East Branch South Branch Kishwaukee River Watershed Plan

Including the Union Ditch & Virgil Ditch Systems

EXECUTIVE SUMMARY

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INTRODUCTION

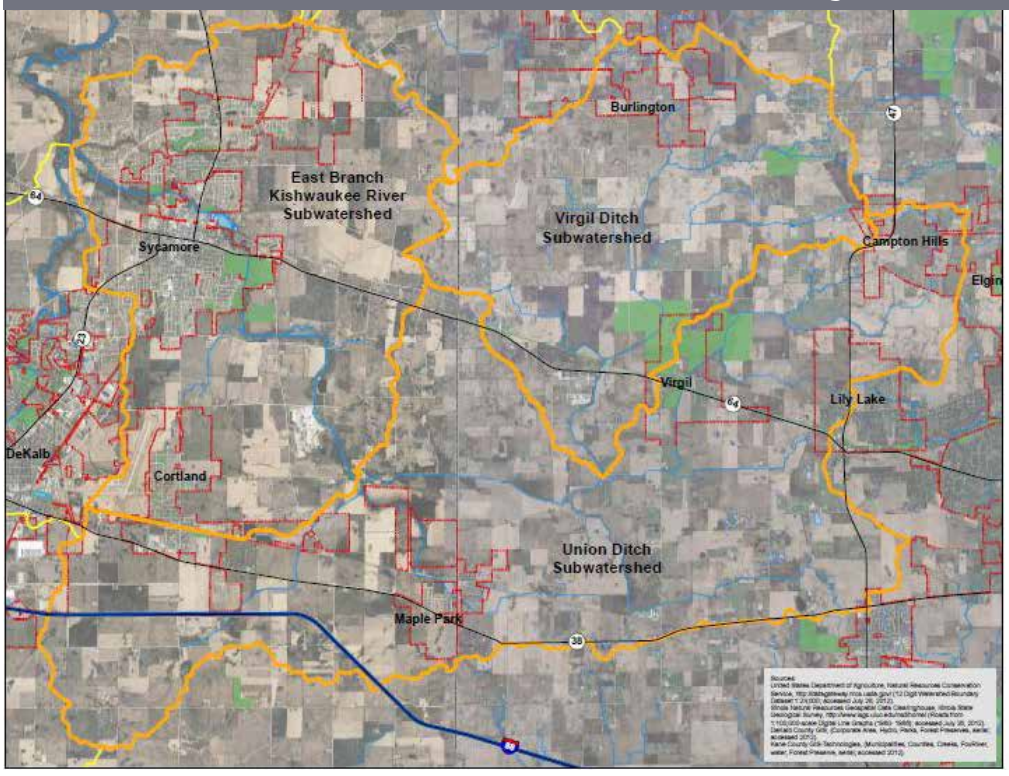
People live, work, and play in areas of land known as watersheds. A watershed is best described as an area of land where surface water drains to a common location such as a stream, river, or lake (see image, right). The source of groundwater recharge to aquifers, streams, and lakes is also considered part of a watershed. Watersheds are complex systems because there is interaction between natural elements such as climate, surface water, groundwater, and vegetation and human elements. Human influences can produce polluted stormwater runoff, increase impervious surfaces, alter stormwater flows, and degrade or fragment natural areas.

