

Chapter 6. Hydromodification

6.1. Introduction

This chapter specifies management measures to protect coastal waters from sources of nonpoint pollution related to hydromodification activities. Illinois' 61,769-acre coastal zone has undergone tremendous and permanent hydrologic and hydraulic modifications. Much of the coastal shorelines and riparian areas have been modified and hardened. The purposes of these monumental changes have been to protect urban infrastructure, to manage wastewater and floods, and to provide for navigation. The hydromodifications of the inland Chicago Area Waterway System (CAWS), much of which is included in the coastal zone, is described in detail in MWRD (2008).

Much of the Lake Michigan shoreline is hardened to protect infrastructure.. The original revetments were built between 1910 and 1931 and suffered deterioration. Between 1974 and 1994, the Chicago District office of the United States Army Corps of Engineers (USACE) conducted a feasibility study to investigate solutions which would protect Lake Shore Drive and manage erosion problems along the entire Illinois Lake Michigan shoreline. From the Feasibility Report, issued in 1994, the eight most critical miles of lakefront were designated for reconstruction. Starting in the late 1990's, USACE's \$300 million Chicago Shoreline Reconstruction Project was undertaken which replaced the revetments and stabilized beaches along long reaches of the lakefront.

This section includes 6 management measures organized in the manner presented in USEPA's guidance documents:

- Physical and Chemical Characteristics of Surface Water for Channelization and Channel Modification Management Measure
- Instream and Riparian Habitat Restoration for Channelization and Channel Modification Management Measure
- Management Measure for Erosion and Sediment Control for Dams
- Chemical and Pollutant Control for Dams Management Measure
- Protection of Surface Water Quality and Instream and Riparian Habitat for Dams Management Measure
- Streambank and Shoreline Erosion Management Measure

USEPA and NOAA have concurred that there are certain hydromodification management measures that are no longer subject to requirements of the Coastal Zone Act Reauthorization Amendments of 1990 (CZARA) Section 6217 Coastal Nonpoint Pollution Control Program due to their coverage in the National Pollutant Discharge Elimination System (NPDES) Stormwater Program (Phases I and II). USEPA and NOAA have identified that the following two measures specified in the 6217(g) guidance for hydromodification management overlap in part or in full with the NPDES storm water regulations:

- Hydromodification, Erosion and Sediment Control for Dams
- Hydromodification, Chemical and Pollutant Control for Dams

These two management measures are therefore excluded from this plan.

6.2.Effects of Hydromodification

This section discusses the general environmental problems of hydromodification and the effects of existing and new hydromodification on Lake Michigan and its tributaries.

6.2.1. Effects of Channelization and Channel Modification Activities

Channelization or channel modification, used interchangeably here, is a form of hydromodification describing river and stream channel engineering undertaken for the purpose of flood control, navigation, and drainage and includes activities like channel straightening, widening, deepening, or relocating. Clearing or snagging operations, which involve the removal of vegetation along the bank or selective removal of logs and dead trees, are included as well. Channelization usually results in more uniform channel cross sections, steeper stream gradients, reduced average pool depths, and decreased physical habitat diversity. Levees along a stream or river channel are also included as channel modifications. A levee is an embankment for flood control. Channel modification activities have greatly impacted floodplains, riverine ecosystems, and wetlands in this country. Channelization can alter water quality, habitat quality, and sediment characteristics, as well as the rates and paths of sediment erosion, transport, and deposition. A frequent result of channelization is a diminished suitability of instream and riparian habitat for fish and wildlife. Hardening of banks along waterways eliminates instream and riparian habitat, decreases the quantity of organic matter entering aquatic systems, and increases the movement of nonpoint source pollutants from the upper reaches of watersheds into downstream waters. Channelization increases water velocity, reducing the ability of natural systems to absorb hydraulic energy and filter pollutants from surface waters. Channelization is implicated as a source of impairment in 10 stream segments in the Illinois Coastal Zone (Table 8-1, Page 229).

Channel modification projects undertaken in the CAWS have straightened, enlarged, and relocated stream channels. Within the Illinois Coastal Zone there are four named stream segments which are part of the CAWS, the main branch of the Chicago River, The North Shore Channel (NSC), the South Branch of the Chicago River (SBCR), and the South Fork of the South Branch of the Chicago River, often called Bubbly Creek. Today there is very little in-stream habitat or canopy cover along the main branch of the Chicago River, or the SBCR. Both of these branches have steep vertical sheet piling walls. There are no shallow areas and very little canopy cover. The NSC is a 7.7 mile long man-made channel. It is mostly straight and has steep earthen side slopes. In-stream habitat is present along partially-shaded banks along some of the channel. Bubbly Creek has steep earthen or riprap banks with vertical sheet piling walls along several reaches (MWRD 2008). The CAWS now requires dredging by MWRD to preserve and maintain this artificial flow structure. Such maintenance activities result in a repeated disturbance and removal of instream and riparian habitat.

6.2.2. Effects of Dams and Flow Alterations (Requested for Exclusion)

Dams are built for flood control, power generation, irrigation, navigation, water supply and other purposes. Impoundments may also be used for recreation and water sports, for fish and wildlife propagation, and for augmentation of low flows. Dams can change a river's hydraulic and hydrologic regimes, water quality, and physical habitat.

Dams can inundate wetlands, riparian areas, and uplands. Dams reduce downstream flooding of structures, but this same flooding is important to some wetlands and riparian forests. Dams can block migration of fish.

Dams with capacity for storage can change the timing and volume of downstream flows and lead to reduced flushing, altered loads of carbon, phosphorus, and nitrogen, and changes in streambed substrates. Lowered discharge and lower peak flows from dams change downstream sediment characteristics. Together, these changes impact a wide variety of aquatic resources.

Four impoundments were identified within the Illinois Coastal Zone through a review of the National Inventory of Dams (USACE 2013) and consultation with the IDNR's Office of Water Resources (Figure 6-1). These dams are part of the infrastructure built to protect Lake Michigan from untreated wastewater. Flows from Lake Michigan through the Chicago River Controlling Works (CRCW), O'Brien Lock and Dam and Wilmette Pumping Station are limited by a US Supreme Court Decree and federal regulations to support commercial navigation and maintain water quality. IDNR Office of Water Resources (OWR) regulates the annual diversion for the State of Illinois from Lake Michigan to comply with these federal limits. The management measures for dams only apply to constructed impoundments that meet one of the following sets of criteria: (1) 25 feet or more in height and greater than 15 acre-feet in capacity, or, (2) 6 feet or more in height and greater than 50 acre-feet in capacity (USEPA 2001).

The Wilmette Pumping Station controls flow between Lake Michigan and the NSC. It is located at Sheridan Road between Central Avenue and Linden Avenue and consists of several pumps and an open channel with a sluice gate. During most times, lake water is brought into the NSC to augment low flows, either by gravity or pumping, depending on lake and NSC water levels. During large storms, water can be released from the NSC to Lake Michigan to prevent flooding in Wilmette, Evanston and areas south. The hydraulic height of this dam is less than 6 feet. This structure does not meet NOAA's requirements for height or storage to be classified under USEPA and NOAA's rules (2001).

The North Branch of the Chicago River has a grade control structure at its confluence with the NSC. The North Branch Dam has a stepped overflow spillway. If there are no flows in the North Branch Chicago River then there is no storage pool behind the dam. Based on the best available data, the lowest elevation of the stepped spillway is 579.00 feet and the channel upstream of the dam is 578.79 and quickly rises to 579.40 feet. The hydraulic height of this dam is less than 6 feet. This structure does not meet NOAA's requirements for height or storage to be classified under USEPA and NOAA's rules (2001).

The CRCW regulates flows from Lake Michigan and the Chicago River. There is a navigation lock, a pumping station, and two sets of sluice gates. Flow regulation is through the sluice gates, which under

normal lake and river levels, allow gravity flow from Lake Michigan to the Chicago River. During large storms, flood water can be released from the CAWS to Lake Michigan to prevent flooding in Chicago. The hydraulic height of this dam is less than 6 feet. This structure does not meet NOAA's requirements for height or storage to be classified under USEPA and NOAA's rules (2001).

O'Brien Lock and Dam is located on the Calumet River and controls flow from Lake Michigan to the Calumet River and Cal-Sag Channel (CSC). There are four submersed sluice gates controlling flow from the lake. Normal hydraulic lift at the lock is two feet, depending on lake and river levels. During large storms, flood water can be released from the CAWS to Lake Michigan to prevent flooding. The hydraulic height of this dam is less than 6 feet. This structure does not meet NOAA's requirements for height or storage to be classified under USEPA and NOAA's rules (2001). The CRCW, the O'Brien Lock and Dam, and the North Branch Dam do not have sufficient height nor large enough constructed impoundments and are therefore excluded in accordance with the definitions of dams in USEPA (2001). These structures regulate diversions from Lake Michigan and provide for commercial navigation. In urbanized areas covered by NPDES Phase II regulations, two of the three management measures for dams are excluded, as mentioned in section 6.1. Therefore, we request that this source be excluded from Illinois' CNPCP.

6.2.3 Effects of Streambank Erosion

The force of flowing water can cause erosion of a streambank. The eroded material is carried and redeposited downstream. Currents can sort the coarser-grained sands and gravels from finer silt particles, depositing them in different locations downstream. Erosion is a natural process influencing creation and maintenance of riparian habitats. Sands and gravels eroded from streambanks are deposited in the channel and provide habitat for various life stages of many benthic organisms and fish. The finer-grained silts and clays carried further downstream until quiescent conditions allow for settling of the fine materials.

Hydromodification increases the depth and velocity of stream flow and increases erosion, bank undercutting and sloughing. Consequently, fine material including silt and sand is suspended in the water column, increasing turbidity and negatively impacting aquatic communities. Excessively high sediment loads can smother submersed aquatic vegetation beds, cover shellfish beds, fill in pools, and contribute to increased levels of turbidity and nutrients. Legacy pollutants including DDT, PCBs, and heavy metals which had been buried get churned up and can enter the food chain.

6.3. Management Measures for Hydromodification Sources

This section addresses management measures for hydromodification. Management measures are economically achievable means to control pollution of coastal waters, which reflect the greatest degree of pollutant reduction achievable through the application of the best available nonpoint pollution control practices, technologies, processes, siting criteria, operating methods, or other alternatives (USEPA 1993).

1. (6.3.1) Physical and Chemical Characteristics of Surface Water for Channelization and Channel Modification Management Measure

2. (6.3.2) Instream and Riparian Habitat Restoration for Channelization and Channel Modification Management Measure
3. (6.3.3) Management Measure for Erosion and Sediment Control for Dams (Excluded)
4. (6.3.4) Chemical and Pollutant Control for Dams Management Measure (Excluded)
5. (6.3.5) Protection of Surface Water Quality and Instream and Riparian Habitat for Dams Management Measure (Exclusion Requested)
6. (6.3.6) Streambank and Shoreline Erosion Management Measure

6.3.1 Physical and Chemical Characteristics of Surface Water for Channelization and Channel Modification Management Measure

This management measure is intended to be applied to public and private channelization and channel modification activities in order to prevent the degradation of physical and chemical characteristics of surface waters from such activities, evaluate potential changes in surface water characteristics, and target opportunities to improve conditions for fish and wildlife. Implementation of this management measure is intended by USEPA (2001) to occur concurrently with implementation of Management Measure for Instream and Riparian Habitat Restoration. For existing projects, this management measure guides operation and maintenance programs to use any opportunities available to improve the physical and chemical characteristics of the surface waters.

