COMMUNITY ASSISTANCE
PLANNING REPORT NO. 312

A LAND AND WATER RESOURCE MANAGEMENT PLAN FOR MILWAUKEE COUNTY: 2012-2021

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A LAND AND WATER RESOURCE MANAGEMENT PLAN FOR MILWAUKEE COUNTY: 2012-2021

Prepared by the

Southeastern Wisconsin Regional Planning Commission

In Cooperation with

Milwaukee County Department of Transportation and Public Works—
Architecture, Engineering, and Environmental Services Division
and
Milwaukee County Department of Parks, Recreation and Culture

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REPORT SUMMARY

INTRODUCTION

In 1997, Chapter 92 of the *Wisconsin Statutes* was amended to require, and give authority for, counties to develop their own land and water resource management plans (LWRMP). The LWRMP is a State-mandated long-range planning document intended to guide the activities of the County Environmental Services Division, which acts as the County's land and water conservation department, in its efforts to protect and improve land and water resources. The initial Milwaukee County LWRMP was adopted by the County Board in 2001. A revised and updated version of the plan was approved in 2006. This second revision of the LWRMP has been prepared following the requirements of Chapters ATCP 50 and NR 151 of the *Wisconsin Administrative Code*, as adopted in 2002. The developments of such plans are intended to serve as a multi-year work plan which will:

- Specifically address the implementation of State nonpoint source pollution abatement performance standards developed by the Wisconsin Departments of Natural Resources (WDNR) and Agriculture, Trade and Consumer Protection (DATCP);
- Identify local land and water resources concerns, issues, and priorities;
- Establish goals and objectives in response to the identified concerns and issues;
- Develop a comprehensive program integrating existing and proposed resource management programs, plans, and funding sources designed to achieve the established goals and objectives;
- Establish partnerships between agencies, municipalities, and other organizations;
- Incorporate an informational and educational strategy in response to the identified concerns and issues; and
- Identify a method to evaluate and monitor progress.

The Milwaukee County Land and Water Resource Management Plan incorporates inventory findings, including land use, natural resource data, soil erosion levels, and water quality data. Additionally, the plan addresses the principal land and water resource concerns and issues that were identified by the Milwaukee County Land and Water Resource Management Plan Advisory Committee. The principal issues and concerns that were identified by the Advisory Committee include the following:

- The need for control of nonpoint source pollution;
- The loss of wetlands, woodlands, quality farmland, environmental corridors, other green space;
- The condition of, and access to, the Lake Michigan shoreline;

- The need for a local, publicly available natural resource information and education support program; and

- The need for invasive species management and control.

The Milwaukee County Land and Water Resource Management Plan revision contains the following five chapters:

Chapter I–Introduction

Chapter II–Resource Assessment

Chapter III–Related Plans, Regulations, and Programs

Chapter IV–Goals, Objectives, and Work Plan

Chapter V–Progress Monitoring and Evaluation

PUBLIC PARTICIPATION

The plan was developed under the guidance of an Advisory Committee that was comprised of individuals that had natural resource, nonpoint source, agricultural, or environmental backgrounds. The Committee included agency personnel from the Wisconsin Department of Natural Resources (WDNR), the Milwaukee Metropolitan Sewerage District (MMSD), the Natural Resources Conservation Service (NRCS), and Southeastern Wisconsin Regional Planning Commission (SEWRPC); County land conservation and parks department staff; municipal representatives; and a representative from the Southeastern Wisconsin Watersheds Trust, Inc. Three Advisory Committee meetings were held on October 7, 2010, November 11, 2010 and November 30, 2010. The Committee reviewed each chapter of the plan in draft form and provided comments and recommendations, which were then addressed in the final plan. As draft chapters of the plan were completed, copies were placed in downloadable form on the SEWRPC website. This website also included a webpage on which members of the public could ask questions and submit comments on the draft plan update. On March 8, 2011, the Milwaukee County Board Parks, Energy & Environment Committee, which acts as the County's land conservation committee, met to approve the plan; this meeting was open to the public for citizen comment and input. This meeting was announced twice in the *Daily Reporter* prior to the meeting. This plan was approved by the Advisory Committee on November 30, 2010; the Milwaukee County Board Parks, Energy & Environment Committee on June 14, 2011; and the Milwaukee County Board of Supervisors on June 23, 2011, with final approval by the Wisconsin Land and Water Conservation Board on August 2, 2011.

ASSESSMENT OF WATER QUALITY AND NONPOINT SOURCE POLLUTION ISSUES

The water resources and the watershed areas of Milwaukee County are illustrated on Map 12 in Chapter II of this report. Most of the rivers, streams, and lakes in Milwaukee County currently are designated for a warmwater sportfish water use objective. However, some of those resources are determined to have limited forage fish or limited aquatic life use objectives. In addition, some of those resources have water use objectives established under special variances set forth in Chapter NR 104 of the *Wisconsin Administrative Code.* The majority of the water resources in the County are currently partially meeting the established water use objectives. Section 303(d) of the Federal Clean Water Act requires that states periodically submit a list of impaired waters to the U.S. Environmental Protection Agency for approval. Impaired waters are those which are not meeting their established water use objectives. The waterbodies in Milwaukee County that have been listed as Section 303(d) waters are included for various reasons and include all or portions of the following: the Kinnickinnic River in the Kinnickinnic River watershed; the Menomonee River and Little Menomonee River in the Menomonee River watershed; the Milwaukee River, Beaver Creek, and Indian Creek in the Milwaukee River watershed; Oak Creek in the Oak Creek Watershed; the Root River and the Root River Canal in the Root River watershed; and the Milwaukee Harbor estuary and outer harbor. In addition, four public beaches along the Lake Michigan shore—Bradford Beach, Doctors Park Beach, McKinley Beach, and South Shore Beach—are listed as being impaired.

The proposed 2010 impaired waters list that the State of Wisconsin submitted to the USEPA would add Cherokee Creek, Holmes Avenue Creek, the South 43rd Street Ditch, and the section of the mainstem of the Kinnickinnic River upstream of S. Chase Avenue in the Kinnickinnic River watershed and Honey Creek in the Menomonee River watershed.

According to the results from the 2007 County soil loss survey, it was estimated that soil losses from the vast majority of the fields surveyed were at or below the tolerable soil loss rate. This suggests that past local, State, and Federal conservation program efforts have been successful in helping farmers manage soil erosion. Monitoring will still be carried on to insure this success. In addition to soil erosion on agricultural lands, nonpoint source pollution from urban areas was identified in the plan as one of the primary issues to specifically address.

SUMMARY OF WORK PLAN

The land and water resources plan is intended to identify, prioritize, and address land- and water-related resource conservation issues in Milwaukee County. It focuses on reducing the nonpoint source pollution from rural and urban areas in the County to the levels needed to achieve the water use objectives. It also seeks to enhance Lake Michigan bluff protection initiatives, maintain the existing information network and land information portal, and limit the introduction and reduce the spread of invasive species in Milwaukee County. The work plan elements are designed to meet the State nonpoint source pollution abatement performance standards and prohibitions. In addition, the plan also has specific objectives for the preservation and protection of land and water resources. The goals, objectives, and recommended actions contained in this plan were developed to focus on the priority issues and concerns identified by the LWRMP Advisory Committee. Five goals were established for the plan:

1. Improve water quality through the reduction of sediment and nutrient delivery to surface waters in Milwaukee County.

2. Protect, maintain, and restore land and water resources in Milwaukee County.

3. Enhance Lake Michigan bluff protection initiatives.

4. Maintain the existing information network and land information web portal.

5. Limit the introduction and reduce the spread of invasive species in Milwaukee County.

The recommended goals, work plan objectives, and planned actions for the years 2012-2016 are summarized in the following sections, and are presented in Table 26 in Chapter IV of this report.

Improve Water Quality through the Reduction of Sediment and Nutrient Delivery to Surface Waters in Milwaukee County

In order to improve water quality, the work plan objectives and actions include measures for controlling nonpoint source pollution, reducing erosion from unstable streambanks, and preventing future closings of Lake Michigan beaches. Achieving the goal of improving water quality involves several objectives. These include:

- Encouraging public awareness of water quality problems and stormwater issues. Ensuring that County staff is adequately trained to develop strategies and implement technologies to solve water quality problems;

- Implementing NR 216 stormwater requirements;

- Working with partners to identify and implement measures to prevent future beach closings resulting from bacterial contamination;

- Conducting and promoting streambank stabilization projects and projects employing best management practices to reduce erosion;

- Implementing the recommendations outlined in the County pond and lagoon management plan;
- Compliance with the NR 151 agricultural performance standards; and
- Minimizing introductions of chloride into surface waters of the County.

Protect, Maintain, and Restore Land and Water Resources in Milwaukee County
In order to protect, maintain, and restore land and water resources in Milwaukee County, the work plan identifies measures to increase public awareness, manage county-owned lands, and maintain natural areas. Many of these efforts will be conducted in collaboration with the County's partners. The work plan objectives include:

- Continue to manage the Milwaukee County-owned natural areas using the latest advancements in restoration ecology;
- Increase public awareness of the value of land and water resources in Milwaukee County;
- Maintain and acquire high-quality natural areas in accordance with the Milwaukee County park and open space plan; and
- Maintain land in river corridors for recreational use and access.

Enhance Lake Michigan Bluff Protection Initiatives
Bluff stability conditions are important considerations in planning for the protection and sound development and redevelopment of lands located along the Lake Michigan shoreline. The plan seeks to maintain and improve the protection of these bluffs. The principal work plan objectives related to bluff protection identified in the plan include:

- Continue to improve and maintain Lake Michigan shoreline protection measures and abate shoreline erosion problems in Milwaukee County; and
- Maintain lakefront land for recreational use and access.

Maintain the Existing Information Network and Land Information Web Portal
The County's existing information network and land information web portal provide land and water resource information to the County staff, natural resource professionals, developers, and citizens enabling them to make sound decisions regarding the management of natural resources in Milwaukee County. The plan recommends maintaining and updating these systems. The work plan objectives identified in the plan to accomplish this include:

- Ensure that mapping and the geographic information system (GIS) infrastructure are updated on a regular basis; and
- Promote effective use of the GIS by County staff, natural resource professionals, developers, and citizens.

Limit the Introduction and Reduce the Spread of Invasive Species in Milwaukee County
Invasive species can alter ecological relationships among native species and can affect ecosystem function, economic value of ecosystems, and human health. In order to more effectively control the infestation and spread of nonnative and invasive animal and plant species, the following work plan objectives have been identified:

- Provide information to County staff and residents about how to control invasive species;
- Develop a comprehensive and coordinated approach to the management of invasive species in Milwaukee County; and

- Manage infestations of invasive species in Milwaukee County-managed properties.

