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**Illinois Coastal Management Program
Issue Paper**

Chicago River and North Shore Channel Corridors

Introduction

The ICMP coastal zone includes corridor sections of the Chicago River and the North Shore Channel. Including these inland waterways will provide the opportunity for the ICMP to consider issues, which could have direct and significant impacts on Lake Michigan. The corridors follow the course of the waterways that have connection to Lake Michigan and which act as an interface between the lake and inland drainage. The boundaries were established by selecting the first through street landward from the river’s edge or along a major thoroughfare. This provides for consideration of public parks along these waterways.

The inclusion of the Chicago River and the North Shore Channel has the support of Wilmette, Evanston, Skokie, Lincolnwood and Chicago, which border these waterways. It also has the support of the Metropolitan Water Reclamation District of Greater Chicago (MWRDGC) which serves a critical role in the management of the inland waterways.

The following statements were provided in response to an IDNR public outreach asking to identify areas, which would merit special attention in the ICMP. These statements provide the general basis and rationale for inclusion of these waterways:

- The Chicago River and the North Shore Channel is a contiguous system with Lake Michigan. There is exchange of water and biota between Lake Michigan and the North Shore Channel /Chicago River System and by means of the locks at the mouth of the Chicago River and sluice gates at Wilmette Harbor. (8)
- As the Chicago River and the North Shore Channel exchange flows with the lake especially during storm events, issues such as water quality, flooding, point and non-point source pollution, access, invasive species control, and protection of aquatic life cannot be technically separated from impacts on the Lake coastal zone. (13)

ICMP Chicago Waterway Segments

Following are brief general descriptions of segments of the Chicago Area Waterway System (CAWS) that are included within the ICMP Boundary (The Little Calumet and Grand Calumet waterways are discussed in Issue Paper M.). These are segmented in order to provide geographic descriptions of the areas and issues. The ICMP segments are as follows:

Main Stem Chicago River	1.5 miles
South Branch Chicago River	4.5 miles
South Fork of the South Branch	1.3 miles
North Branch Chicago River	8.7 miles (includes 1-mile North Branch Canal)
North Shore Channel	7.7 miles

Total ICMP Length is ~ 23.7 miles

**Figure 1-1
Chicago Area Waterway System (CAWS)**

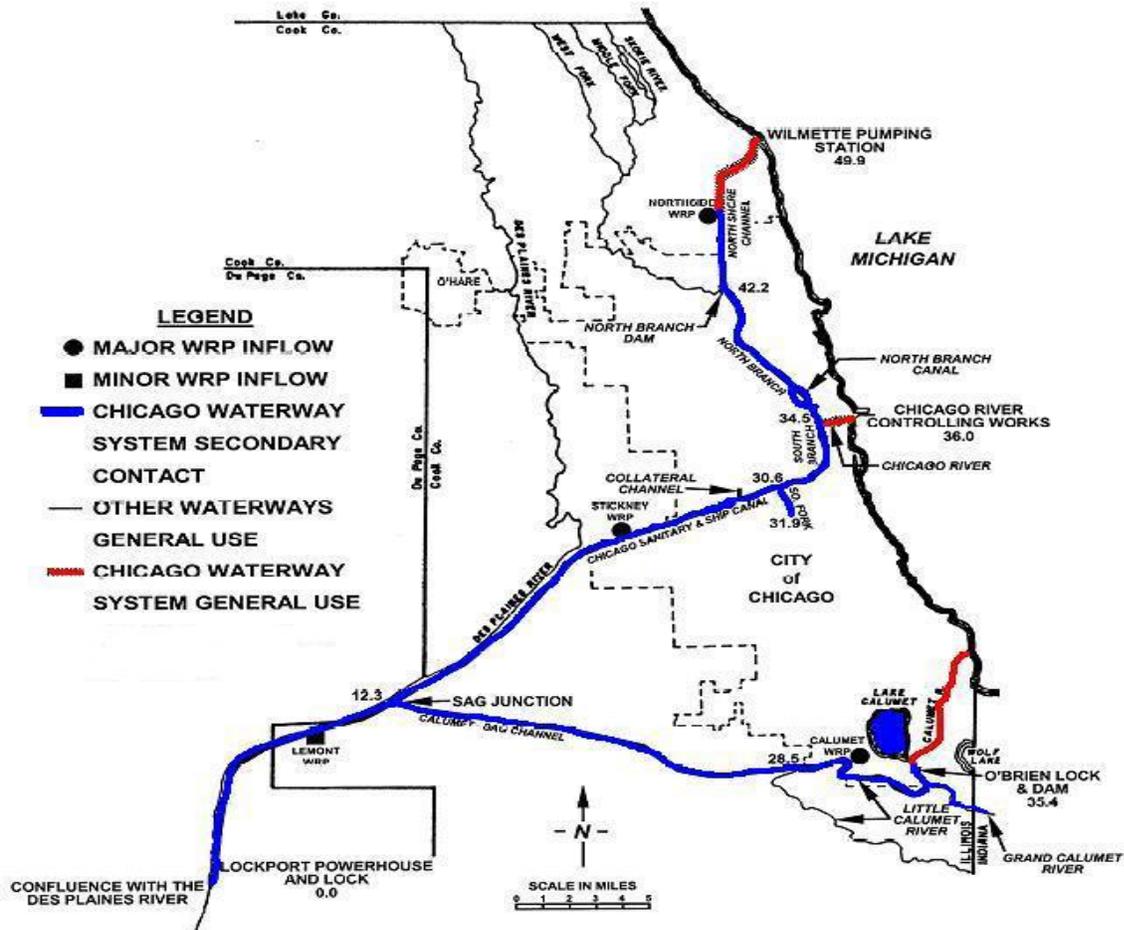


Figure provided by MWRDGC modified by CDMO: \weisenberger\UAA\2nd draft\Section 3 UAA11-5-04.doc (<http://www.chicagoareawaterways.org/documents/CAWS-UAA-DRAFT-REPORT.pdf>)

The **Main Stem Chicago River** from the Chicago River Controlling Works to the junction of the North and South Branches is 1.5 miles in length. The Main Stem, as it flows through the City, is one of the most visible aspects of the City that separates it from the highways and majestic buildings that adorn the Lake Michigan skyline. To many Chicagoans, it is commonly referred to as the City’s “second shoreline.” Segments of the river are bordered by a riverwalk and recreational boating and fishing are becoming increasingly popular with locals and visitors. The amount of open space along the river is limited, and the City has plans to increase the number of public plazas along the river. (4)

The construction and improvement of the Chicago Harbor began in 1833. The harbor includes a 970-acre outer basin protected by exterior breakwaters totaling 12,663 feet in length and a 224-acre inner basin protected by interior breakwaters totaling 6,578 feet in length. The Army Corps of Engineer (USACE) Chicago District's portion of the project consists of the main and north branches of the river. This includes a 21 feet deep navigation channel from Rush Street to North Avenue, a 29 feet deep approach channel, a 28 feet deep maneuvering channel, and a 21 feet deep river entrance channel separated by the Chicago Harbor Lock. The lock's chamber is 80 feet wide by 600 feet long and is 22.4 feet deep at its low pool elevation. The lock is operated 24 hours per day, seven days per week. (12)

The Chicago River serves as a vital transport link between Lake Michigan and the Illinois Waterway. Federal responsibility for improving navigation on the river began in 1899. By 1941, the river was transformed into its present configuration. The principal commodities transported on the river consist of sand, gravel, crushed rock, scrap iron, fuel oil, coal and non-metallic minerals. (12)

The Main Stem is approximately 200 feet wide west of Michigan Avenue and up to 250 feet wide east of there. It has vertical concrete and sheet pile sidewalls throughout its length. It is 20 feet deep at the west end and 26 feet deep at the east end. The river alignment is generally straight with three bends near Michigan Avenue, Orleans and State Streets (IEPA 2002). The banks are developed with high-rise offices, residential buildings, and open space that consist of hardscape plazas and cafes. (4)

The **South Branch Chicago River** is a 4.5-mile long segment from the confluence with the North Branch and Chicago River to the confluence with the Chicago Sanitary & Ship Canal at the Damen Avenue/I-55 Bridge. Generally, the South Branch follows its original course. A short reach was relocated in 1928 to eliminate a major bend. (4) The South Branch is maintained by the Rock Island District Corps of Engineers.

