UPPER SOUTH BRANCH KISHWAUKEE RIVER WATERSHED IMPROVEMENT PLAN

A WATERSHED-BASED GUIDE TO PROTECTING AND RESTORING WATERSHED HEALTH

EXECUTIVE SUMMARY

Applied Ecological Services, Inc.™

By Applied Ecological Services, Inc.
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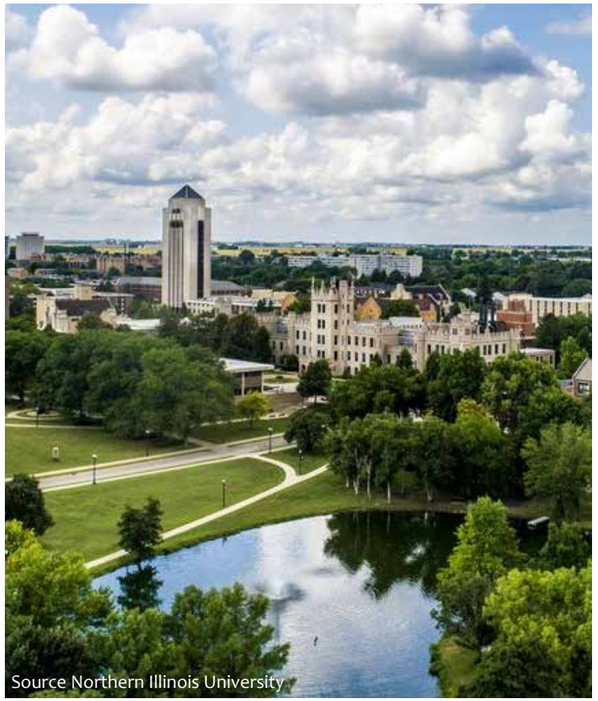
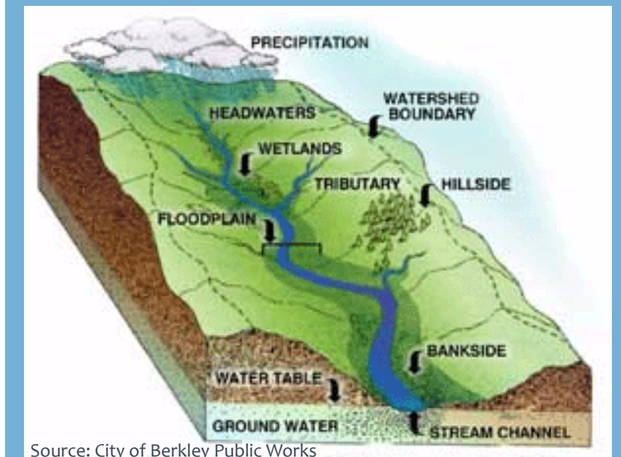
INTRODUCTION

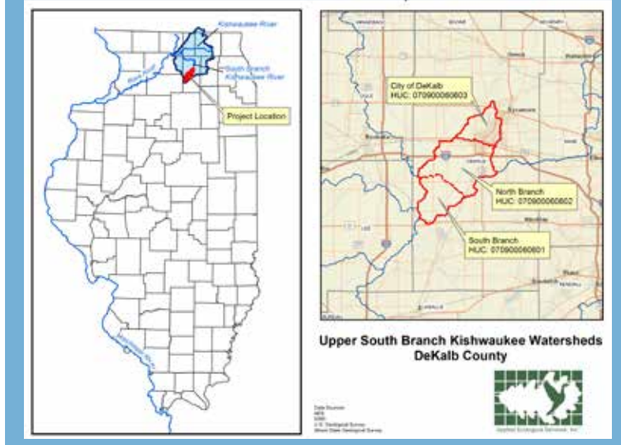
People live, work, and play in their "watershed" every day. A watershed is best described as an area of land where surface water drains to a common location such as a stream, river, lake, or other body of water. The source of groundwater recharge to streams, rivers, and lakes is also considered part of a watershed. Despite the simple definition for a watershed, they are complex in that there is interaction between natural elements such as climate, surface water, groundwater, vegetation, and wildlife as well as human elements such as agriculture and urban development that produce polluted stormwater runoff, increases to impervious surfaces, altered stormwater flows, and degradation or fragmentation of natural areas. Other common names given to watersheds, depending on size, include basins, sub-basins, subwatersheds, and Subwatershed Management Units (SMUs).

