# Central South Branch Kishwaukee River Implementation Plan

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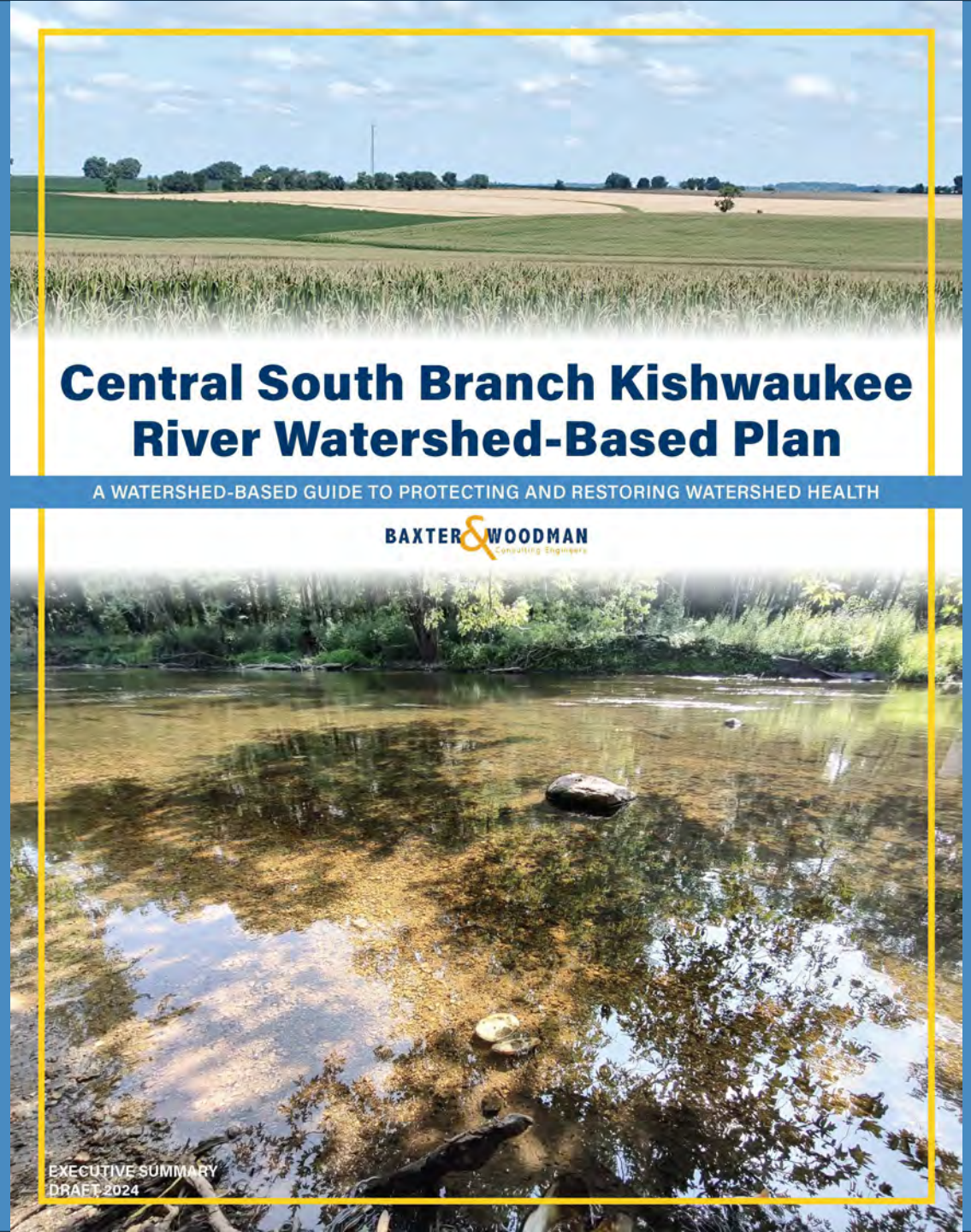
BAXTER & WOODMAN
Consulting Engineers

# Agenda

- Executive Summary
- Water Quality Monitoring Plan
- Report Cards
- Information & Education Plan