The South Branch consists of vertical dock walls throughout most of its length. It varies from 200 to 250 feet wide and 15 to 20 feet deep. There are three former navigation slips off the South Branch near Ashland Avenue. This stretch of river, which runs through Chicago's Chinatown, is mainly commercial and industrial. (4)

The **South Fork of the South Branch** flows into the South Branch. From the Racine Avenue Pumping Station to the confluence with the South Branch, the South Fork is 1.3 miles long. The channel varies from 100 to 200 feet wide and 3 to 13 feet deep. The majority of the bank consists of steeply sloped earth or rock materials with several sections with vertical dock walls (4)

The South Fork of the South Branch, which was the primary sewer for the Union Stock Yards and the meatpacking industry, was once so polluted that it became known as Bubbly Creek. (5) Land-use along the canal is dominated by industrial and commercial uses. There is limited open space within nearby residential areas. Vacant land is often heavily contaminated. Land uses and barge and commercial traffic limit recreational use of the waterways (City of Chicago 1999). The South Fork is primarily a stagnant side-channel to the South Branch, as the original creek has been mostly filled in. Currently, there is virtually no natural flow into the system. Most flow occurs when the MWRDGC Racine Avenue Pumping Station is discharging combined sewer overflow to the South Fork. (4)

The ICMP section of the **North Branch Chicago River** (NBCR) is 7.7 miles long or 8.7 miles when the 1-mile long North Branch Canal is included. The NBCR stretches from the junction of the Chicago River and the South Branch, up to the North Shore Channel junction. (4)

For description, the NBCR is divided into two segments (upper and lower), with the junction of these segments at the Diversey Parkway Bridge. The upper and lower segment lengths are 2.7 miles and 5

miles, respectively. The lower segment follows its original course for about 5 miles from the junction of the Chicago River and the South Branch. The channel has been deepened and widened in this area and consists of vertical concrete and steel walls with an average width and depth of 150 to 300 feet and 10 to 15 feet, respectively. In several reaches, the banks consist of vertical dock walls in various states of disrepair. (4)

The upper 2.7-mile segment channel consists of earthen side slopes with an average width and depth of 90 feet and 10 feet, respectively. The channel has been either straightened or relocated into straight segments with steep earthen side slopes. This reach of the river consists of a mix of commercial, industrial, residential and park land/open space. It is one of the few stretches with homes bordering the river. (4)

The North Branch Canal, which is an alternate route around Goose Island, is 1 mile long adding an additional mile to the North Branch. The canal was constructed in the 1870s and connects around to the North Avenue turning basin, and forms the east side of Goose Island. The North Branch Canal has a straight alignment and consists of vertical steel walls with an average width and depth of 80 to 120 feet and 4 to 8 feet, respectively. A major residential conversion of the former Montgomery Ward building is taking place, with 298 residential units being planned. This development is immediately adjacent to the North Branch Canal and opposite Goose Island. Many of these residential developments are bringing people closer to the river where land prices are more affordable than Lake Michigan development shoreline activities. (4)

Many of the neighborhoods have taken an active interest in enhancing banks of the NBCR, particularly the communities at Ravenswood and Lathrop. However, many of the homes along the Ravenswood section of the NBCR have built docks and structures on land that belongs to the MWRDGC and through these structures, homeowners have access to the waterway (Chicago Tribune 2003). Along with residential homeowners, some commercial businesses and industries have conducted stream improvement activities. (4)

The **North Shore Channel** begins at its confluence with the NBCR in West River Park and extends upstream for 7.7 miles, ending at the MWRDGC Wilmette Harbor and Diversion structure. The Wilmette Harbor Association is a not-for-profit Illinois Corporation that operates Wilmette Harbor. The harbor has room for approximately 300 vessels, both powerboats and sailboats.

The North Shore Channel is a drainage canal built between 1907 and 1910 to flush the sewage-filled North Branch of the Chicago River down the Chicago Sanitary and Ship Canal. The wastes from the north suburban communities of Evanston, Wilmette, Winnetka and others were diverted away from the lake and drained through the newly created main canal. In the 1920s, the MWRDGC built the North Side treatment plant at Howard Street in Skokie, adjacent to the channel. (9) The landfill created by the construction of the channel was subsequently developed into Wilmette's magnificent Gillson Park. Construction of Wilmette's most famous landmark, the Baha'i Temple, was started in 1920, but was not completed until 1953. (7)

The North Shore Channel consists of earthen side slopes with an average width and depth of 90 feet and 5 to 10 feet, respectively. The channel is generally straight except for four bends. Each bank has about a 10 to 15 foot wide submerged shelf, which transitions into a steep earthen side slope. The narrow riparian corridor in the reach is mostly parkland, which is owned by the MWRDGC and managed in some locations by Evanston, Skokie and Wilmette. The channel's riparian land use includes parks and a few commercial lots. (4)

Key Factors in Understanding the Issues of Concern

The central issues of concern given for proposing the inclusion of the waterways are Water Quality, Invasive Species, Riparian Habitat and Parks, Recreation, and Public Access. These issues are directly related to and affected by the controlling structures separating Lake Michigan and the waterways, the diversions occurring through these structures, Lake Michigan water supply withdrawals, and the effluent discharges and storm runoff into the waterways. Key issue-dependent factors include the history of the Lake Michigan diversion, the U.S. Supreme Court Decree limiting the diversion, the sources of diversion and accounting methods, the regional water supply demands on Lake Michigan, and the Tunnel and Reservoir Project (TARP). A brief description of the history and status of these controlling factors is given below which provides a sense of the complexity and interrelationship of these factors in addressing the issues of concern.

History of the Lake Michigan Diversion - With the development of the Chicago metropolitan area, sewer and drainage improvements led to severe sanitation problems in the mid to late 1800s. The newly constructed sewers moved water and wastes into the Chicago River, which until 1900 drained to Lake Michigan. The water quality of Lake Michigan deteriorated and contaminated the city's primary water supply. (1) Typhoid fever, cholera and dysentery plagued people. Disease resulting from water polluted by human wastes brought about a state of emergency. (9)

A second problem that occurred during this time period was an increase in the overbank flooding within the city. As more roads were built and buildings constructed, the sewer system was correspondingly expanded. The increase in impervious area from the newly constructed roads and buildings increased the rate and volume of stormwater runoff and resulted in increased flooding. (1)

In 1887, a plan was evolved to cut through the ridge separating the Great Lakes drainage system and the Mississippi River drainage system with a canal. This canal would begin at the southerly tip of the south branch of the Chicago River and carry the wastes away from the lake and down to the Mississippi River through the Des Plaines and Illinois Rivers. The MWRDGC was created in 1889 by the state legislature to affect this plan. To reverse the flow of the Chicago River, a 28-mile canal was built from the south branch of the river through the low summit and down to Lockport. It was completed in 1900. Locks at the mouth of the Chicago River and at Lockport control the flow in this canal, known as the Chicago Sanitary and Ship Canal. (9) Flow in the rivers was maintained by diverting large amounts of Lake Michigan water into the rivers. (4)

Between 1907 and 1910, the MWRDGC constructed a second canal called the North Shore Channel. It extended from Lake Michigan at Wilmette in a southerly direction to the north branch of the Chicago River. The Wilmette Controlling Works regulates the amount of Lake Michigan flow allowed down the channel with one vertical lift gate. The four abandoned 250 cfs pumps have not been used for diversion since the 1970s. (1) Finally, the Calumet-Sag Channel was constructed to carry sewage from South and East Chicago to the Chicago Sanitary and Ship Canal. The O'Brien Lock and Dam is located on the Calumet River and regulates the flow of Lake Michigan water into the Calumet-Sag Channel. (4)

The Chicago Sanitary and Ship Canal followed the course of the older I & M Canal. In 1938, the Chicago River Controlling Works was constructed at the mouth of the Chicago River, regulating the amount of Lake Michigan water allowed to pass into the river and restricting river flooding from entering Lake Michigan. The Lockport Lock and Dam controls the water level in the Chicago Sanitary and Ship Canal. (1)

In 1967, a U.S. Supreme Court Decree limited the diversion of Lake Michigan water by the State of Illinois and its municipalities, including sewage and sewage effluent derived from domestic pumpage, to a

five-year average of 3,200 cubic feet per second (cfs). The USACE was to have a role of “general supervision and direction.” The 1967 Decree as amended on December 1, 1980 limits the diversion, including domestic pumpage, to an average of 3,200 cfs over a 40-year running average accounting period. (2)

Sources of Diversion - The Lake Michigan diversion consists of three primary components:

1. Domestic Pumpage from Lake Michigan used for water supply and not returned to lake,
2. Stormwater Runoff from the diverted Lake Michigan watershed, and
3. Direct Diversions through the three-lakefront control structures.

