

goals and objectives

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2.1 WATERSHED ISSUES AND OPPORTUNITIES

The following list of watershed issues and concerns was identified and prioritized by the Dead River Watershed Planning Committee during the initial meetings, shown below with priority vote counts. Issues identified during the watershed assessment are shown in *italics*.

- A. Stream Restoration (61)
 - 1. Encourage good stream bank protection measures and remove poor practices and debris including the removal of concrete rip rap/armoring
 - 2. Streambank erosion control and restoration in ravine areas
 - 3. Bluff erosion / *property damage* in ravines
 - 4. Streambank vegetation / *buffer* restoration
 - 5. *Streambank modification*
 - 6. *Fish habitat restoration / sedimentation in IBSP*
 - 7. Make grant funds available for homeowner to make bank repairs
- B. Stream Maintenance (44)
 - 8. Create a group to maintain stream where homeowners are unable
 - 9. Establish regular (annual/semi-annual) stream cleanup
 - 10. Stream obstructions / *debris* / enclosures
 - 11. Garbage/ yard waste in streams
 - 12. Location and cleaning of existing infrastructure including concrete “banks”
 - 13. If there is a dedicated drainage easement, whoever holds the easement needs to maintain the property
- C. Water Quality (36)
 - 14. Stormwater infiltration into sanitary sewers in streams and other areas
 - 15. *Bluff / soil* erosion and sediment control
 - 16. *Streambank erosion from, and at, stormsewers, point discharges, and/or hydraulic structures* (9)
 - 17. Algae in creeks
 - 18. 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)
- 19. *Contamination/ industrial point sources of pollution*
- 20. Need water quality monitoring for metals and other pollutants
- 21. Impact from airport such as fuel spills
- 22. Burning leaves in ditches
- 23. *Land use change*
- 24. *Beach closures*
- D. Flood Risk/Damage (33)
 - 25. Update floodplain maps and adopt corrections (to remove properties or buildings from the flood insurance purchase requirement)
 - 26. Reduce flooding
 - 27. *Floodplain protection*
- E. Watershed Coordination (30)
 - 28. Coordinate transportation projects with SMC
 - 29. Better coordination among governments within the watershed especially related to stormwater management goals & responsibilities (effort & financing)
 - 30. Drainage District role and participation
 - 31. Identify responsibilities of each jurisdiction and homeowners (need to clarify lead for activities – should there be a local organization?)
 - 32. Need up-to-date data



Bull Creek

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- F. Watershed Hydrology (21)
 - 33. *Hydrologic modification*
 - 34. Investigate impact of changing land use on groundwater and surface water levels
 - 35. Restore hydrology for Glen Flora Tributary historic floodplain/wetland outfall location per Waukegan City Master Plan
 - 36. Identify historic water flow patterns (ground and surface)
 - 37. Remove concrete and other debris from abandoned properties
- G. Education/Communication (15)
 - 38. Periodic homeowner newsletter of BMPs
- H. Natural Resources (14)
 - 39. Information on control and identification of invasive and exotic species
 - 40. *Instream and riparian / buffer habitat identification and management*
 - 41. Encourage or restore fish passage from lake up into streams
 - 42. *Protect and restore wetlands and seeps*
 - 43. *Threatened and endangered species and habitat*
 - 44. *Beach erosion*
 - 45. *Low biological stream quality*

In order to streamline the watershed planning process for the Kellogg Creek and Dead River watersheds, the above list was combined with Kellogg Creek issues and opportunities to create the combined list below, prioritized based on the sum of the votes cast in similar issue categories. This combined list was used to develop the goals and objectives for both watersheds.

- 1. Stream Restoration and Management (158)
- 2. Flood Risk & Flood Damage (49)
- 3. Natural Resources (48)
- 4. Watershed Education & Communication (47)
- 5. Water Quality (36)
- 6. Watershed Coordination (30)
- 7. Watershed Hydrology (21)



Failing stormwater infrastructure

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2.2 GOALS AND OBJECTIVES

Based on the issues and concerns identified by stakeholders, and on the resources and condition of the watershed, the following goals, objectives, and indicators were established.

ISSUE 1: STREAM RESTORATION AND MANAGEMENT

Goal 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.