Educational Programming
Developing and implementing sound educational programming is an important component of the land and water resource management plan. Work plan objectives and action items related to educational programming have been integrated into the work plan set forth in Table 26 in Chapter IV of this report. The planned actions presented in the work plan that are related to educational programming form a framework within which a variety of educational strategies can be utilized in order to promote achievement of the goals of the land and water resource management plan. Specific strategies include developing, posting, and distributing reference and educational materials related to the natural resource issues facing the County and approaches to managing the resources and solving resource-related problems; sponsoring and participating in workshops and conferences related to water quality, stormwater, and land and water conservation issues; and responding to inquiries.

Much of the County's public educational programming is conducted in collaboration or cooperation with the County's partners in managing land and water resources. These partners include the local governments within the County; State agencies, such as DATCP, WDNR, and the University of Wisconsin-Extension; the MMSD; and private organizations, such as the Southeastern Wisconsin Watersheds Trust, Inc. (Sweet Water), the Southeastern Wisconsin Invasive Species Consortium (SEWISC), and local friends groups to the Milwaukee County Parks.

Performance Standards Implementation Strategy
The goals, work plan objectives and planned activities presented in the Milwaukee County land and water resource management plan represent part of the framework for an annual work plan that will be developed and carried out by Milwaukee County over the next five years. Proposed planned activities were broadly defined in order to meet future changes in the environment, changes in programs and policies, changes in local priorities, and changes in available funding. As required by DATCP, the plan sets forth a more detailed list of planned activities, as a strategy to implement the nonpoint pollution performance standards and prohibitions under NR 151 of the *Wisconsin Administrative Code*. A strategy for implementation of performance standards and prohibitions is described in Chapter IV of this report.

The strategy for implementation of standards and prohibitions in agricultural areas include several elements. The County will conduct information and education activities to 1) educate landowners about Wisconsin's agricultural standards and prohibitions, applicable conservation practices, and cost-share grant opportunities; 2) promote voluntary implementation of conservation practices necessary to meet the performance standards and prohibitions; 3) inform landowners of compliance procedures and agency roles; and 4) make landowners aware of expectations for compliance and consequences for noncompliance. The County will identify and evaluate farms for compliance with performance standards and prohibition. The County will document and report on compliance status. Where sites are determined to be out of compliance, technical assistance and cost-sharing may be offered to the landowner to bring them into compliance. The County will administer such funding and technical assistance.

Estimated Costs
Since this plan does not have the authority to establish County budget items, the estimated costs provided below are solely intended to satisfy state LWRM planning requirements and do not in any way represent anticipated Milwaukee County budgets. It is also assumed that no additional staff resources will be made available to implement this plan beyond what is currently allocated to land and water conservation programs in the County (approximately three full time employees). The cost estimates contained in Table 27 in Chapter IV of this report are based on average annual costs to maintain existing program efforts and staffing levels.

It is reasonable to assume that existing staff will be able to provide a significant portion of the time required for implementation of this plan. If additional manpower is needed, it will be obtained through cooperative ventures with local universities, colleges, and volunteer groups; consultants, and limited-term or seasonal staff increases. As discussed in Chapter I of this report, the County Department of Parks, Recreation & Culture has been very successful in its efforts to develop and utilize volunteers in its natural area management activities.

PROGRESS MONITORING AND EVALUATION

The monitoring and evaluation of program efforts is important to ensure the effectiveness of the planned activities described in Chapter IV of this plan. The Milwaukee County Environmental Services Division currently employs a variety of methods to monitor and evaluate the progress of program efforts. These methods include the GIS database, advisory committees, annual progress reports, and water quality monitoring. Monitoring program effectiveness will be carried out through analyses and quantification of soil erosion and sediment delivery, priority farm compliance, tracking the level of protection of environmentally sensitive lands and analysis of water quality data. Chapter V of this report describes some of these efforts in more detail and how they will be used to monitor and evaluate the success in implementing planned activities.

Consistent and thorough evaluation and monitoring of conservation efforts is essential to ensure the effectiveness of the Milwaukee County Land and Water Resource Management Plan. An annual progress report will be the primary method used to evaluate progress of implementing the planned activities outlined in Chapter IV of this report. The progress report will consist of a summary of the annual outcomes and accomplishments of planned activities outlined in the work plan. This summary may include, but is not limited to: completed information and education activities, landowners contacted, best management practices designed and installed, conservation and nutrient management plans written or revised, cost-share agreements developed, erosion control plans reviewed, compliance monitoring and status, and other planned program results. These annual progress reports will be compiled and forwarded to the DATCP and the WDNR. The results of the monitoring and evaluations conducted over the term of this plan (2012-2021), will be used to improve the next land and water resource management plan.

Chapter I

INTRODUCTION

The Milwaukee County Land and Water Resource Management Plan is intended to provide for the restoration, improvement, and protection of ecological diversity and quality and to promote the beneficial use of the land, water, and related resources found within the County. This plan establishes goals to guide County and other agency initiatives over the five-year period from 2012 through 2021. These goals and the work plan presented in the plan provide a tool for the guidance and coordination of the activities of a variety of agencies and programs and the basis for funding initiatives from a variety of private, local, State, and Federal sources.

OVERVIEW OF STUDY AREA

Milwaukee County is located in southeastern Wisconsin and is bordered on the east by Lake Michigan, on the north by Ozaukee County, on the west by Waukesha County, and on the south by Racine County. The impacts of urbanization within the County and in the surrounding areas have affected and continue to affect the County.

The County covers about 243 square miles and contains 10 cities and nine villages. There are no unincorporated towns within the County. There are all or parts of seven natural watersheds within the County. These include the entire Kinnickinnic River and Oak Creek watersheds; portions of the Fox River, Menomonee River, Milwaukee River, and Root River watersheds, and the areas draining directly to Lake Michigan. The County contains about 1,298 acres of inland surface waters. Because of the importance of considering entire watersheds in water resource planning, consideration has been given to the entire watershed areas impacting on or impacted by the County, even though the focus of this planning effort is restricted to Milwaukee County. While most of the County is located within the Great Lakes drainage basin, the subcontinental divide between this basin and the Mississippi River basin traverses the southwestern corner of the City of Franklin. This divide has important implications for some aspects of land and water resources planning.

According to the year 2000 U.S. Census, over 940,000 persons lived in Milwaukee County. The highest population densities were found in the central portion of the County, mostly within the City of Milwaukee. While the County is highly urbanized, some land remains in agriculture, mostly in the Cities of Franklin and Oak Creek. The primary form of agriculture involves cash-grain farming for corn and soybeans. Major industries within the County are located within the City of Milwaukee as well as in other communities.

Milwaukee County continues to undergo urban growth, development, and redevelopment and faces the challenge of balancing this growth with the protection and maintenance of its natural resources. The County has a diversified natural resource base, including the Lake Michigan nearshore area, major river systems, and several small inland lakes and ponds. In addition, the County contains significant areas of quality woodlands, wetlands, and grasslands, the most important of which are incorporated into the areas designated as environmental corridors.

PLAN BACKGROUND AND PURPOSE

In 1997, the State Legislature, through 1997 Wisconsin Act 27, amended Chapter 92 of the *Wisconsin Statutes*, requiring that all counties develop a land and water resource management plan (LWRMP). The intent of this charge is to foster and support a locally led process which is intended to address each individual county's unique natural resources, identify particular problems associated with the resource base, and establish a plan to help protect and restore those resources. In addition, the county plans are intended to focus on State minimum nonpoint source pollution performance standards related to agriculture and urban development. The plan development process is intended to encourage innovative programming and leadership and to build local support. The plan identifies the natural resources and their current condition and limitations, and sets forth a strategy that addresses the natural resource issues and problems. This plan also provides a means to educate the public about these issues and problems and include the public in the steps necessary to protect the natural resource base.

Chapter 92 of the *Wisconsin Statutes* requires that county land and water resource management plans be updated every five years in order for counties to be eligible to receive conservation staff funding and cost-share grant monies. The initial Milwaukee County LWRMP was approved in 2001. An updated version of the plan was approved in 2006. This plan is, therefore, the second revision of the initial plan. The revised multi-year land and water resource management plan must meet the requirements of Section 92.06 of the *Wisconsin Statutes* and additional guidelines established by the Wisconsin Department of Agriculture, Trade and Consumer Protection (DATCP) and the Wisconsin Land and Water Conservation Board. This plan will serve as a program guide for local conservation efforts in Milwaukee County.

PLAN DEVELOPMENT AND PUBLIC PARTICIPATION

The Milwaukee County Land and Water Resources Management Plan was developed through a collective effort on the part of a number of agencies and organizations under the overall direction of the Milwaukee County Land Conservation Committee (LCC)[1] and the Milwaukee County Board Parks Energy & Environment Committee. The agencies involved include the Milwaukee County Department of Transportation and Public Works—Architecture, Engineering, and Environmental Services Division; the Milwaukee County Department of Parks, Recreation and Culture (DPRC); the Southeastern Wisconsin Regional Planning Commission (SEWRPC); the Wisconsin Department of Natural Resources (WDNR), and DATCP. The plan was developed under the guidance of the Milwaukee County Land and Water Resource Management Plan Advisory Committee, which was created by the County specifically for plan development purposes and is composed of elected and appointed officials, agency personnel, and citizens knowledgeable in land and water resource matters. The membership and activities of the Committee are documented in Appendix A. In addition, documentation related to the activities of this Committee is on file with the Milwaukee County Department of Transportation and Public Works—Architecture, Engineering, and Environmental Services Division.

Advisory Committee meetings were held on October 7, 2010, November 10, 2010, and November 30, 2010. The Committee reviewed each chapter of the plan in draft form and provided comments and recommendations, which were addressed in the final plan. In addition, the Committee assisted in identifying problem areas and conservation issues and concerns, provided information and technical data for the plan, advised the LWCC on program options for the plan, and helped to coordinate agency programs with the implementation of this plan. As draft chapters of the plan were completed, copies were placed in downloadable form on the SEWRPC website. This website also included a webpage on which members of the public could ask questions and submit comments on the draft plan update. The activities of the Advisory Committee and comments on the plan that were received from members of the public are documented in Appendix A.

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[1]*The members of the Milwaukee County Board Parks, Energy & Environment Committee serve as the Milwaukee County Land Conservation Committee.*

After the plan was completed in draft form, it was submitted to the DATCP and the WDNR for review. On March 8, 2011, the Milwaukee County Board Parks, Energy & Environment Committee met to approve the plan. This meeting was open to the public for citizen comment and input. This meeting was announced twice in the Daily Reporter prior to the meeting. In addition, agricultural landowners received announcements of the meeting by U.S. mail. The plan was approved by the Milwaukee County Land and Water Resource Management Plan Advisory Committee on November 30, 2010, the Milwaukee County Board Parks, Energy & Environment Committee on June 14, 2011, and the Milwaukee County Board of Supervisors on June 23, 2011, with final approval by the Wisconsin Land and Water Conservation Board on August 2, 2011.

LAND AND WATER RESOURCE MANAGEMENT PLAN PRIORITY ISSUES

The Milwaukee County LWRMP is intended to identify, prioritize, and address land- and water-related resource conservation issues in Milwaukee County. A set of goals was developed to address these issues. These goals represent what the County wishes to accomplish over the long term. In support of these goals, work plan objectives were developed to identify the approaches to be taken to achieve the goals of the plan. In addition, specific actions were identified to indicate the means of accomplishing the objectives. The goals identified in the 2006 update of the Milwaukee County LWRMP were:

1. Improve water quality through the reduction of sediment and nutrient delivery to surface waters within Milwaukee County.