Domestic Pumpage from Lake Michigan is used for water supply and its effluent is discharged to the canals via various Water Reclamation Plants (WRPs). Currently, the WRPs that divert domestic pumpage from the lake either discharge to the canal system or to the Des Plaines River and its tributaries. (1)

Since the last comprehensive Lake Michigan water reallocation in 1999, the IDNR has issued nine new Lake Michigan water allocation permits with a combined WY2020 allocation of around 16 million gallons per day (mgd). Two of the new allocations (Villages of Plainfield and Shorewood) represent a new geographic area of Lake Michigan water supply, while the others represent allocations to areas already within the established Lake Michigan water service area. (6)

In 2003, the Northeastern Illinois Planning Commission released their regional forecasts of population, households and employment for the year 2030. Between 2000 and 2030, it is forecasted that the six county N.E. Illinois area will be home to an additional 1.94 million people (from 8,091,720 in 2000 to 10,034,835 in 2030). Many people have assumed that the majority of this growth will be located in the far outlying, rapidly growing suburban fringe areas. However, the report reveals that around 1.16 million (60%) of the 1.94 million will be located in areas that currently receive Lake Michigan water. (6)

IDNR’s long standing water allocation policy has been to provide adequate allocations to meet the current and long term needs of existing permittees. However, the question remains whether this forecasted growth can be accommodated within the constraints of the Decree. Although the diversion for Water Years 2004-2006 are still rough estimates, over the past nine years (1998-2006), Illinois’ diversion has averaged around 2,739 cfs, which is 461 cfs less than the 3,200 cfs legal limit (461 cfs = 298 mgd.) The expected additional 1.16 million residents in the Lake Michigan service area will be added incrementally over the next 25 years, with an ending water demand of around 145 mgd, based on an expected per capita consumption of 125 gallons per capita per day. On paper, at least, it appears that this additional growth can be accommodated, if diversion in the future is similar to what has occurred in the recent past. That however, is an assumption that has a fair degree of uncertainty, given the large variation that can occur with the components of Illinois’ diversion known as direct diversion and stormwater runoff. (6)

Current Lake Michigan water allocation policy requires that new applicants demonstrate that switching over to Lake Michigan water will be the most cost effective long-term water supply and/or that switching over to Lake Michigan water will reduce withdrawals from the deep bedrock aquifer. The ongoing Lake Michigan water reallocation will extend Lake Michigan water allocations for all current water supply permittees out to the year 2030. The IDNR expects to have the ability to allocate sufficient Lake Michigan water to meet the future needs within the current Lake Michigan water service area. (6)

Stormwater runoff that previously drained to Lake Michigan through the Chicago River and the Calumet River now drains to the Chicago Sanitary and Ship Canal and the Calumet Sag Channel, respectively. The drainage area of the diverted Lake Michigan watershed is approximately 673 square miles. (1)

This component of diversion cannot be measured directly and varies considerably depending on the frequency and magnitude of storm events in the Chicago metro region. The Corps uses complicated hydrologic simulation models to estimate this component of flow and has estimated the long-term average stormwater runoff to be 800 cfs. This is approximately 25% of Illinois' allowable diversion, and is another component of diversion over which the state has no control. It is a flow component that has increased dramatically over the century due to continued urbanization in the watershed and to the documented increases in both frequency and magnitude of precipitation events. Based on Corps' Diversion Accounting Reports from 1986-2003, stormwater runoff has averaged 835 cfs. While it remains to be seen if future years will result in a running average stormwater runoff figure closer to the simulated long-term average of 800 cfs, the current estimated 18-year average of 35 cfs over the long-term average can account for 630 cfs-years of Illinois' accumulated water debt. (6)

Direct diversions occur at three lakefront locations: the Chicago River Controlling Works (CRCW), the O'Brien Lock and Dam, and the Wilmette Pumping Station. The direct diversion at each of these locations consists of four components: *lockage, leakage, discretionary flow and navigation makeup flow.*

➤ *Lockage Component* - is the flow used in locking vessels to and from the lake and is managed and operated by the Corps of Engineers. This diversion is dependent on the number of lockages in a given year and on Lake Michigan water levels. Federal navigation policy is that they operate the locks on demand, which means that a vessel is allowed to lock through even if they are the only vessel. The Chicago River lock is the second busiest lock in the country, and the O'Brien lock is in the top ten. Since lake levels have been well below average the last few years, this component of diversion has also been well below the long-term average estimate of 130 cfs. Estimating this component of diversion in the future is very difficult since it is very dependent on Lake Michigan water levels. (6)

➤ *Leakage Component* - is water estimated to pass, in an uncontrolled way, through or around the three-lakefront structures that separate the lake from the waterway. This leakage occurs through the locks, sluice gates, and retaining walls. Historically, leakage flows have fluctuated considerably, based on lake levels and on the conditions of the structures that separate the lake from the river. Most of these structures are operated and maintained by the Corps, which is why MWRDGC no longer has an allocation for leakage. The structures that are not under Corps control include the new Chicago River Turning Basin Wall, which the state built in 1999, and the structures at Wilmette Harbor (1 sluice gate and a pump house). (6) Leakage at the CRCW was substantially reduced with repairs to the lock and turning basin walls during the low Lake Michigan levels in the summer of 2000. (4)

Leakage was excessive in the early 1990s due to high water levels on Lake Michigan and bad seals on the Chicago River lock gates. At that time, it was estimated that leakage through the Chicago River lock was in the range of 300 cfs, and was a significant contributor to Illinois' excessive diversion. The Chicago River lock has exceeded its design life. It is in need of major rehabilitation. The Corps has prepared plans for this but has not been able to receive authority to begin this project from Congress. Fortunately with below average lake levels, this problem has been minimized; however, it could again become a significant diversion management problem if lake levels rise. (6)

➤ *Discretionary Component* - purpose is to maintain the waterways in a reasonably satisfactory sanitary condition by dilution of effluent discharges. In WY2000, the IDNR revised the allocation to the MWRDGC. Their allocations for lockage and leakage were removed since these diversion components are no longer under their direct control, and their allocations for discretionary diversion and navigation make-up water were revised. Discretionary diversion was set at 270 cfs through WY2014 (prior to WY2000, it was set at 320 cfs.), then is reduced to 101 cfs in WY2015 and thereafter. This reduction (from 270 cfs to 101 cfs, a reduction of 169 cfs, or 109 mgd) recognizes that TARP Phase II should be operational by then. (6) Discretionary diversion is seasonal and scheduled such that most of the diversion flow occurs during the warm weather, low flow months of June through October. (4)

➤ *Navigation Makeup Water Component* - is water diverted in the Chicago waterway system to maintain adequate depths required for safe navigation. During forecasted storm events, the water level in the canal system is drawn down as a flood control measure. Depending on whether the Chicago area receives the forecasted rainfall, there may be a need for a navigation make-up diversion. Over the last several years, the IDNR has been working with the USACE to study ways of potentially reducing this component of diversion. This is a complicated issue, since minimum water levels in the canal system are specified in the Code of Federal Regulations. Any change in the Code that would allow a smaller diversion for this flow component must be supported by a detailed Environmental Impact Analysis. While this effort is being pursued, it is expected to be a lengthy process. (6)

The navigation make-up allocation to the MWRDGC was set at 305 cfs through 2020. MWRDGC is allowed to bank unused water from navigation makeup and discretionary diversion over a five year running average to assist them in proper operation of the canal system. Currently their five-year running average is 307 cfs, which is 2 cfs over the combined allocation limit of 305 cfs. (6)

Navigation flows are seasonal and dependent on the level of Lake Michigan because flow through the structure is by gravity only. Leakage has been reduced through repair of gates and construction of new walls. The U.S. Geological Survey (USGS) reported the average annual discharge downstream of the three diversion facilities for the 2001 water year as 80 cfs at the Wilmette Controlling Structure, 217 cfs at the O'Brien Lock and Dam and 312 cfs at the CRCW. (4)

In January 1998, scientists from the USGS, taking routine measurements in the Chicago River, recorded a bi-directional flow in the river. At the surface, the river was flowing east to west, away from Lake Michigan, as expected. However, deep below, near the riverbed, water was traveling west to east, toward the lake. The odd flow was noticed during the following winters as well. During summer months, when boat traffic on the river was high and there was more traffic through the lock, the river flowed away from the lake. But in the winter months, the unusual flow returned. (3)

It was also troubling from an environmental standpoint. If water was flowing eastward in the Chicago River, it had to be coming from the North Branch of the river, which receives much of its flow from one of the world's largest wastewater treatment plants. Water from the North Branch would surely lessen the water quality of the Chicago River, which has a higher use classification. If poorer-quality water was making its way from the river into the lake, through either pumping or leakage, it could potentially threaten the water quality of the lake. (3)