# Executive Summary

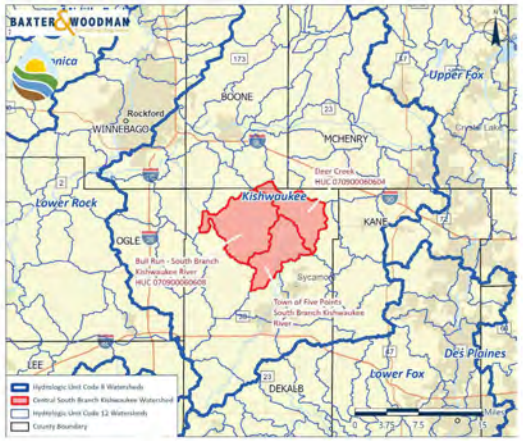


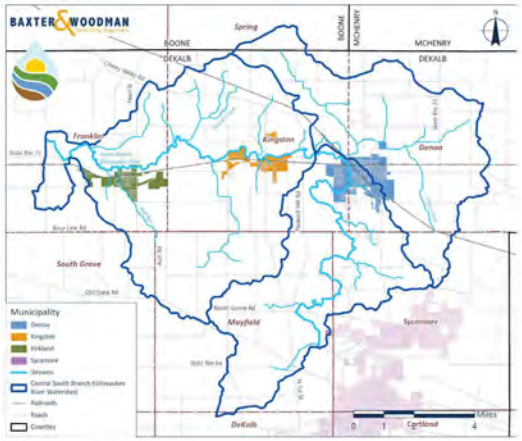
# What is a watershed?

A watershed is the area of land where all the rain that falls on the surface drains to a common location such as a stream or lake, similar to a bathtub where all the water that falls within flows to the drain. Despite the simple definition, there is a complex interaction at play between natural elements (such as climate, surface water, vegetation, and wildlife) and human elements (such as development). Watersheds follow topography, not political boundaries.


Source: Be Water Friendly

**This plan is for the Central South Branch Kishwaukee River watershed. It is large, covering 103 square miles of rural, northern DeKalb County extending into Boone County.**




- Includes Deer Creek (HUC 070900060604), Town of Five Points-South Branch Kishwaukee (HUC 070900060605), and Bull Run - South Branch Kishwaukee River (HUC 070900060608 ) subwatersheds.
- Begins in south near Sycamore and flows north to Genoa, then turns west, flowing through Kingston, Kirkland, and Kishwaukee River State Fish & Wildlife Area.
- Picks up Deer Creek, Haines Creek, Bull Run, and 13 unnamed tributaries on the way.

# Planning Process

Watershed planning is a voluntary, community supported approach to protecting and improving water quality in streams, lakes, and wetlands, protecting groundwater resources, restoring habitat, providing recreational & educational opportunities, and improving quality of life for people. The Central South Branch Kishwaukee River (CSBKR) watershed planning process is supported by DeKalb County Soil and Water Conservation District, DeKalb County Community Foundation, DeKalb County Government, DeKalb County Forest Preserve District, the City of Genoa, and the Villages of Kirkland and Kingston, among others. The planning process involved countless volunteers hours from these partners, local residents, and technical experts. All of the partners recognize the value of addressing non-point source pollution.

**The mission of the watershed plan is to improve water quality by reducing nonpoint source pollution, while preserving agricultural lands and improving habitat, along with increasing our knowledge to help improve the stewardship of the Central South Branch Kishwaukee River watershed.**

# Goals

1. *Encourage agricultural techniques and soil conservation practices that will protect and conserve topsoil, improve soil health, and protect our water resources.*
2. *Improve surface water quality to meet water quality standards.*
3. *Build stakeholder awareness of watershed issues through education and stewardship while increasing communication and coordination among stakeholders.*
4. *Protect and manage natural and cultural components of the Green Infrastructure Network and improve fish and wildlife habitat.*
5. *Protect groundwater quantity and quality.*

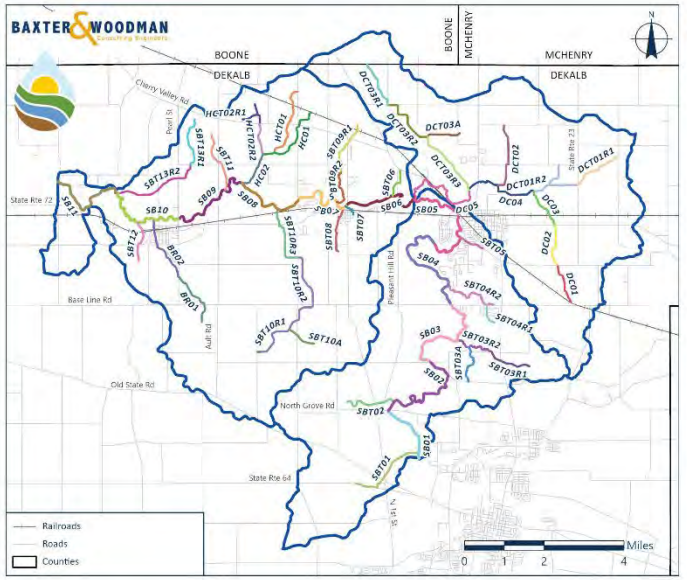
# Landscape Change

Pre-European settlement ecological communities in CSBKR watershed were balanced ecosystems with clean water and diverse plant and wildlife populations. The mosaic of open prairie, wetlands, and oak woodlands were largely maintained by frequent fires ignited by both lightning and the Native Americans that inhabited the area. Herds of bison and elk helped maintain the ecosystem by large scale grazing. During these times most of the water that fell as precipitation was absorbed in prairie and wooded communities and within the extensive wet prairies that likely existed where the upper stream and tributaries exist today.