2. Protect, restore, and enhance wetlands, grasslands, woodlands, environmental corridors, quality farmlands, and natural areas, including those located within Milwaukee County-owned parks and open spaces.

3. Enhance Lake Michigan bluff protection initiatives.

4. Effectively use and maintain the existing information management network and establish a land information web portal to distribute geographic information.

These goals and the supporting objectives and action items from the 2006 update to the plan are listed in Appendix B. The activities that the County has undertaken since 2006 to address these goals, objectives, and actions are described in the next section.

In developing the current update of the Milwaukee County LWRMP, the Advisory Committee reviewed the plan goals in light of the resource inventory and assessment and the discussion of related plans, regulations, and programs, presented in Chapters II and III, respectively, of this report. The goals, objectives, and specific action items of the updated plan are presented in Chapter IV.

PLAN IMPLEMENTATION ACTIVITIES

Since the adoption of the Milwaukee County LWRMP, Milwaukee County and its partners have conducted several projects to implement recommendations of the plan. Implementation activities related to the goals of the 2006 update of the plan are described in the subsections below.

Implementation Activities Related to the Goal of Improving Water Quality through the Reduction of Sediment and Nutrient Delivery to Surface Waters

The County and its partners conducted several projects and activities to reduce the delivery of sediment and nutrients to surface waters and improve water quality within Milwaukee County. These projects and activities, which are described below, reflected several different objectives related to the overall goal.

Training of County and Local Government Staff

In order to encourage public awareness of water quality problems and stormwater issues and to ensure that County staff is adequately trained to develop strategies and implement technologies to solve water quality problems, the County held and participated in several workshops and conferences related to water quality and stormwater issues. In 2008, Milwaukee County helped plan and host a workshop on stormwater education, outreach, and public participation plan updating for municipalities located in the southern portions of the Milwaukee and Menomonee River watersheds. In 2008 and 2009, the County sponsored three winter maintenance workshops that focused on road salt use reduction for public works employees and maintenance employees of public spaces such as schools and parking lots. These workshops were attended by approximately 390 persons. In 2008, the County staff gave a presentation on stormwater management at Bradford Beach at the fifth annual Clean Rivers, Clean Lakes Watershed Planning Conference in Milwaukee. Milwaukee County staff also made a presentation to elementary school children on the topics of stormwater and rain gardens at the 2008 Wisconsin Beach Sweep. In 2009, Milwaukee County hosted a Rainwater Harvesting Event. This hands-on workshop was geared toward landscape professionals, engineers and architects, and homeowners. Topics included rainwater harvesting, wetland filtration, harvesting systems design, permeable pavers, water feature design and construction, and rain gardens. The workshop also presented approaches for homeowners to utilize to incorporate the ideas and techniques present into the design of their property.

Stormwater Management

Milwaukee County has undertaken a number of efforts to manage stormwater on its facilities. In December 2006, the WDNR issued Milwaukee County a Wisconsin Pollutant Discharge Elimination System stormwater discharge permit for a municipal separate storm sewers system as required under Chapter NR 216, "Storm Water Discharge Permits," of the *Wisconsin Administrative Code*. The permit conditions set forth a number of tasks and established a schedule for completing these tasks. With one exception, Milwaukee County met the schedule for permit conditions to be complied with in the years 2007 through 2009. In 2007, the County performed initial field screening on all known stormwater outfalls for which it was responsible. This was completed in October 2007. In December 2007, the County became aware of additional outfalls, but was unable to sample them due to snow and ice formation in the vicinity of the outfalls. This effort was completed in early February 2008. In addition, the County undertook a number of other actions to comply with the requirements of Chapter NR 216. The County developed a training presentation to educate County employees about stormwater and to introduce permit requirements and stormwater regulations. This presentation was given in February 2010 to 288 employees from the County Department of Parks, Recreation, and Culture and the Milwaukee County Zoo. Employees from the Department of Transportation & Public Works were given the training in May 2010. The County implemented an illicit discharge detection and elimination program. The program included ordinance revisions which established a regulatory mechanism prohibiting illicit discharges into, and illicit connections to, the County's storm sewer system. In addition, the program included dry-weather screening of major storm sewer outfalls. Over the period 2007 to 2008, this led to the discovery and disconnection of four illicit connections from the County's storm sewer system. The County modeled its stormwater system to determine its compliance with the performance standards for developed urban areas set forth in Chapter NR 151, "Runoff Management," of the *Wisconsin Administrative Code*. This modeling showed that the County had met the goal of a 20 percent reduction in discharge of total suspended solids by the 2008 deadline specified in the *Administrative Code*. The County has also been updating its storm sewer map on an ongoing basis. The County has developed and is maintaining stormwater pollution prevention plans for several of its facilities including General Mitchell International Airport, Lawrence J. Timmerman Airfield, the Milwaukee County Zoo, and the Milwaukee County Fleet Management Main and North Shops. Maintenance and implementation of these plans has included training for employees and quarterly inspection of the facilities. In addition, the County has received a certification of no exposure for the Milwaukee County Transit System Fiebrantz Bus Garage. Stormwater from General Mitchell International Airport is covered under a separate WPDES stormwater discharge permit.

Activities to Reduce Bacterial Contamination at Lake Michigan Beaches

Milwaukee County has conducted several activities to identify and implement measures to prevent future Lake Michigan beach closings resulting from bacterial contamination. Studies by the University of Wisconsin-Milwaukee Great Lakes Water Institute (GLWI), the Milwaukee Metropolitan Sewerage District (MMSD), and

the City of Milwaukee determined that stormwater runoff is a major contributor to poor water quality at Lake Michigan beaches in Milwaukee County. The City of Milwaukee Health Department conducts extensive water quality testing at Lake Michigan beaches. In addition, the MMSD conducts extensive water quality testing in waterways throughout Milwaukee County, including within the nearshore Lake Michigan area. In order to locate possible sources of bacterial contamination at these beaches, in 2009 Milwaukee County began an investigation into possible cross connections between storm sewers and sanitary sewers at beach locations. These investigations included dye testing and smoke testing of concerned sewers. In addition, the County installed best management practices (BMPs) at specific beaches to reduce bacterial contamination. Over the period 2006 through 2009, the County put substantial effort into addressing the impacts of storm sewer outfalls that are located at Bradford Beach and McKinley Beach.

At Bradford Beach, the County installed a system of BMPs based upon an innovative design that incorporated sustainable and aesthetic features. Bio-infiltration cells were installed at six outfalls along the beach to capture contaminants and reduce the volume of stormwater discharged to the beach. These cells were designed to infiltrate about 90 percent of the stormwater entering them. Infiltration swales with native plantings were incorporated into the design of a rebuilt parking lot. Rain gardens were installed and hillsides revegetated in upstream parts of the tributary area to reduce contributions of sediment and stormwater. Signs were installed at the beach for public education. Installation was largely completed in 2008, although some additional improvements were made in 2009. This project received a Best in State Award for Engineering Excellence from the American Council of Engineering Companies, a Wisconsin Public Works Project of the Year Award from the Wisconsin Chapter of the American Public Works Association, and a Blue Wave Award from the Clean Beach Council.

At McKinley Beach, two infiltration systems were installed to reduce stormwater volume and capture contaminants from two outfalls discharging over the beach. At one outfall that discharges over a section of sandy beach, a surface infiltration basin with native plantings was created. At a second outfall situated in a rocky section of beach, a subsurface infiltration basin was installed. The construction of these BMPs was completed during 2009.

The DPRC continues to groom Lake Michigan beaches. These grooming procedures follow recommendations made by the GLWI for reducing the retention of bacteria in beach sands. Grooming occurs on a regular basis. For example, Bradford Beach is groomed at least once per week. During peak swimming season, grooming occurs more frequently on this beach.

Implementation of Recommendations Related to Soil Erosion and Water Quality in Milwaukee County Parks Agricultural Lands

The County DPRC owns approximately 1,000 acres of undeveloped parkland that can be used for agricultural uses and that are leased to agricultural operations. In addition, about 300 acres of County parkland are enrolled in the U.S. Department of Agriculture Conservation Reserve Program (CRP). The administration and management of these leases is based upon DPRC's Agricultural Land Lease Policy. This policy recommends terms and conditions upon which DPRC leases lands, including length of leases, rental fees for leases, requirements for conservation plans for leased parcels, and requirements related to the management of leased lands. In 2009, DPRC updated this policy, with the updated version becoming effective in January 2010. The updated policy is described in Chapter III of this report. Included among the elements of the update policy was a reinstatement of the requirements that no annual crops be planted within 75 feet of any river or stream on leased land and that no annual crops or vegetable crops be planted within 30 feet of any field ditch on leased lands.

Streambank Stabilization Activities

Beginning in 2007, Milwaukee County conducted two projects to stabilize unstable and eroding streambanks. The Menomonee River Streambank Project stabilized a failing streambank on the west bank of the Menomonee River across from Hart Park in Wauwatosa. The river was scouring soil from behind an 11-foot high intact stream wall constructed by the Federal Works Project Administration during the 1930s. The destabilized streambank threatened current development in Hart Park. The stabilization was accomplished through installation of a

bioengineered bank treatment with a large rock structure along the toe of the bank. This project had been recommended in the Milwaukee County Stream Assessment report.[2]

In the Grantosa Creek Best Management Practices Project, best management practices were designed and installed along Grantosa Creek in order to reduce sediment, debris and other nonpoint source pollution that was entering the stream and being discharged to the Menomonee River.

Two stream rehabilitation projects conducted by MMSD involved cooperation with Milwaukee County or occurred on County lands. The Underwood Creek project involved removing the concrete channel lining along the reach of Underwood Creek extending from N. Mayfair Road to USH 45 at the location of the Milwaukee County Grounds detention basin diversion structure. The stream channel was realigned, introducing meanders, riffles, and pools, resulting in a significant ecological improvement of the Creek, and creating a more natural and aesthetically pleasing setting. In conjunction with the construction of the Hart Park detention basin, the MMSD stabilized the banks of the mainstem of the Menomonee River in areas adjacent to the Park.

In 2010, Milwaukee County applied to the Federal Emergency Management Agency for grant funding through the Public Assistance Program to repair streambank erosion in County parks that resulted from the July 2010 floods.

Implementation of Recommended Pond and Lagoon Management Measures

Milwaukee County ranked the waterbodies within the County Park system based upon water quality and potential for improvement of water quality. In support of this effort, the County conducted water quality monitoring in several park ponds and lagoons.

