. The 57,000-acre watershed is 12 miles northeast of St. Louis, Missouri and contains 262 miles of streams.

The watershed was once one of the most fertile and productive in Madison County. The uplands were heavily forested, but the forests were almost completely harvested after settlers arrived. Cougars, wolves, and deer roamed through the forests and prairies. Settlers converted prairies to farms for cattle and crops, and the habitat has almost completely disappeared from the watershed.

Limestone bluffs define the edge of the fertile American Bottom. On the bluffs also sits Sugarloaf Mound, formerly a signal station of Native American tribes. Below the bluffs in the American Bottom is Cahokia Mounds World Heritage Site.

The fertile watershed also tops rich deposits of coal and shale. Much of the watershed was mined in the 1800s to 1900s.

Today, 10 municipalities are located in the watershed, including Collinsville, Edwardsville, Glen Carbon, Maryville, Pontoon Beach, South Roxana, Troy, and Caseyville. More than 64,000 people live in the area.

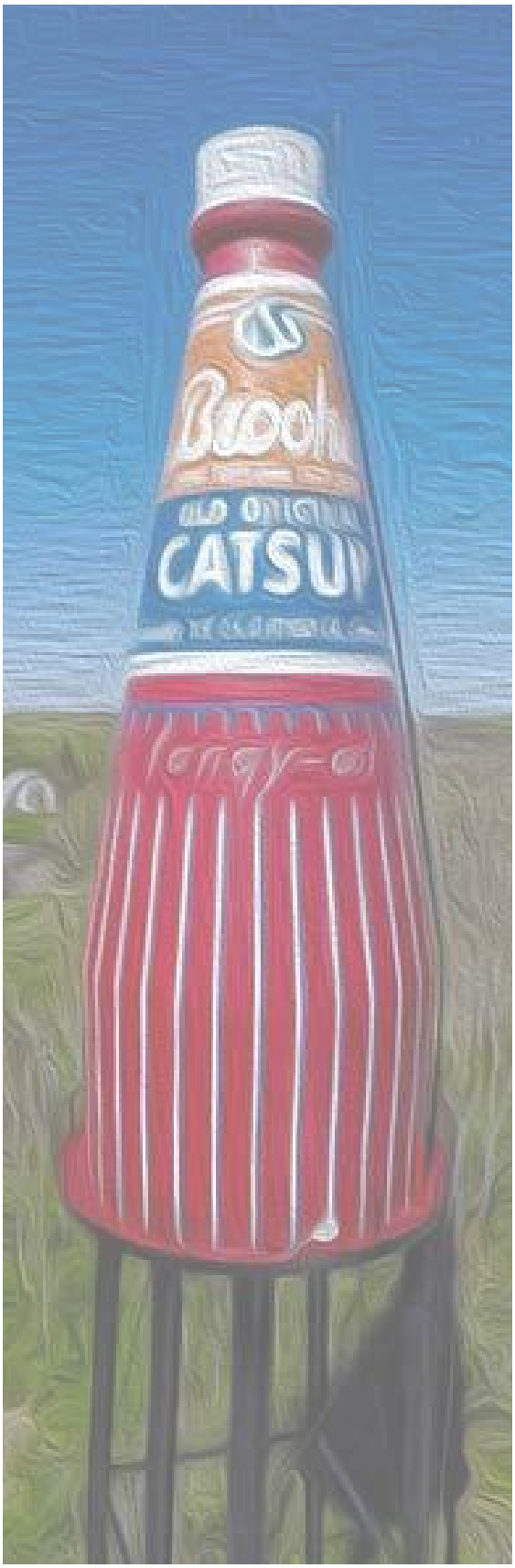
ADDITIONAL KEY FACTS & FEATURES OF THE WATERSHED INCLUDE:

- 23% of the watershed is developed (e.g, houses, businesses).
- 22% of the watershed is deciduous forest
- 4% of the watershed contains wetlands—primarily at the base of the bluffs.
- 17% of land in the watershed is in a designated floodplain.

RECREATION

The Canteen-Cahokia Creek Watershed is a popular location for cycling, including the Madison County Transit (MCT) Nature Trail, MCT Nickel Plate Trail, MCT Schoolhouse Trail, and MCT Heritage Trail. Southern Illinois University-Edwardsville (SIUE) also has miles of trails and trails that connect to the MCT system. Bohm Woods State Nature Preserve, Willoughby Heritage Farm, and McDonough Lake are popular conservation and recreational areas in the watershed. Public access to streams for fishing and paddling is limited.

CONDITIONS



While the Canteen-Cahokia Creek Watershed is considered a somewhat-healthy watershed, many issues exist that make the watershed less healthy.

FLOODING AND STREAMFLOW

Rainfall generates stormwater, which contributes to streamflow and flooding. Floods can be both positive and negative events.

General flooding in the floodplains can help recharge groundwater aquifers (which supply drinking water), disperse seeds, activate vegetation, and clear debris from the creeks.

A flash flood is a rapid rise of water along a stream or low-lying area, usually occurring with heavy rainfall over a short period of time. Flash floods are the most dangerous type of flooding because there is often little or no warning time and because of their potential to cause damage. Flash floods can occur any time, but are most likely to occur in May in this watershed.