Ecological conditions changed quickly and drastically following European settlement in the mid-1800s. Large scale fires ceased, and bison and elk were extirpated. Most wooded communities were harvested, prairies were tilled, and tile systems were installed to drain wetlands as farming became the primary land use. Development patterns continued to urbanize within the Genoa, Kirkland, and Kingston and today are dominated by pockets of primarily residential and commercial uses.

As development increased and the landscape changed, the health of the watershed and its ecosystems deteriorated. Impervious surfaces greatly reduce the ability of precipitation to infiltrate into the ground and instead cause stormwater runoff to quickly reach streams and tributaries. This in turn results in downcutting, widening, and bank erosion causing sediment and nutrient loading downstream. Meanwhile, streams were disconnected from their floodplains and invasive species established within the riparian areas causing loss of wildlife habitat and reduced floodplain function. Nutrients from agricultural land, eroding streams, and other urbanized sources are negatively impacting the biological communities in CSBKR.

*Example of pre-European settlement prairie-savanna landscape at Kishwaukee Forest Preserve*




# Stream Facts

- 84 miles of streams
- South Branch Kishwaukee River and Deer Creek are impaired for Aquatic Life, Fish Consumption, and Primrary Contact
- Excess nitrogen and phosphorus are a concern
- Agricultural lands and eroding streambanks are the biggest contributors of nutrients to streams
- Almost 20 miles of streams are listed as Priority Areas for restoration

*Aerial view of the South Branch Kishwaukee River in Kishwaukee Forest Preserve looking downstream from Glidden Road*

# Important Natural Areas

POTAWATOMI WOODS

PRAIRIE OAKS FOREST PRESERVE

WALNUT GROVE

Important Natural Areas provide large naturalized green spaces that support native species, maintain natural ecological processes, and contribute to the health and quality of life of their communities. These spaces are integral to protecting water quality and habitat and need to be taken care of to perform those functions optimally. The watershed is home to one State Wildlife Area, 12 DeKalb County Forest Preserve District properties, and 12 community parks, totaling 1,737.9 acres.

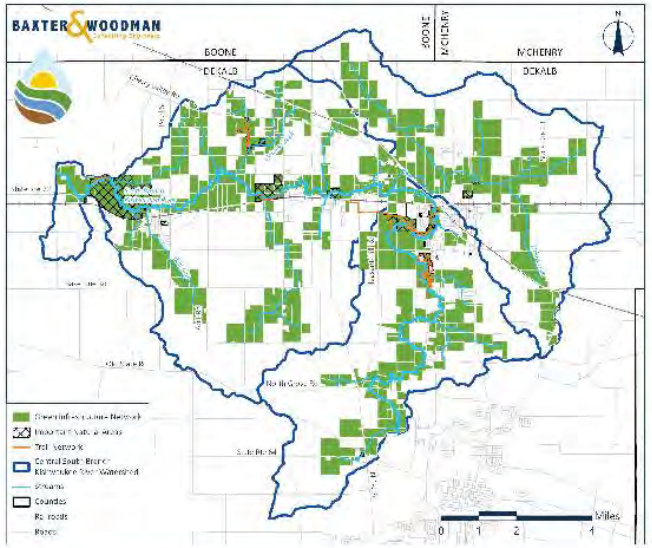
KISHWAUKEE RIVER STATE FISH & WILDLIFE AREA

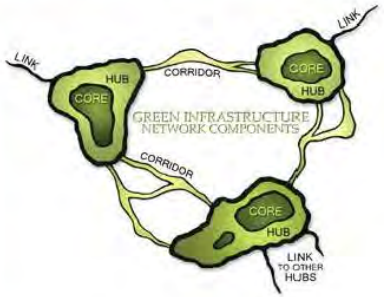
KNUTE OLSON, JR. FOREST PRESERVE

# Green Infrastructure & Your Backyard

A Green Infrastructure Network is a connected system of natural areas and open space that conserves natural ecosystems, sustains clean air and water, and provides a wide array of benefits to wildlife and people. Such a network consists of cores, hubs and linking corridors. Cores and hubs generally consist of the largest and least fragmented areas such as Kishwaukee River State Fish and Wildlife Area, Potawatomi Woods, Kishwaukee Forest Preserve, Russell Woods Forest Preserve, Riverwood Forest Preserve, and the Haines Creek Corridor. Corridors are formed by smaller, privately held parcels along the South Branch Kishwaukee River, tributaries, and trail network. Corridors are extremely important because they provide biological conduits between hubs for wildlife. However, most corridors are not ideal habitat until landowners embrace managing them as green infrastructure.

### GREEN INFRASTRUCTURE NETWORK




Any property owner can improve green infrastructure. You can create a safe place for wildlife by providing 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.

RAIN BARREL

**RAIN GARDEN**
University of Kentucky

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 down spouts 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.

If a portion of a stream runs through your backyard, follow these tips:

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 below).
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 to find out more, see Lake County Stormwater Management Commission's booklet, "Riparian Area Management: A Citizen's Guide," at www.lakecountyil.gov/stormwater.