The County also conducted several shoreline stabilization and erosion control demonstration projects at County park ponds and lagoons. These projects were conducted in accordance with the recommendations of the Milwaukee County pond and lagoon management plan.[3] These projects were intended to reduce loadings of sediment and nutrients into the ponds, improve water quality, and stimulate interest in current methods of shoreline restoration. The projects included the installation of fiber rolls, rock armoring, and native plantings along the shorelines. The plantings included native grasses and emergent aquatic plants. In addition, rain gardens and sedimentation chambers were installed to further reduce loadings. Signs were installed at the ponds to educate the public regarding the purposes of and methods utilized in the projects. Work began at the lagoons in Dineen, Humboldt, and Jacobus Parks in September 2007 and was substantially complete by August 2008. Work at the lagoons in McGovern and Washington Parks started in October 2008 and was substantially complete by August 2009. Design work for a project at a pond in Mitchell Park began in autumn 2010.

The DPRC also conducts aquatic plant management activities at selected park ponds and lagoons in the Milwaukee County Parks System. On an annual basis, the County receives permits from the WDNR to apply herbicide treatments to 15 park ponds and lagoons. In a typical year, only five or six ponds receive treatment. The DPRC also monitors aquatic plant populations at McKinley Marina. Historically, mechanical harvesting and herbicide treatments have been used at this location when populations have reached or exceeded nuisance levels. There has not been a need for treatment at this location since 2005.

Activities Related to Compliance with Agricultural Runoff Performance Standards

In 2007, the County completed a soil loss survey to determine whether soil erosion levels exceeded the maximum tolerable average annual rate of soil erosion ("T" value) for each soil type that will permit a high level of crop productivity to be sustained economically and indefinitely.

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[2]*Inter-Fluve, Inc.,* Milwaukee County Stream Assessment Final Report, *September 24, 2004.*

[3]*Milwaukee County Environmental Services,* Milwaukee County Pond & Lagoon Management Plan, *June 2005.*

Implementation Activities Related to the Goal of Protecting, Restoring, and Enhancing Wetlands, Grasslands, Woodlands, Environmental Corridors, Quality Farmland, and Natural Areas

Milwaukee County has pursued opportunities and projects to protect, enhance, and restore wetlands, grasslands, and woodlands within the County using recognized management techniques. In support of this, it has initiated natural resource inventories in several County parks and natural areas in order to establish baseline data regarding ephemeral wetlands, invasive species, unofficial trails, and rare plant and animal species.

In 2009, the DPRC developed natural area standards for contractors working on DPRC property. It also redeveloped the DPRC's agricultural lease policy.

The County has sought to resolve encroachment issues throughout the park system. Unfortunately, private citizens and businesses have extended lawns, built structures and disposed of yard waste and refuse in natural areas throughout the County Park System. In 2008 and 2009, encroachment issues were resolved at 19 sites.

In support of efforts to protect, restore and enhance natural areas, the DPRC Trails and Natural Areas Program has been actively maintaining existing public/private partnerships and developing new partnerships. Notable partners from the period 2007 through 2009 are listed in Table 1. In 2008 and 2009, the Trails and Natural Areas Program developed over 60 new partnerships. Program partners were involved in a variety of activities including the development, construction, and maintenance of trails; the development of natural resource inventories; the control of invasive plant species; the installation of erosion control measures; and the development of educational materials such as brochures and signs for specific parks.

In one notable project conducted in 2010, DPRC eliminated unbuffered surface runoff from two agricultural fields adjacent to Franklin Savanna State Natural Area by taking two DRPC agricultural fields comprising 19 acres out of production and restoring them to native prairie. This project was conducted in partnership with the Urban Ecology Center and U.S. Forest Service. Funding for the project was provided by the Root-Pike Watershed Initiative Network (Root-Pike WIN).

The County has also involved volunteer groups in its natural areas management activities. In 2009, for example, 3,000 volunteers donated 10,000 hours of labor assisting with ecological restoration and management activities on lands managed by the DPRC. This represents an expansion of the volunteer program from about 1,600 volunteers in 2008. In order to recruit volunteers and educate them as to the importance of their efforts in the management of natural areas, DPRC Trails and Natural Areas staff performs several types of outreach activities. These activities include making presentations at local, regional, and national meetings; giving guest lectures at local schools, colleges, and universities; and publishing articles in State, regional, and international publications. DPRC has also issued press releases on an as needed basis to announce volunteer opportunities and work days in County parks and natural areas.

A considerable portion of the DPRC Trails and Natural Areas staff effort is devoted to controlling invasive species within County parks and natural areas. Each year, DPRC Trails and Natural Areas staff actively works at County parks and at 40 natural areas comprising about 1,500 acres of County lands. As previously noted, these efforts have been supplemented by the efforts of program partners and volunteers. These efforts have included the initiation of natural resource inventories to establish baseline data for invasive species. In addition, in 2008 DPRC in cooperation with the WDNR developed a preparedness plan for the threat posed by emerald ash borer, an invasive wood-boring beetle.[4] The DPRC Trails and Natural Areas staff has implemented the DPRC emerald ash borer plan and has conducted aerial spraying for control of gypsy moth caterpillars.

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[4]*Milwaukee County Department of Parks, Recreation, and Culture and Wisconsin Department of Natural Resources,* Milwaukee County Emerald Ash Borer Preparedness Plan, *December 2008.*

Table 1

NOTABLE PARTNERS WITH MILWAUKEE COUNTY IN LAND AND WATER RESOURCE CONSERVATION ACTIVITIES: 2007-2009

AmeriCorps (National Civilian Community Corps)	Milwaukee Area Technical College Service Learning Program
Badgerland Striders	Milwaukee Biome Project
Bicycle Federation of Wisconsin	Milwaukee Conservation Leadership Corps
Boy Scouts	Milwaukee German Immersion School
Center Street Park Watch	Milwaukee Metro Mountain Bikers
City of Milwaukee	Milwaukee Metropolitan Sewerage District
Cooper Park Watch	Nash Park Watch
Eagle Scouts	Natural Resources Foundation of Wisconsin
Friends of Boerner Botanical Gardens	Neighbors United for Washington Park
Friends of Bradford Beach	North Point Lighthouse Friends
Friends of Cathedral Square Park	The Park People
Friends of Dineen Park	Partners in Parks
Friends of Estabrook Park	Pheasants Forever—Southeast Wisconsin Chapter
Friends of Grant Park	Preserve Our Parks
Friends of Greenfield Park	REI
Friends of Hales Corners Park	Residents for Off-Leash Milwaukee Parks
Friends of Johnsons Park	River Revitalization Foundation
Friends of Kletzsch Park	Riverside Urban Ecology Center
Friends of Kohl Park	St. Bernadette Catholic School
Friends of Mill Pond	Saveland Park Watch
Friends of the Domes	Sheridan Park Friends
Friends of Wehr Nature Center	South Shore Park Watch
Girl Scouts	Southeastern Wisconsin Beach Task Force
Great Lakes Nonpoint Abatement Coalition	Southeastern Wisconsin Invasive Species Consortium
Groundwork Milwaukee	Southeastern Wisconsin Regional Planning Commission
Hawley Environmental School	Southeastern Wisconsin Watershed Trust
Holler Park Neighborhood Association	Story Hill Neighborhood Association
Humboldt Park Watch	Student Conservation Association (SCA)
Hyatt Regency Hotel	University of Wisconsin-Milwaukee Conservation and Environmental Science Program
Jacobus Park Neighborhood Association	University of Wisconsin-Milwaukee Department of Geography
Johnson Controls	University of Wisconsin-Milwaukee Service Learning Program
Juneau Park Friends	Urban Ecology Center
Keep Greater Milwaukee Beautiful, Inc.	U.S. Forest Service
Kops Park Watch	U.S. Natural Resources Conservation Service
Lake Park Friends	Wisconsin Coastal Management Program
Lyons Park Watch	Wisconsin Department of Agriculture, Trade and Consumer Protection
McCarty Park Watch	Wisconsin Department of Natural Resources
Milwaukee Area Land Conservancy	Wedgewood Park Watch

Source: Milwaukee County and SEWRPC.

The County has also been working to identify high-quality natural areas that should be protected. As a part of this effort DPRC staff serves on the SEWRPC Technical Advisory Committee for the Protection and Management of Natural Areas in Southeastern Wisconsin which has been overseeing an updating of the regional natural areas and critical species habitat protection and management plan.

Implementation Activities Related to the Goal of Enhancing Lake Michigan Bluff Protection Initiatives

As previously described, as part of the Bradford Beach project, rain gardens were constructed and hillsides revegetated in the upstream portions of the tributary area in order to reduce stormwater volume and siltation. In addition, DPRC has been coordinating with local residents to stabilize the slopes of bluffs overlooking Lake Michigan along Lincoln Memorial Drive between Lafayette Hill and Kenwood Boulevard. The measures being used in this project include regrading, seeding, planting of native shrubs, and installation of blankets and filtrex logs.

The County has also conducted two projects to maintain lakefront land for recreational use and access. The County has been restoring the Lion Bridges in Lake Park. As part of this project, bluffs have been stabilized where necessary in order to protect the restored bridges. As part of a series of projects to improve McKinley Marina, the County has been replacing a segment of seawall that has failing bulkheads. Sections of the seawall have fallen into the lake creating a public hazard and erosion problems. Design efforts began in 2007 and the project has continued through 2008 and 2009.

Implementation Activities Related to the Goal of Effectively Using and Maintaining the Existing Information Network and Establishing a Land Information Web Portal

In 2007 and 2008, Milwaukee County purchased and installed software to help manage and maintain their existing information management system and to support the deployment of an internet-based countywide interactive map service. This service is designed to support both public and secure geographical information system (GIS) applications access through the worldwide web. This service was launched in early 2009. In support of this service, the County conducted several activities. These activities included acquiring, organizing, and publishing nearly 200 mapping feature types for use in the GIS application. Examples of these features include property, topographic, and floodplain information.[5] In addition, the County participated in providing GIS demonstrations, training, and technical assistance for both County departments and local units of government. Finally, in 2009 the County continued updating software and data in the system.

OTHER NOTABLE LAND AND WATER RESOURCE CONSERVATION ACTIVITIES IN MILWAUKEE COUNTY

During the period from 2007 to 2010, several other projects and activities related to the conservation of land and water resources were conducted in Milwaukee County. While these projects and activities were not included in the work plan described in the 2006 update to the County's land and water resource management plan, they are notable because they included some involvement by the County or were conducted, in whole or in part, on County lands. This section describes these projects and activities.

[5]*The Milwaukee County Automated Mapping and Land Information System Steering Committee, MMSD, and SEWRPC are conducting a program under which SEWRPC is preparing updated floodplain studies and floodplain boundary delineations for streams throughout the County. The delineations for streams within the Oak Creek watershed are complete, and substantial work has been completed on delineations in the Menomonee and Milwaukee River watersheds and the Lake Michigan Direct Drainage Area. Floodplain boundary delineations have been completed on two streams within the Root River watershed. The remainder of the studies and delineations are anticipated to be completed over the next few years.*

Remediation of Legacy Toxic Sediments in Watercourses
During the period 2007 to 2010, efforts were made to remediate legacy toxic sediments in watercourses within Milwaukee County.

