

# CHAPTER TWO: WATERSHED ISSUES, OPPORTUNITIES, GOALS, AND OBJECTIVES

## LAKE MICHIGAN WATERSHED-BASED PLAN

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**COMMON ACRONYMS/ABBREVIATIONS USED IN CHAPTER 2**

BMP – Best Management Practices

FEMA – Federal Emergency Management Agency

IBSP – Adeline Jay Geo-Karis Illinois Beach State Park

Illinois EPA – Illinois Environmental Protection Agency

SMC – Lake County Stormwater Management Commission

WQ – Water Quality

## 2 WATERSHED ISSUES, OPPORTUNITIES, GOALS, AND OBJECTIVES

### 2.1 ISSUES AND OPPORTUNITIES

One of the first tasks the Lake Michigan watershed committee (watershed planning committee) undertook was to identify issues that the Lake Michigan Watershed-Based Plan should address and opportunities or strategies to address those issues. Participants (watershed stakeholders) at the April 24, 2019 kick-off planning meetings identified issues and opportunities they felt were important to the watershed planning process.

**WATERSHED PLANNING COMMITTEE:** A committee comprised of SMC staff and watershed stakeholders with a goal of creating an umbrella watershed-based plan for the Lake Michigan Watershed planning area and reducing nonpoint source pollution.

Stakeholders identified more than 50 issues and opportunities during both kickoff meetings. Additionally, because this plan updates and incorporates the Dead River, Kellogg Creek and Waukegan River watershed-based plans, issues and opportunities identified for those plans were also considered. The Waukegan River plan did not specifically identify issues and opportunities while the Dead River and Kellogg Creek planning processes were combined and share the same set of issues and opportunities. More than 50 issues and opportunities were identified by stakeholders for the Dead River and Kellogg Creek watershed plans.

Table 2-1 summarizes the issues and opportunities identified by stakeholders for the Lake Michigan Watershed-Based Plan as well as for the Dead River and Kellogg Creek Watershed-Based Plans. Issues and Opportunities are summarized by Category and columns in the table indicate how each issue is addressed in the Goals and Objectives or elsewhere in the plan.

Issues and opportunities were most commonly related to ravines and streams, stormwater and flood risk/flood damage, water quality, and partnerships/coordination. The other categories include education and outreach, best management practices (BMPs), lake shoreline and bluffs, habitat and wildlife, climate, access, funding, wetlands, and infrastructure. Several of these issue categories translate directly to watershed planning goals identified in Section 2.2: Ravines and Streams, Stormwater and Flood Risk/Damage, Water Quality, Partnerships and Coordination, Education and Outreach and Habitat and Wildlife. The remaining categories and individual issues and opportunities are addressed by plan objectives or action recommendations elsewhere in the plan.

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**Table 2-1: Issues and Opportunities Identified by Stakeholders and in Previous Watershed-Based Plans**

*Italicized* typeface indicates the issue was identified in the Dead River and Kellogg Creek Watershed-Based Plans; the asterisk (\*) indicates the issue/opportunity applies to multiple categories or does not neatly fit in a single category. The “X” symbol indicates the issue/opportunity is directly addressed by the Goal Category; the carat (^) indicates goals that secondarily address the issue.

WATERSHED ISSUES AND OPPORTUNITIES	GOAL CATEGORIES					
	STREAM, RAVINE AND COASTAL RESTORATION AND MANAGEMENT	FLOOD RISK, FLOOD DAMAGE & STORM-WATER MANAGEMENT	NATURAL RESOURCES AND HABITAT	WATER QUALITY	WATERSHED EDUCATION & COMMUNICATION	WATERSHED COORDINATION & PARTNERSHIPS
<b>ISSUE/OPPORTUNITY CATEGORY: RAVINES AND STREAMS</b>	X					
Ravine erosion	X					
Stormwater management as it relates to ravines	X	^				
Need to address entire ravine, not just mouth at lake	X					
<i>Encourage good stream bank protection measures and remove poor practices and debris including the removal of concrete rip rap/armoring</i>	X		^			
<i>Streambank erosion control and restoration in ravine areas</i>	X		^			
<i>Streambank vegetation / buffer restoration</i>	^		X			
<i>Streambank modification</i>	X		^			
<i>Fish habitat restoration/sedimentation in IBSP*</i>	X		X			
<i>Encourage or restore fish passage from lake up into streams</i>	^		X			
<i>Protect streamside trees</i>	^		X			
<i>Stream obstruction /debris/enclosures/beaver dams</i>	^	X				
<i>Garbage/yard waste in streams</i>	X					