In 2016, survey respondents in the watershed reported 697 floods per year occurring outside the federally designated floodplains.

Besides "flash" rainfall events, stormwater infrastructure in the watershed is often undersized and deferred maintenance has not kept up with needs. Also as impervious surfaces ((e.g., asphalt, concrete) increase, the risk of flash flooding increases.

When the Mississippi River water level is high, the canals in the watershed cannot drain the rainwater from the bluffs. This causes creeks and streams to backup and results in inland flooding.

See page 38 of the watershed plan for more information about flooding.

COSTS OF FLOODING AND POLLUTION

Flooding and water pollution can have significant impact on the watershed's residents. Over a 10-year span, it is estimated that flooding has cost residents $13.1 million. Flooding has also caused stress, loss of property access (including access to entry/exits from homes), lost business income, crop damage, and replacement costs of structures. (Appendix B- page ii-iii).

Water pollution in streams, rivers, and ponds can pose health risks such as skin rashes, pinkeye, respiratory infections, and hepatitis. Pollution can make fish inedible and rivers unpassable for barges and shipping.

WATER QUALITY

Streams naturally move sediment and other particles downstream. As these materials are swept away, others come in from upstream, bringing nutrients, organic matter, and more sediment to the streams and Mississippi River.

The clarity of water—whether it looks clear, "milky," or green—can indicate the conditions of the water. Water that is murky can mean that fish and aquatic life cannot survive—and it looks gross. Orange-colored water, likely from iron and/or manganese, has been observed in parts of the Canteen-Cahokia Creek Watershed.

Clean drinking water is the primary concern with water quality. Humans and animals need clean water to survive. In the watershed, many people and communities use well water for their water supply, including the cities of Edwardsville and Maryville. Contamination of these water sources is a life-safety issue and can be very expensive to fix.

Water quality is further discussed on page 41 of the watershed plan.

	AVG IN WATERSHED (2018)	TARGET AMOUNT	
Dissolved Oxygen (DO)	6.25 MG/L [at McDonough Lake]	no lower than 5.0 mg/l	*Low dissolved oxygen means that fish and other aquatic life can't survive.*
Sediment	17,520 tons/year	14,020 tons/year or 20% reduction	*High sediment means the water is murky and can harm aquatic life (they can't breathe).*
Total	57,110 lbs/year	42,830 lbs/year 25% reduction	*Too much phosphorous inthe water can cause excess algae growth, which suffocates fish and other aquatic life.*
Nitrogen	288,420 lbs/year	245,160 lbs/year 15% reduction	*Too much nitrogen in drinking water is harmful to babies and young livestock. It also causes excess algae growth, which clogs water intakes and kills fish.*
Fecal Coliform	445 cfu per 100 ml	245 cfu per 100 ml	*Large quantities of fecal coliform have potential to cause diseases, such as gastroenteritis and typhoid.*
Manganese	423 ug/L	<1,000 ug/L	*Manganese can cause staining and discoloration. At very high levels, it can cause damage to the nervous system, particularly in children.*

WHAT ARE SOME OF THE CAUSES OF WATER POLLUTION IN THE INDIAN-CAHOKIA CREEK WATERSHED?

- Lawn and agricultural fertilizers, which contribute to high phosphorus levels (page 42).
- Sediment from cropland, which is responsible for 36% of sediment in the watershed (page 41).
- 40% of streams have moderate levels of erosion, which contributes 43% of the sediment in the watershed (page 42).
- Poorly maintained septic tanks on private property (page 43).
- Combined sewers, which carry both stormwater and sewage (page 43).
- Water seeping into and out of cracked and ageing sewer pipes (page 44).
- Littering and dumping (page 44).
- Liquid leaching from landfills and abandoned mines (page 45).

RIPARIAN CONDITIONS

Just as water is essential for aquatic wildlife, many plants grow only in areas with more water, such as wetlands and riparian areas (the land area on either side of a stream). Although riparian vegetation is only a small percentage of land cover in the watershed, it provides important benefits including slowing flooding, filtering pollutants, reducing erosion along stream banks, providing habitat for wildlife, and providing recreation and scenic beauty. Today, 39% of the watershed's riparian areas are in poor condition. Invasive species, such as bush honeysuckle, have degraded riparian areas. In other cases, riparian areas have been cleared for development or to create cropland.

Riparian areas are critical habitat for many bird, mammal, amphibian, reptile, and fish species. (page 46).

WETLANDS

Wetlands are critical for stormwater control, water quality, and the ecosystem. Wetlands act as sponges that absorb large volumes of water during storms and hold water when rivers and creeks are full. Trees and other plants in wetlands cause water to distribute more slowly and evenly in floodplains. In large rain events, high functioning wetlands can hold up to five times the amount of peak flow that would otherwise become flood water. Wetlands also function as one of the most effective pollution removal practices in watershed management.

Wetlands are also "nature's supermarket." They produce great quantities of food for many types of animals. The U.S. Fish and Wildlife Service estimates that 43% of federally threatened and endangered species rely on wetlands for survival.