Channelization and channel modification have a measurable impact on total suspended solids, turbidity, salinity, temperature, nutrients, dissolved oxygen, oxygen demand, and contaminants in surface waters. USEPA (2001) summarizes the implementation of this management measure:

- Evaluate the potential effects of proposed channelization and channel modification on the physical and chemical characteristics of surface waters in coastal areas
- Plan and design channelization and channel modification to reduce undesirable impacts
- Develop an operation and maintenance program for existing modified channels that includes identification and implementation of opportunities to improve physical and chemical characteristics of surface waters in those channels

USEPA recommends the use of models and past experience with similar projects to examine the physical and chemical effects of hydromodification of surface water systems. Models can simulate many physical, chemical, and biological processes and can be used to identify practices to mitigate adverse effects. When properly applied, models are used in conjunction with expert professional judgment to predict and mitigate for the effects of channelization and channel modification projects.

In cases where existing channel modification impacts can be reversed or mitigated to enhance instream or streamside characteristics, several practices can be included as a part of regular operation and maintenance programs. In the Illinois Coastal Zone, this is most applicable to the City of Chicago, which contains the vast majority of channelized shoreline within the Illinois Coastal Zone.

Applicability

The Illinois CNPCP addresses this management measure. This management measure applies to any proposed channelization or channel modification projects, including levees, as well as to existing modified channels. It is intended to reduce the effects of existing and future hydromodifications on physical and chemical characteristics of surface water in Illinois' coastal management area.

Existing Programs or Practices

Programs and activities that are being implemented nationally, statewide or in Cook and Lake Counties for this management measure are listed below. Details on each program which will be used to implement this measure are summarized in Table 6-1.

Regulatory

Several permitting processes apply to channelization projects in the Illinois Coastal Zone. Together, these permits evaluate the potential effects of proposed channelization and channel modification on the physical and chemical characteristics of surface waters and ensure that projects are planned and designed to reduce undesirable impacts. These permits also apply to modifications and repairs to existing channelization structures, many of which are 50 to 100 years old, and encourage modifications which minimize the impacts of existing channels. The Cook County and Lake County Watershed Ordinances and Chicago River Corridor Design Guidelines and Standards in the Chicago Zone Ordinance encourage identification and implementation of opportunities to improve the physical and chemical characteristics of modified channels.

Permitting

The USACE requires **Section 404 permits** for channel modification projects (**33 CFR 323**). USACE rules require an evaluation of all potential impacts, and projects must be designed to avoid, minimize and mitigate impacts. Section 404 applies to the discharge of dredged or fill materials into the waters of the United States. Water quality certification for these projects is provided by the IEPA under Section 401 of the Clean Water Act. The USACE cannot issue a permit without water quality certification from the IEPA. <http://www.gpo.gov/fdsys/pkg/CFR-2012-title33-vol3/pdf/CFR-2012-title33-vol3-part323.pdf>

Section 401 of the Clean Water Act requires that any person applying for a federal permit or license which may result in a discharge of pollutants into waters of the United States must obtain a state water quality certification that the activity complies with all applicable water quality standards, limitations, and restrictions. Projects within the regulatory floodway of rivers, lakes and streams which are not covered under an existing Section 404 permit are required to provide an anti-degradation report which 1) assesses alternatives to the proposed project which will result in reduced pollutant load 2) includes a mitigation plan for unavoidable environmental degradation, 3) identifies and characterized the current physical, biological and chemical conditions of the waterbody impacted by the proposed project, 4) quantifies the potential increase in pollutant load and potential impacts of the proposed project. Permits issued under Sections 9 and 10 of the Rivers and Harbors Act also require Section 401 certification. It is required that the proposed activity be conducted in manner that does not violate water quality standards. IEPA has the option to waive the Section 401 certification, grant the permit,

grant the permit with conditions, or deny the permit. IEPA may require monitoring or mitigation as a condition for certification. <http://www.epw.senate.gov/water.pdf>

The **Rivers and Harbors Act of 1899 (Navigable Waters, 33 USC 403)** prohibits unauthorized obstruction or alteration of any navigable Water of the United States (WOUS). This includes structures in or over a navigable WOUS or excavation from or deposition of material into a navigable WOUS affecting the course, location, condition, or capacity of such waters. A Section 10 Permit is issued by the US Army Corps of Engineers. Common permitted activities include shoreline protection, construction of marinas, construction of bulkheads, dredging, beach nourishment, private docks and overhead powerlines. Section 10 permits are subject to Section 401 certification by IEPA.

<http://www.gpo.gov/fdsys/pkg/USCODE-2011-title33/pdf/USCODE-2011-title33-chap9-subchapl-sec403.pdf>

Projects in or along Lake Michigan or which are not within a regulatory floodway are regulated under **Part 3704 of the Rivers, Lakes, and Streams Act (17 IAC 3704)**. The purposes of this Part include regulating construction to prevent the impairment of the rights, interests, or uses of any public body of water or in the natural resources thereof. The routine maintenance of existing structures is exempt. Permits are required. If a proposed project is determined to likely cause an impairment to the natural resources in any public body of water or will cause bank or shoreline instability on other properties, the applicant is required to provide a discussion of the measures that will be included in the project design to minimize or mitigate the negative impacts and an analysis of the extent and permanence of the activity's encroachment on the body of water and of any impairment the activity would have on the rights, interests or uses of the public in the body of water and in the natural resources thereof. The analysis shall consider both the activity alone and the combined effects of similar activities which exist and/or could be lawfully undertaken in the locality. No activity which would result in bank or shoreline instability on other properties will be permitted.

For existing channelized waterways, the law requires that "Maintenance and repair of improved channels, ditches or levees shall follow accepted practices to reduce, as practical, scour, erosion, sedimentation, escape of loose material and debris, disturbance of adjacent trees and vegetation, and obstruction of flood flows." **615 ILCS 5/29a(a) (2012)**.

Consequences of violation of this Part, including unauthorized activity or permit violations will be sought as determined by the IDNR to be necessary and appropriate and may include requiring the removal of the structure, fill or deposit. <http://www.dnr.illinois.gov/adrules/documents/17-3704.pdf>

Part 3708 of the Rivers, Lakes, and Streams Act (17 IAC 3708) governs construction and filling in the regulatory floodway of rivers, lakes and streams in northeastern Illinois. Regional Permit No. 3 "Authorizing Construction of Minor Projects in Northeastern Illinois Regulatory Floodways" is in effect which authorizes certain types of shoreline and streambank protection with limits on the size of shoreline and streambank protection efforts, limits on the types of materials used and their placement, requirements that the disturbance of vegetation shall be kept to a minimum during construction to minimize erosion and sedimentation, and requirements that disturbed areas be seeded or stabilized

upon completion of construction. Projects within Illinois Coastal Zone waterways, floodplains or wetlands which do not meet the requirements to fall under the regional permit are required to apply for a permit. The joint permit application requires detailed information about fill material which will be discharged into waterways and a description of avoidance, minimization and compensatory activities. This information is available to OWR staff during their portion of the permit review process.

<http://www.dnr.illinois.gov/adrules/documents/17-3708.pdf> .

Lake County Stormwater Management Commission (LCSMC) has delegated authority from the OWR to issue permits for development in regulatory floodplain and floodway through an agreement with the OWR. OWR retains regulatory authority over all developments that impact Public Bodies of Water, development in streams with over 1-square mile of drainage area and without a regulatory floodway, and in those cases where detailed studies or the proposed development have changed the regulatory floodway boundary. LCSMC is the primary contact to determine if LCSMC or OWR will be the regulatory authority. http://www.lakecountyil.gov/Stormwater/Documents/Regulatory/TRM/DrftTRM_Sec2.pdf

Additional Regulatory Programs

The **Comprehensive Environmental Review Process (CERP)** is an internal IDNR process to review 1) actions that the department performs or funds, 2) actions that the Department approves and tax incentive is provided, or 3) actions that occur on IDNR-owned or leased land. An action is any activity that may change the existing physical, chemical, or biological conditions of the air, land, or water. Channelization activities which fit any of the three criteria above are reviewed for potential impact on threatened or endangered species, high value natural areas, wetlands, cultural resources, and other resources such as migratory birds, fisheries, forests, prairies, streams, and riparian corridors. Actions that may cause significant alterations to lakes or streams require a public review period. Certain activities in channelized streams such as controlling nuisance aquatic vegetation; transplanting native aquatic or semi-aquatic plants to establish cover, increase habitat diversity and prevent erosion; and maintaining existing levees and water control structures are exempt from review under most circumstances. <http://dnr.state.il.us/orep/docs/CERPmanual.pdf>

The **Cook County Watershed Management Ordinance**, administered by MWRD, applies to channelization projects within the Illinois Coastal Zone in Cook County, IL. It requires that whenever practicable, the existing functions of a riparian environment should be protected and impacts to natural streams and channels should be avoided. It requires mitigation for disturbed channels and riparian environments in the following conditions: (1) modification or relocation of streams or channels, (2) significant changes to the quantity, quality, or distribution of flows draining to any adjacent wetlands or waters, or (3) damage to the vegetation that overhangs, stabilizes or provides overland flow filtration, or shades stream channels, wetlands or impoundments. Mitigation must include meandering, pools and riffles for relocated channels and erosion and sedimentation control practices for all modified channels. Mitigated channels shall be greater than or equal to the length of the disturbed channel and shall be able to withstand all events up to the base flood without increased erosion. Stabilization practices shall be initiated as soon as practicable in portions of the site where construction activities have temporarily or permanently ceased. Hard armoring of banks with concrete bulkheads, riprap, or other man-made

materials shall be avoided where practicable. Hard armoring shall only be used where erosion cannot be prevented by use of bioengineering techniques or gradual slopes and shall not have adverse impacts on other properties or on existing land use. Disturbed areas must be replanted with native vegetation where appropriate, and as soon as possible. The Technical Guidance Manual prepared in conjunction with the ordinance provides examples of native vegetation that is appropriate in riparian environments.

<https://www.mwrd.org/irj/portal/anonymous/managementordinance>

The **Lake County Watershed Development Ordinance**, enforced by Lake County Stormwater Management Commission (LCSMC), requires a watershed development permit for all projects, including repair and modification projects, in Lake County, IL which do not meet the criteria for exemption. Under the ordinance, natural stream channels shall be preserved or conserved. Projects which disturb a streambank require permanent structural or vegetative stabilization. The ordinance further requires that permit applicants chose strategies to minimize stormwater runoff volumes and address water quality impairments through a site development plan which incorporates stormwater infiltration, evapotranspiration, reuse, and other green infrastructure practices and best management techniques. The preferred strategy to meet this requirement is the preservation and enhancement of the stormwater management benefits of natural resources of the development, including floodplains, WOUS, Isolated Waters of Lake County, channels, and natural areas. Runoff volume reductions are required to mitigate for new impervious surface. Up to 100% of the runoff volume reduction required by the ordinance can be achieved through native vegetation. (see **Article IV.B.1.d.(2)(b)(ii)**)

http://www.lakecountyil.gov/Stormwater/Documents/Regulatory/WDO%202012/WDO%2006-11-13_0713.pdf

Chicago River Corridor Design Guidelines and Standards, Chicago Zoning Ordinance (**Municipal Code of Chicago, Title 17 Section 8-0912**), outline the requirements for planned development in and adjacent to the setback area along the Chicago River and its branches within the city limits of Chicago. Specific requirements are in place regarding maximum riverbank steepness, appropriate bank stabilization techniques, native vegetation. There is also a prohibition of new structures within the riverbank buffer that are not required by river-dependent uses. Best management practices are encouraged. This manual includes requirements that riverfront property owners maintain riverbanks, seawalls, and other attached structures on their property from deterioration that may endanger the health or safety of individuals or impair river navigation. This required maintenance is expected to have the added benefit of reducing nonpoint source pollution from failing channelization structures. In addition, repair of excessively steep slopes near Bubbly Creek requires recontouring to achieve a 3H:1V slope and stabilization using native vegetation and bioengineered solutions. Guidelines are provided on the repair and modification of seawalls along Bubbly creek with the goal of reducing channelization and retrofitting with sloped naturally vegetated embankments. (Authorized by **65 ILCS 5/11-13-1**)

http://www.cityofchicago.org/content/dam/city/depts/zlup/Sustainable_Development/Publications/Chicago_River_Plan_Design_Guidelines/ChicagoRiverGuidelines.pdf

Education, Public Outreach and Technical and Financial Assistance

Numerous Education, Public Outreach, and Technical and Financial Assistance resources exist to minimize the impacts of nonpoint source pollution due to channelization in the Illinois Coastal Zone

through evaluation of potential impacts and smart planning, design, operation, and maintenance. The CNPCP will play a role, whenever prudent, in educating and encouraging participation in these programs.