WATERSHED ISSUES AND OPPORTUNITIES	GOAL CATEGORIES					
	STREAM, RAVINE AND COASTAL RESTORATION AND MANAGEMENT	FLOOD RISK, FLOOD DAMAGE & STORM-WATER MANAGEMENT	NATURAL RESOURCES AND HABITAT	WATER QUALITY	WATERSHED EDUCATION & COMMUNICATION	WATERSHED COORDINATION & PARTNERSHIPS
<i>Hydrologic modification</i>	X	X	X	X		
<i>Restore hydrology for Glen Flora Tributary historic floodplain/wetland outfall location per Waukegan City Master Plan/Disconnection of channels from Lake Michigan (drain at state line)</i>	X		X			
<i>Identify historic water flow patterns (ground and surface)/Hydrology patterns in State Park</i>						
<i>Remove concrete and other debris from abandoned properties</i>						
<i>Low biological stream quality</i>				X		
<b>ISSUE/OPPORTUNITY CATEGORY: STORMWATER AND FLOOD RISK/FLOOD DAMAGE</b>		X				
Storm/Sanitary illicit connections		^		^		
Runoff Mitigation (Volume)		X				
Changes in Runoff volume (new models needed)		^				
Reducing impervious surfaces		X				
Impervious surface assessment, ordinances, and reduction		X				
Stormwater runoff reductions		X				
Audit/assess/evaluate/update existing ordinances & assess need for municipalities without ordinances		^				

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WATERSHED ISSUES AND OPPORTUNITIES	GOAL CATEGORIES					
	STREAM, RAVINE AND COASTAL RESTORATION AND MANAGEMENT	FLOOD RISK, FLOOD DAMAGE & STORM-WATER MANAGEMENT	NATURAL RESOURCES AND HABITAT	WATER QUALITY	WATERSHED EDUCATION & COMMUNICATION	WATERSHED COORDINATION & PARTNERSHIPS
Accountability for stormwater similar to stormwater pollution prevention plans during construction (refers to municipal and landowner)		^				
Increase of runoff from single family residences		X				
<i>Streambank erosion from, and at, stormsewers, point discharges, and/or hydraulic structures</i>	X	^				
<i>Stormwater infiltration into sanitary sewers in streams and other areas</i>		^		^		
<i>Land use change/Impact of future development</i>		^				
<i>Update floodplain maps and adopt corrections (to remove properties or buildings from the flood insurance purchase requirement)</i>		^				
<i>Reduce/prevent flooding</i>		X				
<i>Floodplain protection</i>		X				
<i>Need detailed hydrologic study</i>		^				
<i>Investigate impact of changing land use on groundwater and surface water levels</i>		X				
<b>ISSUE/OPPORTUNITY CATEGORY: WATER QUALITY</b>				X		