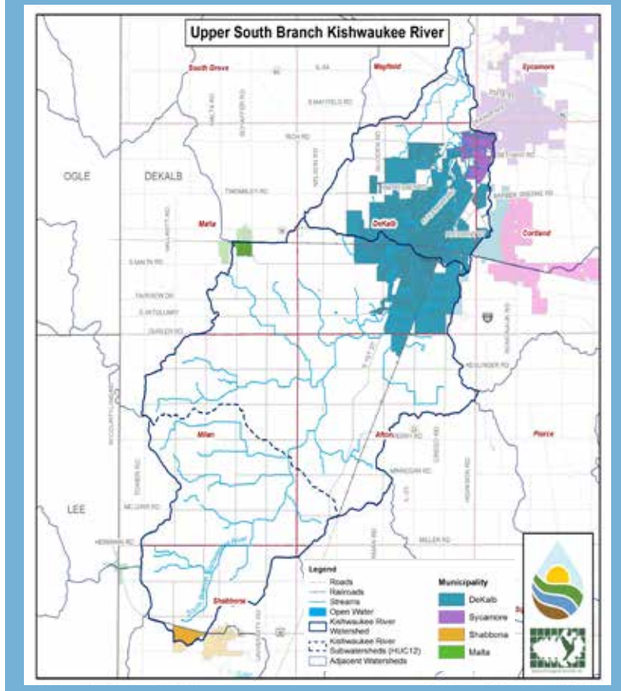
The Upper South Branch of the Kishwaukee River watershed, at 98.8 square miles in size, is a large watershed located in central DeKalb County. It includes three HUC-12-scale watersheds: the South Branch South Branch Kishwaukee River (HUC 070900060601), the North Branch South Branch Kishwaukee River (HUC 070900060602), and the City of DeKalb - South Branch Kishwaukee River (HUC 070900060603). This watershed is all part of the South Branch Kishwaukee River which flows north and east and then west to its confluence with the Kishwaukee River southeast of Rockford before joining the Rock River. The Rock River then flows southwest to join the Mississippi near Moline, Illinois.





Source: City of Berkley Public Works





The watershed-based planning process is a collaborative effort involving voluntary stakeholders. The primary focus is to restore impaired waters and protect unimpaired waters by developing an ecologically-based management plan for the Upper South Branch Kishwaukee River watershed that focuses on improving water quality by protecting green infrastructure, creating protection policies, implementing ecological restoration, and educating the public. Another important outcome is to improve the quality of life for people in the watershed for current and future generations.

The primary purpose of this plan is to spark interest and give stakeholders a better understanding of the Upper South Branch Kishwaukee River watershed to promote and initiate plan recommendations that will accomplish the goals and objectives of this plan. This plan was produced via a comprehensive watershed-based planning approach that involved input from stakeholders and analysis of complex watershed issues by Applied Ecological Service's watershed planners, ecologists, GIS specialists, and environmental engineers.

GOALS

Goal 1: *Build stakeholder awareness of watershed issues through education and stewardship while increasing communication and coordination among stakeholders.*

Goal 2: *Protect and manage natural and cultural components of the Green Infrastructure Network and improve fish and wildlife habitat.*

Goal 3: *Improve surface water quality to meet water quality standards.*

Goal 4: *Encourage agricultural techniques and soil conservation practices that will protect and conserve topsoil, improve soil health, and protect our water resources.*

Goal 5: *Protect groundwater quantity and quality.*

Goal 6: *Manage and mitigate for existing and future structural flood problems.*

THE PAST

A complex interaction existed between several ecological communities including prairies, savannas, woodlands, and wetlands prior to European settlement in the 1830s. The prairie-savanna landscape was maintained and renewed by frequent lightning strike fires, fires ignited by Native Americans, and grazing by bison and elk. Fires ultimately removed dead plant material, exposing the soils to early spring sun, and returning nutrients to the soil. Stream corridors and low wet depressions consisting of sedge meadow, marsh, and wet prairie were abundant. Where the City of DeKalb now sits, there were stretches of continuous woodlands along the banks of the Kishwaukee. Back then most precipitation was absorbed in upland prairie and savanna communities and within the extensive wetlands that existed along stream corridors. Infiltration and absorption of water was so great and the land so flat that most of the defined stream channels that exist today were simply wetland complexes or wet swales.