The mission of the **Watershed and Water Quality Modeling Technical Support Center** is to provide assistance to USEPA Regions, State, and Local Governments, and their contractors in their efforts to improve water quality. This can include creation and application of mathematical models and analysis of data to describe sediment transport, erosion and deposition and surface water quality processes impacted by channelization. Significant technological improvements have been made in computer modeling since the USEPA and NOAA guidance was completed for CNPCP, and the tools provided by the Center are designed to meet the needs of the state and local regulatory community and reduce the need for local entities to invest in model development. <http://www.epa.gov/athens/wwqtsc/>

The **Illinois Urban Manual** was originally developed by the IEPA and is currently hosted and continually updated by the Association of Illinois Soil and Water Conservation Districts through funding from Section 319 of the Clean Water Act. This manual is the go-to technical reference on best management practices for soil erosion and sediment control, stormwater management, and special area protection. It is used by developers, planners, engineers, government officials and others involved in land use planning, building site development, and natural resource conservation in rural and urban communities and developing areas, including the Illinois Coastal Zone. The manual has guidance on best management practice selection, construction specifications, material specifications, and provides standard drawings. The manual covers numerous best management practices which could be applied to meet the goals of planning and designing channelization and channel modification to reduce undesirable impacts and identifying and implementing opportunities to improve physical and chemical characteristics of surface waters in those channels. <http://www.aiswcd.org/ium/>

According to the **IEPA Phase II MS4 Stormwater Program**, MS4 permit holders are required to engage in pollution prevention/good housekeeping for municipal operations. One training priority that MS4 permit holders could focus on is pollution prevention education for park and open space maintenance and landscaping staff. Many of the riparian corridors along channelized streams within the Illinois Coastal Zone are public parkland. Local MS4 permit holders are encouraged to train municipal employees to engage in openspace maintenance in ways which maintain and promote native vegetation, including along streambanks and in riparian corridors.

http://cfpub.epa.gov/npdes/stormwater/menuofbmps/bmp_regulatory.cfm#minmeasure6

Floodplain Management in Illinois Quick Guide, available from the OWR, was written to encourage “smart” development to minimize flood damage. The intended audience is landowners and developers interested in completing projects within floodplains. The guidebook provides visual examples of the hazards of developing within floodplains, including flooding risk and the impacts of adding fill on the upper bank or within the floodplain. Although the main goal is preventing flood damage, a peripheral benefit of the best management practices within the guidebook is reduced streambank modification. http://www.dnr.illinois.gov/waterresources/documents/resman_ilfpmquickguide.pdf

The following types of projects can be funded through **Section 319(h) of the federal Clean Water Act** through IEPA: hydrologic modification projects to implement best management practices for water quality protection, hydrologic studies and planning projects are eligible for funding to assess current conditions and prepare to implement best management practices for water quality protection, and in-stream restoration and monitoring projects are eligible for funding to re-establish original streambed meanders and riparian zones to promote improved water quality and support designated water body uses. <http://www.epw.senate.gov/water.pdf>

The **Streambank Stabilization and Restoration Program**, administered by IDOA and USDA NRCS, is a cost-share program designed to demonstrate effective, inexpensive vegetative and bio-engineering techniques for limiting streambank erosion. Program monies fund demonstration projects at suitable locations statewide and provide cost-share assistance to landowners with severely eroding streambanks. The Illinois Department of Agriculture (IDOA), Illinois' soil and water conservation districts and the Natural Resources Conservation Service of the U.S. Department of Agriculture (USDA NRCS) serve as partners in implementing the program. Urban streams, such as those within the Illinois Coastal Zone, are eligible for funding. <http://dnr.state.il.us/OREP/pfc/Incentives.htm#SSRP>

The **Cook County Technical Guidance Manual**, created by the Metropolitan Water Reclamation District (MWRD) is a companion to the Cook County Watershed Management Ordinance (WMO). It intended to provide information required in support of a Watershed Management Permit, provide guidance to best achieve the WMO's requirement and provide examples to meet the requirements of the WMO. It builds upon the guidance provided in the Illinois Urban Manual. To that end, it provides detailed information on best management practices and requirements, including practices relevant to streambank stabilization and instream sediment controls.

https://www.mwrdd.org/irj/go/km/docs/documents/MWRD/internet/protecting_the_environment/Stormwater_Management/Pdfs/WMO/TGM/TGM.pdf

The **Lake County Technical Reference Manual**, provided by LCSMC, is a companion to the Lake County Watershed Development Ordinance (WDO). It is intended to assist applicants who are seeking to comply with the WDO. It includes technical background and reference information, direction to assist in uniform and comprehensive permit applications, design guidelines, information as a useful resource for planning purposes, and interpretation for the WDO. To that end, it provides detailed information on best management practices and requirements, including practices which minimize erosion due to channelization.

<http://www.lakecountylil.gov/Stormwater/FloodplainStormwaterRegulations/WDOandTRM/Pages/TechnicalReferenceManual.aspx>

New in 2013, the **Chi-Cal Rivers Fund** is a grant program through a private-public partnership which funds projects to enhance in stream habitat for aquatic life within the CAWS. Funded projects may include riverbank naturalization, bank stabilization, riparian buffer planting, in-stream structure installation, and restoration of wetlands, prairies, and forests adjacent to watercourses. www.nfwf.org/chi-cal

In addition to the Technical Reference Manual, LCSMC has produced a **Streambank and Shoreline Protection Manual** for practitioners which includes detailed information on planning and selecting streambank protection measures to protect channels and shorelines against scour and erosion. Vegetative stabilization techniques using native plants, soil bioengineering, and structural practices are covered.

[http://www.lakecountyil.gov/Stormwater/Publications/BMPs/Streambank%20Stabilization%20Manual%20\(Lake%20County%202002\).pdf](http://www.lakecountyil.gov/Stormwater/Publications/BMPs/Streambank%20Stabilization%20Manual%20(Lake%20County%202002).pdf)

Enforcement Mechanisms

The USEPA and USACE are under a memorandum of agreement (MOA) on enforcement of Section 404. Under the MOA, the USACE, as the federal Agency that issues the permits, has the lead on permit violation cases. For unpermitted discharges, USEPA and USACE determine the appropriate lead agency based upon the criteria of the MOA. Enforcement tools include administrative compliance orders requiring a violator to stop any ongoing illegal discharge, civil penalties, and civil judicial enforcement. USEPA and USACE reserve their criminal enforcement authority for only the most flagrant and egregious Section 404 violations. Section 10 violators are issued a cease and desist order, violations are investigated, and administrative or legal action may be taken. Remedial measures can be ordered, and state agencies, including IEPA, can be involved in the decision on appropriate actions.

The IEPA is responsible for the review of Joint Permit applications and issuance of 401 Water Quality Certifications, as appropriate. If the IEPA determines that a discharge subject to a 401 Water Quality Certification will affect the quality of its waters so as to violate any water quality standards in Illinois, the IEPA has the authority to impose conditions or refuse to issue a license or permit. The IEPA, through the 401 Water Quality Certification process, has the authority to file lawsuits against violators of the Rivers and Harbors Act of 1899. IEPA has the authority to assess civil penalties for violations of NPDES requirements and performance standards and for ensuring compliance of MS4 permit holders with their general permit. IEPA is also responsible for the enforcement of NPDES rules for construction activities regulated under 40 CFR 122.26. With respect to enforcement, Section 31 of the Clean Water Act sets the basic framework for environmental compliance assurance and enforcement (415 ILCS §5/31). IEPA can assess civil penalties for violations of NPDES requirements or state water quality standards. 415 ILCS §5/42. In addition to the above, IEPA has the authority to issue citations or initiate enforcement actions for documented violations of the State Water Quality Standards (35 IAC 302). State water quality standards also apply to sites smaller than one acre regardless of whether or not they are required to have an NPDES permit.

The Rivers, Lakes, and Streams Act and Illinois Rivers and Harbors Act gives the IDNR jurisdiction over all waterbodies in the State, navigable and non-navigable and authorizes the Agency to ascertain to what extent, if at all, these waters and shorelines have been or are proposed to be encroached upon by private interests or individuals. The Act gives IDNR authority to either recover full compensation for wrongful encroachment, or to recover the use of the same. The IDNR OWR is responsible for the review of Joint Permit applications and has enforcement authorities. Under the Rivers, Lakes, and Streams Act,

illegal discharge is punishable as a Class A misdemeanor (615 ILCS §5/18). OWR has the authority to issue permits for construction in floodplains and floodways and has related enforcement authority.

For any structure or fill in Lake Michigan, IDNR must evaluate the potential of the activity to result in bank or shoreline instability on other properties. 17 Ill. Adm. Code 3704. If it is determined that the activity would likely cause shoreline erosion or other negative impacts, the applicant is required to submit the supplemental information about the measures to be provided in the project design, construction and operation which would minimize and/or mitigate those impacts.

IDNR also has authority to conduct a comprehensive review on actions funded or performed by IDNR for environmental and historical impacts. Projects expected to have negative impacts can be halted until the project proponent agrees to modifications to minimize or mitigate impacts. IDNR has the power to enforce the laws of the State and the rules and regulations of the Department in or on any lands owned, leased, or managed by the Department (20 ILCS §805/805-515)

MWRD has the authority and the responsibility for administering the Cook County Watershed Management Ordinance. This includes inspections to ensure compliance, issuance of fines, placing a stop-work order, or revoking a permit. They also have technical experience in water quality monitoring and modeling.

LCSMC has the authority and the responsibility for administering the Lake County Watershed Development Ordinance (WDO). This includes inspections to ensure compliance, issuance of fines, placing a stop-work order, or revoking a permit. Legal action may be taken and a notice of the violation may be recorded to the title to the property. LCSMC is available to meet with communities to provide technical assistance on WDO related issues at any time. LCSMC also has delegated authority from the OWR for enforcement of Part 3708 of the Rivers, Lakes and Streams Act (17 IAC 3708).

The Chicago River Corridor Design Guidelines and Standards are enforceable through the Zoning Administrator for the City of Chicago. The City of Chicago Zone Administrator has the authority to deny, revoke or withhold permits, stop work, require abatement or remedial action, issue a fine, or seek other penalties as allowed by law.

At the local level, MS4 Permit Holders have the authority to enforce their local ordinances for new development construction and may take the form of issuing citations, stop work orders, denying the issuance of building or occupancy permits, technical assistance with erosion control plans, etc.

All programs used to implement this measure are listed in Table 6-1. This table summarizes the programs; authorizing legislation; program authority; lead agency enforcement mechanisms; and evaluation methods.

6.3.2 Instream and Riparian Habitat Restoration for Channelization and Channel Modification Management Measure

The purpose of this management measure is to correct or prevent detrimental changes to instream and riparian habitat from the adverse effects of hydromodification. Implementation of this management measure is intended to occur concurrently with the implementation of Management Measure for Physical and Chemical Characteristics of Surface Waters, presented in section 6.3.1.

Intermittent overbank flooding, in combination with low base flows, over the long term provides for aquatic habitat in lotic systems. Woody debris in riparian areas is moved by floods to create physical habitat. Leaf litter enters the system to provide food for macroinvertebrates. Hydromodification projects by their very nature eliminate the forces that create and renew instream and riparian habitat.

