

NORTH MILL CREEK-DUTCH GAP CANAL WATERSHED-BASED PLAN

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INTRODUCTION: The North Mill Creek-Dutch Gap Canal Watershed

1.1 WATERSHED SETTING

What is a watershed? A watershed is the area of land drained by a river/stream system or body of water. As simple as the definition sounds, a watershed is actually a complex interaction between ground, climate, water, vegetation, and animals. In today's developed watersheds, other elements such as sewage, agricultural drainage, impervious surfaces, stormwater and **erosion** are all detrimental to the health of the watershed.

Erosion: Displacement of soil particles on the land surface due to water or wind action.

The North Mill Creek-Dutch Gap Canal **watershed** is a subwatershed of the larger Des Plaines River Basin and encompasses approximately 23,532 acres or 37 square miles in north central Lake County, Illinois and south central Kenosha County, Wisconsin. The North Mill–Dutch Gap watershed includes 39 miles of stream, more than 4164 acres of wetlands and 24 named lakes encompassing approximately 1,066 acres. Smaller unnamed water bodies encompass approximately another 418 acres bring the total for open water to 1,484 acres across the watershed. North Mill Creek-Dutch Gap Canal is actually a headwater tributary of the Mississippi River Basin, which covers 1,245,000 sq. miles of the continental US. North Mill Creek flows into Mill Creek to the Des Plaines and Illinois Rivers before reaching the Mississippi River and eventually the Gulf of Mexico a thousand miles away.

Watershed: An area confined by topographic divides that drains to a given stream or river. The land area above a given point on a waterbody (river, stream, lake, wetland) that contributes runoff to that point is considered the watershed.

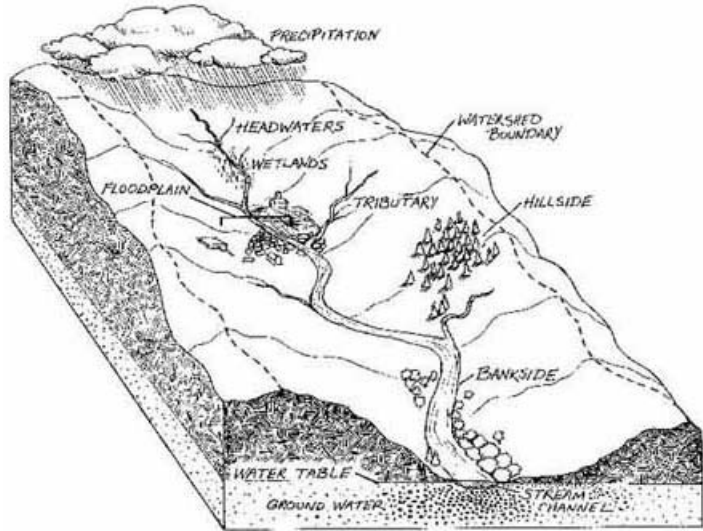


FIGURE 1-1 WATERSHED MAP
*Graphic courtesy of the USEPA

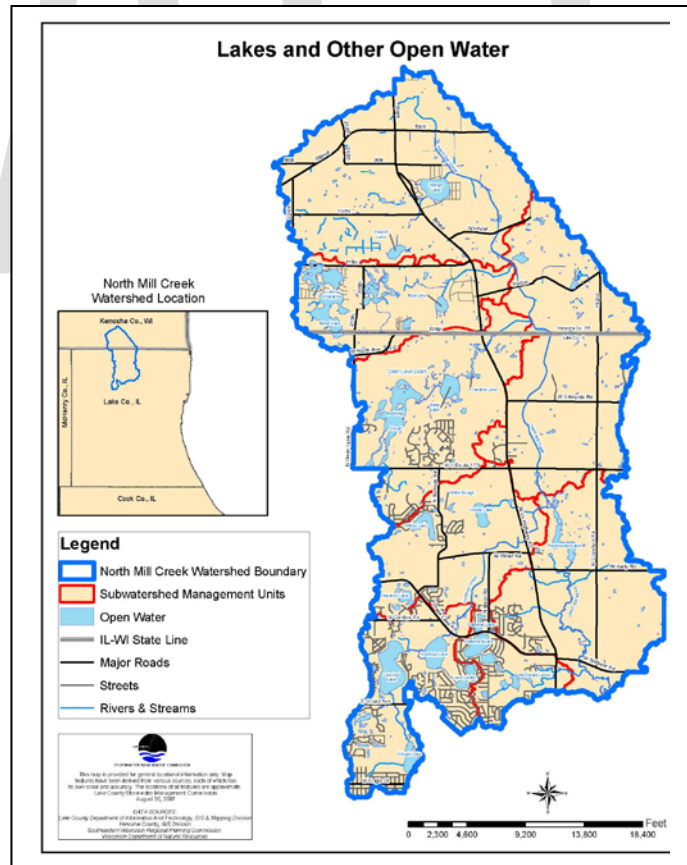
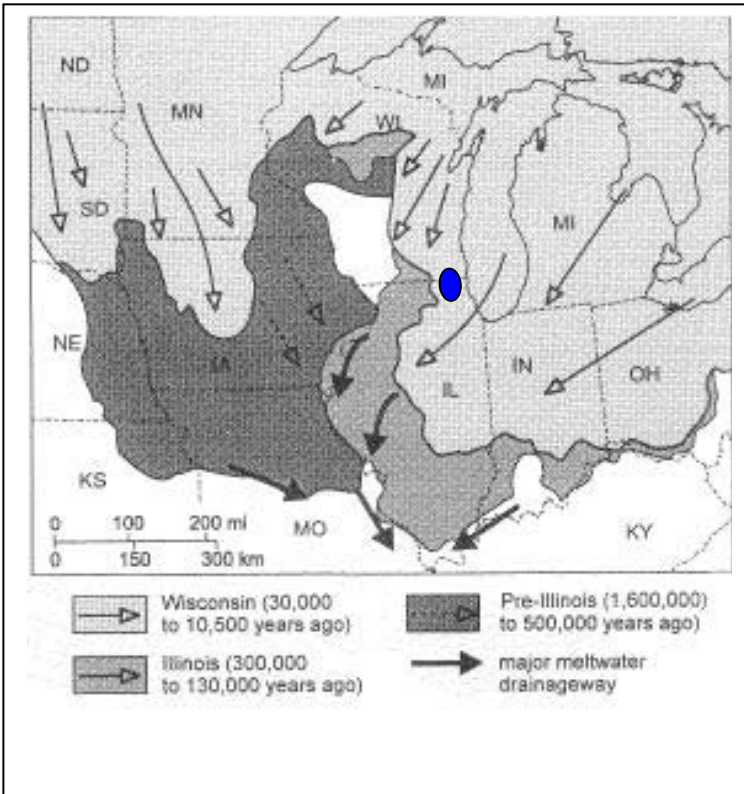