"In the broad, billowy prairies, extending as far as the eye can reach, we have the element of vastness as in scarce any other land; we have a luxuriant sward of emerald greenness, clothing the whole land, down to the very margin of the waters; we have meandering streams, clear as crystal, now smooth, quiet and glassy, then ruffled by winds or rapids; we have clumps of trees, charming groves, disposed with an effect of beauty that might baffle a landscape gardener; now crowning the grassy height, now clothing the green slope with their pleasing shade. From the gentle heights of the rolling prairies, the country, even before the hand of man had broken its surface, wore the aspect of cultivated meadows and rich pasture grounds, irrigated by frequent rivulets."

Highlights from "History of Dekalb County Illinois", Written by Henry Boies in 1868

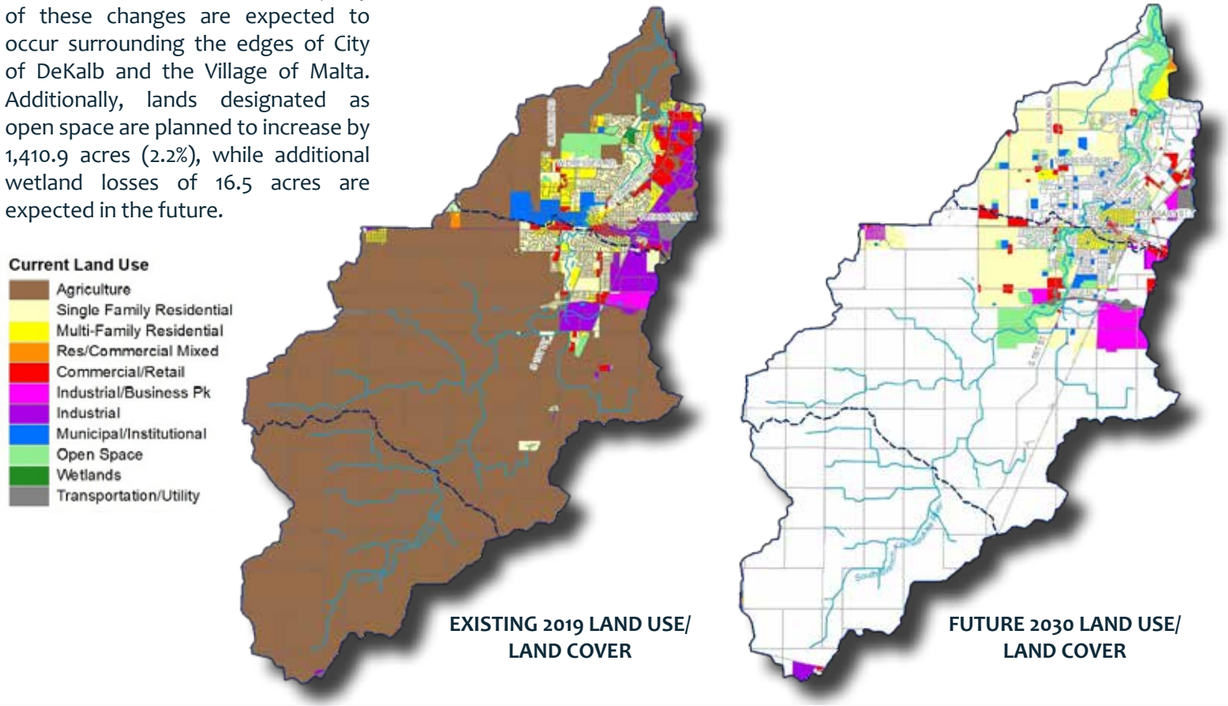
THE PRESENT

European settlement resulted in drastic changes to the fragile ecological communities. Fires no longer occurred, prairie and wetlands were tilled under or drained for farmland or developed, and many channels/ditches were excavated through wet areas to further drain the land for farming purposes. The earliest aerial photographs, taken in 1939, depict the Upper South Branch Kishwaukee River watershed when row crop farming was the primary land use but before residential and commercial development seen today. Some of the woodland communities described along the Kishwaukee near DeKalb were still present in 1939 but farmland clearly replaced nearly all of the prairie and wetland communities. With the advent of farming came significant changes in stormwater runoff. By 1939 defined stream channels had formed or were created throughout the watershed.