WATERSHED ISSUES AND OPPORTUNITIES	GOAL CATEGORIES					
	STREAM, RAVINE AND COASTAL RESTORATION AND MANAGEMENT	FLOOD RISK, FLOOD DAMAGE & STORM-WATER MANAGEMENT	NATURAL RESOURCES AND HABITAT	WATER QUALITY	WATERSHED EDUCATION & COMMUNICATION	WATERSHED COORDINATION & PARTNERSHIPS
More comprehensive assessment of watershed (missing Dead River WQ assessment in Illinois EPA Integrated Report)				^		
Increase the number/frequency/location of water quality assessments				^		
WQ impacts of detention (needs a study)				^		
Macroinvertebrate aquatic assessments (include wetlands, natural areas, IBI survey)				^		
Relict Pollution				X		
De-icing				X		
Sedimentation	X		X	X		
Pesticide use in watershed & homeowner education regarding pesticide use				^	^	
<i>Algae in creeks</i>				X		
<i>Pollutants in stormwater runoff (includes road salt/chlorides, and fertilizers, pesticides, and herbicides from agricultural/lawn/playing field/golf course applications, sediment and nutrient loads, storm sewer systems)</i>				X		
<i>Contamination/ industrial point sources of pollution</i>				X		
<i>Impact from airport such as fuel spills</i>				^		

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WATERSHED ISSUES AND OPPORTUNITIES	GOAL CATEGORIES					
	STREAM, RAVINE AND COASTAL RESTORATION AND MANAGEMENT	FLOOD RISK, FLOOD DAMAGE & STORM-WATER MANAGEMENT	NATURAL RESOURCES AND HABITAT	WATER QUALITY	WATERSHED EDUCATION & COMMUNICATION	WATERSHED COORDINATION & PARTNERSHIPS
<i>Burning leaves in ditches</i>				^		
<i>Beach closures</i>				X		
<i>Dewatering during construction</i>						
<i>Need water quality monitoring for metals and other pollutants</i>				X		
<b>ISSUE/OPPORTUNITY CATEGORY: PARTNERSHIPS AND COORDINATION</b>						X
<i>Building Stronger Partnerships</i>						X
<i>Interjurisdictional Support</i>						X
<i>Some level of municipal coordination across watershed</i>						X
<i>Environmental Justice – show that issues can apply throughout watershed based plan*</i>	^	^	^	^	^	^
<i>Create a group to maintain stream where homeowners are unable</i>						X
<i>Establish regular (annual/semi-annual) stream cleanup</i>					^	X
<i>If there is a dedicated drainage easement, whoever holds the easement needs to maintain the property</i>						
<i>Coordinate transportation projects with SMC</i>		^				



WATERSHED ISSUES AND OPPORTUNITIES	GOAL CATEGORIES					
	STREAM, RAVINE AND COASTAL RESTORATION AND MANAGEMENT	FLOOD RISK, FLOOD DAMAGE & STORM-WATER MANAGEMENT	NATURAL RESOURCES AND HABITAT	WATER QUALITY	WATERSHED EDUCATION & COMMUNICATION	WATERSHED COORDINATION & PARTNERSHIPS
<i>Better coordination among governments within the watershed (incl. WI) especially related to stormwater management goals &amp; responsibilities (effort &amp; financing)</i>						X
<i>Drainage District role and participation</i>						
<i>Identify responsibilities of each jurisdiction and homeowners (need to clarify lead for activities –should there be a local organization?)</i>						
<i>Need up-to-date data</i>	^	^	^	X	^	^
<i>Public involvement in watershed management</i>					^	X
<b>ISSUE/OPPORTUNITY CATEGORY: LAKE SHORELINE AND BLUFFS</b>	X					
Lake Levels	X	^	^			
Beach/Sand Management	X	^	^			^
Lake Michigan stabilization/restoration	X	^	^	^		
Shoreline infrastructure and protection	X	^		^		
Lake shore stabilization/sand management/erosion (bluffs and beaches)	X	^	^			^
Bluff Erosion	X	^	^			
<i>Bluff erosion / property damage in ravines</i>	X	^	^			
<i>Bluff / soil erosion and sediment control</i>	X	^	^			