For existing projects, this management measure guides operations and maintenance of hydromodifications to use any opportunities available to improve or restore in-stream and riparian habitat. USEPA (2001) summarizes the implementation of this management measure:

- Evaluate the potential effects of proposed channelization and channel modification on instream and riparian habitat in coastal areas;
- Plan and design channelization and channel modification to reduce undesirable impacts; and
- Develop an operation and maintenance program with specific timetables for existing modified channels that includes identification of opportunities to restore instream and riparian habitat in those channels.

Applicability

The Illinois CNPCP addresses this management measure. This management measure applies to any proposed channelization or channel modification projects, including levees, as well as to existing modified channels. This management measure is intended to evaluate changes to instream and riparian habitat and evaluate possible improvements

Existing Programs or Practices

Programs and activities that are being implemented nationally, statewide or in Cook and Lake Counties for this management measure are listed below. Details on each program which will be used to implement this measure are summarized in Table 6-1.

Regulatory

Several permitting processes apply to channelization projects in the Illinois Coastal Zone. Together, these permit reviews evaluate the potential effects of proposed channelization and channel modification on instream and riparian habitats and ensure that projects are planned and designed to reduce undesirable impacts. These permits also apply to modifications and repairs to existing channelization structures, many of which are 50 to 100 years old, and encourages modifications which minimize the impacts of existing channels.

Permitting

The **USACE Regional Permit 5: Aquatic Habitat Restoration, Establishment, and Enhancement Activities** is the USACE federal authorization on a regional basis for commonly recurring activities that have minimal individual and cumulative adverse impacts to the environment. This permit authorizes activities in the waters of the United States associated with restoration, enhancement, and establishment of habitats such as riparian areas and wetlands, provided the activities result in a net increase in aquatic resource functions and services. This permit has gone through a federal consistency determination and is consistent with the policies of ICMP. Activities which fall under this permit meet criteria for planning and design which ensure that the activity has been evaluated for potential effects on riparian and instream habitat and is expected to minimize undesirable impacts. The regional permit reduces the bureaucratic paperwork required to complete beneficial projects. <http://www.nwd.usace.army.mil/Missions/CivilWorks/RegulatoryProgram/NationwidePermits.aspx#NW>
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The USACE requires **Section 404 permits** for channel modification projects (**33 CFR 323**). USACE rules require an evaluation of all potential impacts, and projects must be designed to avoid, minimize and mitigate impacts. Section 404 applies to the discharge of dredged or fill materials into the waters of the United States. Water quality certification for these projects is provided by the IEPA under Section 401 of the Clean Water Act. The USACE cannot issue a permit without water quality certification from the IEPA. <http://www.gpo.gov/fdsys/pkg/CFR-2012-title33-vol3/pdf/CFR-2012-title33-vol3-part323.pdf>

Section 401 of the Clean Water Act requires that any person applying for a federal permit or license which may result in a discharge of pollutants into waters of the United States must obtain a state water quality certification that the activity complies with all applicable water quality standards, limitations, and restrictions. Projects within the regulatory floodway of rivers, lakes and streams which are not covered under an existing Section 404 permit are required to provide an anti-degradation report which 1) assesses alternatives to the proposed project which will result in reduced pollutant load 2) includes a mitigation plan for unavoidable environmental degradation, 3) identifies and characterized the current physical, biological and chemical conditions of the waterbody impacted by the proposed project, 4) quantifies the potential increase in pollutant load and potential impacts of the proposed project. Permits issued under Sections 9 and 10 of the Rivers and Harbors Act also require Section 401 certification. It is required that the proposed activity be conducted in manner that does not violate water quality standards. IEPA has the option to waive the Section 401 certification, grant the permit, grant the permit with conditions, or deny the permit. IEPA may require monitoring or mitigation as a condition for certification. <http://www.epw.senate.gov/water.pdf>

The **Rivers and Harbors Act of 1899 (Navigable Waters, 33 USC 403)** prohibits unauthorized obstruction or alteration of any navigable WOUS. This includes structures in or over a navigable WOUS or excavation from or deposition of material into a navigable WOUS affecting the course, location, condition, or capacity of such waters. A Section 10 Permit is issued by the US Army Corps of Engineers. Common permitted activities include shoreline protection, construction of marinas, construction of bulkheads, dredging, beach nourishment, private docks and overhead powerlines. <http://www.gpo.gov/fdsys/pkg/USCODE-2011-title33/pdf/USCODE-2011-title33-chap9-subchapl-sec403.pdf>

Projects in or along Lake Michigan or which are not within a regulatory floodway are regulated under **Part 3704 of the Rivers, Lakes, and Streams Act (17 IAC 3704)**. The purposes of this Part include regulating construction to prevent the impairment of the rights, interests, or uses of any public body of water or in the natural resources thereof. The routine maintenance of existing structures is exempt. Permits are required. If a proposed project is determined to likely cause an impairment to the natural resources in any public body of water or will cause bank or shoreline instability on other properties, the applicant is required to provide a discussion of the measures that will be included in the project design to minimize or mitigate the negative impacts and an analysis of the extent and permanence of the activity's encroachment on the body of water and of any impairment the activity would have on the rights, interests or uses of the public in the body of water and in the natural resources thereof. The analysis shall consider both the activity alone and the combined effects of similar activities which exist and/or could be lawfully undertaken in the locality. No activity which would result in bank or shoreline instability on other properties will be permitted. Consequences of violation of this Part, including unauthorized activity or permit violations will be sought as determined by the IDNR to be necessary and appropriate and may include requiring the removal of the structure, fill or deposit.

<http://www.dnr.illinois.gov/adrules/documents/17-3704.pdf>

Part 3708 of the Rivers, Lakes, and Streams Act (615 ILCS 5) governs construction and filling in the regulatory floodway of rivers, lakes and streams in northeastern Illinois. Regional Permit No. 3 "Authorizing Construction of Minor Projects in Northeastern Illinois Regulatory Floodways" is in effect which authorizes certain types of shoreline and streambank protection with limits on the size of shoreline and streambank protection efforts, limits on the types of materials used and their placement, requirements that the disturbance of vegetation shall be kept to a minimum during construction to minimize erosion and sedimentation, and requirements that disturbed areas be seeded or stabilized upon completion of construction. Projects within Illinois Coastal Zone waterways, floodplains or wetlands which do not meet the requirements to fall under the regional permit are required to apply for a permit. The joint permit application requires detailed information about fill material which will be discharged into waterways and a description of avoidance, minimization and compensatory activities. This information is available to IDNR OWR staff during their portion of the permit review process.

<http://www.dnr.illinois.gov/adrules/documents/17-3708.pdf> .

LCSMC has delegated authority from the OWR to issue permits for development in regulatory floodplain and floodway. The OWR retains regulatory authority over all developments that impact Public Bodies of Water, development in streams with over 1-square mile of drainage area and without a regulatory floodway, and in those cases where detailed studies or the proposed development have changed the regulatory floodway boundary. LCSMC is the primary contact to determine if LCSMC or OWR will be the regulatory authority.

http://www.lakecountyil.gov/Stormwater/Documents/Regulatory/TRM/DrftTRM_Sec2.pdf

CERP is an internal IDNR process to review 1) actions that the department performs or funds, 2) actions that the Department approves and tax incentive is provided, or 3) actions that occur on IDNR-owned or leased land. An action is any activity that may change the existing physical, chemical, or biological conditions of the air, land, or water. Channelization activities which fit any of the three criteria above

are reviewed for potential impact on threatened or endangered species, high value natural areas, wetlands, cultural resources, and other resources such as migratory birds, fisheries, forests, prairies, streams, and riparian corridors. Actions that may cause significant alterations to lakes or streams require a public review period. Certain activities in channelized streams such as controlling nuisance aquatic vegetation; transplanting native aquatic or semi-aquatic plants to establish cover increase habitat diversity and prevent erosion; and maintaining existing levees and water control structures are exempt from review under most circumstances. <http://dnr.state.il.us/orep/docs/CERPmanual.pdf>

The **Cook County Watershed Management Ordinance**, administered by MWRD, applies to channelization projects within the Illinois Coastal Zone in Cook County, IL. It requires that whenever practicable, the existing functions of a riparian environment should be protected and impacts to natural streams and channels should be avoided. It requires mitigation for disturbed channels and riparian environments in the following conditions: modification or relocation of streams or channels, significant changes to the quantity, quality, or distribution of flows draining to any adjacent wetlands or waters, or damage to the vegetation that overhangs, stabilizes or provides overland flow filtration, or shades stream channels, wetlands or impoundments. Mitigation must include meandering, pools and riffles for relocated channels, erosion and sedimentation control practices for all modified channels. Mitigated channels shall be greater than or equal to the length of the disturbed channel and shall be able to withstand all events up to the base flood without increased erosion. Stabilization practices shall be initiated as soon as practicable in portions of the site where construction activities have temporarily or permanently ceased. Hard armoring of banks with concrete bulkheads, riprap, or other man-made materials shall be avoided where practicable. Hard armoring shall only be used where erosion cannot be prevented by use of bioengineering techniques or gradual slopes and shall not have adverse impacts on other properties or on existing land use. Disturbed areas must be replanted with native vegetation where appropriate, and as soon as possible. The Technical Guidance Manual prepared in conjunction with the ordinance provides examples of native vegetation that is appropriate in riparian environments. <https://www.mwrld.org/irj/portal/anonymous/managementordinance>

The **Lake County Watershed Development Ordinance**, enforced by LCSMC, requires a watershed development permit for all projects in Lake County, IL which do not meet the criteria for exemption. Under the ordinance, natural stream channels shall be preserved or conserved. Projects which disturb a streambank require permanent structural or vegetative stabilization. The ordinance further requires that permit applicants chose strategies to minimize stormwater runoff volumes and address water quality impairments through a site development plan which incorporates stormwater infiltration, evapotranspiration, reuse, and other green infrastructure practices and best management techniques. The preferred strategy to meet this requirement is the preservation and enhancement of the stormwater management benefits of natural resources of the development, including floodplains, Waters of the United States, Isolated Waters of Lake County, channels, and natural areas. Runoff volume reductions are required to mitigate for new impervious surface. Up to 100% of the runoff volume reduction required by the ordinance can be achieved through native vegetation. http://www.lakecountyil.gov/Stormwater/Documents/Regulatory/WDO%202012/WDO%2006-11-13_0713.pdf

The **Chicago River Corridor Design Guidelines and Standards, Chicago Zoning Ordinance (Municipal Code of Chicago, Title 17 Section 8-0912)** outlines the requirements for planned development in and adjacent to the setback area along the Chicago River and its branches within the city limits of Chicago. Specific requirements are in place regarding maximum riverbank steepness, appropriate bank stabilization techniques, native vegetation. There is also a prohibition of new structures within the riverbank buffer that are not required by river-dependent uses. Best management practices are encouraged. This manual includes requirements that riverfront property owners maintain riverbanks, seawalls, and other attached structures on their property from deterioration that may endanger the health or safety of individuals or impair river navigation. This required maintenance is expected to have the added benefit of reducing nonpoint source pollution from failing channelization structures. In addition, repair of excessively steep slopes near Bubbly Creek requires recontouring to achieve a 3H:1V slope and stabilization using native vegetation and bioengineered solutions. Guidelines are provided on the repair and modification of seawalls along Bubbly creek with the goal of reducing channelization and retrofitting with sloped naturally vegetated embankments. (Authorized by **65 ILCS 5/11-13-1**) http://www.cityofchicago.org/content/dam/city/depts/zlup/Sustainable_Development/Publications/Chicago_River_Plan_Design_Guidelines/ChicagoRiverGuidelines.pdf

Education, Public Outreach and Technical and Financial Assistance

Numerous Education, Public Outreach, and Technical and Financial Assistance resources exist to minimize the impacts of nonpoint source pollution due to channelization in the Illinois Coastal Zone through evaluation of potential impacts and smart planning, design, operation, and maintenance. CNPCP will play a role, whenever prudent, in educating and encouraging participation in these programs.