Objectives – Restoration

- 1. Remediate detrimental stream channel conditions such as armoring, channelization, siltation, and lack of habitat characteristics with in-stream and channel-specific restoration enhancements such as re-meandering, regrading, bioengineering approaches to stabilization, and habitat structures (pools and riffles, boulders, root wads, etc.)

Indicators: number of sites with detrimental channel conditions addressed by restoration project.

2. Remove or retrofit problem impoundments, dams, and weirs to support fish passage and migration and natural baseflow.

Indicators: number of fish found in upstream reaches; seasonally consistent baseflow.

3. Stabilize all moderately and severely eroded streambanks using BMPs.

Indicators: linear feet of streambanks with moderate or severe erosion stabilized.

4. Beginning with downstream reaches, develop a stream restoration plan and cost estimate for each reach that suffers moderate to severe stream bank erosion.

Indicators: number of restoration plans developed.

5. Reduce the erosive capacity of storm sewer outfalls, drain tiles, and sump pump, roof, and footing drains being discharged into the stream channel through on-site infiltration practices and outfall retrofit and stabilization projects.

Indicators: number of erosion-inducing storm sewer outfalls, drain tile outfalls, and building drains addressed with erosion-reduction / energy-dissipation measures (as assessed by rapid stream inventory every 3 years.)

6. Preserve or establish a minimum 50 foot native riparian buffer to preserve the stream corridor from impacts of adjacent land uses and to support wildlife habitat.

Indicators: linear feet / acres of riparian buffer restored; average buffer width and condition (as assessed by rapid stream inventory every 3 years).

7. Preserve steep slopes and stream corridors with minimum setback and native buffer requirements for land disturbance activities including new development, structures, and redevelopment of previously developed land.

Indicators: number of municipalities adopting setback/ buffer requirements.

8. Reduce sedimentation and meander of stream reaches within Illinois Beach State Park and Spring Bluff Forest Preserve where possible to enhance instream habitat quality and support Lake Michigan aquatic species.

Indicators: improved in-stream habitat quality as measured using biotic indices such as MBI, IBI, or other accepted measure.



Severe streambank erosion

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Objectives – Management

9. Develop a stream management and maintenance plan.

Indicators: development of stream maintenance plan that includes a schedule, proposed funding source, and implementation partner.

10. Develop a program with authority and funding to implement the stream management and maintenance plan.

Indicators: number of stream reaches being addressed by a management and maintenance program.

11. Clear, repair, or replace blocked, damaged, and failing culverts, outfall pipes, stream channels, and other stormwater infrastructure to maintain conveyance and reduce erosion and other impacts of an impaired or blocked stormwater system.

Indicators: number of structures (culverts, outfalls, and headwalls) cleared, repaired, and replaced; number of blockages / debris jams removed.

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ISSUE 2: FLOOD RISK AND FLOOD DAMAGE

Goal B: Reduce flood damage and prevent increased flooding to protect public health & safety, and public and private property and infrastructure investments.

Objectives

1. Maintain riparian and depressional floodplain and wetlands as open and undeveloped to maximize flood storage and conveyance.

Indicators: number of new structures in the floodplain &/or number of floodplain or wetlands permits issued, floodplain and wetland acres preserved as dedicated open space.

2. Mitigate flood damages through flood-proofing of at-risk structures.

Indicator: number of flood damage reports.

3. Mitigate sanitary sewer backup flood damages through remediation / correction of infiltration and cross connections with sanitary sewer system.

Indicators: number of flood damage reports; removal of FPA from inventory.

4. Mitigate local drainage capacity flood damage by providing additional flood storage and or maintaining / improving local drainage system.

Indicators: removal of FPA from inventory; number of flood damage reports; acre-feet of flood storage constructed.

ISSUE 3: NATURAL RESOURCES AND HABITAT

Goal C: Preserve, restore, and enhance a green infrastructure network of terrestrial and aquatic natural resources including streams, riparian corridors, wetlands, and upland resources.

Objectives

1. Adopt and prioritize Green Infrastructure Plan elements and recommendations in local land use plans, policies, and maps to establish the community vision, direction, and intent.



Wetland

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Indicator: number of municipalities adopting Green Infrastructure Plan elements into local land use plans, policies, and maps.