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	STREAM, RAVINE AND COASTAL RESTORATION AND MANAGEMENT	FLOOD RISK, FLOOD DAMAGE & STORM-WATER MANAGEMENT	NATURAL RESOURCES AND HABITAT	WATER QUALITY	WATERSHED EDUCATION & COMMUNICATION	WATERSHED COORDINATION & PARTNERSHIPS
<i>Beach/Lake Michigan shoreline erosion</i>	X	^	^			
<b>ISSUE/OPPORTUNITY CATEGORY: HABITAT AND WILDLIFE</b>			X			
Invasive species management			X			
Deer management			^			
Protect Natural Headwaters of ravines	X		X			
<i>Information on control and identification of invasive and exotic species</i>			X			
<i>Instream and riparian/buffer habitat identification and management</i>			X			
<i>Threatened and endangered species and habitat</i>			X			
<i>Acquire and protect open space in watershed</i>			^			
<b>ISSUE/OPPORTUNITY CATEGORY: EDUCATION AND OUTREACH</b>					X	
Education					X	
Public education/outreach					X	
Education of homeowners/municipal officials/contractors & landscape professionals (particularly related to shoreline/bluff erosion)					X	
Ravine education-all stakeholders					X	

WATERSHED ISSUES AND OPPORTUNITIES	GOAL CATEGORIES					
	STREAM, RAVINE AND COASTAL RESTORATION AND MANAGEMENT	FLOOD RISK, FLOOD DAMAGE & STORM-WATER MANAGEMENT	NATURAL RESOURCES AND HABITAT	WATER QUALITY	WATERSHED EDUCATION & COMMUNICATION	WATERSHED COORDINATION & PARTNERSHIPS
<i>Periodic homeowner newsletter of BMPs</i>					^	
<b>ISSUE/OPPORTUNITY CATEGORY: FUNDING</b>						
Funding for Joint Efforts						^
Identify funding sources (make available to municipalities/townships)						
Funding for MEANINGFUL improvements (making sure the right project or good projects are the ones funded)						
Need to get funding to homeowners to collectively address problems (e.g. ravines)						
Incorporating climate change—grants to implement these projects*						
<i>Funding for projects (public and private)</i>						
<b>ISSUE/OPPORTUNITY CATEGORY: INFRASTRUCTURE</b>	^	^		^		
Infrastructure inventory (aging)		X				
Maintenance of infrastructure		X				
<i>Exposed utilities within stream corridor</i>	^	^	^	^		
<i>Maintenance of existing infrastructure including concrete “banks”/roadways affected by erosion</i>	X	X				
<i>Stormsewer infrastructure aging</i>		X				

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WATERSHED ISSUES AND OPPORTUNITIES	GOAL CATEGORIES					
	STREAM, RAVINE AND COASTAL RESTORATION AND MANAGEMENT	FLOOD RISK, FLOOD DAMAGE & STORM-WATER MANAGEMENT	NATURAL RESOURCES AND HABITAT	WATER QUALITY	WATERSHED EDUCATION & COMMUNICATION	WATERSHED COORDINATION & PARTNERSHIPS
<b>ISSUE/OPPORTUNITY CATEGORY: BEST MANAGEMENT PRACTICES</b>						
BMPs for landowners						
Monitoring/Maintenance of installed/older BMPs						
Nature-based solutions						
Incentivize landowners to participate					X	
<b>ISSUE/OPPORTUNITY CATEGORY: ACCESS</b>						
Public access to ravines/beaches/shoreline					^	
Access for restoration work						
Public access/awareness					X	
<b>ISSUE/OPPORTUNITY CATEGORY: WETLANDS</b>						
Wetlands (restoration/preservation)			X			
<i>Protect and restore wetlands and seeps</i>			X			
<i>Lack of wetland maintenance</i>			X			
<b>ISSUE/OPPORTUNITY CATEGORY: CLIMATE</b>						
Management for resilience		^				

## 2.2 WATERSHED GOALS AND OBJECTIVES

The watershed planning committee generated six (6) watershed goals to address watershed stakeholder issues/concerns. Establishing these watershed goals allowed the watershed planning committee to develop objectives and outcomes for each goal. The goals are central to the development of the watershed action plan (**Chapter 6**). The goals and objectives reflect watershed conditions, address watershed stakeholder priority issues, consider expected changes, and meet current and possible future funders' expectations.