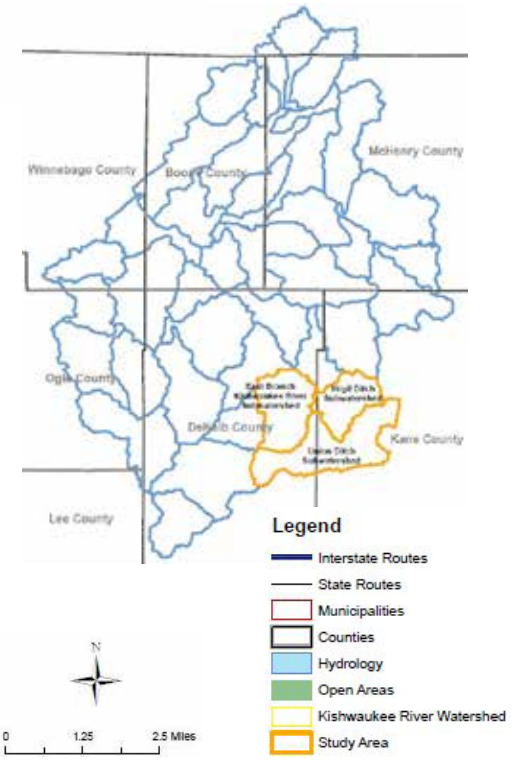
Source: USEPA

The East Branch South Branch Kishwaukee River watershed is located in east-central DeKalb County and western Kane County. The East Branch South Branch Kishwaukee River is a major tributary to the South Branch Kishwaukee River in DeKalb County, with the confluence about one mile west of Shabbona. The watershed drains approximately 123 square miles of land into the South Branch Kishwaukee River. The South Branch Kishwaukee River continues to flow west to its confluence with the Kishwaukee River. From this confluence, the Kishwaukee River flows westward through Rockford before joining the Rock River. The Rock River flows to the southwest where it eventually joins the Mississippi River. The full watershed plan document can be found at: *http://www.dekalbcountywatersheds-il.org/plans.html.*

The East Branch South Branch Kishwaukee River Watershed can be divided into three primary subwatersheds: Virgil Ditch, Union Ditch, and the East Branch South Branch Kishwaukee River. The Virgil Ditch subwatershed finds its headwaters in northwestern Kane County and flows south into Union Ditch. The Union Ditch system generally flows west from Kane County into DeKalb County and flows into the East Branch South Branch Kishwaukee River. As noted above, the East Branch South Branch Kishwaukee River is a major tributary to the South Branch Kishwaukee River.

East Branch South Branch Kishwaukee Watershed and its three subwatersheds: East Branch Kishwaukee River, Virgil Ditch, and Union Ditch





Collectively, there are 72.7 stream miles and 2,475 acres of wetlands in the East Branch South Branch Kishwaukee River Watershed. Two counties, eight municipalities and eleven townships comprise the East Branch South Branch Kishwaukee River watershed. The watershed is split almost evenly between DeKalb and Kane Counties and includes all or part of the Villages of Burlington, Cortland, Elburn, Lily Lake, and Maple Park, Cities of DeKalb and Sycamore, and Town of Virgil.

WATERSHED PLANNING

Watershed planning is a collaborative approach to address natural resource issues and improve water quality protection. This approach allows stakeholders to share information, better target limited financial resources, and address common water-related challenges. These challenges can include improving stream and lake water quality, preserving and protecting groundwater resources, managing stormwater, reducing soil erosion and flood damage, conserving open space, protecting wildlife habitat, providing safe recreational opportunities, supporting opportunities for economic development, and other issues of concern.

Goals were drafted directly from the concerns expressed by the Watershed Steering Committee members and watershed stakeholders. The final goals were adopted in October 2013 and capture the desired outcomes and vision for East Branch South Branch Kishwaukee River (including Union Ditch and Virgil Ditch) watershed.

GOALS

Goal A: *Protect and enhance overall surface and groundwater quality in the East Branch South Branch Kishwaukee River Watershed.*

Goal B: *Reduce existing flood damage in the watershed and prevent flooding from worsening.*

Goal C: *Improve aquatic and wildlife habitat in the East Branch South Branch Kishwaukee River watershed.*

Goal D: *Develop open space in the East Branch South Branch Kishwaukee River watershed and provide recreational opportunities.*

Goal E: *Increase coordination between decision makers and other stakeholders in the watershed.*

Goal F: *Raise stakeholder awareness (residents, public officials, etc) about the importance of best management practices of watershed stewardship.*

Example of the pre-settlement landscape.