## IF YOU SEE ANY OF THESE PLANTS ON YOUR PROPERTY, REMOVE THEM!

**PHRAGMITES**

**BUCKTHORN**

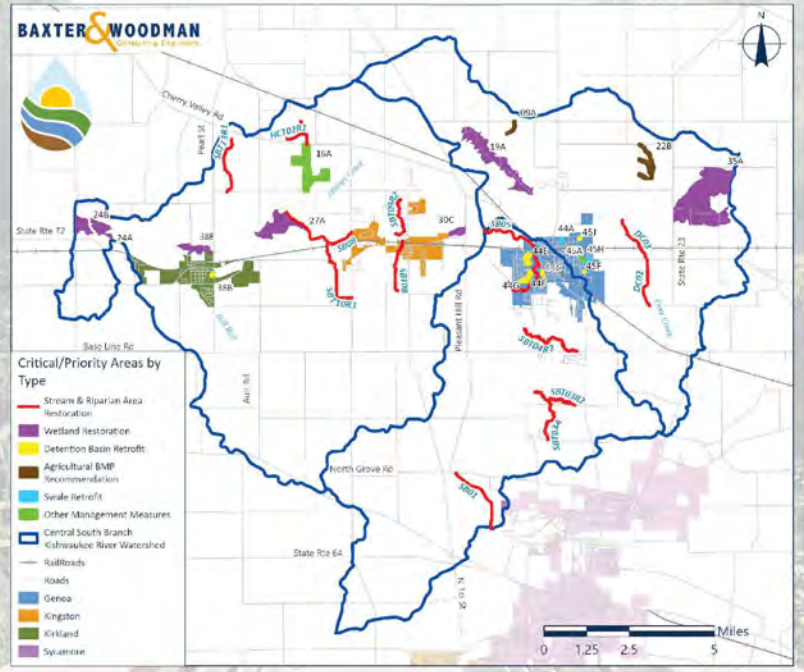
**REED CANARY GRASS**

**PURPLE LOOSESTRIFE**

**GARLIC MUSTARD**

**TEASEL**

# Action Plan & Priority Areas







The Central South Branch Kishwaukee River Watershed-Based 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 watershedwide 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. Priority Area recommendations (mapped above) are most urgent in restoring water quality.

**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.

# Agricultural Land Management

Agricultural land uses represent roughly 89% of the watershed, and nearly all of it is row crop farmland. According to the nonpoint source pollutant loading analysis, cropland contributes the highest loads of nitrogen (255,964 lbs/yr: 20%), phosphorus (53,084 lbs/yr: 65%), and sediment (25,626 t/yr: 51%), in large part due to the extent of agricultural land in the watershed. 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. Additional conservation practices and increases in the extent of reduced tillage practices in the CSBKR watershed are necessary to reduce cropland pollutant loading.

A 16% increase (9,351 acres) in the number of agricultural landowners practicing mulch till, reduced till, or no till would improve water quality substantially. This change alone could reduce watershed wide pollutant loads by 12,625 lbs/year of nitrogen, 5,923 lbs/year of phosphorus, and 3,184 tons/year of sediment and is considered a Priority Area Management Measure. These land management changes could occur on any lands currently practicing conventional tillage.

Recommended agricultural BMPs include:

- Conservation tillage
- Principals of soil health
- Regenerative agriculture
- Tile drainage management
- 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.

# Executive Summary

BAXTER & WOODMAN Consulting Engineers

## CENTRAL SOUTH BRANCH KISHWAUKEE RIVER WATERSHED-BASED PLAN

The water quality seen today in the Central South Branch Kishwaukee River (CSBKR) Watershed is a result of almost 200 years of landscape change. Fortunately, the plan outlines actions that can mitigate existing issues and improve water quality over time. The future health of the watershed is largely dependent on how water and natural resources are managed. That includes implementing environmental restoration practices, such as those identified in the watershd plan, to improve water quality and stream health.

You can help the CSBKR Watershed by starting in your own backyard and supporting local water quality improvement efforts. It will take a community-supported approach and actions at every scale in order to positively impact watershed resources. This watershed-based plan is the first step in helping landwonders understand what can be done to protect and restore the CSBKR Watershed.

Funding for the development of the CSBKR 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, DeKalb County Soil & Water Conservation District, DeKalb County, Northern Illinois University, and the Steering Committee.

For more information on how you can help, contact Dean Johnson at the DeKalb County Soil & Water Conservation District: 815-756-3234 ext. 3, Dean.Johnson@il.nacdnet.net, visit the DeKalb County Watershed website at: www.dekalbcountywatersheds-il.org, or scan the QR code (right).


All photos by Baxter & Woodman unless otherwise noted.