The mission of the USEPA's **Watershed and Water Quality Modeling Technical Support Center** is to provide assistance to USEPA Regions, State, and Local Governments, and their contractors in their efforts to improve water quality. This can include creation and application of mathematical models and analysis of data to describe sediment transport, erosion and deposition and surface water quality processes. Significant technological improvements have been made in computer modeling since the guidance was completed for CNPCP, and the tools provided by the Center are designed to meet the needs of the state and local regulatory community and reduce the need for local entities to invest in model development. <http://www.epa.gov/athens/wwqtsc/>

The **IEPA Quality Assurance and Field Methods Manual- Section D: Special Stream Surveys**, revised in 1996, was used by IEPA through 2008. It provides information on a standardized Stream Habitat Assessment Methodology (SHAM). SHAM has been replaced in Illinois by the Qualitative Habitat Evaluation Index (QHEI), developed by the Ohio Environmental Protection Agency. <http://www.epa.state.il.us/water/water-quality/methodology/special-stream-surveys.pdf> and <http://www.epa.state.oh.us/portals/35/documents/qheimanualjune2006.pdf>

The **Illinois Urban Manual** was originally developed by the IEPA and is currently hosted and continually updated by the Association of Illinois Soil and Water Conservation Districts through funding from Section 319 of the Clean Water Act. This manual is the go-to technical reference on best management practices

for soil erosion and sediment control, stormwater management, and special area protection. It is used by developers, planners, engineers, government officials and others involved in land use planning, building site development, and natural resource conservation in rural and urban communities and developing areas, including the Illinois Coastal Zone. The manual has guidance on best management practice selection, construction specifications, material specifications, and provides standard drawings. The manual covers numerous best management practices which could be applied to meet the goals of planning and designing channelization and channel modification to reduce undesirable impacts and identifying and implementing opportunities to improve instream and riparian habitats. <http://www.aiswcd.org/ium/>

IEPA Phase II MS4 Stormwater Program requires MS4 permit holders are required to engage in pollution prevention/good housekeeping for municipal operations. The most important component related to channelization is employee training programs for park and open space maintenance and landscaping aimed at reducing stormwater pollution. Many of the riparian corridors along channelized streams within the Illinois Coastal Zone are public parkland. It is the responsibility of the local MS4 permit holder to train municipal employees to engage in openspace maintenance in ways which maintain and promote native vegetation, including along streambanks and in riparian corridors. http://cfpub.epa.gov/npdes/stormwater/menuofbmps/bmp_regulatory.cfm#minmeasure6

The following types of projects can be funded through **Section 319(h) of the federal Clean Water Act** through IEPA: hydrologic modification projects to implement best management practices for water quality protection, hydrologic studies and planning projects are eligible for funding to assess current conditions and prepare to implement best management practices for water quality protection, in-stream restoration and monitoring projects are eligible for funding to re-establish original streambed meanders and riparian zones to promote improved water quality and support designated water body uses, and watershed assessments. Projects which primarily protect wildlife habitat are **NOT** eligible. <http://www.epw.senate.gov/water.pdf>

The **Floodplain Management in Illinois Quick Guide**, OWR, was written to encourage “smart” development to minimize flood damage. The intended audience is landowners and developers interested in completing projects within floodplains. The guidebook provides visual examples of the hazards of developing within floodplains, including flooding risk and the impacts of adding fill on the upper bank or within the floodplain. Although the main goal is preventing flood damage, a peripheral benefit of the best management practices within the guidebook is reduced streambank modification. http://www.dnr.illinois.gov/waterresources/documents/resman_ilfpmquickguide.pdf

Units of local government can apply for grant funding through **Park and Recreational Facility Construction Grant Program (PARC), Public Act 096-0820**, to acquire land to protect floodplains, wetlands, natural areas, wildlife habitat, and unique geologic and biologic features. <https://dnr.state.il.us/ocd/newparc1.htm>

The IDNR Office of Resource Conservation’s Division of Wildlife Resources administers the four **Special Wildlife Funds Grant Programs** that are funded by Illinois sportsmen through the purchase of Habitat

Stamps and Migratory Waterfowl Stamps. Eligible projects include those seeking to preserve, protect, acquire or manage habitat (all wetlands, woodlands, grasslands, and agricultural lands, natural or altered) in Illinois that have the potential to support populations of wildlife in any or all phases of their life cycles. https://dnr.state.il.us/grants/special_funds/wildgrant.htm

Acres for Wildlife is an IDNR Landowner Assistance Program. Through “Acres for Wildlife,” landowners receive help in protecting, improving, or developing lasting wildlife habitat on their property. Key provisions include: the program is strictly voluntary, landowners retain complete property control (trespass for any reason is prohibited without landowner permission), there is no cost for IDNR services (or payments for participation). In return for IDNR assistance, landowners pledge their willingness to protect and improve habitat on their land as they are able. Protecting a minimum of one acre of habitat for at least one year is required. Landowners, including riparian land owners, will receive a management plan which may suggest changes to land management including the use of prescribed fire, the control of invasive species, etc. Free native plant seeds or plugs may be provided, and biologists advise land owners on available funding. <https://dnr.state.il.us/orc/Wildliferesources/AFW/>

The University of Illinois Extension provides information on **land use planning and riparian corridor and habitat management** for local communities. They provide guidance on cost-sharing incentive programs available through federal, state, and some local governments help reduce the expenses of restoration or protection. <http://urbanext.illinois.edu/lcr/environmental.cfm>

New in 2013, the **Chi-Cal Rivers Fund** is a grant program through a private-public partnership which funds projects to enhance in stream habitat for aquatic life within the CAWS. Funded projects may include riverbank naturalization, bank stabilization, riparian buffer planting, in-stream structure installation, and restoration of wetlands, prairies, and forests adjacent to watercourses. www.nfwf.org/chi-cal

The **Streambank Stabilization and Restoration Program**, administered by IDOA and USDA NRCS, is a cost-share program designed to demonstrate effective, inexpensive vegetative and bio-engineering techniques for limiting streambank erosion. Program monies fund demonstration projects at suitable locations statewide and provide cost-share assistance to landowners with severely eroding streambanks. IDOA, Illinois' soil and water conservation districts and NRCS serve as partners in implementing the program. Urban streams, such as those within the Illinois Coastal Zone, are eligible for funding. <http://dnr.state.il.us/OREP/pfc/Incentives.htm#SSRP>

The **Cook County Technical Guidance Manual**, from MWRD, is a companion to the Cook County WMO. It intended to provide information required in support of a Watershed Management Permit, provide guidance to best achieve the WMO's requirement and provide examples to meet the requirements of the WMO. It builds upon the guidance provided in the Illinois Urban Manual. To that end, it provides detailed information on best management practices and requirements, including practices relevant to streambank stabilization and instream sediment controls. https://www.mwrdd.org/irj/go/km/docs/documents/MWRD/internet/protecting_the_environment/Stormwater_Management/Pdfs/WMO/TGM/TGM.pdf

The **Lake County Technical Reference Manual**, LCSMC, is a companion to the Lake County WDO. It is intended to assist applicants who are seeking to comply with the WDO. It includes technical background and reference information, direction to assist in uniform and comprehensive permit applications, design guidelines, information as a useful resource for planning purposes, and interpretation for the WDO. To that end, it provides detailed information on best management practices and requirements, including practices which minimize erosion due to channelization.

In addition to the Technical Reference Manual, LCSMC has produced a **Streambank and Shoreline Protection Manual** for practitioners which includes detailed information on planning and selecting streambank protection measures to protect channels and shorelines against scour and erosion. Vegetative plantings using native plants, soil bioengineering, and structural practices are covered.

[http://www.lakecountyil.gov/Stormwater/Publications/BMPs/Streambank%20Stabilization%20Manual%20\(Lake%20County%202002\).pdf](http://www.lakecountyil.gov/Stormwater/Publications/BMPs/Streambank%20Stabilization%20Manual%20(Lake%20County%202002).pdf)

Enforcement Mechanisms

The USEPA and USACE are under a memorandum of agreement (MOA) on enforcement of Section 404. Under the MOA, the USACE, as the federal Agency that issues the permits, has the lead on permit violation cases. For unpermitted discharges, USEPA and USACE determine the appropriate lead agency based upon the criteria of the MOA. Enforcement tools include administrative compliance orders requiring a violator to stop any ongoing illegal discharge, civil penalties, and civil judicial enforcement. USEPA and USACE reserve their criminal enforcement authority for only the most flagrant and egregious Section 404 violations. Section 10 violators are issued a cease and desist order, violations are investigated, and administrative or legal action may be taken. Remedial measures can be ordered, and state agencies, including IEPA, can be involved in the decision on appropriate actions.

The IEPA is responsible for the review of Joint Permit applications and issuance of 401 Water Quality Certifications, as appropriate. If the IEPA determines that a discharge subject to a 401 Water Quality Certification will affect the quality of its waters so as to violate any water quality standards in Illinois, the IEPA has the authority to impose conditions or refuse to issue a license or permit. The IEPA, through the 401 Water Quality Certification process, has the authority to file lawsuits against violators of the Rivers and Harbors Act of 1899. IEPA has the authority to assess civil penalties for violations of NPDES requirements and performance standards and for ensuring compliance of MS4 permit holders with their general permit. IEPA is also responsible for the enforcement of NPDES rules for construction activities regulated under 40 CFR 122.26. With respect to enforcement, Section 31 of the Clean Water Act sets the basic framework for environmental compliance assurance and enforcement (415 ILCS §5/31). IEPA can assess civil penalties for violations of NPDES requirements or state water quality standards. 415 ILCS §5/42. In addition to the above, IEPA has the authority to issue citations or initiate enforcement actions for documented violations of the State Water Quality Standards (35 IAC 302). State water quality standards also apply to sites smaller than one acre regardless of whether or not they are required to have an NPDES permit.

The Rivers, Lakes, and Streams Act and Illinois Rivers and Harbors Act gives the IDNR jurisdiction over all waterbodies in the State, navigable and non-navigable and authorizes the Agency to ascertain to what

extent, if at all, these waters and shorelines have been or are proposed to be encroached upon by private interests or individuals. The Act gives IDNR authority to either recover full compensation for wrongful encroachment, or to recover the use of the same. The IDNR OWR is responsible for the review of Joint Permit applications and has enforcement authorities. Under the Rivers, Lakes, and Streams Act, illegal discharge is punishable as a Class A misdemeanor (615 ILCS §5/18). OWR has the authority to issue permits for construction in floodplains and floodways and has related enforcement authority.

For any structure or fill in Lake Michigan, IDNR must evaluate the potential of the activity to result in bank or shoreline instability on other properties. 17 Ill. Adm. Code 3704. If it is determined that the activity would likely cause shoreline erosion or other negative impacts, the applicant is required to submit the supplemental information about the measures to be provided in the project design, construction and operation which would minimize and/or mitigate those impacts.

IDNR also has authority to conduct a comprehensive review on actions funded or performed by IDNR for environmental and historical impacts. Projects expected to have negative impacts can be halted until the project proponent agrees to modifications to minimize or mitigate impacts. IDNR has the power to enforce the laws of the State and the rules and regulations of the Department in or on any lands owned, leased, or managed by the Department (20 ILCS §805/805-515)

MWRD has the authority and the responsibility for administering the Cook County Watershed Management Ordinance. This includes inspections to ensure compliance, issuance of fines, placing a stop-work order, or revoking a permit. They also have technical experience in water quality monitoring and modeling.

LCSMC has the authority and the responsibility for administering the Lake County Watershed Development Ordinance (WDO). This includes inspections to ensure compliance, issuance of fines, placing a stop-work order, or revoking a permit. Legal action may be taken and a notice of the violation may be recorded to the title to the property. LCSMC is available to meet with communities to provide technical assistance on WDO related issues at any time. LCSMC also has delegated authority from the OWR for enforcement of Part 3708 of the Rivers, Lakes and Streams Act (17 IAC 3708).