THE WATERSHED OVER TIME

A diverse network of prairies and wetlands remained intact in the East Branch South Branch Kiswaukee watershed until European settlers began to alter significant portions of the watershed's natural landscape, hydrology and wetland processes in the 1800s. Where it was feasible, prairies were tilled under and sedge meadow, wet prairie, and marsh communities commonly found in floodplain areas were drained, streams channelized, and existing vegetation cleared to farm the rich soils. Channelization is the process of straightening or redirecting natural streams in an artificially modified or constructed stream bed. Today, the East Branch South Branch Kishwaukee River Watershed is approximately 84% agricultural.

While these changes increased the agricultural productivity of the watershed, they created other problems resulting from the channelization of streams and manmade ditches. Functional wetlands do more for water quality improvement and flood reduction than any other natural resource. In addition, intact wetlands typically provide habitat for a wide variety of plant and animal species. They also provide groundwater recharge, filter sediments and nutrients, and slowly discharge to streams thereby maintaining water levels in streams during drought periods.

Channelization is detrimental for the health of streams and rivers because it eliminates suitable in-stream habitat for fish and wildlife and limits the number of natural in-stream features such as pool-riffle sequences in the channel. In many locations, a berm comprised of historic side-cast dredge spoils cuts off the stream channels from the floodplain.

ISSUES & ASSESSMENT

Early in the planning process, DCWSC members, using input from stakeholders developed a list of watershed issues and concerns. These included:

- Non-point source runoff
- Agricultural runoff
- Industrial runoff
- Fecal coliform/*E. coli*
- The ecological condition of the stream channels including lack of fish and wildlife habit
- Hydrologic modification
- Development in the floodplain/Potential sources of non-point source pollution
- Problem hydraulic structures
- Overbank flooding
- Stormwater management and drainage issues
- Uncompleted FEMA maps, especially the need for establishing base flow elevations in all Zone A areas
- Regulatory/enforcement differences between the ACOE Chicago and Rock Island Districts
- Funding challenges for large scale water quality/flood remediation projects

An assessment of watershed conditions was conducted including stream corridor conditions, stormwater infrastructure, flooding, water quality, land use, wetlands, and other relevant information. This information not only provides a snapshot of current conditions but also serves as baseline data for comparing future watershed assessments. Four important conclusions based on this watershed assessment are summarized here.

1. Water quality is impacted by low dissolved oxygen levels and elevated levels of total suspended solids, bacteria, and nutrients.
2. Stream channels are impacted by streambank ***erosion*** and channelization resulting from poor riparian management, flashy hydrology, unstable streambanks, and stormwater runoff.
3. The conversion of vacant, agricultural, or open land to urban uses has the potential to negatively impact water quality in the watershed.
4. Municipalities, residents, business owners, landowners, and other watershed stakeholders lack the coordination and communication necessary to improve watershed resources.

Stream ***erosion*** occurs when water flowing through a channel transports downstream sediment removed from hillslopes, streambanks, and/or stream beds.

Streambank Erosion & Poor Riparian Management

Land Use Changes

Channelization & Poor Riparian Management

AGRICULTURAL LAND MANAGEMENT

Today, the East Branch South Branch Kishwaukee River Watershed is approximately 84% agricultural. There are many best management practices (BMPs) that are available and appropriate for implementation in agricultural areas. The Natural Resource Conservation Service (NRCS) Illinois Field Office Technical Guides (FOTG) document conservation practices applicable to farming in Illinois and provide details on standards and specifications for these BMPs. The standards describe the conservation practices and where it applies; while the specifications describe the detailed site-specific requirements for constructing, installing, and/or implementing the practice. Many of the BMPs recommended in Chapter 5 of the Watershed-Based Plan are included in the NRCS Illinois FOTG.

Since most of the East Branch of the South Branch of the Kishwaukee River Watershed is used for agricultural purposes, the use of BMPs on agricultural lands is imperative to ensure the protection and improvement of water quality in the watershed. Selecting specific site locations for agricultural BMPs has many considerations including owner willingness to participate, land configuration, and crop management practices already in place. The Watershed-Plan includes a list of general practices that should be implemented throughout the watershed where practicable.