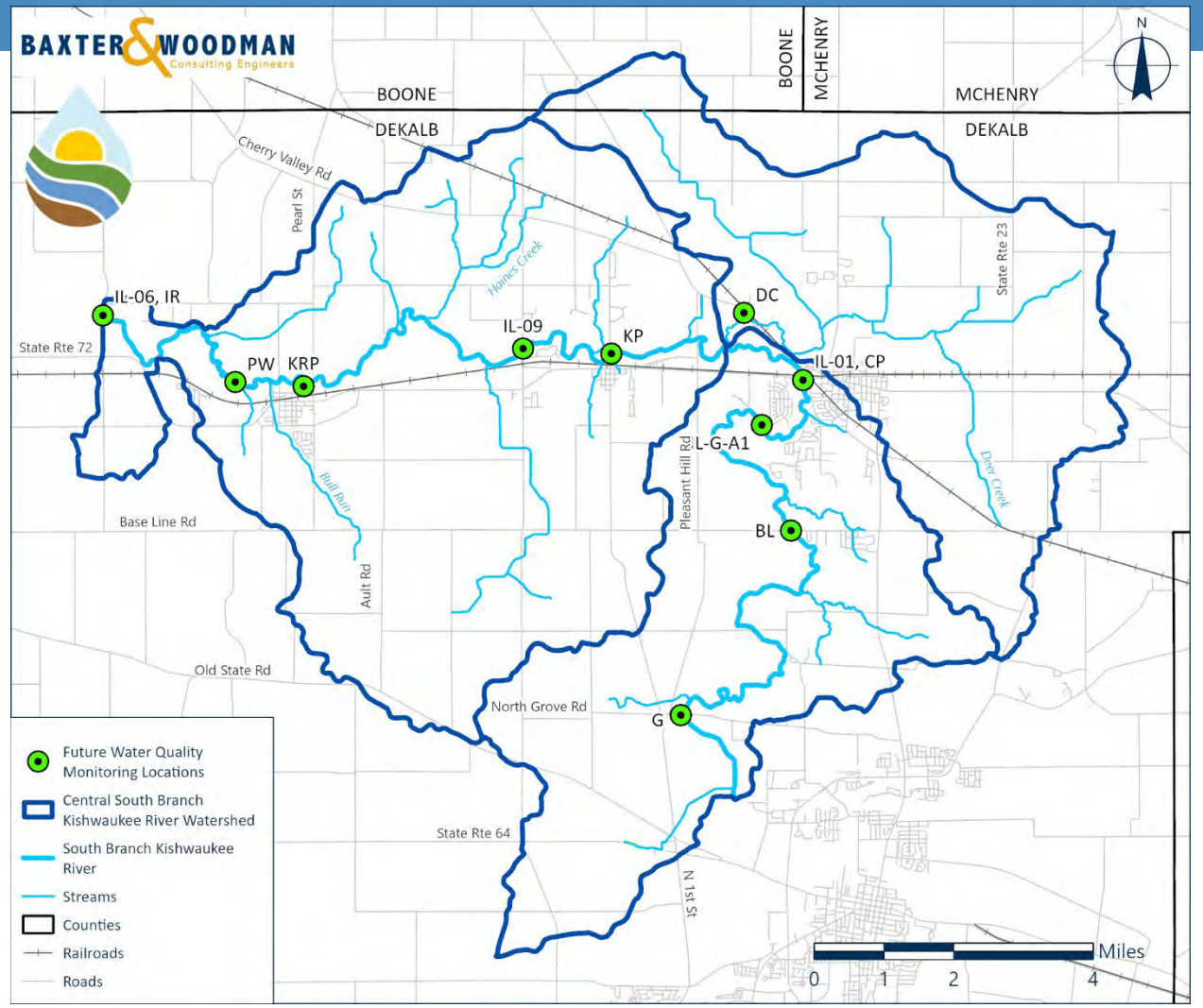
DEKALB COUNTY COMMUNITY FOUNDATION

# Monitoring Plan


**USEPA Element I: Monitoring component to evaluate the effectiveness of the implementation efforts over time**

# Monitoring Plan

- Existing physical and chemical monitoring should continue
- Additional monitoring should include *E. coli* and macroinvertebrates at IEPA monitoring locations at IL-06, IL-01, G every five years



# Monitoring Plan

## Existing monitoring should continue, and *E. coli* and macroinvertebrate sampling should be added to the 5-year monitoring regimes

| Monitoring Entity/Program | Monitoring Location | Schedule/Monitoring Frequency | Parameters Sampled | Cost to Implement |
|---|---|---|---|---|
| **Existing Monitoring Programs** | | | | |
| Illinois EPA Intensive Basin Survey and Special Study | IL-G-A1, IL-01, IL-06, IL-09 | Every 5 years | Physical; Chemical | Not Applicable |
| NIU | 8 sites along CSBKR and tributaries | Yearly | Physical; Chemical | $15K/year |
| **New Monitoring Programs** | | | | |
| Steering Committee or other partners | IL-06, IL-01, G | Every five years | *E. coli* | $1,000 each 5-year cycle |
| Illinois RiverWatch or NIU | IL-06, IL-01, G | Every five years | Biological | $5,000 each 5-year cycle |
| Project lead or landowner | Varies: Specific to each management measure | Pre and post implementation | Physical, Chemical | $5,000 for each project |

