

## 9.0 PRIOR STUDIES AND REFERENCES

The North Mill Creek / Dutch Gap Canal watershed has been studied through a number of inventories and reports. This watershed plan attempts to compile, analyze, and summarize work that has been completed by others as well as integrate new data and information. Agencies and organizations including the Lake County Stormwater Management Commission (LCSMC), *Lake County Health Department (LCHD)-Lakes Management Unit*, CMAP, formerly known as NIPC, *US Army Corps of Engineers (USACE)*, United States Geological Survey (USGS), Illinois Department of Natural Resources (IDNR), *Upper Des Plaines River Ecosystem Partnership*, Lake County Forest Preserve, Kenosha County, Southeastern Wisconsin Regional Planning Commission (SEWRPC), and *Illinois Environmental Protection Agency (Illinois EPA)* have completed studies to assess the condition of, and aid in the ecological restoration of, the North Mill Creek / Dutch Gap Canal watershed.

### 9.1 PRIOR STUDIES AND PLANS

1. Illinois Department of Natural Resources stream biologists sampled the fish community in two locations on the North Mill Creek mainstem (GWA-01 and GWA-03) in 2008. A sample was also taken in Hastings Creek (GWA-A-L-C2), which flows into North Mill Creek just north of Rasmussen Lake. Fish data was used to calculate Index of Biotic Integrity (IBI) scores to evaluate the biological health and water quality of streams in the watershed. Data obtained from these surveys are used in Illinois 2008 Section 305(b) Water Quality Reports and Illinois 303(d) impaired waters lists.
2. In 1996, SMC completed a Flood Problem Areas Inventory (FPAI) of Lake County, which was updated in 2002. The FPAI compiled information on flood problems in the 26 subwatersheds of the county including the North Mill Creek Watershed. As a part of the watershed plan development, SMC contacted local officials as well as stakeholders in January 2011 to get updated flood problem area information for both Kenosha and Lake Counties. There are 15 flood problem areas identified in the watershed. A County-Wide All Natural Hazards Mitigation Plan was completed for Lake County in 2005. The natural hazards assessed include flooding, ice storms, severe winds, tornadoes, extreme heat etc.
3. A Biological Monitoring Study was conducted in 2010 by Living Waters Consulting at four sites in the watershed. The study included collection and identification of fish, macroinvertebrate and mussel specimens in the field, calculation of the qualitative habitat evaluation index (QHEI), laboratory sorting and identification of voucher specimens collected in the field, calculation of the fish- and macroinvertebrate-Index of Biotic Integrity (f-IBI and m-IBI) as well as a summary report describing the data.
4. The United States Geological Survey (USGS) collected physical and chemical water samples at three stations within the watershed. These samples are generally collected on a five-year cycle as part of the Intensive Basin Survey Program. Data obtained from these surveys are used in Illinois 2004 Section 305(b) Water Quality Reports and Illinois Section 303(d) impaired waters lists.

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5. IDNR RiverWatch volunteers and IEPA biologists sampled the *macroinvertebrate* community at three different locations within the watershed. Two locations on the North Mill Creek mainstem and one on Hastings Creek. Volunteers and biologists calculated ***Macroinvertebrate Biotic Index (MBI)*** scores to evaluate the biological health and water quality of streams in the watershed.
6. The Lake County Health Department-Lakes Management Unit completed studies in 2006 on Crooked Lake, Deer Lake, Hastings Lake, Lake Linden, Potomac Lake, Redwing Slough, Slough Lake, Timber Lake, Waterford and, White Lake.
7. A draft Water Quality and Flow Monitoring Study has been completed by the Lake County Health Department. The project consisted of a 9-month water quality and flow monitoring program at three (3) North Mill/Hastings Creek monitoring sites, and a 5-month water quality and aquatic habitat assessment of 12 lakes within the watershed. The overall objective of this study was to document water quality conditions in Hastings and North Mill Creeks and watershed lakes to provide a water quality baseline for the streams and trend information for the lakes. This data will be used to assess trends and the benefits of implementing watershed action recommendations.
8. The Lake County Forest Preserve District has been conducting studies on Rasmussen Lake since 2005 to design and prepare for the removal of the Rasmussen dam. The report findings include bathymetry, sonar, and water quality data as well a sedimentation analysis.
9. In August 2000, the Northeastern Illinois Planning Commission (Now CMAP), in cooperation with the Upper Des Plaines Ecosystem Partnership, completed a draft plan for improving water quality in the Upper Des Plaines River Watershed. The North Mill Creek / Dutch Gap Canal watershed was included in the Watershed Restoration Action Strategy (WRAS). This regional strategy was produced to begin the IEPA planning and implementation process for improving water quality in the watershed.
10. In February 2001, Lake County Stormwater Management Commission completed the Des Plaines River Wetland Restoration Study that identified potential wetland restoration sites in the entire Des Plaines River watershed including some in the North Mill Creek / Dutch Gap Canal Watershed.
11. During the summer of 2007, the Lake County Stormwater Management Commission completed a stream inventory of the North Mill Creek / Dutch Gap Canal watershed. The inventory involved walking the stream reaches collecting measurements, taking photos, and noting in-stream, streambank, and riparian corridor characteristics. A ***Global Positioning System (GPS)*** was used to locate points of interest to be incorporated into a Geographic Information System (GIS) database.
12. During the summer of 2009, the Lake County Stormwater Management Commission completed a detention basin inventory of the North Mill Creek / Dutch Gap Canal Watershed. The inventory involved collecting measurements, taking GPS-Linked photos, noting retro-fit opportunities, and identifying inlets and outlets.

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13. Lake County geographic information for the North Mill Creek / Dutch Gap Canal watershed was compiled over the past years and is accessible via the Lake County Geographic Information System (GIS). The database contains information including wetlands, soils, land use, and other relevant data.
14. The Corps compiled GIS data for the development of a Phase II Study of the entire upper Des Plaines River watershed including North Mill Creek / Dutch Gap Canal.
15. Under the IDNR C2000 program, a Strategic Subwatershed Identification Process (SSIP) was compiled in 2003-2004 for the Upper Des Plaines River Ecosystem Partnership (UDREP). The study covered the entire Upper Des Plaines River watershed including North Mill Creek / Dutch Gap Canal.

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