In 2001, Marcelo García, a professor at the University of Illinois, Civil and Environmental Engineering Department, and fellow researchers successfully proved the likelihood that density currents were causing the bi-directional wintertime flow. With funding provided by the MWRDGC and the IDNR, a fiberglass model was built so that the flow depths would be measurable within the laboratory, convincingly proving density currents are most likely the cause. Analysis of flow velocity profiles measured by the USGS confirmed that during the winter months, density flows develop rather frequently in the Chicago River; eight such events were recorded during January 2004. (3)

Compliance with the U.S. Supreme Court Decree - The USACE has recently certified flows of Illinois' diversion of water from Lake Michigan for Water Years 2002 and 2003. Diversion in Water Year 2002 was 2,919 cubic feet per second (cfs), which is 281 cfs below the annual limit of 3,200 cfs. In Water Year 2003, Illinois diversion was 2,398 cfs, which is 802 cfs below the annual limit! Water Year 2003 set a record for the lowest recorded diversion. As a result, at the end of the 2003 accounting year, Illinois' water debt has been reduced to just 776 cfs-years. This is great news, and continues the trend of reducing our water debt much faster than originally anticipated. Ten years ago, Illinois' water debt stood at 3,725 cfs-years. Illinois' commitment to the other Great Lakes states was to eliminate the water debt by the end of water year 2019. While unofficial, the preliminary estimates of Illinois' diversion for Water Years 2004, 2005 and 2006 are all well below the 3,200 cfs limit. When the USACE release the Diversion Accounting Report for Water Years 2004 and 2005, it is anticipated they will certify that Illinois has fully repaid its water debt. (6)

Eliminating Illinois’ water debt is significant for several reasons. First, it means that Illinois is in full compliance with the U.S. Supreme Court Decree, reducing the potential for conflict with neighboring Great Lakes states. Second, since diversion is strongly influenced by climatic conditions, such as rainfall and water levels on Lake Michigan, it is good policy to have a positive water balance account to enable weathering those times when these climatic factors will cause the diversion to be higher. Lastly, and perhaps of most importance to those who depend on Lake Michigan as a water supply, it increases confidence that the future water demands of the Lake Michigan water service area can be met while staying within the constraints of the Supreme Court Decree. (6)

The **Tunnel and Reservoir Plan (TARP)** is designed to reduce combined sewer overflows (CSOs) into the Chicago and Calumet River systems. TARP consists of tunnels and reservoirs, which intercept CSOs and hold them until the stored wastewater can be pumped to the treatment plants for full treatment. TARP’s purpose is to eliminate water pollution and flooding across Cook County, which originates from combined sewer areas. The tunnels were designed to catch the dirtiest “first flush” portion of the CSO from entering the river and the reservoirs were intended primarily for flood control. TARP capture lessens the need for river reversals to Lake Michigan, a not uncommon pre-TARP method of flood control. Once completed, TARP will consist of 109 miles of tunnels and 15.15 billion gallons of reservoir storage collecting the flow from almost 400 combined sewer overflow points (revised August 2007, MWRDGC). (4)

The purpose of the discretionary diversion allocation is to allow the MWRDGC to divert Lake Michigan water directly into the Chicago Waterway system at the three-lakefront locations during the summer months in order to improve water quality. The primary concern is to keep dissolved oxygen (D.O.) levels above the standard and to assist in moving water down the system to the Des Plaines River. When completed, TARP is supposed to improve conditions by eliminating combined sewer overflows, which would in turn, reduce the need to flush the waterway with Lake Michigan water. (6)

Issues of Concern - The central issues of concern given for proposing the inclusion of the waterways are as follows:

1. Water Quality
2. Invasive Species
3. Riparian Habitat
4. Parks, Recreational Activities, and Public Access

Water Quality

More than 70 percent of the annual flow in the Chicago Area Waterway System is from the discharge of treated municipal wastewater effluent from the following four MWRDGC Water Reclamation Plants (WRPs):

Stickney WRP discharges to the Chicago Sanitary and Ship Canal in Cicero. The plant encompasses approximately 507 acres, and has an average design flow of 1.2 billion gallons per day (bgd) and a design maximum flow of 1.4 bgd, making it perhaps the largest wastewater treatment facility in the world. The Stickney plant provides secondary wastewater treatment for more than 2 million people in a 260 square mile area. (4)

Calumet WRP is situated near the Little Calumet River’s Acme Bend. It has an average design flow of 354 mgd and a maximum design flow of 430 mgd. The service area for this facility is approximately 300 square miles and provides wastewater treatment for approximately 1.2 million people. (4)

North Side WRP discharges to the North Shore Channel near Howard Street. The average design flow from this facility is 333 mgd, with a maximum design flow of 450 mgd. The plant provides wastewater treatment for approximately 1.3 million people in the north Chicago area. (4)

Lemont WRP is situated on the lower reaches of the Chicago Sanitary and Ship Canal near Lemont. The plant's average design flow is 3.4 mgd, with a maximum design flow of 4 mgd. The Lemont WRP provides secondary treatment of wastewater for approximately 12,000 people in a service area that includes 21 square miles. (4)

Combined sewer systems are sewers designed to collect rainwater runoff, domestic sewage, and industrial wastewater in the same pipe. During dry weather periods, combined sewers in the Chicago area waterways transport all of their wastewater to one of the WRPs, where it is treated and then discharged to the river. During wet-weather periods, the wastewater volume in a combined sewer system can exceed the capacity of the sewer system and the existing TARP tunnels. For this reason, combined sewer systems are designed to overflow occasionally and discharge diluted excess wastewater directly to a waterbody. The CSOs contribute to water quality degradation by introducing high levels of bacteria from raw sewage, suspended sediment loading and oxygen demanding substances. Approximately 369 permitted CSOs discharge into the Chicago waterway system, with the dominant contributions coming from those permitted by the City of Chicago, the MWRDGC and the City of Evanston (revised August 2007, MWRDGC). (4)

Five of the CSOs are from major MWRDGC pumping stations. MWRDGC's ongoing TARP Project was implemented to alleviate the polluting effects of CSOs and to provide relief from local flooding by providing holding capacity for 18 billion gallons of combined sewage in its tunnels and reservoirs until it can be pumped to the WRP for full treatment. Although the main reservoirs will not be operational until 2023, significant benefits have already been realized. It is estimated that since the first of the tunnels went online in 1985, more than 850 billion gallons of CSOs have been captured and conveyed to the WRPs for full treatment. Since TARP went online, the waterways have seen an increase in both fish population and diversity of species present. Basement and street flooding have also been reduced and fewer floodwater discharges to Lake Michigan have occurred. To date, more than \$2.7 billion have been spent on the project (revised August 2007, MWRDGC). (4)

Numerous innovative treatment systems (e.g., side-stream elevated pooled aeration structures, TARP) have been placed in the Chicago waterway system to help alleviate water quality problems. However, even with this technology in place, there are still areas of water quality impairment, particularly as it relates to D.O. and temperature. In those reaches where D.O. levels cannot meet General Use standards, even after treatment technologies have been implemented, a site-specific standard may be more appropriate. (4)

The MWRDGC has implemented a CSO notification program for the Chicago waterway system and other surrounding communities are in the process of implementing their own programs. The purpose of the program is to notify the public when overflow events occur that may impact designated uses in the waterways. (4)

The basis for creating use designations for waterways is in the Clean Water Act, which states it is the national goal for waterways to be "fishable and swimmable." The two major use designations that apply to the Chicago waterway system follow:

The General Use water quality standards, comply with Clean Water Act goals in that they protect aquatic life, wildlife, agricultural use, secondary contact, most industrial uses and safeguard the aesthetic quality of the aquatic environment. Primary contact uses are protected for all General Use waters whose physical

configuration permits such use (35 IAC 302.202). Illinois defines primary contact as any recreational or other water use in which there is prolonged and intimate contact with the water involving considerable risk of ingesting water in quantities sufficient to pose a significant health hazard, such as swimming and water skiing. (4)

Secondary Contact and Indigenous Aquatic Life Use standards are intended for those waters not suited for general use activities, but which are appropriate for all secondary contact uses and are capable of supporting indigenous aquatic life limited only by the physical configuration of the body of water, characteristics and origin of the water and the presence of contaminants in amounts that do not exceed water quality standards listed in 35 IAC 302 Subpart D. Secondary contact means any recreational or other water use in which contact with the water is either incidental or accidental and in which the probability of ingesting appreciable quantities of water is minimal, such as fishing, commercial and recreational boating (e.g., canoeing and kayaking) and any limited contact incident to shoreline activity. Since the Secondary Contact Use class does not meet the Clean Water Act goals of “fishable/swimmable,” the state must conduct a Use Attainability Analysis in order to justify any deviation from a General Use designation. (4)