Recommended agricultural BMPs include:

- Nutrient management
- Integrated pest plans
- Conservation crop rotation
- Conservation tillage
- Contour farming
- Terracing
- Grass waterways
- Water and sediment control basins
- Grade stabilization structures
- Drainage water management
- Streambank stabilization practices
- Weirs and cross vanes

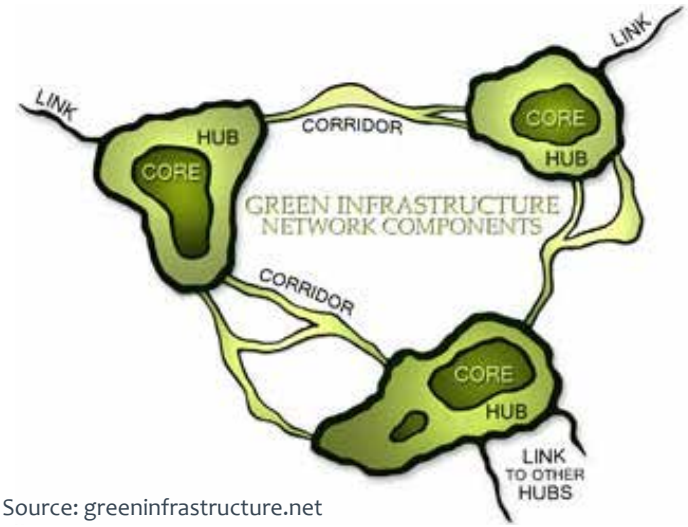
More information on all of these practices can be found in the full watershed plan document at: *http://www.dekalbcountywatersheds-il.org/plans.html.*

Images: Background - Conservation Tillage (no till) farming. Source: farmprogress.com.

Right, top to bottom - Stakeholders identifying issues of concern and implemented BMPs. Conservation crop rotation (Source: USDA NRCS), and grass waterways. (Source: USDA NRCS).

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 Virgil Forest Preserve, Cardinal Creek Forest Preserve, Sycamore Community Park, and Parkside Preserve. Corridors are generally formed by private agricultural or residential parcels along the East Branch South Branch Kishwaukee River and its tributaries as well as along the Great Western Trail. 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.

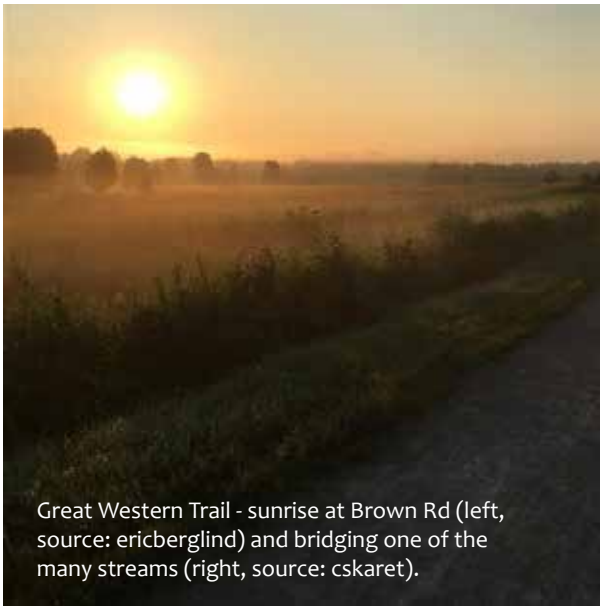


Source: greeninfrastructure.net

Source: Appalachian Traveller.

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.



Great Western Trail - sunrise at Brown Rd (left, source: ericberglind) and bridging one of the many streams (right, source: cskaret).

Source: Rainbarrelsource.com.

RAIN BARREL

RAIN GARDEN

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.
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 clear heavy debris jams.
5. **MANAGE CHEMICAL USE**
   Avoid over fertilizing lawns or spilling/dumping chemicals 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.