Measurable indicators were assigned to each goal to help measure future progress toward meeting each goal as the watershed action plan is implemented. The action plan contains recommended:

- Programmatic actions that address streams, ravines and coastal systems; stormwater management and flooding; natural resources; water quality; education and information; and watershed coordination and partnerships; and
- Site-specific actions that recommend BMPs for specific problem locations identified during inventories and assessments.

**Chapter 7 Plan Implementation and Evaluation** and **Appendix M Milestone Evaluation Scorecards** examine the watershed plan goals by looking at their performance and progress. These sections evaluate milestones related to measurable indicators for the watershed goals and objectives.

### 2.2.1 GOALS AND OBJECTIVES FROM PREVIOUS WATERSHED PLANS

Goals from the Waukegan River, Dead River and Kellogg Creek Watershed-Based Plans were reviewed prior to the development of Goals and Objectives for the Lake Michigan Watershed-Based Plans.

Chapter 1 of the Waukegan River plan identified 17 specific goals:

- Develop education and volunteer programs and increase watershed and river awareness.
- Reduce the flashiness (the tendency for the river to rapidly surge during and after rain events) of the river in order to improve river safety and habitat.
- Acquire, protect and restore open space.
- Implement stream bank erosion prevention and repair measures to prevent dangerous drop-offs and property and habitat damage.
- Promote green infrastructure.
- Provide guidance on obtaining financial assistance for measures.
- Develop and implement a Waukegan River water quality monitoring program.
- Address contaminated sediments and other water quality impairments.
- Institutionalize river clean-up and monitoring programs.
- Provide safe river access and a green trail system.
- Improve habitat for native species.
- Take necessary methods to stop illegal dumping and littering in the riparian corridor.

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- Remove invasive species and restore riparian corridor.
- Develop and enforce necessary laws and ordinances to address current illegal dumping and discharges.
- Implement annual illicit discharge detection program.
- Daylight enclosed reaches.
- Remove blockages in the river to reduce flooding and improve habitat for fish and other wildlife.

These goals are specific and were summarized into 5 more general goals in Chapters 7 and 8 of the Waukegan River Watershed Plan:

1. Improve Water Quality
2. Improve Natural Resources
3. Reduce Flood Damages
4. Educate Watershed Users and Residents
5. Maintain and Monitor Watershed Improvements

The first four of the Waukegan River Watershed Plan goals are similar to Issue/Opportunity Categories identified in Section 2.1 and goals from the Dead River and Kellogg Creek watershed plans. The goal “Maintain and Monitor Watershed Improvements” is consistent with action recommendations identified in Chapter 6 and the Implementation Plan outlined in Chapter 7 of this plan. The Dead River and Kellogg Creek watershed plans were developed during a combined planning process and a single set of issues, opportunities, goals and objectives was developed for both plans. Table 2-2 contains seven goals that were developed for the Dead River and Kellogg Creek watershed plans to address seven issue categories.

**Table 2-2: Issues and Goals in the Dead River and Kellogg Creek Watershed Plans**

ISSUE	GOAL
1: STREAM RESTORATION AND MANAGEMENT	A) Restore and manage the stream system to preserve and enhance stream and riparian health, function, and conveyance as part of a watershed green infrastructure system.
2: FLOOD RISK AND FLOOD DAMAGE	B: Reduce flood damage and prevent increased flooding to protect public health & safety, and public and private property and infrastructure investments.
3: NATURAL RESOURCES AND HABITAT	C: Preserve, restore, and enhance a green infrastructure network of terrestrial and aquatic natural resources including streams, riparian corridors, wetlands, and upland resources.
4: WATERSHED EDUCATION AND COMMUNICATION	D: Watershed residents, students, and communities have adequate knowledge, skills, resources, motivation, and stewardship opportunities to take action on implementing the watershed plan.
5: WATER QUALITY	E: Improve water quality in streams, lakes, and wetlands by reducing pollutants in stormwater runoff and addressing modified hydrology.
6: WATERSHED COORDINATION	F: Improve coordination and decision-making between public, private, and non-profit stakeholders to implement the watershed plan.
7: WATERSHED HYDROLOGY	G: Restore and enhance watershed hydrology and stabilize the stream systems by reducing surface runoff.