Little Menomonee River Moss-American Site Remediation
The Moss-American site comprises 88 acres, including a former creosote facility and six miles of the Little Menomonee River, which is adjacent to the former facility. The former Moss-American property is located at the intersection of Brown Deer and Granville Roads on Milwaukee's northwest side. About 65 acres are undeveloped Milwaukee County park land. About 23 acres are owned by the Union Pacific Railroad and are currently being used for industrial purposes.

Between 1921 and 1976, Moss-American operated a wood-preserving facility that treated railroad ties with a creosote and fuel-oil mixture. Environmental studies by the U.S. Environmental Protection Agency (USEPA) concluded that previous site activities contaminated soil and groundwater as well as sediment in the Little Menomonee River. Contaminants of concern include polychlorinated aromatic hydrocarbons and organic compounds such as benzene, toluene, ethyl benzene, and xylene.

Remediation activities at this site began in 1995 with channel remediation beginning in 2002. As part of the remediation of this site, five sections of the channel of the Little Menomonee River were rerouted, the contaminated sediment was removed and treated, the old channel was filled, and the new channel and areas disturbed by the cleanup were revegetated. This remediation was conducted on an approximately five-mile-long reach of the River. In some sections of the River, the remediation involved removal of sediment, rather than rerouting the channel, because of the presence of bridges crossing the River. These remediation efforts represent implementation of recommendations first made in the Commission's comprehensive plan for the Menomonee River watershed.[6] The remediation of the River was completed in December 2009. An active groundwater treatment system continues to operate on the site.

USEPA will continue to monitor this site through 2026. At that time a determination will be made regarding whether the site can be removed from the Federal Superfund list.

Lincoln Creek and Milwaukee River Sediment Projects
Studies of sediment deposits and sediment transport within the Milwaukee River system showed significant deposits of polychlorinated biphenyls (PCBs) within Estabrook Impoundment along the Milwaukee River and Lincoln Creek.[7] Most of this impoundment lies within or adjacent to Milwaukee County park lands. Based upon the studies, the WDNR has identified three priority areas for addressing the sediments within the impoundment. These include the Blatz Pavilion Lagoon within Lincoln Park, a Phase I project area that includes Lincoln Creek downstream from N. Green Bay Road and the west oxbow of the Milwaukee River, and a Phase II project area that includes the east oxbow of the Milwaukee River and the mainstem of the Milwaukee River from the Estabrook Park dam to a point immediately upstream from Lincoln Park.

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[6]*SEWRPC Planning Report No. 26,* A Comprehensive Plan for the Menomonee River Watershed, *Volume Two,* Alternative Plans and Recommended Plan, *October 1976.*

[7]*Baird and Associates,* Final Report, Milwaukee PCB Mass Balance Project, *September 1997; Jeffrey S. Steuer, Sharon A. Fitzgerald, and David W. Hall,* Distribution and Transport of Polychlorinated Biphenyls and Associated Particulates in the Milwaukee River System, Wisconsin, 1993-1995, *U.S. Geological Survey Water-Resources Investigations Report No. 99-4100, 1999; and Wisconsin Department of Natural Resources,* Estabrook Impoundment Sediment Remediation Pre-Design Study Project Completion Report to USEPA, *PUBL-WI 826, August 2005.*

As the first part of the remediation efforts, nearly 4,000 cubic yards of sediment containing about 300 pounds of PCBs were removed from the Blatz Pavilion Lagoon in Lincoln Park. This project was completed in 2008. Sediment sampling conducted in March 2009 in the vicinity of the Pavilion showed very low to undetectable levels of PCBs. The Blatz Pavilion Lagoon project was the first stage in the WDNR efforts to restore the Milwaukee River in Lincoln Park. This site was selected by the WDNR, Milwaukee County, and local residents for the first stage in remediation efforts because the lagoon is the location of the Blatz Pavilion Community Center which brought park visitors into close proximity to contaminated sediments.

As previously indicated, the Phase I project area includes the downstream portion of Lincoln Creek and the west oxbow of the Milwaukee River. Remediation efforts in this project area will include removal of contaminated sediment, restoration of areas disturbed by sediment removal, and, if funding permits, additional habitat restoration. It is estimated that this project area contains over 100,000 cubic yards of sediment containing over 11,000 pounds of PCBs. It is anticipated that project design and necessary permitting activities for his project will be completed by the end of 2010, and that sediment removal and site and habitat restoration activities will begin in spring 2011 and be completed in spring 2012.

As previously indicated, the Phase II project area includes the east oxbow of the Milwaukee River and the mainstem of the Milwaukee River from the Estabrook Park dam to a point immediately upstream from Lincoln Park. The east oxbow is not known to contain significant deposits of PCB-contaminated sediment. Studies have shown that the one-mile section of the River downstream from the oxbow contains discrete deposits of sediment containing PCBs. In addition, the fixed-crest spillway at the Estabrook Park dam contains several feet of sediment comingled with woody debris. Limited sampling within the spillway indicates the presence of PCBs within the comingled debris and sediment. The USEPA is characterizing the sediments within the Phase II project area. As part of this characterization, sediment samples were collected in early 2010. As of October 2010, the results of this sampling were not available.

Maintenance and Repair of Dams

Estabrook Dam

On July 28, 2009, the WDNR issued an order that Milwaukee County repair or abandon Estabrook dam. This order established:

- A deadline for completing a drawdown of the Estabrook impoundment;
- A requirement for the completion, certification, and submission for approval of plans and specifications for repairs to the dam that had been previously identified in a revised work schedule dated October 16, 2007;
- A requirement that repairs be completed in accordance with approved plans and specifications;
- A requirement that a professional engineer certify the completion of repairs and that these repairs conform to the approved engineering plans; and
- A deadline of October 1, 2010 for performing detailed stability analyses for the entire structure under all loading conditions.

The order also specified that the impoundment shall not be refilled until all the repairs identified in the October 16, 2007 revised work schedule are completed. In addition, it indicated that authorization to refill the impoundment could not be granted until the stability analyses previously referred to are reviewed and approved by the WDNR.

The revised work schedule cited in the order specified required repairs. These included removal of trees and shrubs from all abutments; removal of debris from the fixed crest spillway and ice breakers; concrete repairs to piers, the operating bridge deck and walls, and the surfaces of the fixed spillway and abutments; establishment of

survey benchmarks; and repairs to expansion joints, ice breakers, gates, and abutment banks of the control spillway.

The order set a deadline of January 28, 2011 for the County to inform the WDNR of its intent to either repair the dam or apply for abandonment of the dam and subsequently remove it. The order also set deadlines of July 29, 2011 for the County to submit plans and specifications for the repair of the dam to the WDNR for review and approval and July 27, 2012 for the County to select a competent contractor to repair the structure in accordance with the approved plans and specifications. The order set a deadline of 10 days after the completion of repairs for the County to submit an inspection, operation, and maintenance plan and an emergency action plan to the WDNR for review and approval.

Pursuant to the order, Milwaukee County retained a consultant to perform a detailed stability analysis of the dam under all loading conditions. Preliminary results from the structural assessment concluded that:[8]

- One concrete ice breaker and a portion of a second ice breaker require replacement. The other ice breakers require repairs;
- The gated spillway structure is currently stable under normal pool loading, but requires upstream tie-down anchoring to have a suitable factor of safety at full pool conditions with ice loading;
- The fixed overflow spillway with stoplogs is stable during full pool loading with and without ice loading;
- There is no bedrock scour or undercutting of the dam; and
- Clearing of vegetation along the shore and island and installation of riprap in limited areas along the shore will be required for erosion protection.

The consultant presented preliminary recommendations for the rehabilitation of the dam. These recommendations included some sediment removal, restoration of the gated spillway piers below the low level water line, spot concrete restoration on the overflow spillway section, replacement of two concrete ice breakers, repairs to the remaining ice breakers, and installation of riprap on the shoreline at the gated spillway section. It was estimated that this rehabilitation would extend the life of the dam for approximately 20 years.

Kletzsch Park Dam

The WDNR inspected Kletzsch Park dam on July 30, 2008. Subsequent to this inspection, the Department issued a dam safety report which established a schedule for the County to complete required planning, studies, and repairs to the dam.

The dam safety report set deadlines for the County to submit two plans to the WDNR for review and approval. It required that an emergency action plan for the area downstream of the dam be submitted by April 15, 2010, and it required that an inspection, operation, and maintenance plan be submitted by January 15, 2011.

The dam safety report noted that scour and undermining of this dam have never been investigated and requested that a field investigation for scour and undermining be conducted. The report set a deadline of September 30, 2011 for the results of this investigation to be submitted to the WDNR.

[8] *AECOM, "Estabrook Dam Structural and Environmental Evaluation," September 21, 2010.*

The report indicated that the dam required two repairs. It indicated that trees and moderately dense shrubs were present on the left (looking downstream) bank of the River adjacent to the left abutment of the dam, and it called for those trees and shrubs to be removed and for grass to be established on the bank. In addition, the inspection found deterioration and loss of masonry at the left abutment. It indicated that this deterioration must be evaluated and repaired. The report indicated that the plans and specifications for both of these repairs are to be submitted to the WDNR for review and approval prior to conducting the repairs. The report set a deadline of September 30, 2011 for completing the needed repairs.

Finally, the report noted that the existing benchmark located on the dam is intact. It indicated that a benchmark off the dam was required and requested that the County provide documentation from a registered land surveyor regarding the location and elevation of this additional benchmark by January 15, 2012.

Wildlife Hazard Management at General Mitchell International Airport

In 2009, General Mitchell International Airport (GMIA) developed a plan to identify and abate wildlife-related hazards to aircraft using the airport.[9] This plan was developed in cooperation with the U.S. Department of Agriculture's Wildlife Services. The plan identifies the wildlife species considered to pose the greatest threat to airport activities and specifies procedures for the management of these species and for habitat that provides cover for, or that acts to attract, these species. The plan addresses a variety of species including large mammals, such as deer and coyote; flocking birds, such as pigeons, house sparrows, starlings, and seagulls; large birds, such as waterfowl; and raptorial birds, such as hawks and falcons. Elements of the plan include:

- Monitoring of the populations and activities of the species of concern, both on airport grounds and in the vicinity of the airport;
- Management of wildlife populations on airport grounds. Management measures may include relocation of animals, deterrence measures designed to discourage animals from frequenting airport grounds, and depredation of animals in accordance with the conditions of permits and licenses issued by the Federal and State Governments;
- Management of wildlife habitat on airport grounds to reduce cover for wildlife species of concern;
- Coordination with neighboring landowners on activities to reduce attractiveness of lands in the vicinity of the airport to wildlife species of concern;
- Updating and maintaining wildlife-resistant perimeter fencing around the airport; and
- Maintenance of necessary permits and licenses for wildlife management activities.

Implementation of most of the activities recommended in the plan is conducted on an ongoing or as needed basis.