REMOVE THESE NON-NATIVE AND INVASIVE SPECIES

COMMON REED

BUCKTHORN

REED CANARY GRASS

PURPLE LOOSESTRIFE

GARLIC MUSTARD

TEASEL

PRIORITIZED ACTION PLAN

The effectiveness of the East Branch South Branch Kishwaukee River Watershed-Based Plan will be largely dependent on the successful implementation of the Prioritized Action Plan by watershed stakeholders. The Action Plan serves as a roadmap for watershed improvement and includes programmatic, policy, and site-specific recommendations. Programmatic Actions are focused on watershed-wide action items that are not site specific while the Site Specific Action Plan identifies specific and actual locations where water quality, hydrological modification, and/or flood reduction/ prevention projects can be implemented. The six most important general recommendations include:

1. Remediate existing flood problems and protect against future flooding by reducing stormwater runoff and preserving and restoring areas for surface water storage such as depressional areas, floodplains, and wetlands. These areas also provide water quality improvement benefits.

2. Construct new and retrofit existing stormwater management systems including detention basins and storm sewer outfall culverts to reduce runoff volume and rate and improve water quality in streams.

3. Reduce impervious areas by incorporating permeable pavements and bioinfiltration practices such as depressed islands and rain gardens in parking lots and streets throughout the watershed.

4. Stabilize streambanks to reduce erosion, protect property and infrastructure, and improve water quality and habitat.

5. Provide public education and outreach to all watershed stakeholders as a means of enhancing the understanding of watershed resources and provide opportunities for stakeholders to become involved in plan implementation.

6. Monitor and evaluate watershed plan implementation and changes in watershed conditions to gauge progress on reaching watershed goals.

More details on the action plan, best management practices, and implementation can be found in the full waterhsed plan document at: *http://www.dekalbcountywatersheds-il.org/plans.html.*

Wetland Restoration

Naturalized Detention Basin

Permeable Pavers

Bioinfiltration Strip

Stream Restoration

Water Quality Monitoring & Education

BEST MANAGEMENT PRACTICES (BMPS) & SOLUTIONS TOOLBOX

The watershed-based plan includes a description of BMPs and solutions that when properly applied can reduce stormwater impacts and improve water quality and stream habitat. The toolbox contains BMPs that can be implemented by all levels of watershed stakeholders from residents and landowners to municipalities. BMPs and solutions in the toolbox include:

- Stabilizing and restoring streambanks using bioengineering techniques.
- Installing rain gardens and bioinfiltration practices to help slow, infiltrate, cool, and cleanse stormwater runoff before being discharged into streams.
- Constructing new and retrofitting existing detention basins to help reduce volume and rate of stormwater released during storm events into streams.
- Reducing the area of impervious surfaces and using permeable pavements that allow water to infiltrate into the ground instead of running off as stormwater runoff.
- Restoring and maintaining native riparian buffers along streams and detention basins.
- Creation/restoration of wetlands to help slow, infiltrate, cool, and cleanse stormwater runoff before being discharged into streams.

MONITORING & EVALUATION PLAN

The final chapter of the watershed plan includes the Monitoring and Evaluation Plan. The Monitoring and Evaluation Plan was designed to provide a straightforward means of measuring progress towards watershed goals and plan implementation. Stakeholders should utilize this plan to monitor watershed resources and track whether meaningful progress is being made towards reaching the watershed-based plan's goals. The monitoring plan includes a series of Report Cards developed for each of the goals. The Report Cards are intended to provide a brief description of current conditions, suggest performance indicators that should be evaluated and monitored, milestones to be met, and remedial actions if milestones are not being met.

WHERE DO WE GO FROM HERE?

Historical land uses have played a significant role in the degradation of water resources in the East Branch South Branch Kishwaukee River Watershed. Fortunately, there are actions outlined in the plan that can be taken to mitigate existing issues and prevent additional problems. The future health of the watershed is largely dependent on how stormwater is managed. That includes implementing proven and environmentally-sensitive practices and approaches to stormwater management, such as those identified in this executive summary, to improve water quality and stream health in the watershed.

There is no single fix for the water quality and flooding problems in the East Branch 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 East Branch South Branch Kishwaukee River Watershed.

Funding for the development of the East Branch of the 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.

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

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

All photos by AES, DeKalb County Community Foundation or DCSWCD unless otherwise noted.