FIGURE 1-2 NORTH MILL-DUTCH GAP

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FIGURE 1-3: GEOLOGY The blue region represents the approximate location of the study. This area has been affected all three phases of glaciation; most recently the Wisconsin Period.



Geology- the Watershed Stage

The geologic setting within the watershed was formed during the most recent glacial period known as the Pleistocene Era or “Ice Age” that began approximately 70,000 years ago and ended 10-14,000 years ago. During this time, 80% of Illinois was covered with one or more sheets of glacial ice (Neely and Heister 1987). Although the study area was most likely glaciated repeatedly during the Ice Age, the last glacial retreat, the Wisconsin Glacier, resulted in almost all of the geologic features present today (Fryell 1927). Some of these features include *loess*, *outwash* gravels and sands, and *till*. The Lake Michigan lobe of the Wisconsin glaciation extended as far south as Shelbyville, Illinois. As this lobe retreated, ground moraines, till plains, and *recessional moraines* formed. These formations presently appear as concentric belts around southern Lake Michigan and the Chicago region.

The state of Illinois has 14 geographic or *natural divisions*. Each division is unique from other divisions by its geology and

distribution of *flora* and *fauna*. The North Mill Creek-Dutch Gap Canal watershed is located in the Northeastern Morainal Division (Neely and Heister 1987), a region that was covered by the Lake Michigan Lobe of the Wisconsin ice sheet (Figure 1.3).

Loess: A fine-grained unstratified accumulation of clay and silt deposited by wind.

Outwash: Sand and gravel deposits removed or washed out from a glacier.

Till: A heterogeneous mixture of clay, silt, sand, gravel, stones, and boulders deposited directly by and underneath a glacier without stratification.

Recessional moraines: An end moraine formed during a temporary but significant halt in the final retreat of a glacier.

Natural divisions: Large land areas that are distinguished from each other by bedrock, glacial history, topography, soils, and distribution of plants and animals.

Flora: Collectively, the plants of a particular region, geological period, or environment.

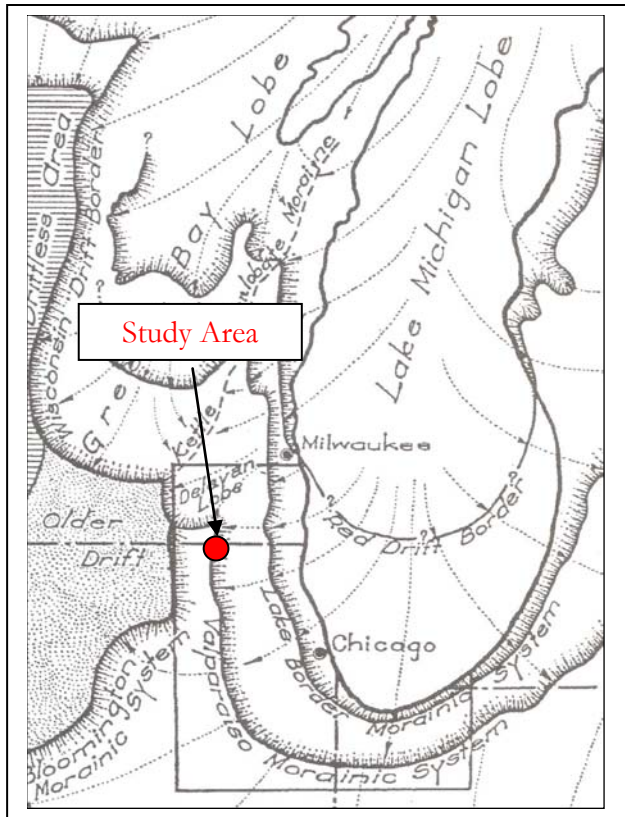
Faunal: Animals of a particular region or period, considered as a group.