Because four of the Dead River and Kellogg Creek planning goals are similar to Waukegan River watershed planning goals and are also similar to several of the issue and opportunity categories identified in Section 2.1, the Dead River and Kellogg Creek goals were chosen as the initial template for development of goals for the Lake Michigan Watershed-Based Plan. The goals were numbered (rather than lettered) and Goal G was deleted, as the issue was addressed by at least three other goals. The stakeholder group and project team refined the goals to reflect current Lake Michigan watershed issues and priorities.

#### NOTEWORTHY: WHAT ARE GOALS VERSUS OBJECTIVES?

##### GOALS:

- Targets for the watershed plan.
- The desired change or outcome to achieve.
- Driven by stakeholder issues and problems identified by the watershed assessment.
- Ideally are clear, concise, and measurable.

##### OBJECTIVES:

- Specific, more precise steps needed to attain goals.
- Position reached or purpose achieved by an activity by a specific time.
- Objective outcomes should be measurable, attainable, relevant, and time-based.
- There may be multiple objectives to achieve a goal(s).

### 2.2.2 WATERSHED GOAL #1: STREAM, RAVINE AND COASTAL RESTORATION AND MANAGEMENT

**GOAL:** Restore and manage stream, ravine, shoreline and bluff systems to preserve and enhance stability, hydrology, beneficial functions and conveyance as part of a resilient and natural watershed system.

**OUTCOME:** *Streams, ravines, shoreline and bluff systems are restored and managed to reduce erosion and provide enhanced functions as part of the watershed green infrastructure and drainage system.*

#### OBJECTIVES:

- a) Stabilize eroding stream, ravine, bluff, and shoreline segments and address localized erosion related to infrastructure.

**Indicator:** Feet of stabilization projects implemented.

- b) Reduce sedimentation and channelization, naturalize stream channels and ravines, and re-establish or improve stream connectivity to Lake Michigan where possible to enhance the beneficial functions of the drainage system.

**Indicator:** Feet of stream and ravine restoration/naturalization projects implemented.

- c) Develop and implement a stream management and maintenance plan/program with a dedicated funding source.

**Indicator:** Feet of stream addressed by management/maintenance program.

- d) Restore and manage riparian areas, ravines, bluffs, and beaches (including vegetation and buffers) to enhance beneficial functions and protect property and infrastructure.

**Indicator:** Acreage of ravine, bluff and beach restoration and management.

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- e) Implement projects to restore or mimic natural hydrology and improve climate resilience, including resilience to fluctuations in Lake Michigan water levels.

**Indicator:** Miles of Lake Michigan shoreline protected from variable water levels

**Indicator:** Number and cost of projects implemented to restore natural hydrology and improve climate resilience as a targeted outcome.

### 2.2.3 WATERSHED GOAL #2: FLOOD RISK, FLOOD DAMAGE AND STORMWATER MANAGEMENT

**GOAL:** Mitigate the effects of increased runoff volumes, reduce ravine erosion and flood damage, and prevent flooding from worsening.

**OUTCOME:** *To the extent achievable, flood damages and stormwater runoff volumes are managed and/or their effects are abated or mitigated.*

#### OBJECTIVES:

- a) Reduce existing flood damage and number of flood problem areas through the implementation of flood mitigation projects, including areas affected by urban flooding.

**Indicator:** Number of flood problem areas positively affected by flood mitigation projects implemented.

**Indicator:** Number/value of claims filed each year per community in the watershed.

- b) Reduce or mitigate runoff volumes through installation of green infrastructure, including trees and bioretention, and other best management practices to lessen flooding and ravine erosion.

**Indicator:** Runoff volume reduction and mitigation measures implemented.

- c) Expand, maintain and manage constructed and natural drainage systems to mitigate flood damage and improve resilience for changing precipitation patterns.

**Indicator:** Number of local drainage system improvement projects implemented.

- d) Support updating of outdated floodplain maps and stormwater ordinances to reflect current flood risk and precipitation data.