# Monitoring Plan

- **Additionally, water quality monitoring should be conducted at individual management measure sites as implementation occurs**
- **Analysis of satellite imagery can be used to track changes in conservation practices over time at the watershed scale**
  - Calculate minimum Normalized Difference Tillage Index (NDTI)
  - Resources available online

# Stream Monitoring Parameters

## Physical & chemical monitoring parameters, collection, and handling procedures

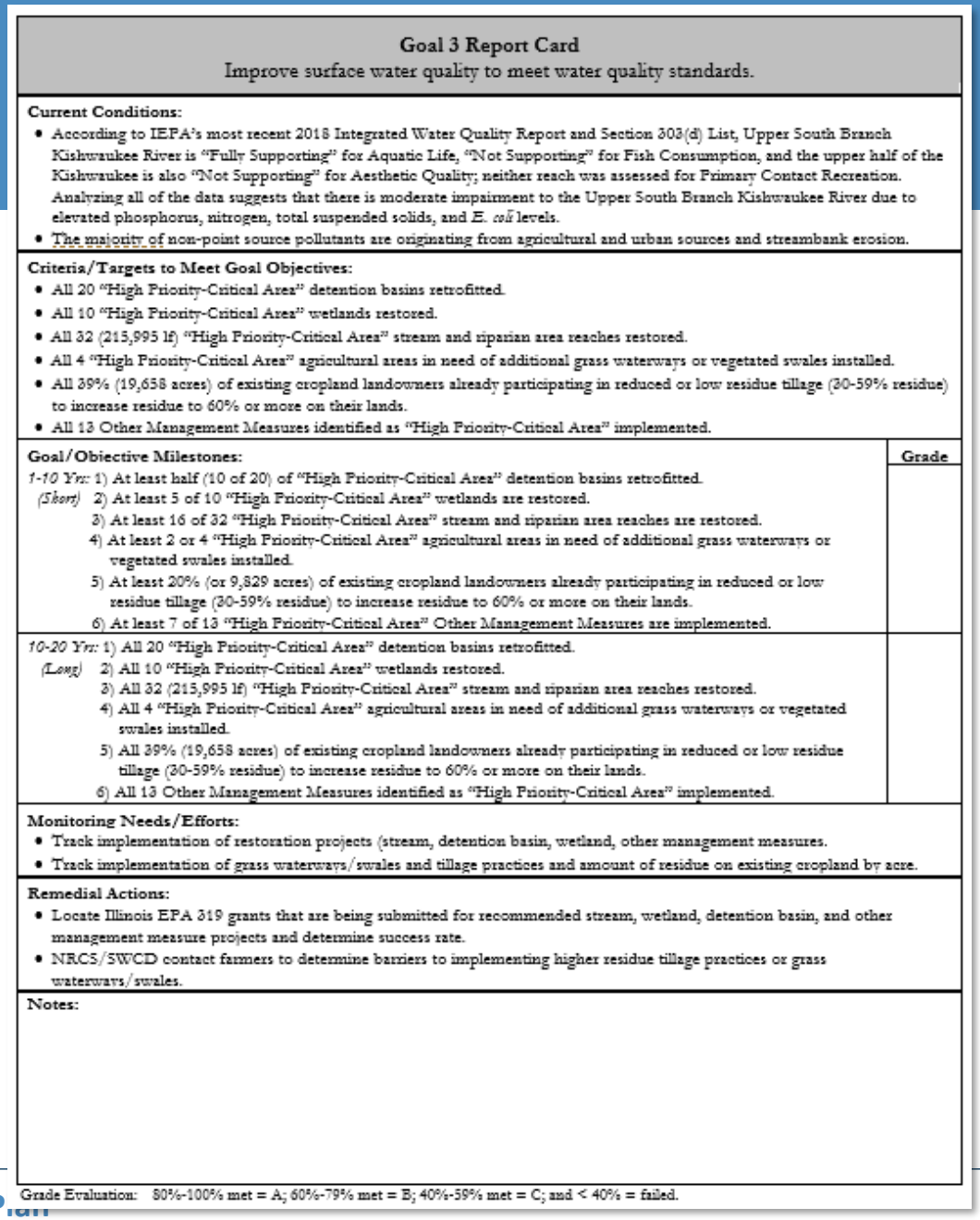
| Parameter | Statistical, Numerical, or General Use Guideline | Container | Volume | Preservative | Max. Hold Time |
|---|---|---|---|---|---|
| **Physical Parameters Measured in Field** | | | | | |
| pH | >6.5 or <9.0 | These parameters are measured in the field | | | |
| Conductivity | <1,667 µmhos/cm | | | | |
| Dissolved Oxygen | >5.0 mg/l | | | | |
| Temperature | <90 F | | | | |
| Turbidity | <14 NTU | | | | |
| **Chemical & Physical Parameters Analyzed in Lab** | | | | | |
| Total Suspended Solids | <19 mg/l | Plastic | 32 oz | Cool 4 °C | 7 days |
| Biochemical Oxygen Demand | <5.0 mg/l | Plastic | 32 oz | Cool 4 °C | 48 hours |
| Ammonia Nitrogen, Nitrate-Nitrite, & Total Kjeldahl Nitrogen | Total Nitrogen (mg/L) *calculated* <2.461 mg/l | Plastic | 32 oz | Cool 4 °C 20% Sulfuric Acid | 28 days |
| Total Phosphorus | <0.0725 mg/l (streams) | Plastic | 4 oz | Cool 4 °C | 28 days |
| Chloride | <500 mg/l | Plastic | 32 oz | Cool 4 °C | 28 days |
| *E. coli* | <235 MPN/100mL | Plastic | 4 oz | Cool 4 °C | <6 hours |