Thousands of acres of wetlands have been lost in the watershed since the settlement of the area. Many were filled in or drained for agriculture. (page 36)

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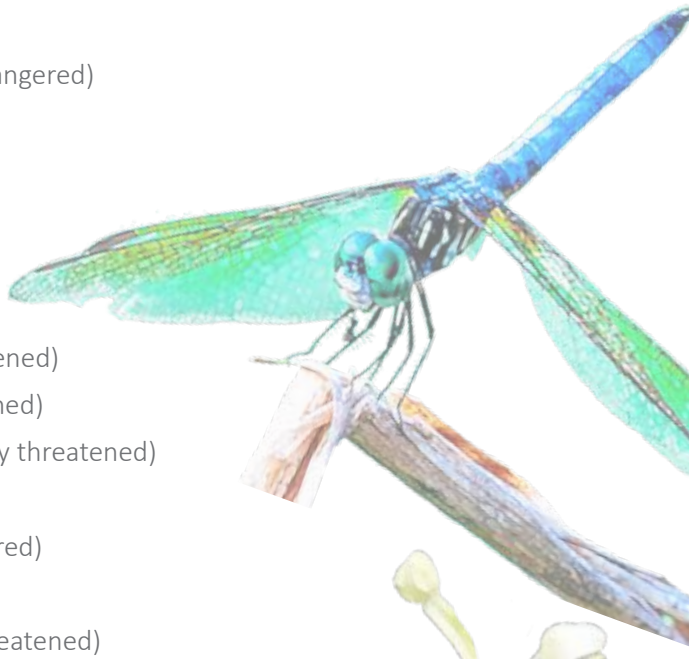
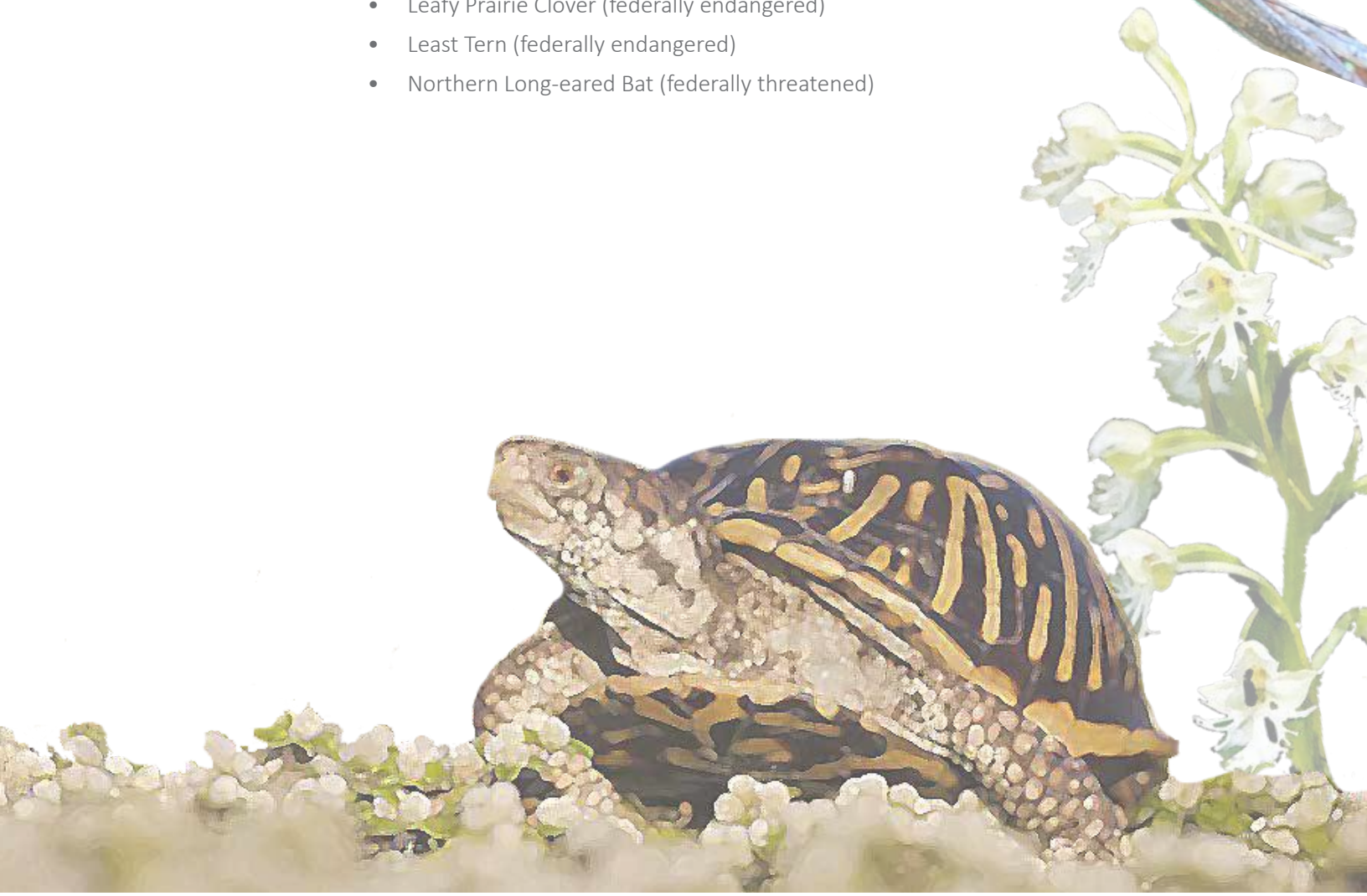
WILDLIFE