Residential and commercial development replaced some of the farmland in and around DeKalb and Sycamore as development expanded around the city centers. Very few wetlands and virtually no woodlands remained by 2017 compared to pre-settlement conditions.

THE FUTURE

Predicted future land use changes shows the largest loss of a current land use/land cover is expected to occur on agricultural land where approximately 9,148.5 acres of the existing 50,404.7 acres (14.5% decrease) is expected to be converted mostly to residential areas as well as some other land uses. The majority of these changes are expected to occur surrounding the edges of City of DeKalb and the Village of Malta. Additionally, lands designated as open space are planned to increase by 1,410.9 acres (2.2%), while additional wetland losses of 16.5 acres are expected in the future.



EXISTING 2019 LAND USE/ LAND COVER

FUTURE 2030 LAND USE/ LAND COVER

CHALLENGES & THREATS

SURFACE WATER

- According to IL EPA's most recent 2018 Integrated Water Quality Report and Section 303(d) List, Upper South Branch Kishwaukee River (IEPA Segment Codes: IL_PQC-02 and IL_PQC-13) is considered impaired for Fish Consumption and Aesthetic Quality.
- Recent water quality data collected within the Upper South Branch Kishwaukee River indicates likely overall impairment from elevated total phosphorus, total nitrogen, and total suspended solids.

LAND USE

- Agricultural land use in the watershed is the single largest nonpoint source contributor of nitrogen (28%), phosphorus (37%), and sediment (53%) to streams, followed by streambank erosion and urban land use.
- While some farms in the watershed utilize conservation practices, much more prevalent use of these practices needs to be implemented throughout the watershed in order to achieve water quality targets.
- Urban land uses contribute the second highest nutrient loads after cropland areas, with 12% of nitrogen and 13% of phosphorus per year, as well as the third highest sediment load (7%).

HABITAT

- Virtually no pre-settlement woodlands remain in the watershed; only 6% of pre-settlement wetlands remain, all in need of ecological restoration and management.
- 81% of the riparian areas along streams and tributaries in the watershed are in poor condition or non-existent.
- Current development policy among the watershed communities does not adequately protect green infrastructure.

IMPORTANT NATURAL AREAS

P.A. Nehring Forest

P.A. Nehring Forest is owned and managed by the DeKalb County Forest Preserve District . The preserve is located on a floodplain next to the Upper South Branch of the Kishwaukee River and is comprised of a mesic woodland of mature oaks, maples, and basswood.

County Farm Woods

Formally a nursing home and dumpsite (neither of which remain on the property), County Farm Woods is a small 8.3-acre forest preserve owned by the DeKalb County Forest Preserve and contains some of the oldest oak trees in DeKalb as well as a naturalized detention basin along the DeKalb Nature Trail and the Upper South Branch Kishwaukee River. It is comprised of an oak woodland.

Elwood Park

An 11.4-acre park on the Elwood House Museum property owned by the City of DeKalb Park District and honoring Isaac Ellwood, who was instrumental in the development of barbed wire. In addition to the historic house, the grounds contain formal gardens and a remnant oak woodland.

Hopkin's Park

Hopkin's Park is managed by the DeKalb Park District and contains 14.6 acres of turf grass under a remnant oak woodland. The park hosts the start of the DeKalb Nature trail which connects Hopkin's Park to Prairie Park. The park has many amenities, including a swimming pool, baseball field, basketball court, tennis court, playground, and flower garden.

Prairie Park

Prairie Park is a 106.3-acre park and the largest park in the watershed; it is managed by DeKalb Park District. Amenities at the park include a disc golf course, picnic tables, and walking trails. The park contains a remnant oak woodland and prairie along the Upper South Branch Kishwaukee River and DeKalb Nature Trail.