Sanitary Sewer Capacity, Management, Operations, and Maintenance (CMOM) Efforts

As part of a May 2002 stipulation agreement regarding sanitary sewer overflows between the MMSD and the State of Wisconsin, the District agreed to implement a capacity, management, operations, and maintenance (CMOM) program. CMOM principles were proposed by the USEPA in 2001 as a part of a draft Sanitary Sewer Overflow (SSO) Rule.[10] Generically, CMOM, principles are directed at reducing SSOs through stating the goals and objectives of an organization regarding overflows and the strategies and tactics that will be employed to achieve the goals. The MMSD saw the value of applying these principles to its other areas of responsibility also.

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[9] *General Mitchell International Airport,* Wildlife Hazard Management Plan, *October 2009.*

[10] *The draft rule was subsequently withdrawn and has not been promulgated.*

Therefore, the MMSD developed and documented a broad CMOM Program to address its wastewater conveyance and storage system, its wastewater treatment plants, and the watercourse systems under its jurisdiction.

As part of its rules, the MMSD requires each of its satellite municipalities, including Milwaukee County, to develop a local CMOM program. The program objectives are to:

- Better manage, operate, and maintain collection systems;
- Investigate capacity constrained sections of the collection systems; and
- Proactively prevent SSOs.

As the owner of a satellite system to the MMSD, Milwaukee County is conducting ongoing implementation of its CMOM program. Implementation includes efforts to reduce infiltration and inflow to sanitary sewers that the County owns. As of October 18, 2010, the County has completed full inspection of 936 manholes, representing 98 percent of its manholes. As a result of these inspections, repairs and external improvements have been made to the majority of the manholes. These repairs and improvements include removal and replacement of manhole lids, removal and resetting of manhole frames, removal of masonry chimneys, installation of precast concrete chimneys, installation of chimney seals, and abandonment of some manholes. The County has also conducted cleaning and testing of its sanitary sewer mains, force mains, and laterals. As of October 18, 2010, the County has cleaned and flushed 151,513 linear feet of mains, force mains, and laterals, representing about 76 percent of the pipes in its system. In addition, the County has completed smoke testing of 41,670 linear feet, dye testing of 866 linear feet, and televised inspection of 101,852 linear feet of sanitary sewer pipes.

Chapter II

RESOURCE ASSESSMENT

INTRODUCTION

The conservation and wise use of agricultural and natural resources and the preservation of cultural resources are important factors influencing the growth and development potential of Milwaukee County. Aside from the County's physical location, the natural resource base is one of the assets that make the County a desirable community in which to reside and work. The natural resources of Milwaukee County not only provide recreational and aesthetic value, but also provide economic value. Protecting this resource base is important to maintain biological diversity, which could be degraded by inappropriate development. Accordingly, future development should be guided to be consistent with the ability of the natural resource base to support various forms of urban and rural development without deterioration of the existing natural resources in the County.

The natural resources in Milwaukee County are susceptible to permanent damage resulting from inappropriate land use, transportation, and public facility development. Additionally, traditional occupations such as farming and horticulture place significant burdens on the natural resource base. Sufficient understanding of the characteristics and elements of the natural resources must exist in order to prevent the environmental degradation and monetary costs associated with overuse and alteration of the existing natural resource base. A sound land and water resource planning program must recognize that natural resources in the County are limited. Milwaukee County and the local governments within the County must work together to develop a sound planning process that acknowledges the potential threats to the resource base, and provides goals and objectives to preserve, protect and enhance that resource base, and also, educates the public on the value of natural resources and the benefits of good land stewardship.

This chapter provides inventory information on existing agricultural, natural, and cultural resources in Milwaukee County. The resource assessments that are discussed include soil types, existing farmland, farming operations, topography and geology, Lake Michigan bluff and ravine areas, nonmetallic mineral resources, surface water and groundwater resources, forest resources, natural areas and critical species habitats, environmental corridors, park and open space sites, cultural (historical and archaeological) resources, and demographics and land use.

The base year for inventory data presented in this chapter ranges from 2000 to 2009. Much of the inventory data has been collected through regional land use, natural area, and water quality planning activities conducted by SEWRPC. Additional inventory data has been collected from and by Milwaukee County, local units of government, and State and Federal agencies including the Wisconsin Department of Natural Resources (WDNR); Wisconsin Department of Agriculture, Trade, and Consumer Protection (DATCP); State Historical Society of Wisconsin; and the U.S. Department of Agriculture (USDA).

SOILS AND AGRICULTURAL RESOURCES

Soil Survey

The USDA Soil Conservation Service, now the Natural Resources Conservation Service (NRCS), issued a soil survey for Milwaukee County in 1971[1]. This survey was updated in 1998.[2] Soils were identified and mapped and organized by soil association, soil series, and soil type. The soil survey results, including the attributes of each soil type, are now available on the NRCS website as part of the Soil Survey Geographic (SSURGO) database. Unless otherwise noted, the soil information in this chapter was obtained from the SSURGO database.

Soil properties exert a strong influence on the manner in which the land is used, especially where land use is continually changing and evolving, as it is in Milwaukee County. Soils directly affect the types of land use that can take place, whether those uses are agricultural, recreational, commercial, or residential. Any comprehensive land and water resource management plan needs to evaluate how soils are currently being used, and also, how soils should best be used and managed over time. The soil survey can play an important role in land use decisions. The information contained in the soil survey can help identify which areas of the County are suitable for agricultural use and areas with limitations for development due to wet soils or bedrock near the surface.

Soil Associations

A soil association is a landscape that has a distinctive pattern of soils. There are six soil associations in Milwaukee County and Map 1 shows their spatial distribution across the County. Soils are typically grouped into an association by drainage patterns, as well as surface horizon thickness. The general soil associations can be used for comparing suitability of relatively large areas for various land uses. However, for specific applications, the aforementioned detailed soil survey information should not be solely relied upon, an onsite field survey may be necessary for confirmation purposes. Soils, as a whole, are very diverse and polymorphic, making it necessary to field verify what is actually on the landscape.

Topographical features, particularly slopes, have a direct bearing on the potential for soil erosion and the accumulation of sediment on the beds of surface waters. Map 2 shows the steepness of slopes in Milwaukee County. Slope steepness affects the velocity and, accordingly, the erosive potential of runoff. The amount of slope or relief on the land is one of the most important factors governing soil development processes and determines many of the physical and chemical properties of a specific soil. Additionally, slope is also one of the principal factors involved in soil erosion. As slopes increase, so also does the erosion rate. Highly erodible lands (HEL) are those areas in the County that have slopes greater than 6 percent. Although areas that have slopes less than 6 percent are still prone to erosion without proper management, the areas that are greater than 6 percent slope are of most concern. The NRCS considers a farm field to be HEL if one-third or more of that field contains slopes of 6 percent or greater. The soils in these areas are difficult to manage, not only for agriculture, but also for urban development. Land surface slopes, based on soils classification interpretations, within Milwaukee County range from less than 1 percent to over 20 percent. The majority of land area in Milwaukee County, approximately 53.0 percent, has slopes that are between 0 and 6 percent based upon soil interpretations. The remaining classes of 6 to 12, 12 to 20, and greater than 20 percent occupy approximately 9.9 percent, 0.6 percent, and 0.3 percent, of the County land area respectively. Additionally, about 36.2 percent of the land area is not assigned a slope classification, either because soil surveys were not conducted because of the presence of urban development or because the land is described as disturbed land, such as landfills and gravel pits.

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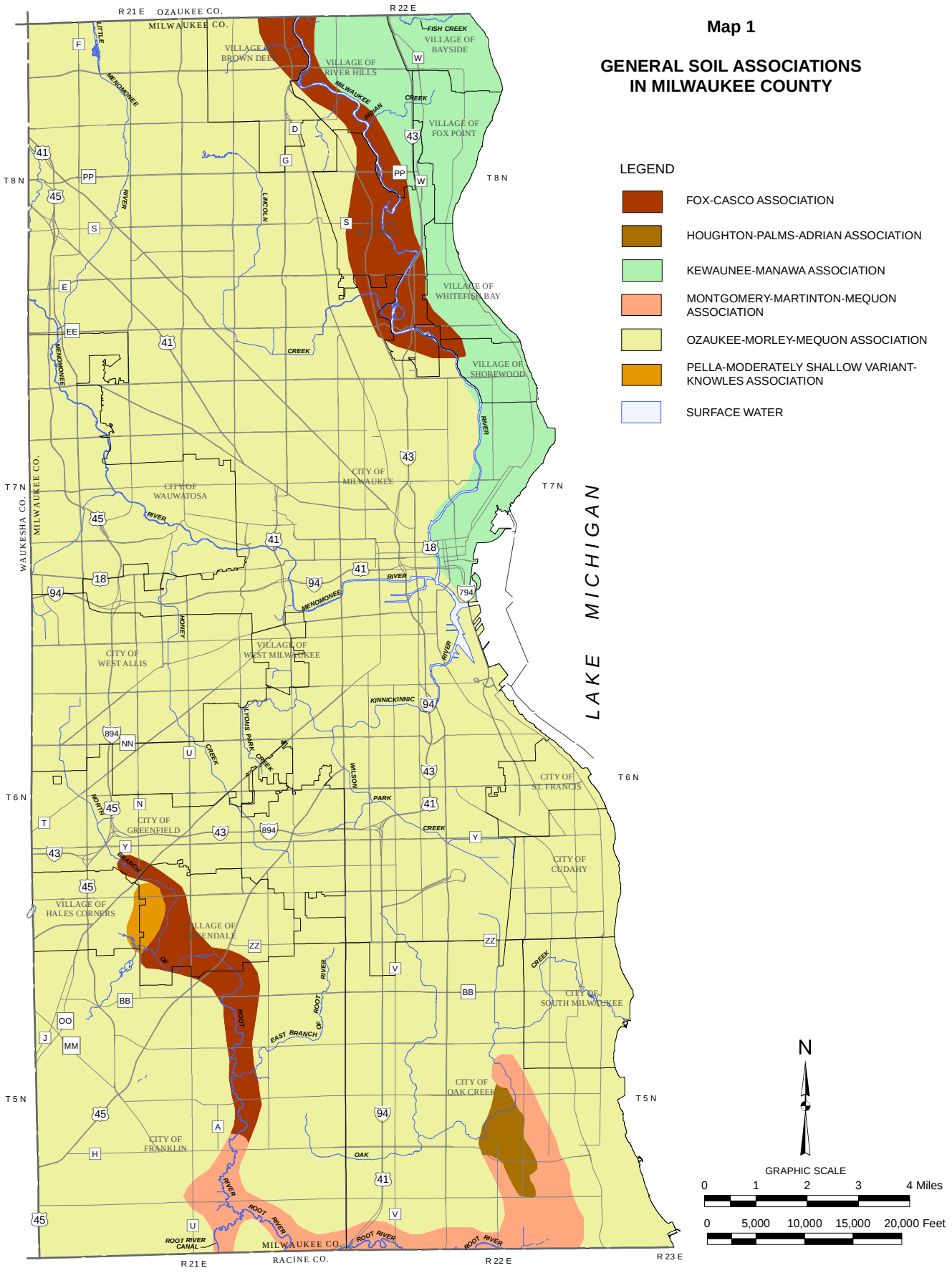
[1] *Documented in the USDA Soil Conservation Service,* Soil Survey of Milwaukee and Waukesha Counties, Wisconsin, *1971.*