Wildlife can be good indicators of stream health because they reflect the conditions of multiple factors in the environment. (page 47)

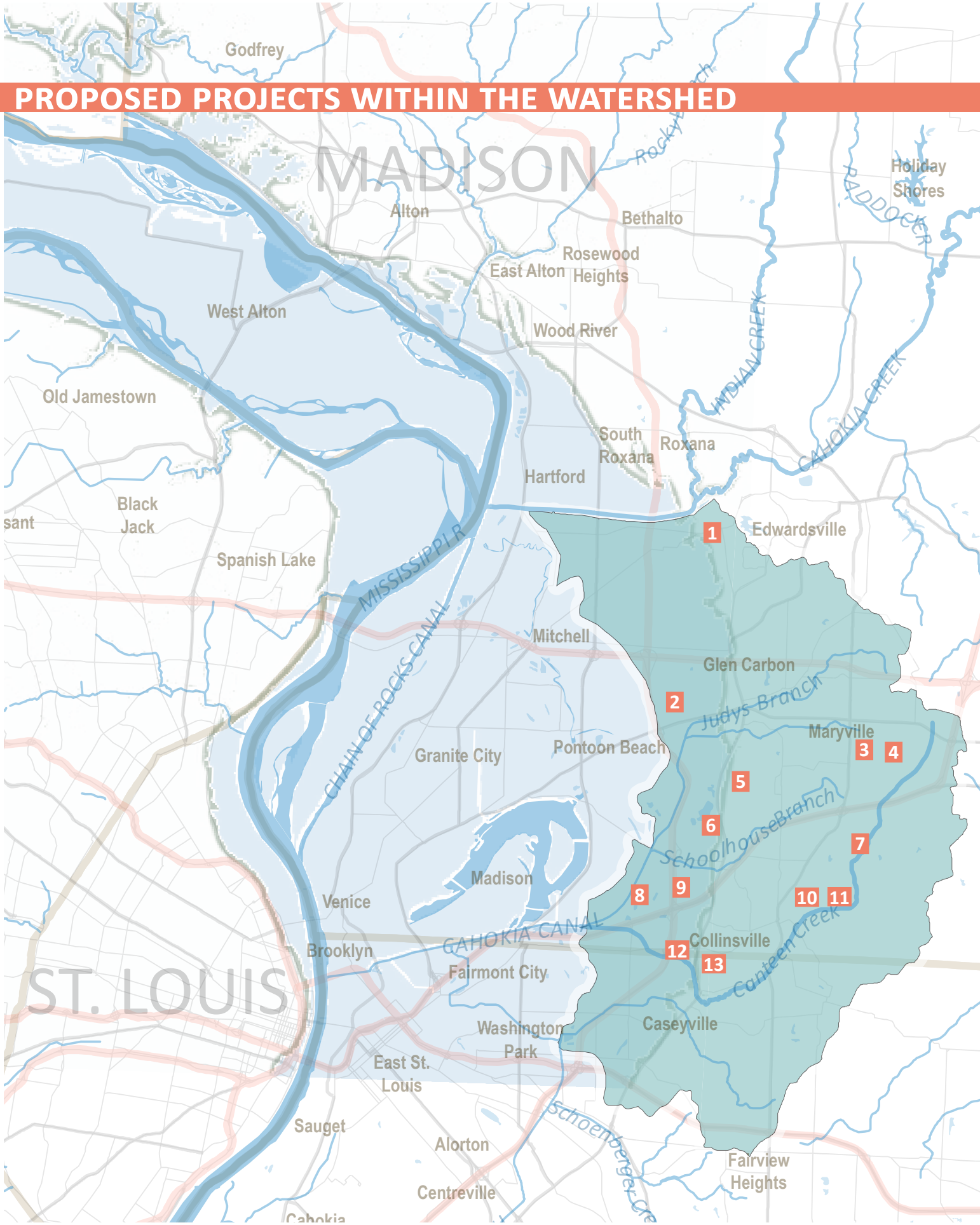
Historically, the watershed was home to:

- Black-crowned Night Heron (state endangered)
- Illinois Chorus Frog (state threatened)
- Lined Snake (state threatened)
- Little Blue Heron (state endangered)
- Ornate Box Turtle (state threatened)
- Royal Catchfly (state endangered)
- Decurrent False Aster (federally threatened)
- Eastern Massasauga (federally threatened)
- Eastern Prairie Fringed Orchid (federally threatened)
- Indiana Bat (federally endangered)
- Leafy Prairie Clover (federally endangered)
- Least Tern (federally endangered)
- Northern Long-eared Bat (federally threatened)





PROPOSED PROJECTS WITHIN THE WATERSHED



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PROJECT IDENTIFICATION

Thirteen specific project locations were identified in the watershed plan. These projects address life safety issues and multiple goals of this plan by implementing a variety of Best Management Practices. Madison County can use this short list to help communities and landowners address the needs identified in the stakeholder engagement process.