When the Wisconsin ice sheet receded approximately 14,000 years ago, it deposited the Valparaiso and Lake Border moraines (Figure 1.4). As a result, the study area is characterized by rough, glacial landform *topography*. The study area is also unique in Illinois because the soils are derived from *glacial drift* that lead to the development of poorly drained soils and many natural lakes and stream systems.

Glacial Drift: Earth and rocks which have been transported by moving ice or land ice.

Topography: The relative elevations of a landscape describing the configuration of its surface.

FIGURE 1-4: MORaine DEPOSITS developed from advancing and retreating glaciers, the latest being the Wisconsin glacier.
Source: The Physiography of the Region of Chicago (Fryell 1927)



The **bedrock** of the study area is composed primarily of dolomite, limestone, sandstone, shale, and coal. Fossils indicate that bedrock was formed during a geologic period known as the Silurian that began approximately 440 million years ago. Rock formed during this period is found at the surface only in the northern third of the state. Today, these rock formations are economically important because they yield limestone and other important minerals.

Bedrock: The solid rock that underlies loose material, such as soil, sand, clay, or gravel.

1.2 THE WATERSHED OVER TIME

Mammoth remains found in Bristol that date between 12,000 and 13,000 years ago provide the oldest historical record of the watershed.

Mammoth bones gently removed in the fall of 1992 from what had become a Kenosha County field, provided the first evidence that humans had butchered a mammoth east of the Mississippi River. Since that time, remains of two more mammoths have been discovered in the area. The third animal excavated most recently in the vicinity of Mud Lake had a large number of cut marks on its bones, showing it had been scavenged by humans after it was dead.

Much later in history, in the early 1800's, pre-settlement natural community mapping in the North Mill Creek-Dutch Gap Canal watershed indicated there were high-quality natural communities such as savannas, wetlands/marsh, prairie and woodland. Most of the watershed at that time was a landscape of scattered oak trees with the combined prairie and wetland understory typical of savannas. The predominant savanna was interspersed with marsh/wetland, oak woodlands, wet prairie and open water lakes. The northeastern watershed landscape was mostly prairie and very large complexes of marsh/wetland. The marsh/wetland and prairies in the Wisconsin portion of the watershed is supported by current accounts by local farmers that the soils and hydrology on the Wisconsin side of the watershed is much different than soils on the Illinois side of the watershed.

NOTEWORTHY: Natural Communities

A **natural community** is made up of all living things in a particular ecosystem but is usually named by its dominant vegetation type. Prior to European settlement in the 1830's, when the Potawatomic were the last of several Native American tribes who called the area home, Lake County exhibited a

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mix of natural communities including prairies, savannas, oak woodlands, dune complexes, and wetlands.

Savanna: A type of woodland characterized by open spacing between its trees and by intervening grassland.

Wetland: Wetlands are land that is inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and under normal conditions, do support a prevalence of plants adapted for life in saturated soil conditions (hydrophytic vegetation). A wetland is identified based on three attributes: 1) hydrology, 2) hydric soils and 3) hydrophytic vegetation.

Marsh: An area of soft, wet, low-lying land, characterized by grassy vegetation and often forming a transition zone between water and land.

FIGURE 1-5: PRE-EUROPEAN SETTLEMENT NATURAL COMMUNITIES

The historical government land survey (1838-1840) indicated pre-settlement natural communities in the North Mill Creek-Dutch Gap Canal watershed included savanna, wet meadow/prairie, marsh, prairie, oak woodlands, and upland forest. The pre-settlement area was dominated by savanna type vegetation.



High quality wetland/wet prairie



High quality oak woodland/savanna

FIGURE 1-6: HISTORIC MARSH SLOUGHS were channelized to improve drainage for farming.



Typical historic stream channel



Typical altered stream channel – Dutch Gap

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These natural communities likely worked in unison to infiltrate and treat precipitation, which minimized surface stormwater runoff leaving the watershed with the large marsh/prairie complexes rather than defined stream channels in the north. Red Wing Slough is likely the landscape that most closely resembles the marsh/wetland complexes that once existed in the northeast part of the watershed. Following European settlement, most of the watershed was altered for agricultural purposes. This resulted in the clear-cutting of savanna and woodlands, clearing of prairies, and installation of drain tiles and agricultural ditches to convey water from the marshes into stream channels to create farmland. The Dutch Gap Canal is actually a channel that was excavated to drain wetland for farmland. The name Dutch Gap shows up for the first time on an 1887 plat map. It was probably formed by the individual efforts of several Wisconsin farm families before it was completed by a steam-powered dredge in 1916. (Kenosha News December 6, 2000)

While much of the watershed still remains in farms, suburban development of the watershed began with lakeside subdivisions. A rapid increase in suburban development began in the 1990s and carried through much of the 2000 decade, resulting in new suburban villages mixing with the older rural areas of the watershed. In Illinois, the watershed is comprised of portions of the Villages of Antioch, Lake Villa, Old Mill Creek, and Lindenhurst. These municipalities are interspersed with unincorporated areas of Antioch, Newport, and Lake Villa Townships that make up over half of the Illinois side of the watershed. In Wisconsin, the watershed is comprised of portions of the Village of Bristol and Salem Township. Most (88%) of the Wisconsin side of the watershed is within the Village of Bristol, which expanded to include the entire Town of Bristol in 2010.