The Chicago waterway system has three waterways classified as General Use including the:

- North Shore Channel from the North Side WRP up to Lake Michigan
- Chicago River from the CRCW to the junction of the NBCR
- Calumet River from the O’Brien Lock and Dam to Lake Michigan

The following provides water quality information, specific to each waterway segment:

Main Stem Chicago River - The Chicago River is currently designated General Use, but on occasion the flow in the NBCR will enter into the Chicago River when the force of the discretionary diversion and lock flow is not sufficient to overcome a density current (discussed on page 9) found in the Chicago River (personal communication, Lanyon 2003). This can cause the bacteria standard for this reach of the waterway to be exceeded. Between the period of November and April, no discretionary diversion water is withdrawn from Lake Michigan through the Chicago River Controlling Works. (4)

South Branch Chicago River - The only water quality impairment listed in the state’s 2004 305(b) report is from PCBs, which are contributing to advisories on fish consumption. The South Branch’s current use designation is Secondary Contact. (4) Temperature issues from the Midwest Generation, LLC, Fisk Electric Generating Station interfere with upgrading the South Branch’s aquatic life designation. Episodic wet weather related sags in D.O. below the standards occur as a result of CSO events. (Rob Sulski, IEPA, August 2007)

South Fork of the South Branch - The headwaters of the South Fork used to be the site of the Union Stock Yards from the late 1800s until closing in 1971. The South Fork was also the recipient of large amounts of slaughterhouse and rendering waste. As a result, the sediments in the South Fork are heavily contaminated from old by-products of the stockyards, plus organic matter from the Racine Avenue pump station (Hill 2000). (4)

The South Fork is primarily a stagnant side-channel to the South Branch, as the original creek has been mostly filled in. Currently, there is virtually no natural flow into the system. Most flow occurs when the MWRDGC Racine Avenue pumping station is discharging CSO to the South Fork. The flow coming from this pumping station is high in oxygen demanding compounds as well as floatable materials (e.g., sanitary waste products). The South Fork is impaired by high pH, low D.O. and total phosphorus (IEPA 2004). The primary cause of impairment is from CSOs along the South Fork, with the majority of the

flow coming from the Racine Avenue pumping station. The South Fork's current use designation is Secondary Contact. (4)

North Branch Chicago River - The MWRDGC owns, manages and controls the Webster Avenue aeration station, which is used to increase D.O. levels in the waterway and the North Branch pumping station near Lawrence Avenue. The Lawrence Avenue pumping station discharges CSO flow to the NBCR when the TARP tunnels are full. (4)

Water quality impairments listed in the state's 2004 305(b) report for the North Branch are silver, total nitrogen, D.O., total dissolved solids, chlorides, physical habitat alterations, total suspended solids, aldrin, iron, flow alterations, oil and grease, and Pand hexachlorobenzene. Potential causes for impairment include municipal point sources, combined sewer overflow, urban runoff/stormwater, hydro-modification, channelization, habitat modification, bank or shoreline modification, highway maintenance and runoff, contaminated sediments and flow regulation. Episodic wet weather related sags in D.O. below the standards occur as a result of CSO events. The North Branch's current use designation is Secondary Contact. (4)

North Shore Channel - Through the 1960s and early 1970s, the North Shore Channel was flushed on a regular basis by opening the Wilmette sluice gates to allow fresh Lake Michigan water flush down the channel. During this period, the water quality in the Upper Channel was very good, consisting primarily of lake water. However, in recent decades, discretionary diversion flows have been reduced which has affected water quality.

Unlike the rest of the Chicago waterways, the North Shore Channel carries two use designations. The reach of this waterway above the North Side WRP is designated as General Use, whereas, the section of the North Shore Channel downstream of the North Side WRP is designated as Secondary Contact and Indigenous Aquatic Life. The General Use portion of this waterway receives CSO and overflows from storm sewers. Most of the time this segment of the North Shore Channel experiences periods of no or little flow as a result of reduced discretionary diversion from Lake Michigan (personal communication, Dick Lanyon, MWRDGC 2003). The lack of flow creates a stagnant situation, resulting in D.O. levels falling below Illinois water quality standards and General Use bacteria standards. (4)

The North Side WRP discharges to the North Shore Channel near Howard Street in Skokie. The main portion of the North Side WRP began operation in 1928 and was a model for modern sewage treatment technology. The plant serves over 1.3 million people residing in a 141 square mile area, which includes the City of Chicago, north of Fullerton Avenue, and the northern Cook County suburbs. The North Side Plant removes pollutants from wastewater through a series of physical and biological processes. The plant has a design capacity of 333 million gallons per day. (10)

This plant provides the primary flow for the North Shore Channel downstream of Howard Avenue. The flow from the North Side WRP creates a backwater area upstream of the facility and occasionally provides a flow of wastewater upstream to Lake Michigan during extreme wet-weather conditions. Approximately 16 reversals have occurred at the Wilmette pump station since 1985 and they have ranged in magnitude from nine (9) to 774 million gallons (MWRDGC 2004). (4)

Just downstream of the North Side WRP is the Devon Avenue Instream Aeration Station. This aeration station helps aerate the North Shore Channel when D.O. levels fall below the water quality standard, as measured by a D.O. probe at the North Branch Pumping Station. According to the IEPA 2004 305(b) report, the North Shore Channel is impacted by zinc, nickel, total nitrogen, D.O., total phosphorus, PCBs, fecal coliforms, flow alterations, physical habitat limitations and excess algal growth. More recent data suggest zinc and nickel are no longer pollutants of concern in the North Shore Channel. (Rob Sulski,

IEPA, August 2007) Causes of impairment include CSOs, municipal point sources, stormwater runoff, flow regulation at Wilmette, hydro-modification of the waterway and channelization. (4)

The current official status of the Upper North Shore Channel is General Use based upon historical water quality conditions maintained by regular flushing of the channel with lake water through the Wilmette sluice gates. The MWRDGC discharges treated, but not disinfected, wastewater from the North Side plant into the channel, which further impedes flow of water in the channel between the sluice gates and Howard Street. The IEPA, through the Use Attainability Analysis, has determined that the current water quality of the channel is such that it should be designated as Limited Contact Recreation due to the high bacterial counts and stagnation (low oxygen) in the channel. Although the current water quality supports this designation, usage of the Upper North Shore Channel by recreational canoeists and rowing teams is increasing yearly. (9)

Proposed Use Classifications and Water Quality Standards for the Chicago area waterways The integrated assessment of the physical, chemical, biological, and waterway use conditions in the Chicago waterways has resulted in recommendations for revised use classifications and water quality standards. The six factors that the state must take into consideration when conducting a Use Attainability Analysis in order to demonstrate that the attainment of a Clean Water Act goal use is not feasible, was specifically included in the stakeholder involvement process. The Chicago area waterways Use Attainability Analysis differs from most, in that, improving conditions are prompting a potential use upgrade for most reaches rather than the typical scenario where existing conditions are not supporting an existing designated use and are prompting consideration of a use downgrade. In either case, the criteria are still applicable. In the case where a use upgrade is being considered, the criteria were applied in evaluating the feasibility of potential future use designations rather than ones that are already in place. Summarized below are the six factors affecting use attainment in various reaches of the Chicago area waterways. (4)

Factor 1- Naturally occurring pollutant concentrations prevent the attainment of the use.

Factor 2- Natural, ephemeral, intermittent or low flow conditions or water levels prevent the attainment of the use, unless these conditions may be compensated for by the discharge of sufficient volume of effluent discharges without violating state water conservation requirements to enable uses to be met.

Factor 3- Human-caused conditions or sources of pollution prevent the attainment of the use and cannot be remedied or would cause more environmental damage to correct than to leave in place.

Factor 4- Dams, diversions or other types of hydrologic modifications preclude the attainment of the use and it is not feasible to restore the water body to its original condition or to operate such modifications in such a way that would result in the attainment of the use.

Factor 5- Physical conditions related to the natural features of the water body, such as the lack of a proper substrate, cover, flow, depth, pools, riffles, and the like, unrelated to water quality, preclude attainment of aquatic life protection uses (may be used for determining aquatic life use, but may not be used solely to determine recreational use).

Factor 6- Controls more stringent than those required by Sections 301(b) and 306 of the Clean Water Act would result in substantial and widespread economic and social impact.

Given that more than one of the six criteria is applicable, certain uses cannot be attained in the Chicago area waterways. Factors 2, 3, 4 and 5 prevent the consistent attainment of a high quality aquatic life that would meet the goals of the Clean Water Act. Good quality aquatic habitat is limited and the waterways would need to undergo major habitat restoration to improve the fish and macroinvertebrate assemblages.