SPECIFIC PROJECT LOCATIONS

For each project location, the problem/issue is explored, along with a description of the problem. Then, potential solutions that might be used to address the issue(s) are discussed. These specific project locations are only *potential* projects. The types of projects suggested are voluntary, not mandatory, and each one warrants further stakeholder engagement and assessment. Landowners with a stake in the projects may not have been consulted. These sites are identified for outreach purposes only, to begin plan implementation. The following specific project locations are listed and numbered from north to south (not in order of priority)and more information in on page 94 in the watershed plan:

[1] Old Cahokia Creek

[2] County Ditch Erosion and Siltation

[3] Retention Basin (Maryville)

[4] Burdick Branch

[5] Sugar Bend Subdivision (Collinsville)

[6] McDonough Lake Flooding

[7] Canteen Creek Erosion and Flooding (Collinsville)

[8] Brushy Lake

[9] Schnieder Ditch

[10] Flooding Of Lebanon Rd Near Branch Rd

[11] Canteen Creek Tributary Pollution

[12] State Park Place Flooding

[13] Canteen Creek West of Route 157

SPECIFIC PROJECTS

1 Old Cahokia Creek

Description of Problem: A large area south of the Cahokia Diversion Canal and west of the bluff line floods often. This area is home to two Illinois state threatened species, and the soils are sandy and highly erodible. The area used to be sand prairie, and pockets of prairie remnants that remain are very rare. This area was identified as an Action Area in the 2004 East St. Louis and Vicinity Ecosystem Restoration and Flood Damage Reduction Project.

Possible Solution: Restore the historic channel of Old Cahokia Creek while being sensitive to remnant sand prairie, habitat and protecting archaeologically significant sites. This site also provides an excellent opportunity to incorporate recreational trails that connect to the larger county trails system.

2 County Ditch Erosion and Siltation

Description of Problem: The "County Ditch" is a highly channelized (i.e., straightened) segment of Cahokia Creek flowing north to south through Madison County. The ditch channels water from the bluffs to the east and the low-lying land to the west, and receives high levels of sediment deposition. The banks of the ditch also lose soil due to the high force of water moving through the channel.

Possible Solution: Increase frequency of maintenance of the ditch, including bank restoration, dredging, and restoration of the creek bed. Upstream of the ditch, work with farmers to implement practices to trap sediment before it leaves land that drains directly to the ditch.

3 Retention Basin (Maryville)

Description of Problem: A privately owned retention basin behind Mary Drive in Maryville is in a separate parcel owned by an absentee landowner. It drains to Burdick Branch. The basin has been silting in for many years, reducing its capacity to retain water, and has also had many algae blooms, which make wateer toxic to fish and humans.

Possible Solution: Once the property is sold, the parcel containing the basin could be divided and added to one or more neighboring parcels or the City, thus passing on maintenance requirements.

4 Burdick Branch

Description of Problem: Burdick Branch is a tributary to Cahokia Creek that flows east to west through Maryville. It has severe bank erosion and high sediment deposits throughout its length.

West of Route 157, Burdick Branch has been straightened. The stream is silting in and caving in at this location, with large amounts of farm topsoil entering and being deposited. It also experiences frequesnt logjams.

Possible Solution: The stream and its tributaries run through Maryville and unincorporated county. The western end of the stream is under the jurisdiction of Collinsville Township. These entities are the best placed to coordinate easements and project work needed to stabilize streambanks and channels and improve riparian vegetation.

5 Sugar Bend Subdivision (Collinsville)

Description of Problem: The Sugar Bend Estates and Deer Creek subdivisions in Collinsville have had contamination from fecal coliform from improperly maintained private sewer systems. The problem is that they are manifold collection systems so it is difficult to identify which individual system(s) are causing the problem.

Possible Solution: Continue to expand the city's private sewer system maintenance outreach and education. Continue to expand the public sewer system, converting older private sewer systems.

6 McDonough Lake Flooding

Description of Problem: McDonough Lake is situated between I-255 and Illinois Route 157, northeast of Horseshoe Lake. Several houses are situated on the south shore of the lake. These homes, and the lake itself, are in the 100-year floodplain. Floodwaters overtop the roads and reach some of these homes frequently. The lake has been filling with sediment and silt, losing capacity for water storage, over many years. Groundwater in the area is also high.

Possible Solution: Dredge of the lake, elevate of surrounding properties, and install upstream sediment control practices.

7 Canteen Creek Erosion and Flooding (Collinsville)

Description of Problem: Canteen Creek has severe streambank erosion and has caused flooding to houses in the area of White Birch Lane in Collinsville.

Possible Solution: Install streambank erosion and channel stabilization projects.

8 Brushy Lake

Description of Problem: The Brushy Lake Ecological Restoration Area is located near Collinsville in Madison County. The site is within the newly-formed Middle Mississippi River Conservation Opportunity Area, contains an important natural site (Levee Lake), is specifically identified within the 2004 East St. Louis and Vicinity Ecological Restoration and Flood Damage Reduction Project, and is depicted as high quality habitat. Due to its urban location, the site offers tremendous opportunities for flood storage, ecological restoration, scientific studies, environmental education, and outreach. Multiple public benefits can be realized at the site, including hiking (recreation), flood storage, water filtration, and improved air quality.

Possible Solution: Restore this site, adjacent to I-255 and I-55, as a regional detention area, holding excesswater from Cahokia Creek and freeing up channel space in the creek for drainage from the American Bottom watershed.