P.A. NEHRING FOREST

COUNTY FARM WOODS

HOPKIN'S PARK

AGRICULTURAL LAND MANAGEMENT

Agricultural land can be a significant contributor of nutrients and sediment to local streams when practices such as grass swales, filter strips, and reduced tillage farming are not in place. Observations made during Applied Ecological Services' field inventory in late spring 2019 indicate that additional grass waterways or vegetated swales may be necessary in some fields. Implementing these practices where obviously eroded swales have been identified could reduce pollutant loading.

Additional conservation practices and increases in the extent of reduced tillage practices in the Upper South Branch Kishwaukee River watershed are necessary to reduce cropland pollutant loading. Within the Programmatic Action Plan, AES recommends encouraging the 39% (19,658 acres) of cropland landowners already participating in low residue tillage (30-59% residue) to increase residue to 60% or more on their lands. This change alone could reduce watershed-wide pollutant loads by 16,912 lbs/year of nitrogen, 7,506 lbs/year of phosphorus, and 3,025 tons/year of sediment. The Programmatic Action Plan includes a list of general practices that should be implemented throughout the watershed where practicable.

Recommended agricultural BMPs include:

- Conservation tillage
- Principals of soil health
- Regenerative agriculture
- Subsurface (tile) drainage best management practices and bioreactors
- Vegetated swales
- Filter strips

There are numerous agricultural measures and funding sources that can be utilized by farmers to implement practices on their land to improve water quality and soil health, while reducing soil and nutrient losses. Many recommended programs are offered through the DeKalb County Soil and Water Conservation District (SWCD), U.S. Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS), and Farm Service Agency (FSA).

More information on all of these practices can be found in the full watershed plan document at: *http://www.dekalbcountywatersheds-il.org.*