# Goal Milestones

## USEPA Element G: Description of interim measurable milestones

## Goal Report Cards

- **One for each goal**
- **Grade Evaluation:**
  - 80%-100% met = A;
  - 60%-79% met = B;
  - 40%-59% met = C;
  - and < 40% = failed.



**Goal 3 Report Card**
Improve surface water quality to meet water quality standards.

**Current Conditions:**
- According to IEPA's most recent 2018 Integrated Water Quality Report and Section 303(d) List, Upper South Branch Kishwaukee River is "Fully Supporting" for Aquatic Life, "Not Supporting" for Fish Consumption, and the upper half of the Kishwaukee is also "Not Supporting" for Aesthetic Quality; neither reach was assessed for Primary Contact Recreation. Analyzing all of the data suggests that there is moderate impairment to the Upper South Branch Kishwaukee River due to elevated phosphorus, nitrogen, total suspended solids, and *E. coli* levels.
- The majority of non-point source pollutants are originating from agricultural and urban sources and streambank erosion.

**Criteria/Targets to Meet Goal Objectives:**
- All 20 "High Priority-Critical Area" detention basins retrofitted.
- All 10 "High Priority-Critical Area" wetlands restored.
- All 32 (215,995 lf) "High Priority-Critical Area" stream and riparian area reaches restored.
- All 4 "High Priority-Critical Area" agricultural areas in need of additional grass waterways or vegetated swales installed.
- All 39% (19,658 acres) of existing cropland landowners already participating in reduced or low residue tillage (30-59% residue) to increase residue to 60% or more on their lands.
- All 13 Other Management Measures identified as "High Priority-Critical Area" implemented.

**Goal/Objective Milestones:** | **Grade**

*1-10 Yrs:* *(Short)*
1) At least half (10 of 20) of "High Priority-Critical Area" detention basins retrofitted.
2) At least 5 of 10 "High Priority-Critical Area" wetlands are restored.
3) At least 16 of 32 "High Priority-Critical Area" stream and riparian area reaches are restored.
4) At least 2 or 4 "High Priority-Critical Area" agricultural areas in need of additional grass waterways or vegetated swales installed.
5) At least 20% (or 9,829 acres) of existing cropland landowners already participating in reduced or low residue tillage (30-59% residue) to increase residue to 60% or more on their lands.
6) At least 7 of 13 "High Priority-Critical Area" Other Management Measures are implemented.

*10-20 Yrs:* *(Long)*
1) All 20 "High Priority-Critical Area" detention basins retrofitted.
2) All 10 "High Priority-Critical Area" wetlands restored.
3) All 32 (215,995 lf) "High Priority-Critical Area" stream and riparian area reaches restored.
4) All 4 "High Priority-Critical Area" agricultural areas in need of additional grass waterways or vegetated swales installed.
5) All 39% (19,658 acres) of existing cropland landowners already participating in reduced or low residue tillage (30-59% residue) to increase residue to 60% or more on their lands.
6) All 13 Other Management Measures identified as "High Priority-Critical Area" implemented.

**Monitoring Needs/Efforts:**
- Track implementation of restoration projects (stream, detention basin, wetland, other management measures.
- Track implementation of grass waterways/swales and tillage practices and amount of residue on existing cropland by acre.

**Remedial Actions:**
- Locate Illinois EPA 319 grants that are being submitted for recommended stream, wetland, detention basin, and other management measure projects and determine success rate.
- NRCS/SWCD contact farmers to determine barriers to implementing higher residue tillage practices or grass waterways/swales.

**Notes:**

Grade Evaluation: 80%-100% met = A; 60%-79% met = B; 40%-59% met = C; and < 40% = failed.