2. Implement the Green Infrastructure Plan to guide prioritization, preservation, restoration, and management of important core and connecting green infrastructure elements and buffers.

Indicators: acres of Category 1 or 2 Green Infrastructure lands / linear feet of stream channel and buffer preserved and restored (through public ownership, conservation organization ownership, conservation easement, or other preservation measure)

3. Preserve and improve ecological and biological quality of aquatic and terrestrial natural resources by improving habitat characteristics, stabilizing watershed hydrology, improving water quality, reducing coverage of exotic and invasive species and preserving threatened and endangered species.

Indicators: biological survey data (Macroinvertebrate Biotic Index, Index of Biotic Integrity, and Floristic Quality Index scores), threatened and endangered species populations

4. Reduce shoreline / beach erosion in Illinois Beach State Park to preserve rare plant communities and habitat for

resident and migratory species.

Indicators: linear feet/acreage of shoreline lost or gained.

5. Reduce the potential of contamination from adjacent land uses to Illinois Beach State Park, its waters, and Lake Michigan.

Indicators: agency contamination reports and monitoring data; remediation of contaminated sites completed.

6. Remove barriers to fish and other species migration by restoring and enhancing hydrologic connections of streams to Lake Michigan.

Indicators: number of barriers removed / hydrologic connections restored; number of barrier-free stream miles / stream miles accessible from Lake Michigan.

ISSUE 4: WATERSHED EDUCATION AND COMMUNICATION

Goal D: Watershed residents, students, and communities have adequate knowledge, skills, resources, motivation, and stewardship opportunities to take action on implementing the watershed plan.

Objectives

1. Increase watershed stewardship opportunities and participation in management, monitoring, and restoration.

Indicators: number of watershed stewardship events; number of participants in watershed stewardship activities; number of stream reaches covered by a stewardship group.

2. Convey messages from the education plan with public relations, education, outreach and media vehicles to increase public awareness and understanding of watershed issues.

Indicators: number of placements and mentions in local and regional media; number of presentations and number of audience members reached by presentations.

3. Provide technical assistance to watershed communities,



Lake Michigan beach, Illinois Beach State Park

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the development community, residents and other stakeholders to help them implement watershed plan recommendations.

Indicators: Technical/informational items distributed to target audiences (subject matter/messages specified in education plan); number of participants in technical workshops.

4. Provide conservation and / low impact development (LID) practice guidelines and case studies to educate municipalities and the development community about innovative or alternative development approaches.

Indicators: number of local government officials and staff participating in LID workshops; number of permits for / acres of new conservation developments as compared to conventional development; pre- and post-workshop knowledge assessment tools (e.g., tests).

5. Educate and involve students through watershed stewardship activities and watershed-based curricula.

Indicators: number of students participating in watershed stewardship activities; number of students reached by watershed-based curricula.

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ISSUE 5: WATER QUALITY

Goal E: Improve water quality in streams, lakes, and wetlands by reducing pollutants in stormwater runoff and addressing modified hydrology.

Objectives

1. All watershed streams and lakes meet or exceed state water quality standards.

*Indicators: Phosphorous < 0.05 mg/L
Dissolved oxygen (DO) > 5.0 mg/L
Index of Biotic Integrity (IBI) > 30
Macroinvertebrate Biotic Index (MBI) < 6.0
Trophic State Index < 70 (Sand Pond)*

2. Reduce non-point source pollution loading from existing and new development (streets, parking lots, turf grass lawns, and other impervious surfaces) by controlling inputs and using on-site best management practices (BMPs).

Indicators: water quality monitoring data (DO, phosphorous, turbidity); linear feet / acres of BMPs installed; linear feet of retrofitted drainage swale.

3. Prevent erosion from construction sites to reduce turbidity and total suspended solids.

Indicators: turbidity of construction site runoff; number of violation notices for construction sites.

4. Prevent erosion and flow of chemical pollutants (fertilizers and pesticides) from farmland, golf courses, parks and yards into streams and wetlands by reducing / controlling inputs.

Indicators: acres / linear feet of BMPs installed and/or BMP implemented, both across the landscape and along the stream channel; number of wetlands and/or onsite detention ponds enhanced for water quality improvement.