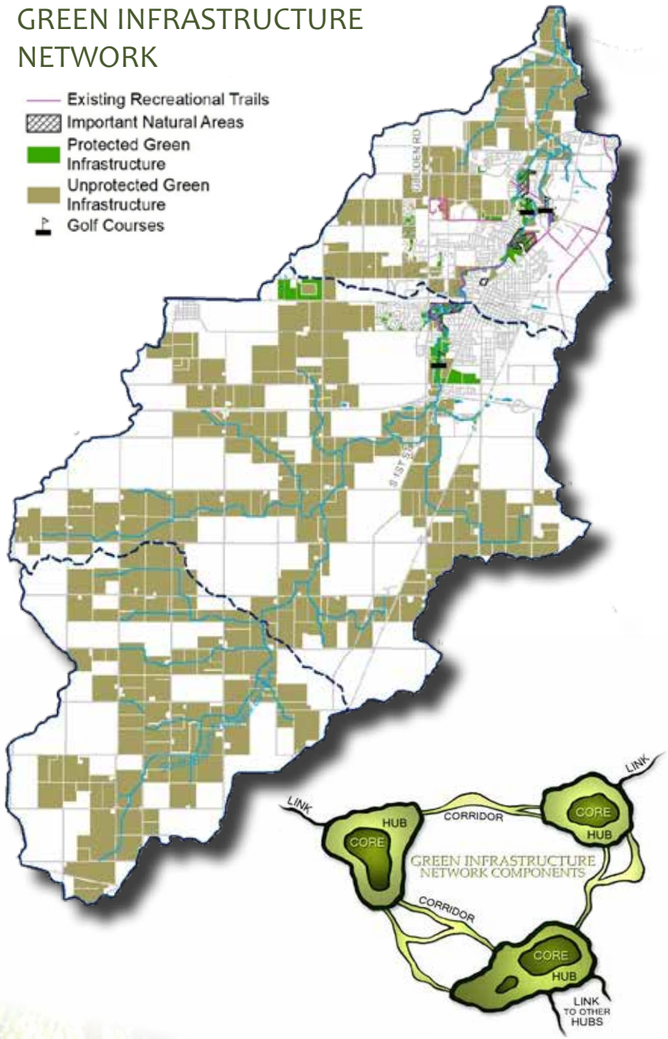
GREEN INFRASTRUCTURE & YOUR BACKYARD

A Green Infrastructure Network is a connected system of natural areas and other open space that conserves natural ecosystem values and functions, sustains clean air and water, and provides a wide array of benefits to wildlife and people. The network is made up of hubs and linking corridors. Hubs generally consist of the largest and least fragmented areas such as P.A Nehring Forest Preserve, Hopkin's Park, Prairie Park, and County Farm Woods. Corridors are generally formed by private agricultural or residential parcels along the Upper South Branch Kishwaukee River and its tributaries. Corridors are extremely important because they provide habitat conduits between hubs. However, most parcels forming corridors are not ideal green infrastructure until landowners embrace the idea of managing stream corridors or creating backyard habitats.

Any property owner can improve green infrastructure. Create a safe place for wildlife by providing a few simple things such as food, water, cover, and a place for wildlife to raise their young. The National Wildlife Federation's Certified Wildlife Habitat® and the Conservation Foundation's Conservation@Home programs can help you get started.

Creating a rain garden, or a small vegetated depression, to capture water is another way of promoting infiltration while beautifying your yard and providing additional habitat. Disconnecting your roof downspouts and capturing that runoff in rain barrels not only reduces the amount of runoff entering streams, but also serves as a great source of water for irrigating your yard.

GREEN INFRASTRUCTURE NETWORK



Source: greeninfrastructure.net

If a portion of a stream runs through your backyard, here are some tips to help properly manage your piece of the green infrastructure network:

1. A NATURAL, MEANDERING STREAM IS A HAPPY STREAM
   Work with experts to restore degraded streams and protect healthy ones.
2. REMOVE NON-NATIVE SPECIES
   Identify and remove plants that are out of place (see photo guide, right).
3. PLANT NATIVE VEGETATION
   Plants adapted to the Midwest climate can help control erosion by stabilizing banks.
4. NO DUMPING
   Avoid dumping yard waste and remove debris jams.
5. MANAGE CHEMICAL USE
   Avoid over fertilizing lawns or spilling/dumping chemicals, especially near waterways.

For more detailed information, check out the Lake County Stormwater Management Commission's booklet, "Riparian Area Management: A Citizen's Guide," at www.lakecountyil.gov/stormwater.

Source: Rainbarrelsource.com.

RAIN BARREL

RAIN GARDEN

STREAM RESTORATION

REMOVE THESE NON-NATIVE AND INVASIVE SPECIES

COMMON REED

BUCKTHORN

Source: Loras.edu.

PURPLE LOOSESTRIFE

GARLIC MUSTARD

REED CANARY GRASS

TEASEL

ACTION PLAN

The Upper South Branch Kishwaukee River Improvement Plan includes a voluntary Action Plan developed to provide stakeholders with recommendations to address plan goals. The Action Plan includes programmatic and site-specific recommendations. Programmatic recommendations are general watershed-wide remedial, preventatitve, and regulatory actions. Site-specific recommendations include actual locations where conditions are best to implement projects that can improve water quality, green infrastructure, and aquatic and terrestrial habitats.

Programmatic recommendations include...