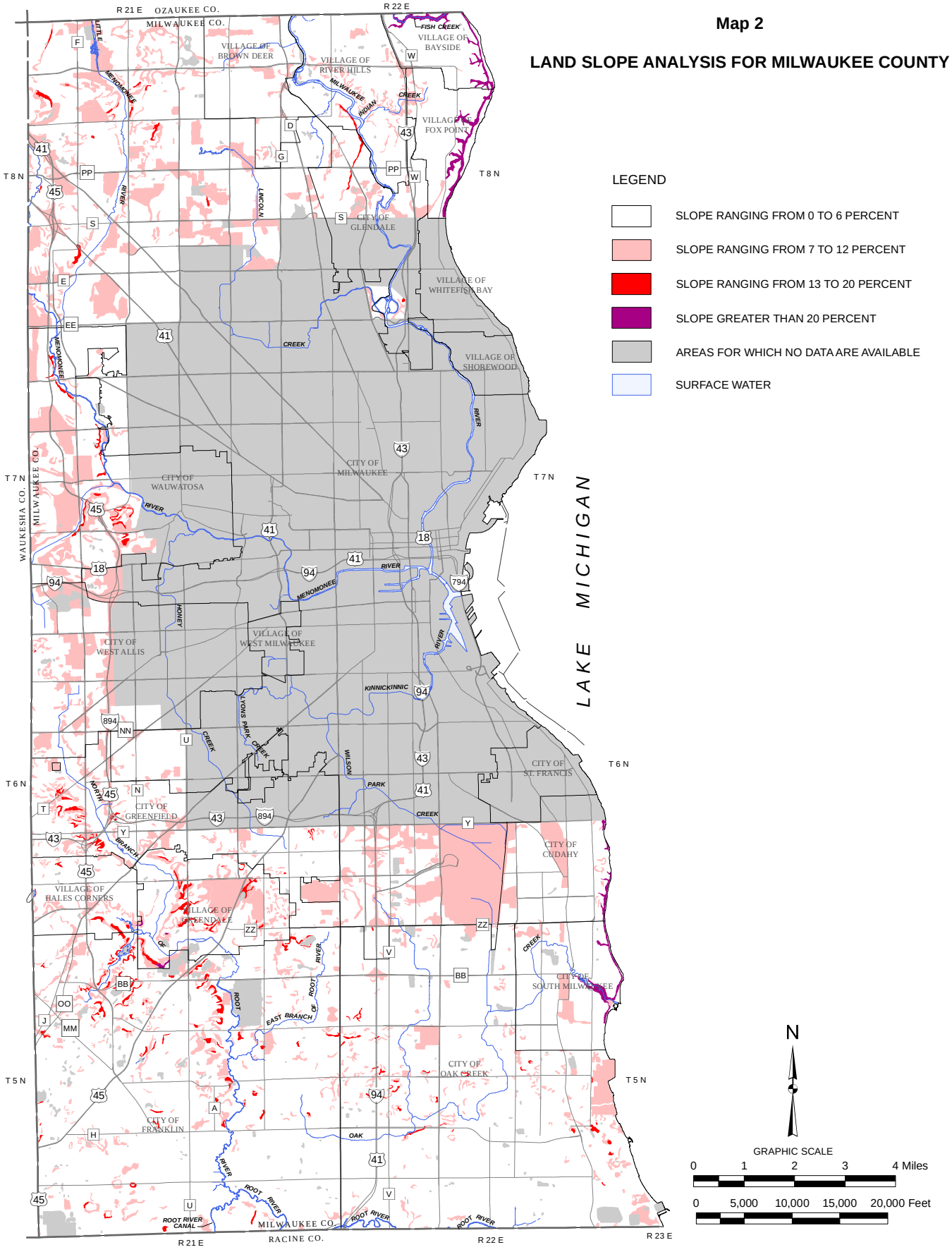
[2] *USDA Natural Resources Conservation Service,* Soil Survey of Milwaukee and Waukesha Counties, Wisconsin, January 1998.



Source: U.S. Department of Agriculture Natural Resource Conservation Service and SEWRPC.

Map 2

LAND SLOPE ANALYSIS FOR MILWAUKEE COUNTY



Source: U.S. Department of Agriculture Natural Resources Conservation Service and SEWRPC.

Soil Limitations for Development

A variety of soil characteristics can impact the suitability of land for development. Severe structural soils, as identified by the NRCS, impose significant limitations on development of dwellings with or without basements and structures requiring septic tank absorption fields. Severe structural soils possess properties or site features that are so unfavorable or so difficult to overcome that special design, significant increases in construction costs, and possibly increased maintenance are required. A high water table, flooding, shrinking and swelling, and organic layers can cause the movement of footings and affect dwellings with or without basements. Likewise, a high water table, depth to bedrock, large stones, slope, and flooding affect the ease of excavation and construction and also influence the performance of septic tank absorption fields.

Soils that are saturated with water or that have a water table at or near the surface are known as hydric soils, and they pose significant limitations for most types of development. High water tables often cause wet basements and poorly functioning absorption fields for private onsite waste treatment systems. The excess wetness may also restrict the growth of landscaping plants and trees. Wet soils also restrict or prevent the use of land for crops, unless the land is artificially drained. Map 3 depicts hydric soils in Milwaukee County, as identified by the NRCS. The land areas covered by hydric soils identified in the County and each local government is shown in Table 2. Because soil survey data are unavailable for portions of the County, the areas shown in the table should be considered minimum values. Although such areas are generally unsuitable for development, they may serve as important locations for restoration of wetlands and wildlife habitat.

Soil Suitability for Agricultural Production

The U.S. Natural Resources and Conservation Service (NRCS) has classified soils into capability groupings that indicate their general suitability for most kinds of farming. The groupings are based upon composition and limitations of the soils, the risk of damage when they are used, and the way they respond to treatment. Under the NRCS system, there are eight capability classes ranging from Class I, which have few limitations, to Class VIII, which have severe limitations due to soils and land forms so rough, shallow, or otherwise limited that they do not produce economically worthwhile yields of crops, forage, or wood products.[3] In general, Class I soils have the widest range of uses, the least risk of damage, and are most suitable for cropland; Class II soils have some limitations that reduce the choice of plants that can be grown, or require moderate conservation practices to reduce the risk of damage when used; Class III and IV soils have severe limitations that reduce the choice of plants, require special conservation practices, or both. The soils in the remaining classes have progressively greater natural limitations not suitable for cropland, but used for pasture, grazing, woodland, wildlife, recreation, and esthetic purposes. Generally, lands with Class I and II soils are considered "National Prime Farmlands" and lands with Class III soils are considered "Farmlands of Statewide Significance."

The locations of the Milwaukee County Class I, II, and III soils are shown on Map 4 and the areas are set forth in Table 3. As shown on Map 4, much of the County is covered by soils which are well suited for agricultural use (mainly Class II soils). It is important to note that for much of the County, soil survey data upon which to classify soil capability are not available. This includes all or portions of the Cities of Cudahy, Glendale, Greenfield, Milwaukee, St. Francis, Wauwatosa, and West Allis and the Villages of Shorewood and Whitefish Bay.

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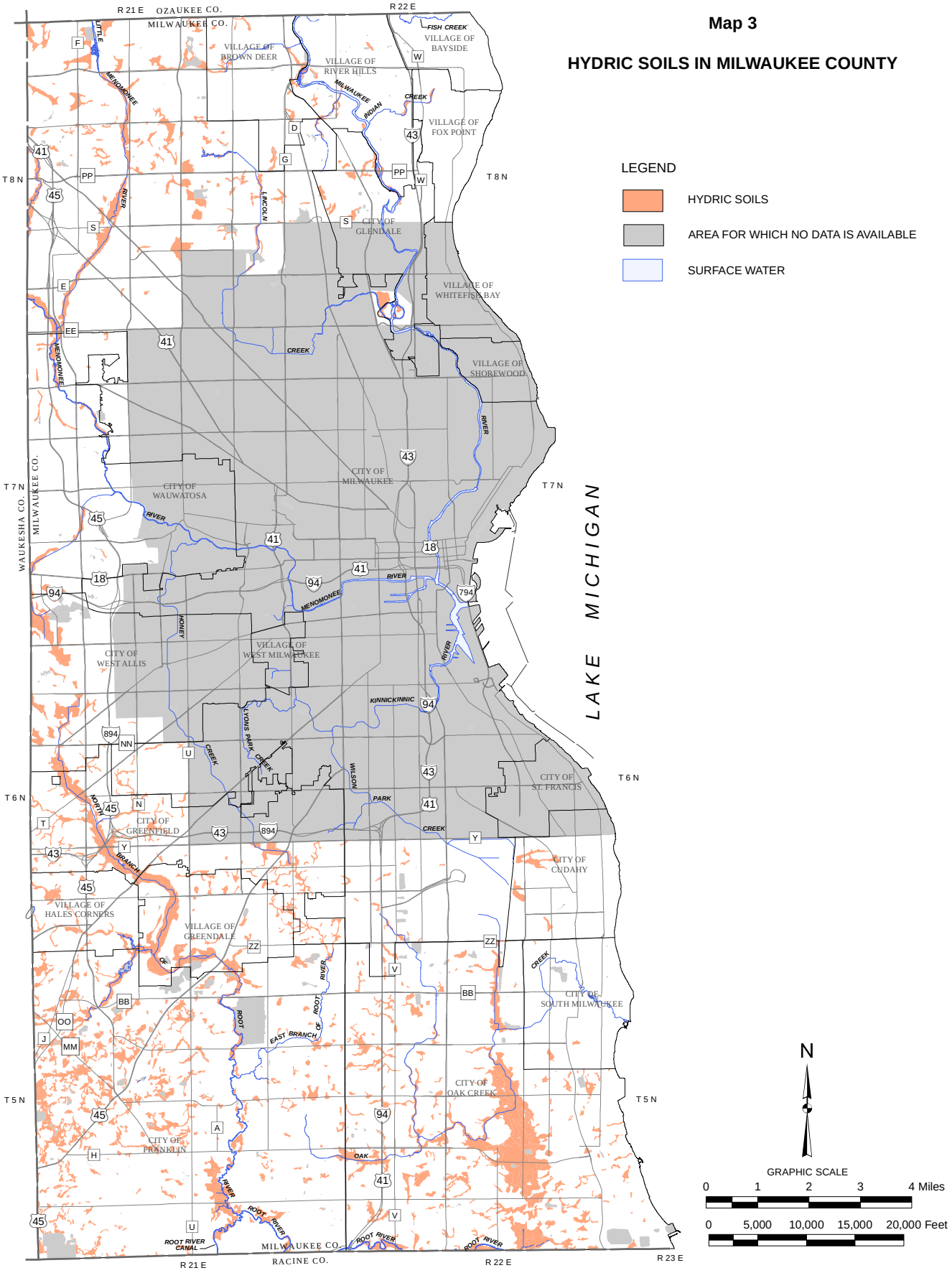
[3]*It should be noted that the NRCS has also developed a land evaluation system for farming that considers soil-based factors, including a soil productivity factor, the capability class, and others. The land evaluation rating may be combined with the site assessment factors that are not related to soil characteristics, through a land evaluation and site assessment system ("LESA" system) that integrates soil-based and nonsoil-based factors for evaluation farmland. Site assessment factors may include the level of on-farm investment, compatibility with adjacent uses, proximity to urban development, distance to public utilities, and others. It is envisioned that, given the widespread familiarity with that system, the capability class system would be used for purposes of rating farmland under the Land and Water Resource Management Plan.*



Source: U.S. Department of Agriculture Natural Resource Conservation Service and SEWRPC.