9 Schnieder Ditch

Description of Problem: Schnieder Ditch receives large amounts of water; upstream detention is needed. Water is currently pumped up to the ditch by several pumps. The City of Collinsville would prefer to switch to one pump, and regrade the channels or install deeper culverts.

Possible Solution: Increase detention upstream at Brushy Lake, regrade the ditch and related channels, and install one lift station.

10 Flooding of Lebanon Rd Near Branch Rd

Description of Problem: The intersection of Lebanon Road and Branch Road floods about once every five to 10 years.

Possible Solution: Increase detention upstream or downstream of the intersection, plus an increased culvert size underneath the road.

11 Canteen Creek Tributary Pollution

Description of Problem: The Collinsville area has a history of mining activity. Coal mines east of the city operated until the 1950s. Besides issues with subsidence (land sinking into the mine), the need for soil lead remediation, and capping the "gob piles" of pyrite, the City of Collinsville has had to monitor the water quality in its creeks. In one section of Canteen Creek, the color of the water changes from clear to orange. One of the slag piles have mostly been capped, but there is one nearby where the adjacent ditch is colored orange—there may be a leak. The banks of Canteen Creek are also highly eroded in places.

Possible Solution: Additional targeted water quality monitoring could help pinpoint the source of pollutants to the creek so that unsealed/uncapped mining wastes and other pollutants can be contained. Re-establishing and restoring the riparian area around the creeks will also help slow the flow of surface runoff to the creeks and filter the water.

12 State Park Place Flooding

Description of Problem: State Park Place, a low-lying unincorporated community bordering Collinsville and Cahokia Mounds State Park, often experiences flooding. Particularly severe flooding occurred in State Park Place when Canteen Creek breached its small levees in 1995 and 1998. Further information about these levees and the entity maintaining them has not yet been found. State Park Place also has significant issues with private sewage failures. Canteen Creek runs along the northern border of the community and is highly channelized with significant bank erosion.

Possible Solution: Drainage solutions for this area need to be explored in further detail. Acquisition and restoration of more property for the State Historic Park would decrease flood risk. A possible solution for this area is a FEMA buy-out of properties as a result of frequent flooding and sewage/water quality issues. These properties could then be used for detention. Restoration of the riparian area along the creek would improve bank stabilization and could incorporate recreational trails that connect to Cahokia Mounds and other regional trails.

13 Canteen Creek West of Route 157

Description of Problem: As identified in Oates Associates' 2010 report for Madison County, "Canteen Creek flooding occurs periodically as a result of localized storms and ponding from hillside runoff. The leveed portion of Canteen Creek west of State Route 157 overtops at a flow of approximately 3,000 cubic feet per second (cfs) causing damage adjacent to the creek. This levee offers no protection from even the 10% annual chance flood." In addition to this report, Collinsville Township reported that the ditch is very deep, making maintenance difficult.

Possible Solution: Make ditch and levee improvements, with additional flood storage where feasible.

HOW TO GET INVOLVED

If you would like to help promote healthy water quality and reduce flooding in the watershed, there are several ways to get involved.