Despite the physical limitations observed, there are reaches that have experienced dramatic improvements in water quality since the original Secondary Contact and Indigenous Aquatic Life Use standards were established. Such improvements must be recognized through an upgrade in water quality standards where appropriate. (4)

The recreational use data demonstrate that Secondary Contact forms of recreation (e.g., kayaking, canoeing, fishing and recreational boating) are occurring in the waterways, and these uses need to be protected. The physical and institutional limitations, along with periodic impairments to water quality from the CSOs and stormwater, prevent the attainment of Primary Contact recreation (e.g., swimming) for the next ten years. Technological improvements in capturing CSOs and controlling stormwater runoff have improved water quality. Most communities with CSOs are in the process of implementing basic control measures and funding the long-term control measures by completing TARP. (4)

Use Attainability Analysis Progress and Studies

(IEPA: Environmental Progress – Winter 2005; revised August 2007, Rob Sulski IEPA)

The Use Attainability Analysis concluded that “secondary contact standards” in effect since the early 1970s, involving only “incidental and accidental” human contact and that did not provide for balanced aquatic wildlife, could be upgraded on several river segments. It found that improved wastewater treatment, stream aeration stations and TARP had contributed to substantial improvement in water quality throughout the Chicago metro area, and increased recreational use and fish populations had resulted. Detailed engineering analyses are underway to provide the costs and feasibilities of the various management options, with eliminating combined sewer overflows, disinfection of treated wastewater discharges, additional supplemental aeration, flow augmentation and cooling.

(Source: <http://www.epa.state.il.us/environmental-progress/v30/n4/chicago-waterways.html>)

Invasive Species

Two species of Asian carp (bighead and silver) have spread up the Mississippi River system since escaping southern fish farms in the 1980s. The carp are now found in the Illinois River, where they are poised to enter the Great Lakes through the Chicago Sanitary and Ship Canal. Fisheries biologists believe that if Asian carp enter the Great Lakes they will out-compete native fish for food and habitat, disrupt the ecosystem, and crash the region's \$4.5 billion fishery, which is what happened in the big pools of the Mississippi River where Asian carp now make up over 90 percent of the fish life.

(Source: <http://www.greatlakesnews.org/story3.htm>)

A temporary barrier was constructed in 2002 in the Chicago Sanitary and Ship Canal to block the Asian carp from endangering the lakes' ecosystem. It has an estimated life of three to five years and cables that provide its electric current are beginning to corrode. Thus far, Congress has failed to appropriate the monies needed to complete the construction of a permanent barrier and to fund its ongoing operating costs.

In January 2007, bi-partisan legislation to fund the completion and maintenance of the permanent Asian carp barrier was introduced in Congress under House Bill - HR 553 and Senate Bill - S 336. The Great Lakes Asian Carp Barrier Act (H.R. 553) would direct the Secretary of the Army, at federal expense, to: (1) upgrade and make permanent Barrier I, construct Barrier II, operate and maintain Barriers I and II as a system, conduct a study of a range of options and technologies for reducing impacts of hazards that may reduce the efficacy of the Barriers, and provide to each state a credit in an amount equal to that of funds contributed by the state toward Barrier II (which the state may apply to any cost-sharing responsibility for an existing or future federal project with the Corps of Engineers); and (2) conduct a feasibility study of the range of options and technologies to prevent the spread of aquatic nuisance species between the Great

Lakes and the Mississippi River basins through the Chicago Sanitary and Ship Canal and other aquatic pathways. (Source: http://www.washingtonwatch.com/bills/show/110_HR_553.html#toc0)

There has been a growing interest in exploring the issues associated with the ecological separation of the Lake Michigan and Des Plaines River watersheds to provide a 100% effective barrier against the exchange of aquatic invasive species. The Alliance for the Great Lakes has received funding from the Great Lakes Fisheries Commission, the Great Lakes Fisheries Trust and the International Joint Commission to conduct a preliminary scoping study. While ecological separation can imply a number of potential control options such as a chemical barrier or creating a dead zone in a portion of the Chicago waterway, in all probability this study will focus on hydrologic separation of the two watersheds. Depending on where in the waterway a separation control structure/s is/are proposed, this could impact the measurement and determination of Illinois' diversion. While this study may be a catalyst for further action, it will not eliminate the need for Congress to fund much more detailed studies by a consortium of Federal agencies, which could easily take ten years and \$20-30 million to complete. (6)

Riparian Habitat

Main Stem Chicago River - The channel's riparian land use is limited with segments bordered by the riverwalk. (4)

South Branch Chicago River - The neighborhoods surrounding this reach have one of the lowest amounts of open space per capita (Gobster and Westphal 1998). The channel's riparian land use is mainly commercial and industrial. There is limited pioneer vegetation in abandoned lots. Aquatic habitat is limited to areas under bridges. (4)

South Fork of the South Branch - The channel's riparian land use is dominated by industrial and commercial uses, although there is an upscale single-family home development being constructed. (4)

North Branch Chicago River - The upper segment's riparian land use includes a mix of commercial, industrial, residential, parks and open space. The upper segment has a continuous band of dense vegetation along the banks, which provides habitat for a variety of fish, birds, and turtles. The lower segment's riparian land use includes a mix of industrial/commercial and residential uses, and has limited aquatic life around bridges and piers. (4)

The riparian land use along the North Branch Canal includes a mix of industrial/commercial and limited natural vegetation. The canal has limited aquatic life around bridges. The fenced off banks offer limited access to the river in this reach, with shoreline recreational uses restricted to some fishing and river viewing from bridges. While there is some natural vegetation along the banks, the majority of riparian land consists of commercial and industrial buildings. A small marina is on Goose Island, but it is primarily limited to putting in recreational boats for storage and launching them in early summer. (4)

North Shore Channel - The narrow channel has vegetative overhang and provides habitat for various fish, bird, and turtle species. The riparian area has many older trees, picnic facilities, parks, a few launches for non-motorized boats and some paved trails. From an ecological perspective, the North Shore Channel provides an important riparian habitat that is generally lacking in the greater Chicago section of Lake Michigan. Conservation of rare and endangered species and migratory bird stopover areas depends on efforts to improve and protect habitat along the North Shore Channel and the Chicago River, as well as the Lake Michigan shoreline. NOAA has produced an Environmental Sensitivity Index map for the Lake Michigan Shoreline, which shows the channel as an ecologically sensitive habitat for waterfowl and other water birds. (8) The North Shore Channel provides habitat for belted-kingfishers, warblers, beavers, black-crown night herons and various types of water turtles. The black-crowned night heron was placed

on the Illinois endangered species list in 1977. The herons are protected under the Migratory Bird Treaty Act of 1918 and the Illinois Wildlife Code of 1971. (4)

The banks of the Upper North Shore Channel represent the largest remaining woodland habitat in Evanston and provide a critical corridor for wildlife on Chicago's North Shore. Migratory birds, especially waterfowl, find it a safe resting stop for spring and fall migration. Aquatic wildlife observed along the North Shore Channel includes common snapping turtles, red-eared sliders and bullfrogs. Animals as large as whitetail deer and coyotes use the channel banks as part of their natural territorial range or for movement in and out of the Evanston area. The channel also supports a local beaver population. It is also an important potential preserve for native plants though it has suffered from extensive invasion by exotic species. A species list for wildlife observed along the Upper North Shore Channel (recorded by the Evanston Ecology Center) is provided in the report. (9)

Parks, Recreation, and Public Access

Chicago River Corridor Development Plan - In 1993, the City Space Program was initiated by the City of Chicago to improve the quality of life for Chicagoans, particularly children and youth. The City of Chicago, the Chicago Park District and the Forest Preserve District of Cook County developed City Space jointly. It is an intergovernmental initiative, which sets open space development goals, policies and priorities. Two-hundred specific projects to increase open spaces in Chicago, including neighborhood parks, community gardens, river trails, nature preserves and new lakefront parks were identified. (4)

The Greenways Project encourages businesses and neighborhood groups to work with local governments to propose greenways along inland waterways and abandoned rail corridors through intergovernmental collaboration and land donations. Capital projects incorporated as Greenways projects are derived from the 1998 Chicago River Corridor Development Plan and landscape improvements initiated as part of the River Greening Program. (4)

The River Corridor Plan was designed to establish a river edge park and walkway through downtown and a continuous greenway along the north and south branches of the Chicago River. The City created zoning policies that require new riverside developments to provide public access and landscaping in preparation for the eventual expansion of the riverwalk along the river's entire length. (4)