The Chicago River Corridor Design Guidelines and Standards are enforceable through the Zoning Administrator for the City of Chicago. The City of Chicago Zone Administrator has the authority to deny, revoke or withhold permits, stop work, require abatement or remedial action, issue a fine, or seek other penalties as allowed by law.

At the local level, MS4 Permit Holders have the authority to enforce their local ordinances for new development construction and may take the form of issuing citations, stop work orders, denying the issuance of building or occupancy permits, technical assistance with erosion control plans, etc. All programs used to implement this measure are listed in Table 6-1. This table summarizes the programs; authorizing legislation; program authority; lead agency enforcement mechanisms; and evaluation methods.

6.3.3 Management Measure for Erosion and Sediment Control for Dams (Excluded)

The purpose of this management measure is to prevent sediment from entering surface waters during the construction or maintenance of dams.

Applicability

State coastal nonpoint control programs are not required to include this management measure because the NPDES storm water regulations for industrial activities on construction sites apply to this source of pollution.

6.3.4 Management Measure for Chemical and Pollutant Control for Dams (Excluded)

The purpose of this management measure is to prevent downstream contamination from pollutants associated with dam construction activities.

Applicability

State coastal nonpoint control programs are not required to include this management measure because the NPDES storm water regulations for industrial activities on construction sites apply to this source of pollution.

6.3.5 Management Measure for Protection of Surface Water Quality and Instream and Riparian Habitat for Dams (Exclusion Requested)

The purpose of this management measure is to protect the quality of surface waters and aquatic habitat in reservoirs and in the downstream portions of rivers and streams that are influenced by the quality of water contained in the releases (tailwaters) from reservoir impoundments. Impacts from the operation of dams to surface water quality and aquatic and riparian habitat should be assessed and the potential for improvement evaluated. Additionally, new upstream and downstream impacts to surface water quality and aquatic and riparian habitat caused by the implementation of practices should also be considered in the assessment.

Applicability

Management measures and practices for dams are restricted to constructed impoundments that are either (1) 25 feet or more in height and greater than 15 acre-feet in capacity, or, (2) 6 feet or more in height and greater than 50 acre-feet in capacity (USEPA 2001). As noted in section 6.2.2, none of the impoundments within the Illinois Coastal Zone fit the minimum requirements. New dam construction within the Illinois Coastal Zone, fitting the minimum criteria for inclusion in the CNPCP, is incredibly unlikely.

The stream gradients of waterways within the Illinois Coastal Zone are very low; therefore a dam for hydroelectric power would need a very large reservoir to create adequate hydraulic head for power generation. The undeveloped land available in this region is not sufficient to create a large enough reservoir to power a hydroelectric dam. Likewise, a reservoir large enough for flood control would require more land than is available. The costs of mitigating for the environmental impacts and population displacement, along with meeting permitting requirements which would result from building a large dam and reservoir, are out of proportion with the anticipated benefits for either hydroelectric

power or flood control. In addition, there is a lack of political will for dam construction. IDNR has been working with USACE on a project to remove 16 lowhead dams statewide. Therefore, we request that this management measure be excluded from the CNPCP.

6.3.6 Streambank and Shoreline Erosion Management Measure

This management measure is intended to be applied by States to eroding coast lines and streambanks in coastal rivers and creeks. The measure does not imply that all shoreline and streambank erosion must be controlled. Some amount of natural erosion is necessary to provide the sediment for beaches in estuaries and coastal bays, for point bars and channel deposits in rivers, and for substrate in tidal flats and wetlands. The measure, however, applies to eroding shorelines and streambanks that constitute an NPS problem in surface waters.

There are numerous streambank and shoreline stabilization techniques that are effective in controlling coastal erosion wherever it is a source of nonpoint pollution. Bioengineering techniques involving marsh creation and vegetative bank stabilization may be effective in locations with limited exposure to strong currents or wind-generated waves. In other cases, the use of traditional engineering approaches, including beach nourishment or coastal structures, may be more appropriate. In addition to controlling those sources of sediment input to surface waters which are causing NPS pollution, these techniques can halt the destruction of wetlands and riparian areas located along the shorelines of surface waters. Once these features are protected, they can serve as a filter for surface water runoff from upland areas, or as a sink for nutrients, contaminants, or sediment already present as NPS pollution in surface waters.

Stabilization practices involving vegetation or coastal engineering should be properly designed and installed. These techniques should only be applied where there will be no adverse effects to aquatic or riparian river habitat or to the stability of adjacent shorelines. This management measure is also intended to promote institutional measures that establish minimum set-back requirements or measures that allow a buffer zone to reduce concentrated flows and promote infiltration of surface water runoff in areas adjacent to the shoreline.

USEPA (2001) summarizes the management measure as follows:

- Where streambank or shoreline erosion is a nonpoint source pollution problem, streambanks and shorelines should be stabilized. Vegetative methods are strongly preferred unless structural methods are more cost-effective, considering the severity of wave and wind erosion, offshore bathymetry, and the potential adverse impact on other streambanks, shorelines, and offshore areas.
- Protect streambank and shoreline features with the potential to reduce NPS pollution.
- Protect streambanks and shorelines from erosion due to uses of either the shorelands or adjacent surface waters.

Applicability

The Illinois CNPCP addresses this management measure. This management measure is intended to be applied by States to eroding shorelines in coastal bays, and to eroding streambanks in coastal rivers and

creeks. The measure does not imply that all shoreline and streambank erosion must be controlled. Some amount of natural erosion is necessary to provide the sediment for beaches in estuaries and coastal bays, for point bars and channel deposits in rivers, and for substrate in tidal flats and wetlands. The measure, however, applies to eroding shorelines and streambanks that constitute an NPS problem in surface waters. It is not intended to hamper the efforts of any States or localities to retreat rather than to harden the shoreline.

Existing Programs or Practices

Programs and activities that are being implemented nationally, statewide or in Cook and Lake Counties for this management measure are listed below. Details on each program which will be used to implement this measure are summarized in Table 6-1.

Regulatory

Streambank and shoreline stabilization projects are subject to a number of different permitting requirements. Together, these regulations ensure that streambanks and shoreline features are protected from erosion due to adjacent landuse and stabilization projects are planned and implemented in a way that prefers vegetative methods over structural methods and reduces adverse impacts to other streambanks, shorelines, and offshore areas.

Permitting

USACE Regional Permit 10- Bank Stabilization, Clean Water Act Section 404(e) are the federal authorization on a regional basis for commonly recurring activities that have minimal individual and cumulative adverse impacts to the environment. This permit allows bank stabilization to be authorized under a streamlined permit if it meets 7 criteria related to the extent of the activity and methods used. This permit has gone through a federal consistency determination and is consistent with the policies of ICMP. The regional permit reduces the bureaucratic paperwork required to complete beneficial projects. http://www.usace.army.mil/Portals/2/docs/civilworks/nwp/2012/NWP_13_2012.pdf

The USACE requires **Section 404 permits (33 CFR 323)** for bank stabilization projects. USACE rules require an evaluation of all potential impacts, and projects must be designed to avoid, minimize and mitigate impacts. Section 404 applies to the discharge of dredged or fill materials into the waters of the United States. Water quality certification for these projects is provided by the IEPA under Section 401 of the Clean Water Act. The USACE cannot issue a permit without water quality certification from the IEPA. <http://www.gpo.gov/fdsys/pkg/CFR-2012-title33-vol3/pdf/CFR-2012-title33-vol3-part323.pdf>

Section 401 of the Clean Water Act requires that any person applying for a federal permit or license which may result in a discharge of pollutants into waters of the United States must obtain a state water quality certification that the activity complies with all applicable water quality standards, limitations, and restrictions. Projects within the regulatory floodway of rivers, lakes and streams which are not covered under an existing Section 404 permit are required to provide an anti-degradation report which 1) assesses alternatives to the proposed project which will result in reduced pollutant load 2) includes a mitigation plan for unavoidable environmental degradation, 3) identifies and characterized the current

physical, biological and chemical conditions of the waterbody impacted by the proposed project, 4) quantifies the potential increase in pollutant load and potential impacts of the proposed project. Permits issued under Sections 9 and 10 of the Rivers and Harbors Act also require Section 401 certification. It is required that the proposed activity be conducted in manner that does not violate water quality standards. IEPA has the option to waive the Section 401 certification, grant the permit, grant the permit with conditions, or deny the permit. IEPA may require monitoring or mitigation as a condition for certification. <http://www.epw.senate.gov/water.pdf>

The **Rivers and Harbors Act of 1899 (Navigable Waters, 33 USC 403)** prohibits an unauthorized obstruction or alteration of any navigable WOUS. This includes structures in or over a navigable WOUS or excavation from or deposition of material into a navigable WOUS affecting the course, location, condition, or capacity of such waters. A Section 10 Permit is issued by the USACE. Common permitted activities include shoreline protection, construction of marinas, construction of bulkheads, dredging, beach nourishment, private docks and overhead powerlines. <http://www.gpo.gov/fdsys/pkg/USCODE-2011-title33/pdf/USCODE-2011-title33-chap9-subchapl-sec403.pdf>

Projects in or along Lake Michigan or which are not within a regulatory floodway are regulated under **Part 3704 of the Rivers, Lakes, and Streams Act (17 IAC 3704)**. The purposes of this Part include regulating construction to prevent the impairment of the rights, interests, or uses of any public body of water or in the natural resources thereof. The routine maintenance of existing structures is exempt. Permits are required. If a proposed project is determined to likely cause an impairment to the natural resources in any public body of water or will cause bank or shoreline instability on other properties, the applicant is required to provide a discussion of the measures that will be included in the project design to minimize or mitigate the negative impacts and an analysis of the extent and permanence of the activity's encroachment on the body of water and of any impairment the activity would have on the rights, interests or uses of the public in the body of water and in the natural resources thereof. The analysis shall consider both the activity alone and the combined effects of similar activities which exist and/or could be lawfully undertaken in the locality. No activity which would result in bank or shoreline instability on other properties will be permitted. Consequences of violation of this Part, including unauthorized activity or permit violations will be sought as determined by the IDNR to be necessary and appropriate and may include requiring the removal of the structure, fill or deposit. <http://www.dnr.illinois.gov/adrules/documents/17-3704.pdf>

Rivers, Lakes, and Streams Act (615 ILCS 5): Floodway Construction in Northeastern Illinois, 17 IAC 3708 governs construction and filling in the regulatory floodway of rivers, lakes and streams in northeastern Illinois. Regional Permit No. 3 "Authorizing Construction of Minor Projects in Northeastern Illinois Regulatory Floodways" is in effect which authorizes certain types of shoreline and streambank protection with limits on the size of shoreline and streambank protection efforts, limits on the types of materials used and their placement, requirements that the disturbance of vegetation shall be kept to a minimum during construction to minimize erosion and sedimentation, and requirements that disturbed areas be seeded or stabilized upon completion of construction. Projects within Illinois Coastal Zone waterways, floodplains or wetlands which do not meet the requirements to fall under the regional permit are required to apply for a permit. The joint permit application requires detailed information

about fill material which will be discharged into waterways and a description of avoidance, minimization and compensatory activities. This information is available to IDNR OWR staff during their portion of the permit review process. <http://www.dnr.illinois.gov/adrules/documents/17-3708.pdf> .