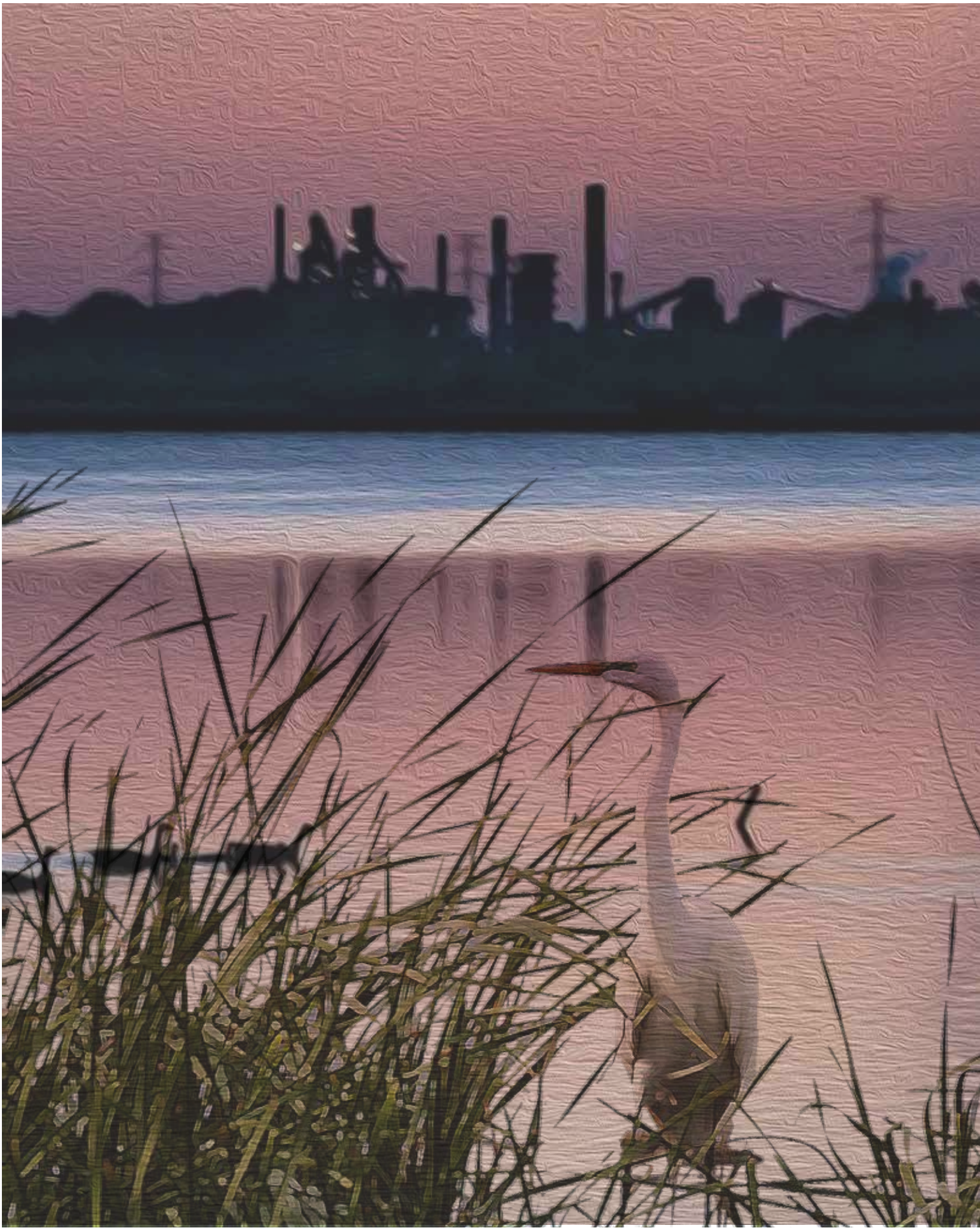
If you are a **landowner, farmer, or land manager**, you can make planting decisions that improve soil health and water quality. The Madison County Soil and Water Conservation District (SWCD) can provide assistance on topics including fertilizers, tillage, seed mixes, cover crops, crop rotation, woodland improvement, erosion control, and more. Find out more by contacting madisoncoswcd@gmail.com or calling 618-656-7300 ext. 3.

If you are a **homeowner**, you can contact HeartLands Conservancy about the Conservation@Home program, which offers guidance in designing your yard for wildlife and stormwater management. Find out more at https://www.heartlandsconservancy.org/conservationhome.php.

If you **live next to a creek, pond, or lake**, you can protect the trees that grow on its banks - and plant more! This will prevent soil erosion and make pleasant, shady habitat for aquatic creatures. Find out more at https://greatriversgreenway.org/design-guidelines/environmental/streambank-planting/.

If you are interested in **learning more about stream health**, you can join Illinois RiverWatch to volunteer to assess stream health using citizen science. This program, locally based out of the National Great Rivers Research and Education Center in East Alton, trains people to measure flow and collect aquatic insects in their neighborhood streams, and then interpret the results to find out how healthy the stream is. Find out more at http://www.ngrrec.org/Riverwatch/.

The cumulative actions of individuals and communities across the watershed can make a big difference in the health of people, wildlife, and the environment.



BEST MANAGEMENT PRACTICES

PREVENTIVE & POLICY-BASED ACTIONS: COMMUNITIES, COUNTIES, TOWNSHIPS, UNITS OF GOVERNMENT

There are many ways to improve the quality of water and reduce flood impacts in the Canteen-Cahokia Creek Watershed. (This list a sample of possible actions and not a comprehensive list. For full information, see the full Canteen-Cahokia Creek Watershed Plan.)

PROTECTION, RESTORATION, AND MANAGEMENT OF NATURAL AREAS

Conserving, restoring, and managing open spaces, particularly natural areas, is a particularly useful way to reduce negative impacts to water quality and flooding. Communities and counties can protect steep slopes, wetlands, and riparian areas through their comprehensive plans, ordinances, and subdivision regulations. In addition, natural areas often provide excellent public recreation areas for hiking, walking, wildlife observation, biking, and paddling.

STORMWATER INFRASTRUCTURE

Stormwater infrastructure does not typically have a dedicated source of funding like sewer or water infrastructure. Possible solutions for financing stormwater infrastructure (including green infrastructure) and management include a stormwater utility, property or sales taxes, special assessment districts, municipal bonds and state grants, and low interest loans through the state revolving fund.

Likewise, storm drains require regular maintenance and cleaning to prevent clogging and backflow.

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NATURAL RESOURCE CONSERVATION POLICIES, SUCH AS RIPARIAN AREA (STREAMSIDE) VEGETATION POLICIES

A riparian buffer is an undisturbed, naturally vegetated stip of land adjacent to a body of water (typically a stream). Among their many benefits, riparian buffers improve water quality, reduce erosion, store floodwater, and provide habitat for wildlife. A riparian buffer ordinance protects a riparian area from clearcutting, new development, and other disturbances and promotes planting new native plants and trees.

HeartLands Conservancy has developed a model riparian buffer ordinance that communities can adopt. Email info@heartlandsconservancy.org for information.