Main Stem Chicago River - Recreational navigation boating occurs in the Chicago River, with many excursion boats motoring up and down the downtown waterway. In addition, the Chicago University Rowing Team, through the Chicago River Rowing and Paddling Center, uses the river in the early morning hours for training. Friends of the Chicago River host several waterway recreational events each year, many of them taking place in the Chicago River as it flows through downtown. Several commercial canoe rental and launch facilities, such as Chicago River Canoe and Kayak and Chicagoland Canoe Base, cater to locals and tourists within the city. Marina City located under the building complex locally known as the "corncocks" provides recreational slips for pleasure boats. Light commercial barge traffic also occurs in the Chicago River. (4)

Recreation and navigation use surveys of the Chicago River were conducted for 14 days between June 24, 2003 and September 7, 2003. The teams counted the number of times various recreational uses were observed. The observed activities and the number of times observed were fishing 2 and power boating - 29. Commercial navigation was observed in areas where the USACE maintains the channel. Other recorded recreational uses include:

- Boat locking measured by the USACE was 17,372, 18,268 and 15,009 vessels in 2001, 2002, and 2003, respectively;

- Dragon Boat Races (sculling) by the Michigan Dragon Boat Association in 2004;
- Kayaking by the Chicago Area Sea Kayakers Association at the Chicago Lock;
- Sculling observed by the Chicago River Rowing & Paddling Association;
- Friends of the Chicago River estimated their proposed canoe access along the Chicago River would be 1,000 users in 2004;
- The Chicago River Schools Network estimate their proposed canoe access on the Chicago River System will be 10,000 users year round;
- Friends of the Chicago River estimated that in 2004, the Urban Canoe Adventures (U-CAN) canoe trips included 32 users and the Flatwater Classic 797 users. (4)

The Chicago Park District has plans for a small boat access opposite the mouth of the river at the Chicago Lock. It will be called DuSable Park (after the first non-native settler of this area). It will serve as a link between the Chicago River and Lake Michigan water trails. (11)

In addition to boating and sightseeing, many Chicagoans use the Chicago River for angling. The area between Michigan Avenue and Columbus Drive is popular with anglers, with a variety of gamefish species being caught (Gobster and Westphal 1998). (4)

South Branch Chicago River - Recreational amenities located along the South Branch include Ping Tom Park where there is access for fishing and three marina launch sites, including Crowley's Marina, Skokie Marine Corporation, and South Branch Marina. The River City Marina, located just south of the Loop, contains approximately 50 recreational boat slips. The Rezmer Development Group is requesting the City of Chicago approve their plans for 5,000 residential units to be located on 62 acres along the South Branch. A river walk will be developed along with this planned development. The City of Chicago is also planning to develop canoe launch sites at Ping Tom Park and Western Avenue. (4)

Recreation and navigation use surveys of the South Branch were conducted for 15 days between June 24, 2003 and October 1, 2003. The observed activities and the number of times observed were skiing -5, canoeing, kayaking, fishing and power boating -10, fishing -66, and power boating -89. Commercial navigation was observed in areas where the USACE maintains the channel. The Friends of the Chicago River estimate that in 2004, the Urban Canoe Adventures (U-CAN) trips included 32 users and their field trips included 240 users, for River Rescue Day. (4)

South Fork of the South Branch - The City of Chicago is planning to build a canoe launch at the Illinois and Michigan Canal Origins Park on Bubbly Creek and develop a pullover and drop-off point for canoes on Ashland Avenue (City of Chicago 1999). Bank fishing is also common at the South Branch confluence. Just north of the South Fork, between West 34th and 32nd Streets, is Bridgeport Village, a new single-family residential development. This is one of many new developments that are being constructed along the Chicago River area. Many of these developments are creating river walks to connect the waterways to the people. (4)

Recreation and navigation use surveys of South Fork were conducted on July 15, 2003. The only observed use was power boating. Commercial navigation was observed in areas where the USACE maintains the channel. The Friends of the Chicago River estimated 30 users in 2004 for River Rescue Day Canoe trips. (4)

North Branch Chicago River - At River Park, on the city's north side, a small dam creates a "waterfall" at the confluence of the North Branch and the North Shore Channel. It also marks the place where the North Branch becomes navigable. The North Branch becomes a wide, highly engineered river flowing

southeast through the neighborhoods of the city toward the downtown area. Several canoe launches will be located along this stretch of the river as the Chicago River Development Plan is put in place. (11)

Recreational activities in the North Branch include fishing, canoeing, kayaking and some power boating. The Lincoln Park Boat Club and the Chicago Union Rowing and Paddling Foundation share a boat launch facility near the North Avenue turning basin at the end of the Federal Navigable Waterway. The City of Chicago would like to enhance the existing facility with a boat storage and marina that would allow for motorized and canoe boat launches. Non-motorized boat facilities are also available at Clark Park, a ten-acre passive recreation area. (4)

The Friends of the Chicago River hold their annual Chicago River Flatwater Classic and other events in the lower reaches of the North Branch. The Annual Chicago Chase rowing regatta is also held here. West River Park, where the North Branch meets the North Shore Channel, is a favorite spot for fishing. The City of Chicago has plans to build a boat ramp from Argyle Street to the canoe launch in West River Park. The City also plans to build a ramp from Albany Street to the canoe launch at North Park and develop a water-edge portage path between these two canoe launches. (4)

At the dam structure in West River Park, the City has plans to rebuild the waterfall and create a safe run for small craft over the structure (City of Chicago 1999). Along with these improvements, the City plans to improve aquatic habitat in the river adjacent to West River Park. The MWRDGC and the Friends of the Chicago River are also looking at plans at dam modifications (MWRDGC August 2007). In addition to river access at West River Park, the City plans to encourage river access with new developments that would be constructed between Lawrence Avenue and Chicago Avenue. Also being planned are several boat-mooring structures associated with some restaurants and condominium complexes. (4)

Recreation and navigation use surveys of the North Branch were conducted for 16 days from June 17, 2003 through October 1, 2003. The observed activities and the number of times observed were skiing or tubing -2, wading -7, canoeing, sculling or kayaking -130, fishing -80, and power boating -105. Small craft commercial navigation was observed downstream of Addison Street where the USACE maintains the channel. The following additional recreation related activities are noted in the record:

- One boat launch at Clark Park; Multiple private docks;
- Chicago Chase Rowing Regatta – The Chicago Union Rowing and Paddling Foundation estimated 300 users in 2004 at Wolf’s Point Bridge;
- Canoes and kayaks available for rental - The Chicago River Canoe & Kayak Rental estimates 5,000 users launched at Skokie and Clark Park during 2004;
- The Lincoln Park Boat Club and Chicago Union Rowing and Paddling Foundation use North Avenue Boat House at Le Moyne & Magnolia at the North Avenue Turning Basin;
- The Chicago Union Rowing and Paddling Foundation proposed canoe access at Lawrence/North Ave./22nd St. and estimated 80 users between Feb. – Nov. 2004;
- Several events taking place on the river, including: River Rescue Day, canoe trips, Environmental Schools Network, Flatwater Classic, Restoration/Beautification Projects. The Friends of the Chicago River estimated that in 2004, Urban Canoe Adventures (U-CAN) trips included 433 users, field trips included 260 users, the Flatwater Classic included 797 users, and River Rescue Day included 760 users. (4)

North Shore Channel - Recreational craft can, and do, interchange between the Channel/Chicago River System and Lake Michigan. The North Shore Channel should be regarded as an extension of the recreational opportunities offered by Lake Michigan to the people of Illinois. The very straight bed of the channel and its protection from wind and waves make it ideal for beginner canoes and for sculling. The

Evanston Ecology Center hosts beginner canoe camps. (8) The Northwestern Rowing Club, the Loyola Academy Rowing Club and the New Trier High School Rowing Club all operate out of the Dammrich Rowing Center at Channelside Park. (9) This straight canal with a slow current and few powerboats is ideal for race practice, newer paddlers, and rowing shells. The Skokie Park District plans to create a boat access in a new park on Oakton Street. An old canoe landing at Bridge Street in the Ladd Arboretum could be rehabilitated to provide adequate access to the entire channel. (11)