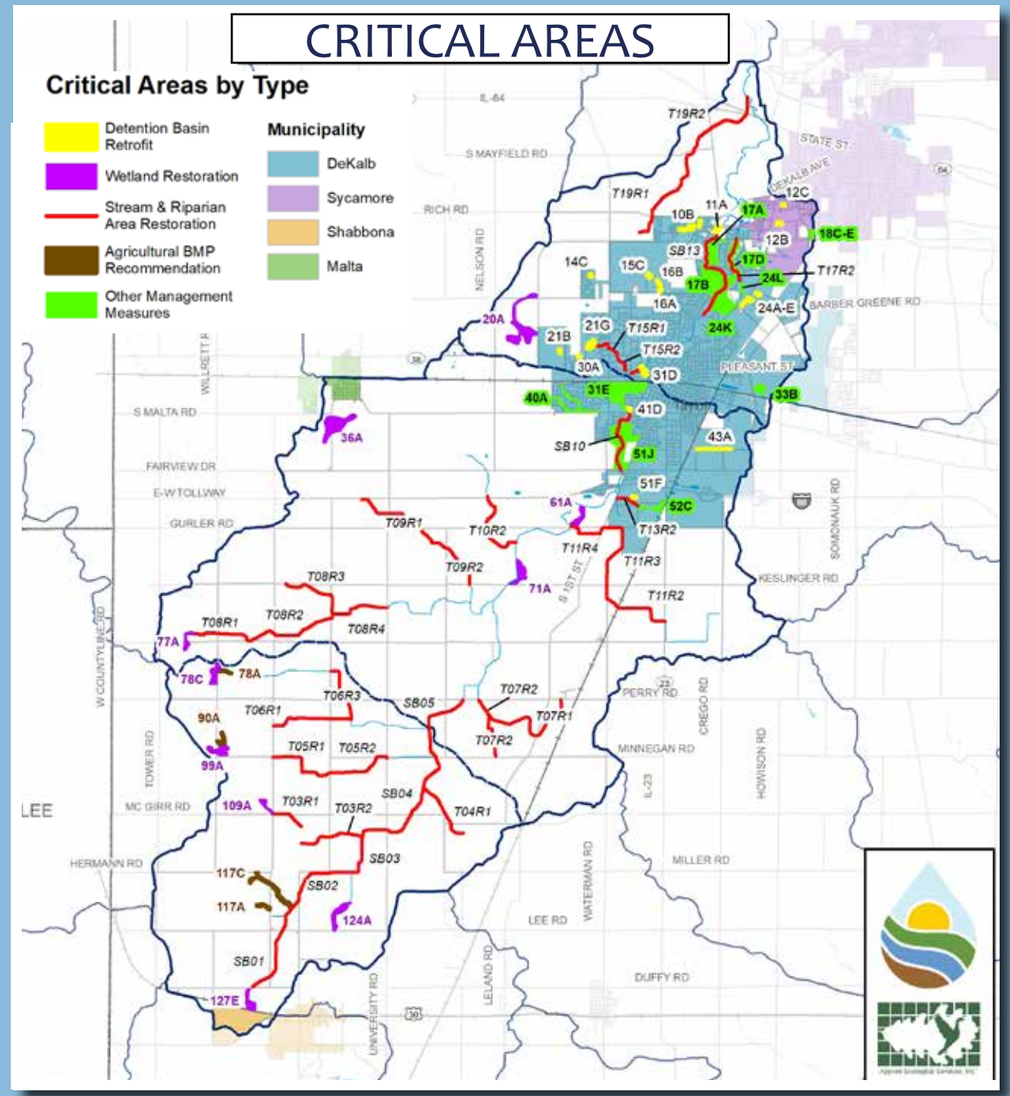
- Ordinance and Policy Recommendations
- Rainwater Harvesting & Re-use
- Native Landscaping
- Street Sweeping
- Septic System Maintenance
- Green Infrastructure Planning
- Conservation Design & Low Impact Development
- Water Quality Trading & Adaptive Management

Site-specific recommendations include...

- Detention Basin Retrofits
- Wetland Restoration
- Stream & Riparian Area Restoration
- Agricultural Management Practices
- Other Management Measures:
  - Natural Area Restoration
  - Golf Course Naturalization
  - Parking Lot BMPs

The recommended programmatic and site-specific management measures provide a solid foundation for protecting and improving watershed conditions over time, and should be updated using the Report Cards established for each goal as projects are completed or other opportunities arise. Key implementation stakeholders are encouraged to organize partnerships and develop various funding arrangements to help delegate and implement the recommended actions. More details on the action plan, report cards, and implementation can be found in the full watershed plan document.

CRITICAL AREAS



A NOTE ON STREAM & RIPARIAN AREA RECOMMENDATIONS:

Stream and riparian area recommendations generally focus on restoring and improving the riparian corridor. Where existing buffers are less than 75 feet, recommendations include extending buffers where possible; that said, extending a riparian buffer to 75 feet where no buffer exists is not always achievable. In these cases, recommendations included increasing the buffer to 50 feet along each bank. Most of the highly channelized agricultural reaches in the watershed are in the more advanced stages of recovering a stable two-stage channel, which should be encouraged and protected during other restoration and maintenance activities.