The watershed includes several high quality and remnant natural areas and is identified as a “Conservation Opportunity Area” in the Illinois Wildlife Action Plan. Natural areas of particular note include: Red Wing Slough – owned by the Illinois Department of Natural Resources, Mud Lake Sedge Meadow in Wisconsin - privately owned, and Ethel’s Woods Forest Preserve, which is undergoing restoration and is owned by the Lake County Forest Preserve District.

1.3 IMPACTS OF WATERSHED DEVELOPMENT

Under natural conditions most of the precipitation that falls to the earth is intercepted by or taken up by plants and evaporated back into the air, or seeps into the ground and either becomes groundwater or travels in a shallow layer underground until it seeps back out in a low area such as a lake, wetland or stream and becomes the base flow that keeps these water features “wet” during the dry months of the year. In heavy rain or snowmelt events, the excess precipitation that isn’t taken up by plants and doesn’t infiltrate into the soil becomes runoff. As natural conditions are changed in a watershed to allow for development such as fields for farming, and built environments like buildings, lawns, roads and parking lots, there is less vegetation and open soil available to infiltrate precipitation, while at the same time there are more impervious surfaces that water runs off from. These conditions result in significant increases in stormwater runoff flowing quickly to our streams, wetlands and lakes through stormsewers and drain tiles. At the same time, less precipitation is available to plants and to recharge our groundwater aquifers.

NOTEWORTHY: Urbanization Increases Runoff
 As farms, fields and woodlands in the watershed are developed into more urban land uses, what was once pervious open space is converted to *impervious* built up surfaces. This action reduces the amount of land available for the natural infiltration of precipitation into the ground. As impervious surfaces increase so does the volume of stormwater runoff, which can result in flooding and degraded water quality and habitat. In the absence of sensitive development practices, projected development trends over the next 20-30 years are expected to worsen flooding and water quality problems and decrease open space areas.

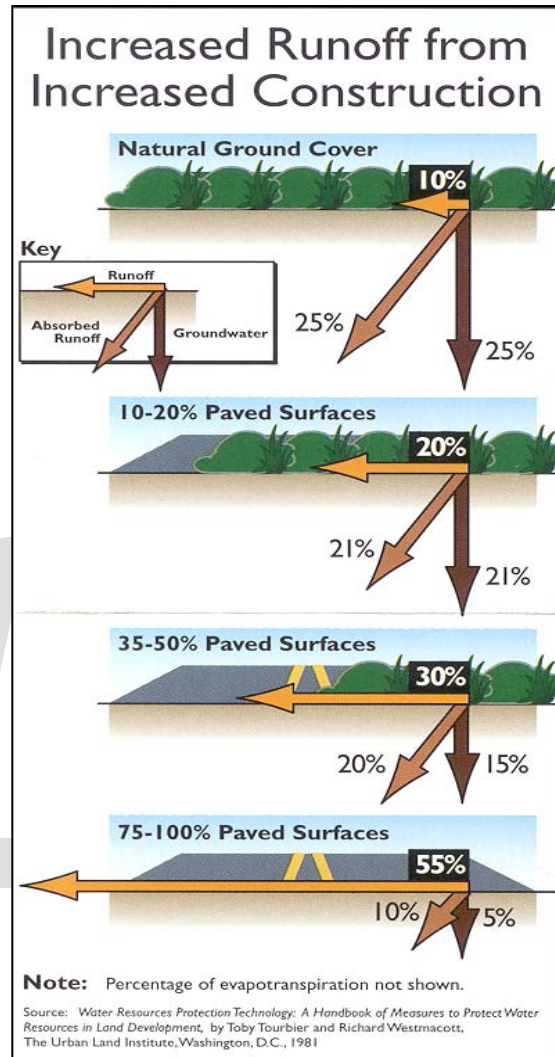


FIGURE 1-7: INCREASED RUNOFF FROM INCREASED CONSTRUCTION DIAGRAM

The rapid flow of water to streams results in what is termed “flashy hydrology”. Water levels rise quickly during a storm event to a much higher than natural level and then fall quickly after a storm is over. In addition, since much the precipitation has been converted from infiltrating into the ground to runoff, there isn’t enough shallow ground water to maintain stream base flow in the dry months to support aquatic habitats and water quality, and ground water aquifers that support our water supply are not being recharged.