Despite the deterioration of water quality in the upper North Shore Channel, usage of the waterway for recreational activities has been steadily growing and surrounding communities, especially the Village of Skokie, have been promoting usage of the channel and its surrounding parkway. The MWRDGC owns the land along McCormick Boulevard and the upper North Shore Channel. This land had been sorely neglected for a number of years and was by the mid-1980s a community eyesore. The MWRDGC developed guidelines and wanted suggestions for its improvement. The Village of Skokie came forward with plans to turn the area into a recreational park with biking and jogging paths, seating areas, etc. At the same time, a group of private citizens proposed using the park to display large-scale contemporary sculptures. What evolved by 1988 was the Skokie Northshore Sculpture Park, a collaboration between these two entities. The Village cleaned and landscaped the area and created parking lots, pathways, benches and other amenities. The citizens incorporated as a private not-for-profit organization with a mission to select, install and maintain a world-class sculpture exhibition and to provide educational programs to enhance the appreciation of these exhibits. (9)

Recreational uses include shore activities such as walking, fishing, biking, jogging, and nature exploration. Recreation and navigation use surveys of the North Shore Channel were conducted for 14 days between June 24, 2003 and October 1, 2003. The observed activities and the number of times observed were wading -1, fishing -57, canoeing, sculling or kayaking -16, and power boating -4. No commercial navigation was observed. The following additional recreation related information was noted:

- 3 canoe launches - 2 from Oakton and Ladd Arboretum, and 1 at Lincoln Village;
- The Woodlands Academy, Loyola Academy, North Park College, Northwestern University and New Trier High School Rowing Club report recreational use from mid-March to November at the Oakton and North Shore Channel launch;
- The Evanston Ecology Center reported 896 canoe launches in 2003;
- Recreational use was reported at the Skokie Park District Dock and Fishing Pier;
- Several events taking place on the channel, including River Rescue Day, canoe trips, and the Environmental Schools Network. (4)

The Ladd Arboretum is a living memorial to Evanston's past and present leaders. It is also a perpetual tribute to the individual initiative, community concern, civic cooperation and even worldwide involvement that have brought it into existence. It stretches along a three-quarter mile segment of McCormick Boulevard on a narrow, 23-acre strip of reclaimed land leased from the MWRDGC. It follows the diagonal course of the North Shore Channel from Green Bay Road to the northeast, to Emerson and Golf Road in the southwest. (9)

The Evanston Ecology Center was built in 1974 and serves as the educational nucleus of the Ladd Arboretum. The Ecology Center strives to foster a greater appreciation, awareness and knowledge of the natural environment and our interdependence with it. It houses an office, classroom/lecture room, a nature/gift store, a small resource library, and curriculum resource materials. Programs, classes, and services of the Ecology Center range from introductory natural history classes covering areas such as plant identification and animal study to sensory awareness programs for children and beginning naturalists. (9)

The Skokie Park District has developed the parkland along the western bank of the North Shore Channel into the Canal Bank North Park. This park is the site of the Skokie Northshore Sculpture Park, one of the premier outdoor arts facilities in the Chicago area, containing over 70 large-scale contemporary sculptures created by noted regional, national, and international artists. The District has been a leader in promoting recreational activities on the Channel with the opening of the Dammrich Rowing Center in 2001. This state-of-the-art facility is located on a 3.4-acre site on the east side of the Channel, north of Oakton St., and leased from the MWRDGC. It features a boat launch and a 5,000 square foot indoor training center, promoting kayaking, canoeing and sculling. There is free public access for non-motorized boats. (9)

Chicago Canoe and Kayak is a private organization that operates from Channelside Park on the East Side of the North Shore Channel on Oakton just east of McCormick. The organization provides rentals of canoes and kayaks, outings and trips. (9)

The Evanston Bicycle System Improvement Plan notes hazards associated with bike trail-roadway crossings and the potential for accidents. This plan also highlights the benefits of a path along the western bank of the North Shore Channel noted as follows, “Next to the lakefront path, the participants at the Community Bicycle Planning Workshop picked the Evanston and Skokie North Shore Channel trails as their most popular recreation destination. Skokie has plans to upgrade their Sculpture Park trails along the west side of the channel and they are currently constructing a new trail and park along the east side of the channel from Oakton to Main. It is the Recommendation of this plan that Evanston improves its portion of the North Shore Channel trail by upgrading existing trails, filling in crucial trail gaps and providing safe and convenient access connections to the trails.” (9)

In order to avoid dangerous roadway crossings and to provide an unimpeded bikeway from Green Bay Road to Oakton Street along the proposed eastern bank bikeway, the Evanston Environment Board proposes that the City of Evanston install bike path underpasses at the five bridges crossing the Channel in Evanston. (9)

Elderly and Handicapped Access for Canoeing - Easy access for the elderly and handicapped persons is lacking in the existing canoe access points (Ecology Center and Dammrich Rowing Center). Wheel chair access (ramp) and handicap friendly docking facilities would provide access to the channel. (9)

Wildlife Observation Paths and Viewing Platforms - Nature trails and viewing platforms would provide better access for people to observe wildlife, for use as fishing, and to view water activities such as the High School and Collegiate Rowing clubs. One area to be considered as a location might be along the bank side at Elizabeth Boynton Harbet Park. (9)

ICMP Opportunities, Projects and Studies for Consideration

Problems and issues that may be addressed by the ICMP include the following: research, testing and analysis, erosion, point and non-point source pollution, infrastructure, dredging, recreational access, and natural resource protection, creation, and rehabilitation. Other such topics can and should be applied to the River/Channel system, in synergy with activities appropriate for the like coastal region itself. Communities influenced by the system (Wilmette, Skokie, Chicago, Evanston and Lincolnwood) have addressed the revitalization and utilization of the system for natural resource, recreation and commercial purposes. (13)

Plan assistance, monetary or otherwise, can help these communities achieve the regeneration of the River/Channel system as a vital part of the region’s character. Financial assistance for accessibility and infrastructure repair has already been proposed. Additional assistance to address water quality, aquatic

life, and other surrounding resources (forest, wetland, marsh areas and their incumbent wildlife and foliage) provide an appropriate accompaniment to coastal area projects. (13)

There is a comprehensive watershed plan for the North Branch Chicago River watershed. The watershed plan contains numerous project recommendations for in-the-ground projects that will improve water quality, reduce flood damages, and enhance and restore natural resources in the watershed. In addition, the draft North Branch Open Space plan offers a great number of opportunities to improve conditions in the watershed through open space acquisition and restoration. The North Branch partnership has also been working on multi-objective flood damage reduction studies for several areas in the watershed. ICMP funding could be used for site-specific flood studies in many areas of the watershed that investigate how to reduce flood damages in an environmentally friendly manner. The funding could also be used to build in-the-ground projects recommended by completed studies as listed below:

- Development of programs and initiatives that promote park development and public walkways along the Chicago River system
- South Fork of South Branch (Bubbly Creek) – restoration and cleanup of 1.25 miles of riverine habitat and sediment on the South Branch of the Chicago River
- North Branch Canal – in stream water quality improvement and wetland habitat
- South, North, and Diversey Turning Basin – river bank and riverine habitat improvements to former commercial turning basins
- Ping Tom Park – reconstruction of riverbank
- DuSable Park – reconstruction of riverbank at mouth of river
- AAA Boat Yard – reconstruction of riverbank for new park site
- Horner Park – reconstruction of riverbank (stabilization and habitat improvements)
- Legion Park – reconstruction of riverbank (stabilization and habitat improvements)
- Devon Ave./Lincoln Village – bank improvements and public access to connect with adjacent suburban communities
- The conversion of the head of the North Shore Channel into a wetland environment to act as a “natural filter” for stormwater discharge from the channel into the lake should be a priority. (13)

Existing Authorities include the following:

- Metropolitan Water Reclamation District of Greater Chicagoland (MWRDGC)
- Illinois Department of Natural Resources (IDNR)
- Chicago, Evanston, Skokie, Lincolnwood, Wilmette, and their park districts
- Cook County Forest Preserve District
- United States Army Corps of Engineers, Chicago District and Rock Island District
- Illinois Environmental Protection Agency (IEPA)
- United States Environmental Protection Agency (USEPA)
- United States Coast Guard

Existing Committees

Friends of the Chicago River is the only organization solely dedicated to the Chicago River. Since 1979, Friends has been working to improve the health of the Chicago River for the benefit of people and wildlife and, by doing so, has laid the foundation for the river to be a beautiful, continuous, easily accessible corridor of open space in Metropolitan Chicago. Friends’ work spans the entire Chicago River system and its surrounding watershed, focusing on a greener river with a healthy habitat, an accessible river that people can use and enjoy, and a river cared for by a broad group of supporters. Friends work in

partnership with municipalities, businesses, community groups, schools, peer organizations, government agencies and individuals on projects that benefit the river.

Friends of the Chicago River website: <http://chicagoriver.org/home/>

References

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12. http://www.lrc.usace.army.mil/co-o/Chgo_Rvr.htm
13. IDNR Questionnaire and Outreach Response