LCSMC has delegated authority from the OWR to issue permits for development in regulatory floodplain and floodway. OWR retains regulatory authority over all developments that impact Public Bodies of Water, development in streams with over 1-square mile of drainage area and without a regulatory floodway, and in those cases where detailed studies or the proposed development have changed the regulatory floodway boundary. LCSMC is the primary contact to determine if LCSMC or OWR will be the regulatory authority.

http://www.lakecountyil.gov/Stormwater/Documents/Regulatory/TRM/DrftTRM_Sec2.pdf

Additional Regulatory Programs

CERP is an internal IDNR process to review 1) actions that the department performs or funds, 2) actions that the Department approves and tax incentive is provided, or 3) actions that occur on IDNR-owned or leased land. An action is any activity that may change the existing physical, chemical, or biological conditions of the air, land, or water. Streambank stabilization activities which fit any of the three criteria above are reviewed for potential impact on threatened or endangered species, high value natural areas, wetlands, cultural resources, and other resources such as migratory birds, fisheries, forests, prairies, streams, and riparian corridors. Actions that may cause significant alterations to lakes or streams require a public review period. Certain activities in channelized streams such as controlling nuisance aquatic vegetation; transplanting native aquatic or semi-aquatic plants to establish cover increase habitat diversity and prevent erosion; and maintaining existing levees and water control structures are exempt from review under most circumstances. <http://dnr.state.il.us/orep/docs/CERPmanual.pdf>

The **Cook County Watershed Management Ordinance**, enforced by MWRD, applies to development projects within the Illinois Coastal Zone in Cook County, IL. It requires that whenever practicable, the existing functions of a riparian environment should be protected and impacts to natural streams and channels should be avoided. It requires mitigation for disturbed channels and riparian environments in the following conditions: modification or relocation of streams or channels, significant changes to the quantity, quality, or distribution of flows draining to any adjacent wetlands or waters, or damage to the vegetation that overhangs, stabilizes or provides overland flow filtration, or shades stream channels, wetlands or impoundments. Mitigation must include meandering, pools and riffles for relocated channels, erosion and sedimentation control practices for all modified channels. Mitigated channels shall be greater than or equal to the length of the disturbed channel and shall be able to withstand all events up to the base flood without increased erosion. Stabilization practices shall be initiated as soon as practicable in portions of the site where construction activities have temporarily or permanently ceased. Hard armoring of banks with concrete bulkheads, riprap, or other man-made materials shall be avoided where practicable. Hard armoring shall only be used where erosion cannot be prevented by use of bioengineering techniques or gradual slopes and shall not have adverse impacts on other properties or on existing land use. Disturbed areas must be replanted with native vegetation where appropriate, and as soon as possible. The Technical Guidance Manual prepared in conjunction with the ordinance

provides examples of native vegetation that is appropriate in riparian environments.
<https://www.mwrd.org/irj/portal/anonymous/managementordinance>

The **Lake County Watershed Development Ordinance**, enforced by LCSMC, is applicable to Lake County, IL. It requires permits for proposed development in floodplains and flood-prone areas or which create wetland impacts or modify to the flood-prone area of a channel. Under the ordinance, natural stream channels shall be preserved or conserved. Projects which disturb a streambank require permanent structural or vegetative stabilization. Permit applicants must choose strategies to minimize stormwater runoff and address water quality impairments. The preferred strategy is preserving and enhancing the stormwater management benefits of the natural resources features of the development site, which includes streams. Other options for minimizing runoff include using best management practices to enhance the infiltration and storage characteristics of the development site, using open channels with native vegetation to convey runoff, structural solutions to provide water quality and volume reduction benefits. All development must meet the following performance standards: 1) conserve natural streams and channels, 2) limit removal of riparian vegetation to one side of the channel, 3) limit clearing of channel vegetation to that which is essential for construction, 4) submit for review and approval a 5) seed or otherwise stabilize all disturbed areas associated with channel modification using the Native Plant Guide for Streams and Stormwater Facilities in Northeastern Illinois as a minimum standard.
http://www.lakecountyil.gov/Stormwater/Documents/Regulatory/WDO%202012/WDO%2006-11-13_0713.pdf

The **Chicago River Corridor Design Guidelines and Standards, Chicago Zoning Ordinance (Municipal Code of Chicago, Title 17 Section 8-0912)** outlines the requirements for planned development in and adjacent to the setback area along the Chicago River and its branches within the city limits of Chicago. Specific requirements are in place regarding maximum riverbank steepness, appropriate bank stabilization techniques, native vegetation. There is also a prohibition of new structures within the riverbank buffer that are not required by river-dependent uses. Best management practices are encouraged. This manual includes requirements that riverfront property owners maintain riverbanks, seawalls, and other attached structures on their property from deterioration that may endanger the health or safety of individuals or impair river navigation. This required maintenance is expected to have the added benefit of reducing nonpoint source pollution from failing channelization structures. In addition, repair of excessively steep slopes near Bubbly Creek requires recontouring to achieve a 3H:1V slope and stabilization using native vegetation and bioengineered solutions. Guidelines are provided on the repair and modification of seawalls along Bubbly creek with the goal of reducing channelization and retrofitting with sloped naturally vegetated embankments. (Authorized by **65 ILCS 5/11-13-1**)
http://www.cityofchicago.org/content/dam/city/depts/zlup/Sustainable_Development/Publications/Chicago_River_Plan_Design_Guidelines/ChicagoRiverGuidelines.pdf

Education, Public Outreach and Technical and Financial Assistance

Numerous Education, Public Outreach, and Technical and Financial Assistance resources exist to minimize the impacts of nonpoint source pollution due to streambank and shoreline erosion in the Illinois Coastal Zone.

The USACE currently has a **Great Lakes Restoration Initiative (GLRI) grant** to re-grade part of the Chicago River riverbank at Horner Park and plant native species to stop erosion. This funding source could be used for similar projects within the Illinois Coastal Zone in the future.

<http://www.lrc.usace.army.mil/Missions/CivilWorksProjects/HornerPark.aspx>

The **Illinois Urban Manual** was originally developed by the IEPA and is currently hosted and continually updated by the Association of Illinois Soil and Water Conservation Districts through funding from Section 319 of the Clean Water Act. This manual is the go-to technical reference on best management practices for soil erosion and sediment control, stormwater management, and special area protection. It is used by developers, planners, engineers, government officials and others involved in land use planning, building site development, and natural resource conservation in rural and urban communities and developing areas, including the Illinois Coastal Zone. The manual has guidance on best management practice selection, construction specifications, material specifications, and provides standard drawings. The manual covers numerous best management practices which use vegetative methods instead of structural methods to protect streambank and shoreline features from erosion.

<http://www.aiswcd.org/ium/>

The **IEPA Phase II MS4 Stormwater Program** requires MS4 permit holders to engage in pollution prevention/good housekeeping for municipal operations. The most important component related to streambank and shoreline erosion is employee training programs for park and open space maintenance and landscaping aimed at reducing stormwater pollution. Many of the riparian corridors along channelized streams within the Illinois Coastal Zone are public parkland. It is the responsibility of the local MS4 permit holder to train municipal employees to engage in openspace maintenance in ways which maintain and promote native vegetation, including along streambanks and in riparian corridors.

http://cfpub.epa.gov/npdes/stormwater/menuofbmps/bmp_regulatory.cfm#minmeasure6

The **Floodplain Management in Illinois Quick Guide**, OWR, was written to encourage “smart” development to minimize flood damage. The intended audience is landowners and developers interested in completing projects within floodplains. The guidebook provides visual examples of the hazards of developing within floodplains, including flooding risk and the impacts of adding fill on the upper bank or within the floodplain. Although the main goal is preventing flood damage, a peripheral benefit of the best management practices within the guidebook is reduced streambank modification.

http://www.dnr.illinois.gov/waterresources/documents/resman_ilfpmquickguide.pdf

Section 319(h), IEPA- The following types of projects can be funded through Section 319(h) of the federal Clean Water Act: hydrologic modification projects to implement best management practices for water quality protection, hydrologic studies and planning projects are eligible for funding to assess current conditions and prepare to implement best management practices for water quality protection, in-stream restoration and monitoring projects are eligible for funding to re-establish original streambed meanders and riparian zones to promote improved water quality and support designated water body uses, and watershed assessments. <http://www.epw.senate.gov/water.pdf>

The University of Illinois Extension provides information on **land use planning and riparian corridor and habitat management** for local communities. They provide guidance on cost-sharing incentive programs available through federal, state, and some local governments help reduce the expenses of restoration or protection.. <http://urbanext.illinois.edu/lcr/environmental.cfm>

The **Streambank Stabilization and Restoration Program**, administered by IDOA and USDA NRCS, is a cost-share program designed to demonstrate effective, inexpensive vegetative and bio-engineering techniques for limiting streambank erosion. Program monies fund demonstration projects at suitable locations statewide and provide cost-share assistance to landowners with severely eroding streambanks. The Illinois Department of Agriculture (IDOA), Illinois' soil and water conservation districts and the Natural Resources Conservation Service of the U.S. Department of Agriculture (NRCS) serve as partners in implementing the program. Urban streams, such as those within the Illinois Coastal Zone, are eligible for funding. <http://dnr.state.il.us/OREP/pfc/Incentives.htm#SSRP>

New in 2013, the **Chi-Cal Rivers Fund** is a private-public partnership which funds projects to enhance in stream habitat for aquatic life within the CAWS. Funded projects may include riverbank naturalization, bank stabilization, riparian buffer planting, in-stream structure installation, and restoration of wetlands, prairies, and forests adjacent to watercourses. www.nfwf.org/chi-cal

The **Cook County Technical Guidance Manual**, MWRD, is a companion to the Cook County Watershed Management Ordinance (WMO). It intended to provide information required in support of a Watershed Management Permit, provide guidance to best achieve the WMO's requirement and provide examples to meet the requirements of the WMO. It builds upon the guidance provided in the Illinois Urban Manual. To that end, it provides detailed information on best management practices and requirements, including practices relevant to streambank stabilization and instream sediment controls.

https://www.mwrdd.org/irj/go/km/docs/documents/MWRD/internet/protecting_the_environment/Stormwater_Management/Pdfs/WMO/TGM/TGM.pdf

The **Lake County Technical Reference Manual**, LCSMC, is a companion to the Lake County WDO. It is intended to assist applicants who are seeking to comply with the WDO. It includes technical background and reference information, direction to assist in uniform and comprehensive permit applications, design guidelines, information as a useful resource for planning purposes, and interpretation for the WDO. To that end, it provides detailed information on best management practices and requirements, including practices which minimize erosion due to channelization.

<http://www.lakecountyil.gov/Stormwater/FloodplainStormwaterRegulations/WDOandTRM/Pages/TechnicalReferenceManual.aspx>

In addition to the Technical Reference Manual, LCSMC has produced a **Streambank and Shoreline Protection Manual** for practitioners which includes detailed information on planning and selecting streambank protection measures to protect channels and shorelines against scour and erosion. Vegetative plantings using native plants, soil bioengineering, and structural practices are covered.

[http://www.lakecountyil.gov/Stormwater/Publications/BMPs/Streambank%20Stabilization%20Manual%20\(Lake%20County%202002\).pdf](http://www.lakecountyil.gov/Stormwater/Publications/BMPs/Streambank%20Stabilization%20Manual%20(Lake%20County%202002).pdf)

Enforcement Mechanisms

The USEPA and USACE are under a memorandum of agreement (MOA) on enforcement of Section 404. Under the MOA, the USACE, as the federal Agency that issues the permits, has the lead on permit violation cases. For unpermitted discharges, USEPA and USACE determine the appropriate lead agency based upon the criteria of the MOA. Enforcement tools include administrative compliance orders requiring a violator to stop any ongoing illegal discharge, civil penalties, and civil judicial enforcement. USEPA and USACE reserve their criminal enforcement authority for only the most flagrant and egregious Section 404 violations. Section 10 violators are issued a cease and desist order, violations are investigated, and administrative or legal action may be taken. Remedial measures can be ordered, and state agencies, including IEPA, can be involved in the decision on appropriate actions.