**Indicator:** Number of updated Federal Emergency Management Agency (FEMA) floodplain maps and local stormwater ordinances (less than 10 years old) and area impacted by them.

- e) Purchase and remove structures that are repetitively flooded or in danger of catastrophic damage from flooding or ravine/bluff erosion through the voluntary buyout program.

**Indicator:** Number of Voluntary Floodplain/Hazard Mitigation Buyouts.

### 2.2.4 WATERSHED GOAL #3: NATURAL RESOURCES AND HABITAT

**GOAL:** Preserve, restore and enhance a green infrastructure network and system of terrestrial and aquatic natural resources and ecosystems including riparian corridors, wetlands, beaches, bluffs and upland resources to provide for natural hydrology, native plant and wildlife communities and buffers for aquatic and high-quality natural resources.



**OUTCOME:** *Natural resources are identified, managed, restored and protected, including a series of hubs and connections, to enhance beneficial functions, native plants and wildlife, and high quality and/or locally endemic or distinctive natural areas of the watershed.*

**OBJECTIVES:**

- a) Protect and enhance ecological quality of aquatic and terrestrial resources by improving water quality and managing invasive species, while preserving and protecting threatened and endangered species and ecosystems.

**Indicator:** Number of waters from which Illinois EPA removes the aquatic life use impairment.

**Indicator:** Acres of invasive species removal/management projects.

- b) Preserve, restore, and create wetlands and wetland buffers wherever possible.

**Indicator:** Acres of wetlands enhanced and/or restored.

- c) Identify and connect environmental corridors across community, county and state lines.

**Indicator:** Number of regional green infrastructure projects.

- d) Preserve, manage, and restore rare or unique habitat and natural communities in the Chiwaukee Prairie Illinois Beach Lake Plain and Ramsar Wetland of International Importance.

**Indicator:** Acres of coastal lake plain preserved, managed and/or restored.

- e) Preserve, manage, and restore rare or unique habitat and natural communities in other protected natural areas within the watershed.

**Indicator:** Acres of protected natural areas (outside the coastal plain) preserved, managed and/or restored.

- f) Protect existing healthy trees, and plant and maintain a diversity of native trees in appropriate locations within natural and developed areas.

**Indicator:** Area of tree canopy.

#### **2.2.5 WATERSHED GOAL #4: WATERSHED EDUCATION AND COMMUNICATION**

**GOAL:** Watershed stakeholders (residents, property owners, students, non-profit organizations and public agencies) have adequate knowledge, skills, resources, motivation and stewardship opportunities to implement the watershed plan and associated programs.

**OUTCOME:** *Stakeholders have adequate information, knowledge and opportunity to implement the watershed plan.*

**OBJECTIVES:**

- a) Conduct a watershed outreach campaign to inform and engage the public about watershed issues and solutions, landowner responsibilities and opportunities, available resources and the benefits of implementing the watershed plan recommendations.

**Indicator:** Number of people reached by watershed outreach campaign.

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- b) Educate local government officials and agencies, consultants and contractors working in the watershed, landscapers and nurseries, property managers and landowners on road salt alternatives and application BMPs to minimize the use or impact of road salt by public and private snow removal providers.

**Indicator:** Number of public agencies and local private contractors attending the annual Lake County De-icing Workshop.

**Indicator:** Number of public agencies with winter maintenance responsibilities that use alternative de-icing products.

- c) Educate local government officials and agencies, consultants and contractors working in the watershed, landscapers and nurseries, and landowners on best practices related to Lake Michigan shoreline and bluff maintenance/management and ravine management.

**Indicator:** Number of people that receive information about shoreline, bluff, and ravine management.

- d) Educate property owners and caretakers through outreach programs such as Conservation@Home or Rain Ready on ways to improve the quality and quantity of water leaving their property, protect their property from flooding, protect rare or high-quality natural resources that might exist on their property, and contribute to resilient ecosystems.

**Indicator:** Number of property owners implementing recommendations made through such programs and/or number certified by the program(s).