# Implementation & Schedule

- Identifies key watershed stakeholders and partners
- Implementation schedule outlined within various sections and individually for each project
- List of potential funding sources in Appendix G
- Includes IEPA, IDNR, USFWS, USACOE, USDA/NRCS, NFWF, River Network, Conservation Fund, National Park Service, and many others

# Information & Education Plan

**A successful I&E Plan first raises awareness among stakeholders of watershed challenges and opportunities. The goal is to equip municipal staff, elected officials, and others with tools to establish watershed-based restoration practices and policies and implement them.**

# Information & Education Plan

## How do we get the word out about our plan?

### For each Education Action we need to…

- Identify and analyze target audience
- Create messages for each audience
- Package message to those audiences
- Distribute the message
- Evaluate the I&E program

# Information & Education Plan

| Education Action of Campaign | Target Audience | Communication Vehicles | Priority/ Schedule | Lead (Supporting) Organization | Outcomes, Change in Action | Estimated Cost |
|---|---|---|---|---|---|---|
| Regenerative Agriculture Workshop | Farmers and Ag Industry | Social Media, Websites, local publications | Critical/ Fall/ Winter 2025/2026; Every other year | SWCD (NRCS) | Understanding of the Nutrient Loss Reduction Strategy, improved water quality and soil health. | $1,000 |
| Water Quality Educator Resources | DeKalb County Educators | Emails, Communication with School Districts | Critical/ Ongoing | U of I Extension, DeKalb County Farm Bureau Ag Literacy Coordinator, (SWCD) | Provide useful tools to educate the Educators and Students on understanding watersheds and how to improve water quality in DeKalb County | $1,500 |
| Water Quality Monitoring | Stakeholders | Social Media, Watershed Website | Critical/ Ongoing | DeKalb County Community Foundation, SWCD and NIU (Steering Committee) | Collect data that establishes baseline information and identifies issues and accomplishments | $15,000 |

# Information & Education Plan

| Education Action of Campaign | Target Audience | Communication Vehicles | Priority/ Schedule | Lead (Supporting) Organization | Outcomes, Change in Action | Estimated Cost |
|---|---|---|---|---|---|---|
| Educate Elected Officials about the completed plan to 1) encourage them to adopt the Central South Branch Kishwaukee Watershed Improvement Plan 2) encourage amendments of municipal comprehensive plans, codes and ordinances to include watershed plan goals/objectives | Elected Officials, Community Leaders | Meetings with boards, special presentations with community leaders | Critical/ Immediately following completion of the plan | SWCD, DeKalb County Community Foundation (Steering Committee) | All communities within the watershed adopt the plan and encourage implementation of identified watershed issues within their jurisdiction | N/A |
| Critical Planning Areas Bus Tour | Stakeholders and Elected Officials | Newspaper, Social Media | Medium/ 2026 | DeKalb County Community Foundation (SWCD) | Bring attention to areas identified as critical planning areas in the watershed plan to encourage buy-in to implement recommended BMPs | $2,500 |
| Citizens Mobilization Programs: (storm drain stenciling, River Clean Ups) | Residents, Volunteers, and Landowners | Newspaper, Social Media and websites | Medium/ Seasonally | Municipalities, Park Districts (SWCD) | Create awareness, activism and ownership of the watershed within the community | TBD |
| Urban Educational Seminars: Examples Rain Gardens, Rain Barrel, Lawn to River Webinar | Stakeholders | Newspaper, Social Media, Websites | Critical/ Ongoing | U of I Extension, SWCD, Park Districts, SWCD (Municipalities) | Encourage Homeowners to install BMPs to control runoff and implement water quality improvements | TBD |

# Information & Education Plan

| Education Action of Campaign | Target Audience | Communication Vehicles | Priority/ Schedule | Lead (Supporting) Organization | Outcomes, Change in Action | Estimated Cost |
|---|---|---|---|---|---|---|
| Inform Farmland owners and renters about the plan and recommended actions, Inform and support farmland owners and renters to evaluate and implement recommended actions within the watershed plan | Agricultural landowners and farmers | Meetings of farmland owners and operators | Critical/ Ongoing | SWCD, NRCS (Steering Committee) | Encourage implementation of identified watershed projects and discuss funding mechanisms to install BMPs | $500 |
| Provide the School Districts within the Central South Branch of the Kishwaukee River Watershed with information about the watershed as a means to support outdoor curriculum within the watershed's green infrastructure. | Schools, Students and Educators | Emails, letters and Social Media | Critical/ Annually | U of I Extension, DeKalb County Farm Bureau Ag Literacy Coordinator and SWCD (Steering Committee) | Students within the watershed will have the understanding of how our environmental community works together through curriculum created and delivered by Natural Resource Educators | $5,000 |
| Outreach Programs that inform the community of ways to improve water quality within the watershed. | Stakeholders | Articles, Social Media, face to face meetings | Critical/ Ongoing | U of I Extension, SWCD (Steering Committee) | Create Awareness | TBD |

# Watershed Planning Schedule

**Finalize Executive Summary**

**Complete full draft of WBP report**

**Draft Watershed-Based Plan due to IEPA January 10, 2025, with completed Joint WBP Evaluation Checklist**

# Questions?