High flows that cannot be conveyed by drain tiles, stream channels or stormsewers can result in flood damage as water backs up into low areas and overtops streambanks. These rapid rise and fall storm events frequently erode our stream banks toppling streamside trees and carrying debris downstream until it becomes lodged in a debris jam that causes additional erosion as water has to find its way around the jam. In addition to toppling trees from stream banks, erosion also changes the stream channel. The channel has to erode by cutting down and widening to accommodate the additional flow from the increased stormwater runoff. The result is that road, sanitary and stormsewer infrastructure may also be undermined by erosion as the channel changes in size or flow path to accommodate great volume of runoff flow.

Increased stormwater flows also cause pollution damage. Stormwater runoff carries pollutants that have collected in or on our landscape as it hurries its way through drain tiles or stormsewers to our wetlands, lakes and streams. Excess nutrients from fertilizers and animal waste (whether from farm

or subdivision) and road salt, hydrocarbons and metals from our roads and autos are just a few of the sources of these pollutants. Erosion from construction sites and farm fields adds to the in-stream erosion created by increased stormwater flows, contributing pollutants to our lakes and streams. Erosion leaves behind sediment that fills drain tiles and stormsewers ending up in our lakes and streams; degrading aquatic habitat for fish and the aquatic insects that are critical links in the food web.

1.4 WHERE DO WE GO FROM HERE?

The health of the North Mill Creek-Dutch Gap watershed is a direct reflection of how we collectively manage the landscape of the watershed. There are all together approximately 15,000 people, two counties, five municipalities, four townships and a number of other local, state and regional jurisdictions that strongly influence what happens on the landscape of the North Mill-Dutch Gap watershed. Every watershed resident/landowner can make an individual difference on their land that results in cleaner water, less flood damage and improves aquatic habitat in streams, lakes and wetlands. Off to a good start, one hundred thirty (130) people representing sixty-two (62) organizations/jurisdictions and thirty-four (34) individual residents participated in the watershed planning process over the period of 14 months providing valuable input on next steps. An additional two hundred thirty people received planning updates and meeting/event invitations via our watershed contact list.

Watershed “Influentials”

While each and every property owner/resident in the watershed can make a difference, there are several stakeholders that wield a lot of influence.

- The five municipal and two county governments located in the watershed guide what happens to the watershed landscape through land use and development and land management policies, decisions and regulations.
- There are also several very large landowners and farmers that manage large acreages in the watershed that can significantly influence watershed conditions. They also influence other farming, nursery and equestrian uses, and therefore broader watershed outcomes. The largest single landowner is the Lake County Forest Preserve District. The District owns 3,053 acres, which is approximately 13% of the watershed.
- Influential land managers include not only the large land owners, but all of the riparian and lakeside landowners and lake and homeowner associations in the watershed. How they manage their yards, runoff from their properties, and how they maintain shoreline and stream buffers can significantly influence aquatic resources because they manage the water’s edge.



Lake County Forest Preserve will be removing the dam on Mill Creek that creates Rasmussen Lake and restoring the historic stream channel.

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Fortunately there is something that we can all do, and this watershed plan outlines the actions that need to be taken to restore watershed conditions and our impaired lakes and streams to a healthy state. There is more than one possible future for the watershed, and the future we realize will depend on the choices we make to manage the portion of the watershed landscape that we are responsible for or can influence. The business-as-usual trajectory using conventional development, farm practices, stormwater management and landscape management practices that got us where we are today, will result in continued soil and stream loss to erosion, water pollution, degraded natural resources and flood damage. As an alternative to business-as-usual, this plan presents recommendations and the tools to support their implementation that will integrate the needs of people with the preservation of environmental resources rather than offering “development” or “preservation” as an either/or choice. Implementing this watershed plan can reverse the current trend of a degraded watershed and begin the road to recovery.

1.5 ABOUT THIS WATERSHED PLAN

PLAN PURPOSE:

The *Lake County Stormwater Management Commission (SMC)* took the lead to develop this watershed plan for the North Mill Creek/Dutch Gap Canal watershed. The purpose of this effort was to come up with a plan to restore watershed lakes, streams and wetlands to a healthy condition while reducing the impacts of water pollution and flood damage on watershed residents, and providing opportunities for watershed stakeholders to have a significant role in the process. This plan was developed with, and generally accepted and supported by, a broad representation of watershed stakeholders who participated in the planning process. A significant outcome of this planning effort and the implementation of the plan going forward is to return the ten watershed lakes and two streams that are presently listed as being “impaired” on the Illinois 303(d) list of impaired waters to conditions that fully support their designated uses.

Lake County Stormwater Management Commission (SMC): Government agency created to coordinate the stormwater activities of over 90 jurisdictions throughout Lake County. They provide technical assistance, local knowledge and problem-solving skills to coordinate flood damage reduction, flood hazard mitigation, water quality enhancements and natural resource protection projects and programs.

This plan identifies *Best Management Practices (BMPs)* to remedy/*mitigate* losses of natural resources, water quality degradation, and flood damages. The plan also makes recommendations for watershed stakeholders to implement to preserve, manage, and restore natural resources as well as prevent actions that will cause or exacerbate unintended water quality and flood damage problems. Watershed planning brings communities together to protect and improve the land and water resources they share and impact.