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PROPOSED ACTIONS BEST MANAGEMENT PRACTICES

ON-THE-GROUND ACTIONS FOR RESIDENTS, HOMEOWNERS, FARMERS,& LANDOWNERS

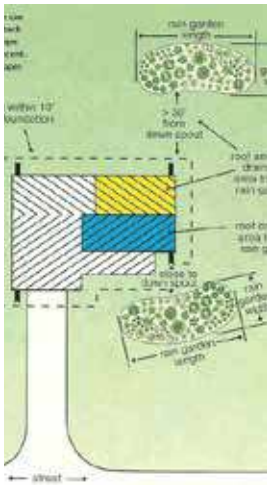
Further resources can be found in the Indian-Cahokia Creek Watershed Plan and on Madison County and HeartLands Conservancy's websites.

NUTRIENT MANAGEMENT PLANS
Farmers use Nutrient Management Plans to address manure disposal and manage fertilizer. The goal is to supply plants with the ideal amount of nutrients, minimize runoff, and improve soil condition.

COVER CROPS
A cover crop is a plant that is used primarily to slow erosion, improve soil health, smother weeds, control pests and diseases, increase biodiversity, and add other benefits on a farm or large garden. In many research studies, corn yields were between 3 and 10 % higher after cover crops planted.

CONSERVATION TILLAGE
Conservation tillage is a soil management technique that leaves at least 30% of the soil surface covered by residue after planting. This planting method increases water infiltration thanks to a more stable soil structure.

GRASSED WATERWAYS
Grassed waterways are broad, shallow, shaped channels designed to carry rainwater across farmland without causing soil erosion. The grass cover and root system in the waterway slows the water flow and protects the channel from eroding.



ACTIONS FOR COMMUNITIES, SUBDIVISIONS, & BUSINESSES

BIOSWALES & VEGETATIVE SWALES
A bioswale is essentially a ditch or shallow depression designed to remove sediment and pollution from rainwater runoff. The gently sloping trough is filled with native vegetation, providing a path for water to run through slowly rather than rushing into the storm sewer or stream.

The plants and soil in the bioswale slow and clean the water before it enters the stream or ground.

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DETENTION BASINS
A detention basin is an excavated area installed near streams to protect neighborhoods and subdivisions against flooding and erosion by storing water and slowly releasing it. They require regular maintenance, which is typically the responsibility of a homeowners association.

SINGLE PROPERTY FLOOD REDUCTION STRATEGIES
Basement flooding is typically caused by improper site grading, sewer backup, and infiltration through basement walls. Possible solutions for homeowners include regrading the site, downspout disconnection, incorporating rain gardens, and reducing impervious pavement in the yard.

STREET TREES
Street trees are trees planted in the public right-of-way, typically the area between the street and sidewalk or house. Street trees capture and filter rainwater, reduce air pollution, and increase property values.

ACTIONS FOR FORESTS

WATER AND SEDIMENT CONTROL BASINS (WASCOB)
Water and Sediment Control Basins (WASCOBs) are earthen basins constructed to trap sediment and water. The basins help prevent sediment from reaching streams and reduce gully erosion.

SEPTIC SYSTEM MAINTENANCE
Failing septic systems are expensive to replace or repair, and improper maintenance is the most common cause of system failure. When septic systems fail, untreated waste is released, pose risk to a the community's health and contaminate water wells.

TIMBER STAND IMPROVEMENT (TSI)
TSI involves periodic cutting in an immature stand of trees to stimulate growth. The best way to determine if a forest is suitable for TSI is to have a professional forester assess the stand. TSI helps native trees thrive that helps absorb stormwater more effectively.

INVASIVE SPECIES REMOVAL
Invasive species are plants or animals that are not native to our area and are likely to cause harm to the environment and the economy. Invasive species are one of the greatest threats to natural resources in Illinois. When invasive plants choke out the native plants, it can cause erosion problems due to their shallow roots. Removing invasive plants, and replacing them with native species, can significantly improve environmental health, stormwater retention, and reduce erosion.

ACTIONS FOR STREAMS, PONDS, & LAKES

LOGJAM REMOVAL
Logjams are a natural occurrence, and provide beneficial habitat for fish and wildlife. However, logjams can also have negative consequences; they can increase the impacts of flooding by causing water to back up and over the banks. Logjam removal should only be performed after a thorough inspection.

STREAM/LAKE DREDGING
Periodically, sediment will accumulate in ponds to the point that they become too shallow to effectively capture water. Although sediment must be tested prior to removal, it can usually be disposed of in a landfill or spread on land elsewhere and be reseeded. Occasionally a permit is needed for dredging.

SHORELINE/STREAMBANK STABILIZATION AND CHANNEL RESTORATION
There are several different ways to stabilize eroding streams and shorelines. Some methods include stonetoe protection, two-stage channels, and structures (typically made of rock) that slow the flow of water to prevent further erosion.

PONDS AND WETLANDS
Wetlands are among the most effective ways to remove pollution from stormwater and can also help with flood control. Native plants on the edge of ponds and wetlands help protect against erosion, provide critical habitat, and reduce nuisance animals, such as Canada Geese.

RIPARIAN BUFFERS
Ripiarian buffers are the undisturbed, native vegetation areas next to a stream. They protect the stream, support wildlife, reduce erosion, provide recreational space, and filter water pollutants.

Madison County Watershed Plans

www.co.madison.il.us/departments/planning_and_development

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