The IEPA is responsible for the review of Joint Permit applications and issuance of 401 Water Quality Certifications, as appropriate. If the IEPA determines that a discharge subject to a 401 Water Quality Certification will affect the quality of its waters so as to violate any water quality standards in Illinois, the IEPA has the authority to impose conditions or refuse to issue a license or permit. The IEPA, through the 401 Water Quality Certification process, has the authority to file lawsuits against violators of the Rivers and Harbors Act of 1899. IEPA has the authority to assess civil penalties for violations of NPDES requirements and performance standards and for ensuring compliance of MS4 permit holders with their general permit. IEPA is also responsible for the enforcement of NPDES rules for construction activities regulated under 40 CFR 122.26. With respect to enforcement, Section 31 of the Clean Water Act sets the basic framework for environmental compliance assurance and enforcement (415 ILCS §5/31). IEPA can assess civil penalties for violations of NPDES requirements or state water quality standards. 415 ILCS §5/42. In addition to the above, IEPA has the authority to issue citations or initiate enforcement actions for documented violations of the State Water Quality Standards (35 IAC 302). State water quality standards also apply to sites smaller than one acre regardless of whether or not they are required to have an NPDES permit.

The Rivers, Lakes, and Streams Act and Illinois Rivers and Harbors Act give the IDNR jurisdiction over all waterbodies in the State, navigable and non-navigable and authorizes the Agency to ascertain to what extent, if at all, these waters and shorelines have been or are proposed to be encroached upon by private interests or individuals. The Act gives IDNR authority to either recover full compensation for wrongful encroachment, or to recover the use of the same. The IDNR OWR is responsible for the review of Joint Permit applications and has enforcement authorities. Under the Rivers, Lakes, and Streams Act, illegal discharge is punishable as a Class A misdemeanor (615 ILCS §5/18). OWR has the authority to issue permits for construction in floodplains and floodways and has related enforcement authority.

For any structure or fill in Lake Michigan, IDNR must evaluate the potential of the activity to result in bank or shoreline instability on other properties. 17 Ill. Adm. Code 3704. If it is determined that the activity would likely cause shoreline erosion or other negative impacts, the applicant is required to submit the supplemental information about the measures to be provided in the project design, construction and operation which would minimize and/or mitigate those impacts.

IDNR also has authority to conduct a comprehensive review on actions funded or performed by IDNR for environmental and historical impacts. Projects expected to have negative impacts can be halted until the project proponent agrees to modifications to minimize or mitigate impacts. IDNR has the power to enforce the laws of the State and the rules and regulations of the Department in or on any lands owned, leased, or managed by the Department (20 ILCS §805/805-515)

MWRD has the authority and the responsibility for administering the Cook County Watershed Management Ordinance. This includes inspections to ensure compliance, issuance of fines, placing a stop-work order, or revoking a permit. They also have technical experience in water quality monitoring and modeling.

LCSMC has the authority and the responsibility for administering the Lake County Watershed Development Ordinance (WDO). This includes inspections to ensure compliance, issuance of fines, placing a stop-work order, or revoking a permit. Legal action may be taken and a notice of the violation may be recorded to the title to the property. LCSMC is available to meet with communities to provide technical assistance on WDO related issues at any time. LCSMC also has delegated authority from the OWR for enforcement of Part 3708 of the Rivers, Lakes and Streams Act (17 IAC 3708).

The Chicago River Corridor Design Guidelines and Standards are enforceable through the Zoning Administrator for the City of Chicago. The City of Chicago Zone Administrator has the authority to deny, revoke or withhold permits, stop work, require abatement or remedial action, issue a fine, or seek other penalties as allowed by law.

At the local level, MS4 Permit Holders have the authority to enforce their local ordinances for new development construction and may take the form of issuing citations, stop work orders, denying the issuance of building or occupancy permits, technical assistance with erosion control plans, etc.

6.4 Coordination for Hydromodification Sources

Administration and implementation of the Coastal Nonpoint Source Program will be housed within the Illinois Coastal Program. This office:

- Consults and coordinates within IDNR, and among IEPA and other state agencies, local governments, interstate agencies, and regional agencies within the coastal zone, assuring full participation in carrying out the purposes and management policies as cited in the ICMP
- Administers the Coastal Grants Program, making annual funds available for competitive grants
- Coordinates with the IEPA for coastal nonpoint source pollution control projects
- Administers Federal Consistency reviews, in cooperation with the OWR, to ensure that federal actions affecting land or water use within the coastal zone are consistent with the ICMP.

The ICMP coordinates with the IDNR Office of Realty and Environmental Planning for reviews under the Comprehensive Environmental Review Process (CERP), including reviews of projects funded through Coastal Grants which include planning to mitigate the impacts of hydromodification.

The ICMP Office also coordinates with the OWR Division of Water Resource Management - Lake Michigan Programs Section, which is responsible for managing the state's interests in Lake Michigan, and issuing permits for work in and along the Lake Michigan shore, waterways, and within floodplains and floodways. The Section also monitors technical studies related to the lake level, bank erosion, and sediment movement. OWR is responsible for evaluating joint permitting applications and is aware of permitting decisions and any permitting issues from IEPA or USACE. OWR, as mentioned above, is also involved in Federal Consistency determinations regarding hydromodification projects within the Illinois Coastal Zone.

Implementation of the CNPCP is coordinated with the IEPA Bureau of Water Nonpoint Source Unit, which administers the statewide Illinois Nonpoint Source Management Program and the Section 319 grant program. Section 319 (h) provides funding for various projects that reduce nonpoint source water pollution. Funds may be used to conduct assessments, develop and implement watershed management plans, provide technical assistance, demonstrate new technology and provide education and outreach. Projects which mitigate the impacts of hydromodification and which are implementing a watershed management plan can be funded through the 319 program. The monitoring programs which ensure that the CNPCP is effective at preventing and mitigating nonpoint source pollution related to channelization are incorporated into the statewide Illinois Nonpoint Source Management Program.

ICMP collaborates with MWRD and LCSMC and municipal stakeholders to disseminate information on trainings and funding opportunities. ICMP has attended, participated in, and presented at public meetings and trainings regarding the Lake County Watershed Development Ordinance and the Cook County Watershed Management Ordinance and will continue coordination activities in the future.

Table 6-1 Management Measure Programs and Practices for Hydromodification Sources

Program or Practice	Authorizing Legislation	Program Authority	Lead Implementing Agency	Enforcement Mechanism(s)	Evaluation Method(s)	Management Measures
401 Water Quality Certification	Environmental Protection Act (415 ILCS 5/) Federal Water Pollution Control Act	35 IAC 302.105 33 CFR 1251-1387	Illinois Environmental Protection Agency	Issuance of Water Quality Certification. Issuance of cease and desist orders, orders requiring remediation, administrative penalties, criminal penalties, civil penalties.	Number of 401 certifications	6.3.1, 6.3.2, 6.3.5
Acres for Wildlife Program			Illinois Department of Natural Resources			6.3.2
Chi-Cal Rivers Fund			National Fish and Wildlife Foundation			6.3.1, 6.3.2, 6.3.5

Program or Practice	Authorizing Legislation	Program Authority	Lead Implementing Agency	Enforcement Mechanism(s)	Evaluation Method(s)	Management Measures
Chicago River Corridor Design Guidelines and Standards, Chicago Zoning Ordinance	65 ILCS/11-13-1	Municipal Code of Chicago, Title 17 Section 8-0912	City of Chicago	Civil penalties, fines		6.3.1, 6.3.2, 6.3.5
Cook County Technical Guidance Manual			Metropolitan Water Reclamation District of Greater Chicago			6.3.1, 6.3.2, 6.3.5
Cook County Watershed Management Ordinance	55 ILCS 5/5-1062.1, 70 ILCS 2605/1 et seq.	70 ILCS 2605/1	Metropolitan Water Reclamation District of Greater Chicago (or authorized municipality)	Issuance of permit. Permittees are required to monitor for 5 years post-construction and submit water quality data to MWRD.	MWRD will evaluate data for effectiveness	6.3.1, 6.3.2, 6.3.5

Program or Practice	Authorizing Legislation	Program Authority	Lead Implementing Agency	Enforcement Mechanism(s)	Evaluation Method(s)	Management Measures
"Dredge and Fill", Section 404	Federal Water Pollution Control Act	33 CFR 323	US Army Corps of Engineers	Issuance of permits, administrative compliance orders, civil penalties, criminal penalties		6.3.1, 6.3.2, 6.3.5

Program or Practice	Authorizing Legislation	Program Authority	Lead Implementing Agency	Enforcement Mechanism(s)	Evaluation Method(s)	Management Measures
Great Lakes Restoration Initiative			United States Environmental Protection Agency			6.3.5
Habitat assessment technical assistance			Illinois Environmental Protection Agency			6.3.2
Illinois Urban Manual			Association of Illinois Soil and Water Conservation Districts			6.3.1, 6.3.2, 6.3.5
Lake County Technical Reference Manual			Lake County Stormwater Management Commission			6.3.1, 6.3.2, 6.3.5
Lake County Watershed Development Ordinance	55 ILCS 5/5-1062	70 ILCS 2605/1	Lake County Stormwater Management Commission (or authorized municipality)	Issuance of permit. Permittees are required to monitor for 5 years post-construction and submit water quality data to LCSMC.	LCSWMC will evaluate data for effectiveness	6.3.1, 6.3.2, 6.3.5
Local Zoning	65 ILCS/11-13-1		Local Governments	Civil penalties, fines		6.3.1, 6.3.2, 6.3.5

Program or Practice	Authorizing Legislation	Program Authority	Lead Implementing Agency	Enforcement Mechanism(s)	Evaluation Method(s)	Management Measures
Monitoring and modeling technical assistance			Illinois Environmental Protection Agency US Environmental Protection Agency			6.3.1
NPDES Stormwater Program	Environmental Protection Act (415 ILCS 5/) Federal Water Pollution Control Act	35 IAC 309 33 CFR 1251-1387	Illinois Environmental Protection Agency	Issuance of permits. Issuance of cease and desist orders, orders requiring remediation, administrative penalties, criminal penalties, civil penalties.	Annual stormwater pollutant loads to receiving waters	6.3.1, 6.3.2, 6.3.5
Park and Recreational Facility Construction Grant Program (PARC)	Public Act 96-820		Illinois Department of Natural Resources			6.3.2

Program or Practice	Authorizing Legislation	Program Authority	Lead Implementing Agency	Enforcement Mechanism(s)	Evaluation Method(s)	Management Measures
Regulation of Public Waters / Floodway Construction in Northeastern Illinois	Rivers Lakes and Streams Act (615 ILCS 5)	17 IAC 3704 17 IAC 3708	Illinois Department of Natural Resources Office of Water Resources	Issuance of permits. Issuance of cease and desist orders requiring remediation, criminal penalties	Number of permits issued	6.3.1, 6.3.2, 6.3.5
Riparian Corridor and Habitat Management			University of Illinois Extension			6.3.2
Section 10 Permit	River and Harbors Act (33 USC 403)	33 CFR 322 33 CFR 1251-1387	US Army Corps of Engineers	Issuance of permits. Issuance of cease and desist orders, administrative penalties, criminal penalties, requirement of remedial measures		6.3.1, 6.3.2, 6.3.5

Program or Practice	Authorizing Legislation	Program Authority	Lead Implementing Agency	Enforcement Mechanism(s)	Evaluation Method(s)	Management Measures
Section 319 Grant Program	Federal Water Pollution Control Act		Illinois Environmental Protection Agency			6.3.1, 6.3.2, 6.3.5
Special Wildlife Funds Grant Program			Illinois Department of Natural Resources			6.3.2
Stream Habitat Monitoring Manuals			Illinois Environmental Protection Agency			6.3.2
Streambank and Shoreline Protection Manual			Lake County Stormwater Management Commission			6.3.1, 6.3.2, 6.3.5
Streambank Stabilization and Restoration Program			Illinois Department of Agriculture, United States Department of Agriculture Natural Resources Conservation Service			6.3.1, 6.3.2, 6.3.5

Program or Practice	Authorizing Legislation	Program Authority	Lead Implementing Agency	Enforcement Mechanism(s)	Evaluation Method(s)	Management Measures
Watershed and Water Quality Modeling Technical Support			United States Environmental Protection Agency			6.3.1, 6.3.2