Best Management Practices (BMPs): BMPs are non-structural practices such as site planning and design aimed to reduce stormwater runoff and avoid adverse development impacts - or structural practices that are designed to store or treat stormwater runoff to mitigate flood damage and reduce pollution. Some BMPs used in urban areas may include stormwater detention ponds, restored wetlands, vegetative filter strips, porous pavement, silt fences and biotechnical streambank stabilization.

Mitigation: Measures taken to eliminate or minimize damage from development activities, such as construction in wetlands or Regulatory Floodplain filling, by replacement of the resource.

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PROJECT PLANNING TEAM AND PROJECT FUNDING:

The SMC took the lead in securing cost-share funding from IL EPA through a Clean Water Act Section 319 grant to fund a water quality monitoring study and develop a watershed-based plan for North Mill Creek. Recognizing that water flow doesn't respect political boundaries or land ownership, and that a significant portion of the watershed lay on the Wisconsin side of the state line, SMC expanded the planning effort into a bi-state watershed plan. The "paid" planning team included SMC and the Lake County Health Department Lakes Management Unit (LMU or Lakes Management) who lead the water quality monitoring effort, and several consultants who provided monitoring and planning support including: Northwater Consultants; Living Waters; and Bleck Engineering. Staff of the Lake County Forest Preserves, the Villages of Lindenhurst, Bristol, Old Mill Creek, and Lake Villa, Kenosha County and Lake County Planning and Development departments, Lake County Public Works and Division of Transportation, the Southeastern Wisconsin Regional Planning Commission, the Natural Resources Conservation Service on both sides of the state line, IL Department of Natural Resources, WI Department of Natural Resources and of course the IL Environmental Protection Agency provided data, information and strong planning support. The watershed plan was ultimately funded in part with the Section 319 grant and by the Lake County Stormwater Management Commission.

NOTEWORTHY: SMC Watershed Planning Authority:

SMC's authority for stormwater management for Lake County and development of this Watershed Plan is provided in 55 ILCS 5/5-1062. This state-level enabling legislation was enacted in response to the major flooding that occurred in October 1986 and August 1987 that caused widespread damages and dislocations across northeastern Illinois.

Lake County established the Lake County Stormwater Management Planning Committee in December 1987; a municipal/county partnership made up of six municipal members and six County Board members. In response to the enabling legislation at the state and county level, Lake County developed and adopted a Comprehensive Stormwater Management Plan in June 1990 and adopted an update of that plan in 2002. This watershed plan will be adopted as an amendment to the 2002 Comprehensive Plan.

SMC's authority for stormwater management enables it to:

- Enact and implement a countywide stormwater management plan that includes the management of natural and man-made drainageways and incorporates watershed plans
- Prescribe and enforce rules and regulations for watershed management, floodplains and control of stormwater runoff countywide
- Levy up to a 0.20% annual tax to implement the stormwater management plan

SCOPE AND PROJECT APPROACH

The primary scope of this project is the development of a comprehensive watershed-based management plan for the 37 square mile bi-state North Mill Creek / Dutch Gap Canal watershed that identifies actions to improve water quality, protect and enhance green infrastructure and natural resources, and reduce flood risks. The planning approach was designed to help stakeholders from multiple jurisdictions and with various interests to better understand and become engaged in the watershed, with a desired planning outcome to spur implementation of watershed improvement projects and programs that will accomplish the goals and objectives established by this plan.

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One of the key federal programs supporting watershed improvement is the Clean Water Act Section 319 Nonpoint Source Pollution Prevention Program. This program targets voluntary activities that reduce nonpoint source pollution of the nation's waters. The Section 319 program supports a wide variety of voluntary watershed activities, and in Illinois provides funding for education, watershed planning, and best management practices and projects such as pollution prevention, stream restoration, and drainage system water quality retrofits. To be eligible for Section 319 funds however, watersheds are required to have a watershed-based plan or Total Maximum Daily Load (TMDL) implementation plan. The North Mill Creek-Dutch Gap Canal watershed plan is designed to meet the nine minimum elements required by US EPA for a watershed-based plan.

NOTEWORTHY: USEPA Elements of a Watershed-Based Plan

The nine elements are as follows:

- 1) Identification of the causes and sources or groups of similar sources of pollution that will need to be controlled to achieve the pollutant load reductions estimated in the watershed-based plan;
- 2) Estimate of the pollutant load reductions expected following implementation of the management measures described under number 3 below;
- 3) Description of the nonpoint source management measures that will need to be implemented to achieve the load reductions estimated under number 2 above and an identification of the critical areas in which those measures will be needed to implement the plan;
- 4) Estimate of the amounts of technical and financial assistance needed, associated costs, and/or the sources and authorities that will be relied upon, to implement the plan;
- 5) Public information/education component that is designed to change social behavior;
- 6) Plan implementation schedule;
- 7) Description of interim, measurable milestones;
- 8) Set of criteria that can be used to determine whether pollutant loading reductions are being achieved over time;
- 9) Monitoring component to evaluate the effectiveness of the implementation efforts over time.