- e) Utilize trainings, workshops, public meetings, personal site visits, newsletters, websites, media, campaigns, and stakeholder word of mouth to provide watershed stakeholders opportunities to participate in watershed programs and projects.

**Indicator:** Number of landowners that receive information about watershed programs and projects.

**Indicator:** Number of workshops.

- f) Facilitate and engage the public, schools and youth groups (students), and homeowner associations to volunteer for stream, beach and natural area stewardship and maintenance.

**Indicator:** Number of volunteers for stream, beach and natural area stewardship and maintenance.

### 2.2.6 WATERSHED GOAL #5: WATER QUALITY

**GOAL:** Improve water quality and address modified hydrology.

**OUTCOME:** *Water quality improves and water bodies support their designated uses (are not impaired).*

#### **OBJECTIVES:**

- a) Watershed streams, beaches and lakes meet applicable water quality standards, including those within the Waukegan Harbor Area of Concern.

**Indicator:** Number of water bodies meeting applicable standards.

- b) Reduce the potential for legacy contaminants/pollutants to migrate beyond their current extent.

**Indicator:** Site remediation projects completed.

- c) Develop and implement a watershed monitoring program to collect and assess and report physical, chemical, and biological water quality data on streams and applicable areas of Lake Michigan on a regular basis.

**Indicator:** Implementation and support of watershed monitoring program.

**Indicator:** Regular reports on water quality monitoring to community and stakeholders

- d) Reduce nonpoint source pollution loading and erosion from existing development, re-development and construction sites by controlling inputs, installing green infrastructure and implementing BMPs.

**Indicator:** Monitoring data trends for common nonpoint source pollutants.

- e) Reduce the quantity of road salt needed for safe and cost-effective winter maintenance to reverse the current trend of rising chloride levels in water bodies.

**Indicator:** Winter Maintenance Program establishment including: policy and manual development, de-icing workshop attendance and certification.

- f) Reduce fecal contamination impacting Lake Michigan beaches by controlling contributing sources and performing appropriate beach management activities.

**Indicator:** Number of beach closures.

- g) Mitigate modified hydrology by implementing BMPs and restoring the natural drainage system, including (where appropriate) removal, restoration or retrofitting of impoundments and piped or channelized segments in streams and reductions in impervious surfaces.

**Indicator:** Number of projects implemented to mitigate modified hydrology.

## 2.2.7 WATERSHED GOAL #6: WATERSHED COORDINATION AND PARTNERSHIPS

**GOAL:** Improve coordination, engagement and decision-making between public, private and non-profit stakeholders to implement the watershed plan.

**OUTCOME:** *Stakeholders coordinate and utilize available resources to implement watershed improvement projects.*

### **OBJECTIVES:**

- a) Watershed communities and stakeholder organizations adopt the Lake Michigan Watershed-Based Plan.

**Indicator:** Number of municipalities, counties, agencies and organizations that adopt the Lake Michigan Watershed-Based Plan.

- b) Establish a watershed committee to guide watershed plan implementation, provide technical assistance and information to watershed stakeholders, help secure funding, update the plan or plan priorities and coordinate multi-partner projects.

**Indicator:** Establishment of watershed planning committee with budget and executive committee.

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**Indicator:** Number of projects advanced/undertaken with the support of the watershed planning committee.

- c) Communities and organizations will designate a representative and participate in the watershed committee.

**Indicator:** Number of communities and organizations that have designated a representative to participate on the watershed planning committee.

- d) Provide stakeholders (including property owners) with information on funding sources and mechanisms for implementing projects and pursue cost-sharing arrangements between stakeholders for watershed projects that have broad, meaningful benefits and impacts.

**Indicator:** Number of projects with alternative or multiple sources of sufficient funding.

- e) Watershed committee annually assesses progress on plan implementation and provides updates to the watershed-based plan every 10 years.

**Indicator:** Number of watershed stakeholders providing feedback for the watershed report cards.

**Indicator:** Number of action recommendations completed.