5. Prevent dumping of inappropriate substances (e.g., yard waste, garbage, household or automotive fluids, etc.) within the stream channel, riparian corridor, and stormsewer network.

Indicators: number of dumping occurrences detected during rapid inventory; municipal reports on IDDE.



Glen Flora Country Club

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6. Reduce fecal coliform contamination on Lake Michigan beaches / nearshore waters by controlling contributing sources including gull populations.

Indicators: number of beach closures; water quality sampling / fecal coliform data.

7. Improve infiltration and reduce stormwater flows to improve in-stream hydrologic and baseflow conditions, to address low dissolved oxygen, water temperature, and streambank erosion.

Indicators: water monitoring data (stream flow, temperature, and dissolved oxygen).

8. Develop and implement a watershed monitoring program to collect and monitor water quality and biological data on a regular basis.

Indicator: established monitoring program; record of monitored data.

9. Retrofit existing stormwater management structures such as detention ponds and roadside swales to improve water quality.

Indicator: number of acres of retrofitted detention basins; linear feet or square feet of retrofitted swales.

10. Reduce or modify the use / application of road salt and other chemicals for snow and ice management to reduce the impact of chlorides and toxic substances on water quality.

Indicator: specific conductivity water quality data; long-term tracking of salt use by municipalities, county and other road maintenance authorities; number of road maintenance agencies educated regarding de-icing practices.

ISSUE 6: WATERSHED COORDINATION

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

Objectives

1. Pursue cost-sharing arrangements between jurisdictions for watershed preservation/improvement projects that have broad benefits and impacts.

Indicators: number of projects funded by multiple jurisdictions and/or stakeholders.

2. Establish a watershed organization or council with funding and support to guide watershed plan implementation, provide technical assistance to watershed stakeholders, coordinate multi-partner projects, and coordinate with the Lake Michigan Watershed Ecosystem Partnership.

Indicators: establishment of lead organization with budget and executive committee; number of projects advanced/undertaken under the auspices of the watershed organization.

3. Adopt, strengthen, and enforce standards and guidelines intended to preserve watershed resources.

Indicators: number of communities adopting, strengthening, and enforcing standards and guidelines.

4. Watershed municipalities coordinate land use planning and report plans and progress to the watershed council.

Indicators: number of communities using LID and conservation-oriented approaches; number of communities participating in watershed council meetings and reporting on land use changes.

5. Help communities and stakeholders secure project funding by disseminating information to communities

and stakeholders on funding sources and mechanisms for implementing watershed projects.

Indicators: number of communities receiving funding for watershed improvement projects; number of projects installed / undertaken.

6. Local public agencies incorporate watershed improvement best management practices in ongoing management, maintenance, and infrastructure projects (i.e. streets, the manmade drainage system etc.).

Indicators: number of communities adding watershed improvement practices and functions (BMPs) to ongoing activities, plans, and budgets.

7. Understand and track watershed conditions by monitoring watershed resources and trends (hydrologic, biologic, and water quality) and implementation of plan recommendations.

Indicators: watershed monitoring data; years of data collected; number of recommendations implemented.

ISSUE 7: WATERSHED HYDROLOGY

Goal G: Restore and enhance watershed hydrology and stabilize the stream systems by reducing surface runoff.

Objectives

1. Reduce/minimize the rate and volume of runoff from the developed and developing landscape by installing urban BMPs.

Indicators: peak flow data / hydrographs showing reduction in peak flows for the 1-year event; change in rainfall event attenuation time; reduction in stream flow for a given rainfall event.

2. Preserve, restore and enhance overland flow paths.

Indicators: change in rainfall event attenuation time.

3. All new development incorporates conservation design and LID practices to minimize changes / maintain pre-development hydrology and minimize impervious cover.

Indicator: stormwater management plans demonstrating maintenance of pre-development hydrology; percentage

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of impervious cover in watershed.

4. Restore natural hydrologic regime to watershed wetlands and natural areas, including Illinois Beach State Park, Spring Bluff Nature Preserve, and Lyons Woods Forest Preserve.

Indicator: natural area management and monitoring reports.

These watershed goals were used to guide identification of watershed action recommendations and used as the framework for the action and implementation plan.