PREVIOUS AND RELATED STUDIES AND PLANS:

Several previous and concurrent studies of the watershed led to biological, habitat, water quality, and demographic/geographic data. This information was collected, analyzed and summarized, and supplemented with newly collected field data was used to reach conclusions regarding the condition of the resources in the watershed. Field studies completed in association with this planning effort include: detailed stream and detention basin inventories performed by SMC; a biological and water quality monitoring of Hastings and North Mill Creek performed by Lakes Management and Living Waters; a lakes assessment by Lakes Management; a windshield tour and field verification of best management practice locations by Northwater Consulting. A list of previous studies and reports is included in Chapter 9. Summaries of collected field data and reports are included in the Appendices of this report.

PROCESS AND PLAN ORGANIZATION:

The watershed planning process consisted of seven primary steps that translate into the main sections of this plan document.

1. Assemble a Planning Committee

A successful watershed plan depends on the interest, input and engagement of watershed stakeholders. A stakeholder is anyone who has an interest or “stake” in the watershed. The SMC extended invitations to participate to a bi-state list of prospective stakeholders by indentifying all of the related watershed jurisdictions, agencies and organizations, all property owners who owned land along a creek or lake in the watershed (riparian landowners) and all property owners who owned parcels of 25 acres or more. Press releases were sent to the media to encourage newspaper and web coverage of the watershed planning effort and upcoming meetings and events. The outcome was the formation of a watershed planning committee that participated on a voluntary basis over the period of a little more than a year of monthly meetings to assist in developing the plan.

2. Identify Issues and Develop Plan Goals and Objectives

The North Mill Creek / Dutch Gap Canal Planning Committee identified interests, issues, and opportunities to be addressed in the plan process and plan report. The major issues or topics of concern to stakeholders include the importance of: protecting and improving water quality; maintaining open space and preserving natural resources; preventing flood damage; stream health and conveyance; lake health and fisheries; potential impacts of future development; maintaining the natural and constructed drainage system including drain tiles; the future of farming and food production in the watershed; and watershed education and coordination.

3. Inventory and Characterization of Water Resources and the Watershed

This watershed plan includes a characterization and comprehensive assessment of the watershed that is based on collected data, prior studies and field inventories and surveys conducted for this planning process. This section of the plan includes a number of maps, figures and tables of watershed data and analysis on a broad spectrum of topics ranging from demographics, to water quality, flooding and a green infrastructure inventory.

4. Watershed Problems Assessment

Following the inventory and characterization of the watershed, the planning team directed attention to identifying watershed problems based on the data compiled and analyzed in the previous section of the plan. A problems assessment of land use impacts (vulnerability analysis), water quality (pollutant loading), and flood damage conditions in the watershed are included in the topics cover the problems assessment in this section of the plan.

5. Watershed Action Plan

The watershed “action plan” is both a programmatic and site-specific action plan that includes recommendations for best management policies and practices (BMPs) to improve the condition of natural resources, reduce flood damage, and identify critical areas to focus remedial and preventive BMPs to improve water quality. The action plan also addresses watershed cooperation and coordination and is designed to provide the clean water and healthy land desired by watershed stakeholders as expressed in the watershed goals and objectives. The action plan includes watershed-level programmatic recommendations as well as recommending site-specific projects needed to address critical areas in the watershed.

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6. *Implementing, Monitoring and Evaluating Progress*

This section of the plan identifies key stakeholders who are responsible for implementing the watershed plan, potential funding sources for implementation, and an implementation schedule. Evaluating how well stakeholders are doing in terms of achieving the goals and objectives of the watershed plan is also included in this section where a monitoring plan, milestones and a watershed report card support evaluating watershed plan implementation progress. Monitoring programs to track water quality progress and evaluate the effectiveness of the implementation efforts over time with respect to the established criteria and milestones and pollutant load reduction estimates following implementation of recommended BMPs within critical areas are included in this section.

7. *Watershed Outreach, Information & Education Strategy*

Watershed outreach, information & education programs are a vital component to any watershed planning effort because they inform the general public and communities on how to become more aware of the effects of human actions on the quality of a watershed, and how to help make a positive change. There are many stakeholders who have a role and responsibility to behave in ways that protect the water and land resources of the watershed. The outreach, information & education strategy provides guidance on how to reach a broad spectrum of stakeholders to make them aware of their role in the watershed, and is also designed to guide stakeholders in how to take action to meet water quality and other watershed-based goals and objectives.

8. *Glossary of Terms*

The Glossary of Terms (Chapter 8.0) includes definitions or descriptions of technical words or agencies that the user may find useful when reading or using the document. All words that appear in the Glossary show up as bold and italicized (i.e. ***Glossary of Terms***).

9. *References and Prior Studies and Reports*

Chapter 9 contains the list with brief descriptions of the prior studies and reports for the watershed and the references used in compiling the plan report.

Appendices

The Appendix to this report is available on CD. It contains original raw data, methodologies, inventory data, and other information. Of particular mention is the Toolbox of Watershed Best Management Practices (Appendix B). This Toolbox contains watershed restoration and management techniques that can be used to help achieve the watershed goals and objectives identified in the North Mill Creek / Dutch Gap Canal watershed plan.