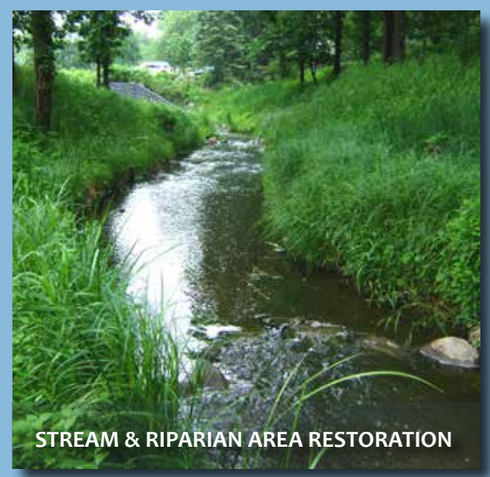
WATER QUALTIY MONITORING & INFORMATION & EDUCATION PLAN

A water quality monitoring plan is an essential part of any watershed plan to evaluate plan implementation outcomes. Physical, chemical, and biological data will be collected over time to track progress towards acheiving water quality improvements and will include total phosphorus, total nitrogen, total suspended solids, *E. coli*, and biological monitoring. Monitoring partners include Illinois EPA, Northern Illinois University, Kishwaukee Water Reclamation District, Illinois Tollway, and the Steering Committee.

The Information & Education (I&E) Plan recommends campaigns that are designed to enhance understanding of the conditions within the Upper South Branch Kishwaukee River watershed. The intention is to promote general acceptance and stakeholder participation in selecting, designing, and implementing recommended Management Measures to improve watershed conditions. The first step in understanding the challenges and opportunities within Upper South Branch Kishwaukee River watershed is to gain a better perspective on how the watershed evolved over time into what exists today. The goal of the I&E Plan is to equip municipal staff, elected officials, and other key stakeholders with the tools necessary to establish watershed-based practices and create changes in behaviors that will improve the overall health of the watershed.


AGRICULTURAL MANAGEMENT PRACTICES


Source: D. Johnson
WATER QUALITY MONITORING


STREAM & RIPARIAN AREA RESTORATION


DETENTION BASIN RETROFIT


WETLAND RESTORATION

WHERE DO WE GO FROM HERE?

The degradation of water resources seen today in the Upper South Branch Kishwaukee River Watershed occurred over almost 200 years of landscape changes. Fortunately, there are actions outlined in the plan that can be taken to mitigate existing issues and improve water quality over time. The future health of the watershed is largely dependent on how stormwater and natural resources are managed. That includes implementing proven and environmentally-sensitive practices and approaches to restoration, such as those identified in this executive summary and the watershd plan, to improve water quality and stream health in the watershed. You can help the Upper South Branch Kishwaukee River watershed by starting in your own backyard and supporting local water quality improvement efforts.

There is no single fix for the water quality and habitat issues in the Upper South Branch Kishwaukee River Watershed. These problems are the cumulative result of decisions made since people moved to the watershed in the 1800s. It will take all stakeholders and actions at every scale in order to positively impact watershed resources. This watershed-based plan is the first step in helping watershed residents and stakeholders understand what can be done to restore the valuable resources of the Upper South Branch Kishwaukee River Watershed.

Funding for the development of the Upper South Branch Kishwaukee River Watershed-Based Plan was provided in part through the USEPA Section 319(h) of the Clean Water Act distributed through the Illinois Environmental Protection Agency. The findings and recommendations herein are not necessarily those of the funding agencies. Funding and support was also provided by the DeKalb County Community Foundation, Kishwaukee Water Reclamation District, Northern Illinois University, and the Steering Committee.

Full Plan available on the
DeKalb County Government website and at:
http://www.dekalbcountywatersheds-il.org

All photos by AES unless otherwise noted.

For more information on how you can help, contact the DeKalb County Watershed Coordinator:

Dean Johnson
DeKalb County Soil & Water Conservation District
1350 West Prairie Drive
Sycamore, IL 60178
815-756-3234 ext. 3
Dean.Johnson@il.nacdnet.net

or visit the DeKalb County Watershed website at:
www.dekalbcountywatersheds-il.org

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