Watershed Plan Review and Adoption Process:

Once completed and reviewed by SMC staff and the watershed planning committee, the SMC approved the start of an official 60-day public review and comment period for the draft watershed plan. The plan was also submitted to the ***Illinois Department of Natural Resources (IDNR)*** Offices of Water Resources and Resource Conservation and ***Chicago Metropolitan Agency for Planning (CMAP)***, for review and recommendations. Any subsequent amendments to the plan will also be submitted to Illinois Department of Natural Resources and Chicago Metropolitan Agency for Planning for review.

Illinois Department of Natural Resources (IDNR): A government agency established to manage, protect and sustain Illinois' natural and cultural resources; provide resource-compatible

recreational opportunities and to promote natural resource-related issues for the public's safety and education.

Chicago Metropolitan Agency for Planning (CMAP) The Chicago Metropolitan Agency for Planning (CMAP) (www.cmap.illinois.gov) formerly known as the Northeastern Illinois Planning Commission (NIPC) has developed model ordinances on stormwater management, soil erosion and sediment control, streams and wetlands, and floodplains for local governments to use in developing regulatory programs. CMAP provides some technical assistance and training opportunities to local governments to improve watershed management activities - including watershed planning and stormwater management.

A public hearing was held at the county seat during the 60-day public comment period. Notice of the hearing was published in the Lake County News Sun (a newspaper of general circulation in the county) prior to the hearing. The Lake County Stormwater Management Commission will review and consider the comments received and may amend or approve the plan and recommend it to the county board for adoption. The county board may then enact the proposed plan by ordinance as an amendment to the Lake County Comprehensive Stormwater Management Plan.

1.6 USING THIS PLAN

WHO SHOULD USE THIS PLAN

This plan will be of limited use without the commitment of watershed stakeholders to improve, restore, manage and steward watershed resources. As the primary land use, development and infrastructure authorities in the watershed, municipal and county agencies and elected officials will have a significant amount of influence and responsibility for implementing this plan. These public agencies represent the interests of their constituents and are strongly influenced by every community resident or landowner. Therefore, every watershed stakeholder may influence the future of the watershed.

State and federal agencies and elected officials and private organizations such as lake associations, homeowner associations and private conservation organizations will also play an important role. State and federal agencies can support the implementation of this plan by approving projects in a timely fashion, supporting projects with funding, and providing technical information, tools and resources to assist local authorities and watershed organizations in their efforts. Private associations and organizations have the ear and influence of their members and can provide significant contributions to land and water protection. Individual watershed residents and landowners must also accept responsibility for managing their own land and water resources responsibly and for working with others to implement this plan.

All jurisdictions, organizations and private landowners and residents will have to work together in order to successfully protect and restore the watershed. The power of water is immense, as anyone who has experienced flooding can attest. The flow of water also does not respect property lines or jurisdictional boundaries, therefore, everyone needs to share in the long-term stewardship responsibility, and share the costs and benefits of watershed improvements.

Plan implementation will also depend on a watershed organization to oversee, guide, coordinate and monitor watershed activities on behalf of all of the stakeholders. This organization

NORTH MILL CREEK-DUTCH GAP CANAL WATERSHED-BASED PLAN

typically forms as an outgrowth of those who participated in the watershed planning process with support coming from a variety of local and state agencies as well as local land use authorities and decision makers. This watershed organization will be the primary mechanism to engage the general public in watershed activities, to support the implementation of the watershed plan, and to voice their concerns and celebrate their successes in restoring watershed resources.

HOW TO USE THIS PLAN

For those unfamiliar with watershed planning, this document may appear overwhelming. There are pages of information with a lot of tables and maps that report on the condition of the watershed to navigate, and many costly recommendations that an individual could not possibly begin to implement. These recommendations are for public agencies to consider. But there are also a number of straightforward actions that each person in the watershed can take to improve the watershed. Every action, no matter how small, when undertaken by many, or key, landowners can have a positive impact on improving the watershed. To get a general understanding of what this plan is about – please read the Executive Summary, which also includes a list of top priority actions for each stakeholder group. For additional details, browse the table of contents and flip to the relevant section you are interested in.

To find out...

- what this plan is intended to accomplish, read about the watershed goals and objectives in Chapter 2.
- detailed information about watershed resources and condition, read the section(s) of interest in Chapter 3.
- what the problems are facing the watershed, Chapter 4 includes a summary and analysis of watershed problems that need to be addressed by the Action Plan.
- what kind of actions can be taken to improve the watershed, the Action Plan in Chapter 5 includes a watershed-wide programmatic action plan that includes general recommendations; and a site-specific action plan directed to critical areas of the watershed that identifies actions that can be taken to help fix problems in a specific area.
- what kind of funding may be available to provide cost share for implementing watershed improvement projects, refer to the Funding Sources in Appendix K.
- what sort of outreach and education is needed so that watershed stakeholders understand the watershed problems, their role in the watershed, and have the capability to implement the Action Plan, refer to Chapter 7 the Watershed Education and Outreach Strategy.