Table 2

HYDRIC SOILS IN MILWAUKEE COUNTY COMMUNITIES: 2006

Civil Division	Hydric Soils (acres)[a]	Percent of Civil Division Area
City of Cudahy	111.0	3.6
City of Franklin	2,759.1	12.4
City of Glendale	135.3	3.5
City of Greenfield	859.5	11.6
City of Milwaukee	1,664.4	2.7
City of Oak Creek	2,911.4	16.0
City of St. Francis	- -	- -
City of South Milwaukee	19.3	0.6
City of Wauwatosa	245.8	2.9
City of West Allis	498.9	6.8
Village of Bayside	- -	- -
Village of Brown Deer	118.1	4.2
Village of Fox Point	9.8	0.5
Village of Greendale	683.9	19.2
Village of Hales Corners	183.4	9.0
Village of River Hills	110.7	3.2
Village of Shorewood	- -	- -
Village of West Milwaukee	- -	- -
Village of Whitefish Bay	- -	- -
Milwaukee County Total	10,310.6	6.6

[a]*Because soil survey data are not available for portions of Milwaukee County, these acreages should be considered minimum values.*

Source: U.S. Department of Agriculture Natural Resources Conservation Service and SEWRPC.

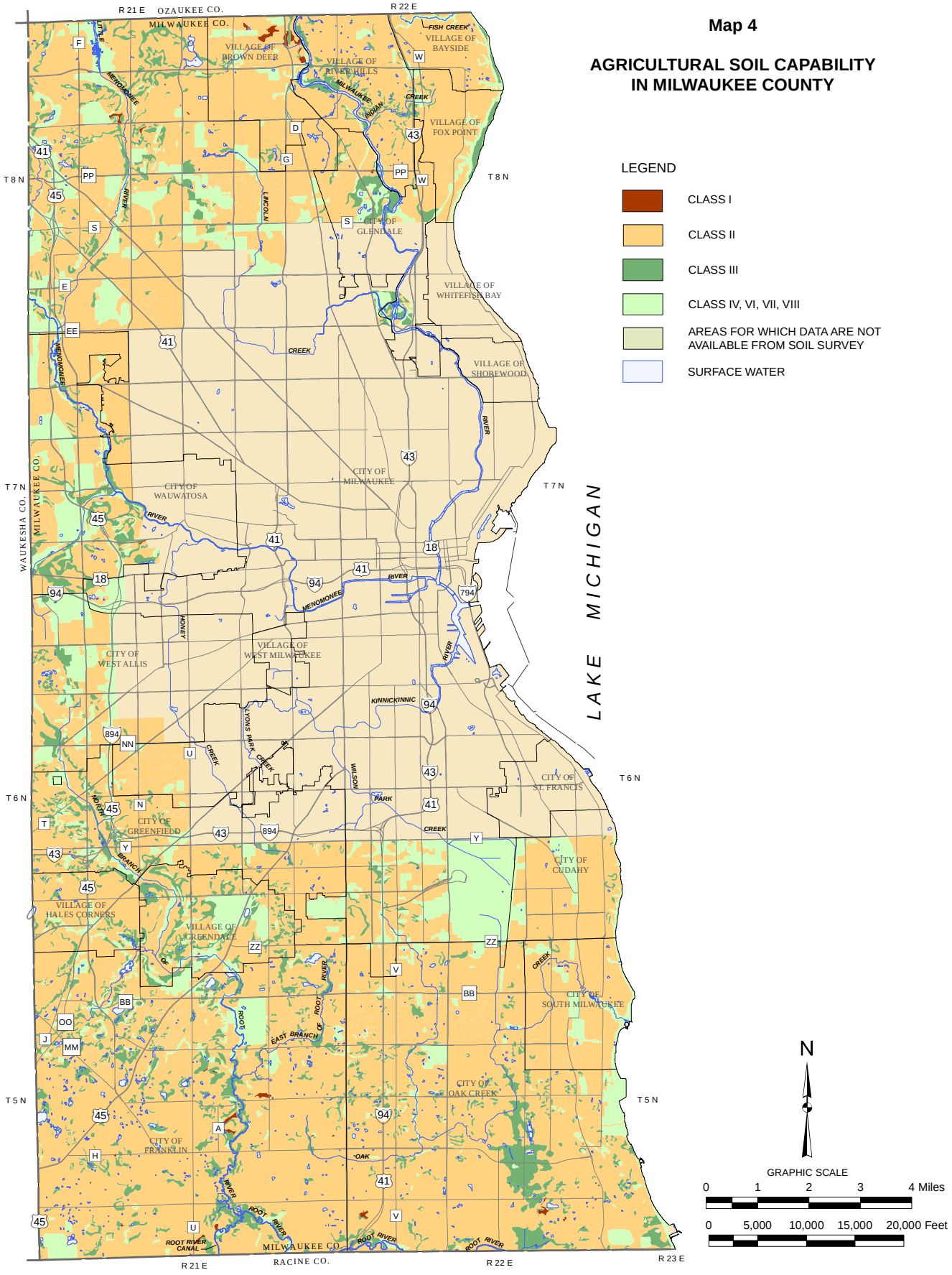
Soil Loss from Agricultural Fields

In May and June 2007, a soil loss transect survey was conducted for agricultural fields in Milwaukee County.[4] This survey collected soil loss data from 392 identified cropland fields in the County. Data collected include existing crops or land use; tillage systems; farm practices; physical topography, including percent slope and slope length; observations of erosion; and soil erosion factor. The majority of the fields assessed had slopes of less than 4 percent and slope lengths of less than 150 feet. Mulch tillage was far more common than conventional tillage. In addition, some fields were observed to be worked by no tillage methods and some were fallow. Some isolated instances of rill or gully erosion were observed. Based on the data gathered, the study predicted that soil loss from sheet and rill erosion on the vast majority of fields surveyed will not be above the soil loss tolerance value (T-value) of the soil type.

Existing Farmland

Agricultural lands in 2000 were identified by SEWRPC as part of the regional land use inventory conducted as part of the regional planning program. The land use inventory identified croplands, pasture lands, orchards, nurseries, specialized farming, and nonresidential farm buildings. Farm residences, together with a 20,000-square-foot dwelling site, are classified as single-family residential land uses. Based on the land use inventory, about 12,921 acres, or about 20 square miles, representing about 8 percent of the County, were in agricultural use in

[4]*Cedarburg Science,* Milwaukee County Soil Loss Transect Report, *August 1, 2007.*



Source: U.S. Department of Agriculture Natural Resource Conservation Service and SEWRPC.

Table 3

AGRICULTURAL SOIL CAPABILITY IN MILWAUKEE COUNTY COMMUNITIES

Civil Division	Class I Soils (acres)	Class II Soils (acres)	Class III Soils (acres)	Class IV, V, VI, VII, and VIII Soils (acres)	Unclassified Soils (acres)	Surface Water (Acres)	Total (acres)
City of Cudahy	0.0	2,158.9	28.7	454.0	409.6	2.7	3,053.9
City of Franklin	53.8	18,142.0	2,241.9	1,339.5	180.1	240.8	22,198.1
City of Glendale	7.7	1,185.0	345.1	264.5	1,887.5	127.7	3,817.5
City of Greenfield	0.0	4,222.8	595.7	596.7	1,963.8	9.9	7,388.9
City of Milwaukee	18.7	15,529.8	1,410.6	5,919.3	38,391.1	590.1	61,859.6
City of Oak Creek	27.9	15,250.3	1,713.0	1,035.6	123.7	57.0	18,207.5
City of St. Francis	0.0	0.0	0.0	0.0	1,638.5	7.4	1,645.9
City of South Milwaukee	0.0	2,664.2	18.9	402.0	5.3	6.2	3,096.6
City of Wauwatosa	3.0	3,678.0	729.1	1,299.9	2,692.7	62.6	8,465.3
City of West Allis	0.0	2,235.4	299.3	1,097.4	3,652.1	15.3	7,299.5
Village of Bayside	0.0	1,266.1	31.5	174.8	4.5	3.1	1,480.0
Village of Brown Deer	76.5	2,367.0	84.7	267.5	8.7	7.3	2,811.7
Village of Fox Point	0.0	1,486.2	112.0	239.9	1.4	0.9	1,840.4
Village of Greendale	0.0	2,100.3	694.5	749.2	7.1	13.4	3,564.5
Village of Hales Corners	0.0	1,678.7	195.2	159.2	5.1	7.6	2,045.8
Village of River Hills	0.2	2,768.1	363.2	117.6	19.0	143.0	3,411.1
Village of Shorewood	0.0	0.0	0.0	0.0	1,020.7	1.1	1,021.8
Village of West Milwaukee	0.0	0.0	0.0	0.0	719.3	0.5	719.8
Village of Whitefish Bay	0.0	1.2	0.0	2.1	1,355.7	0.2	1,359.2
Milwaukee County Total	187.8	76,734.0	8,863.4	14,119.2	54,085.9	1,296.8	155,287.1
Percent of Total Lands	0.1	49.5	5.7	9.1	34.8	0.8	100.0

Source: U.S. Department of Agriculture Natural Resources Conservation Service and SEWRPC.

2000. It should be noted that this figure includes lands actually used for agriculture—primarily cultivated lands and lands used for pasture—and excludes the wetland and woodland portions of farm fields. Table 4 sets forth the areas occupied by farmland in each community and the County in 2000.

Map 5 and Table 4 show the area devoted to farmland use in 2000, categorized as follows:

- Cultivated Lands, which includes lands used for the cultivation of crops, including row crops, grain crops, vegetable crops, and hay.
- Pasture Land and Unused Agricultural Lands, which includes lands used as pasture, or lands which were formerly cultivated or used for pasture which have not yet succeeded to a wetland or woodland plant community.
- Orchards and Nurseries, which includes lands used for orchards or nurseries.
- Specialty Agricultural Lands, which includes sod farms and lands used for crops such as mint, ginseng, and berries.
- Farm Buildings, which includes barns, silos, and other buildings used to store farm equipment or supplies or house farm animals.

Overall, cultivated lands were the predominant type of agricultural use in Milwaukee County accounting for about 72 percent of agricultural land in 2000.

Table 4

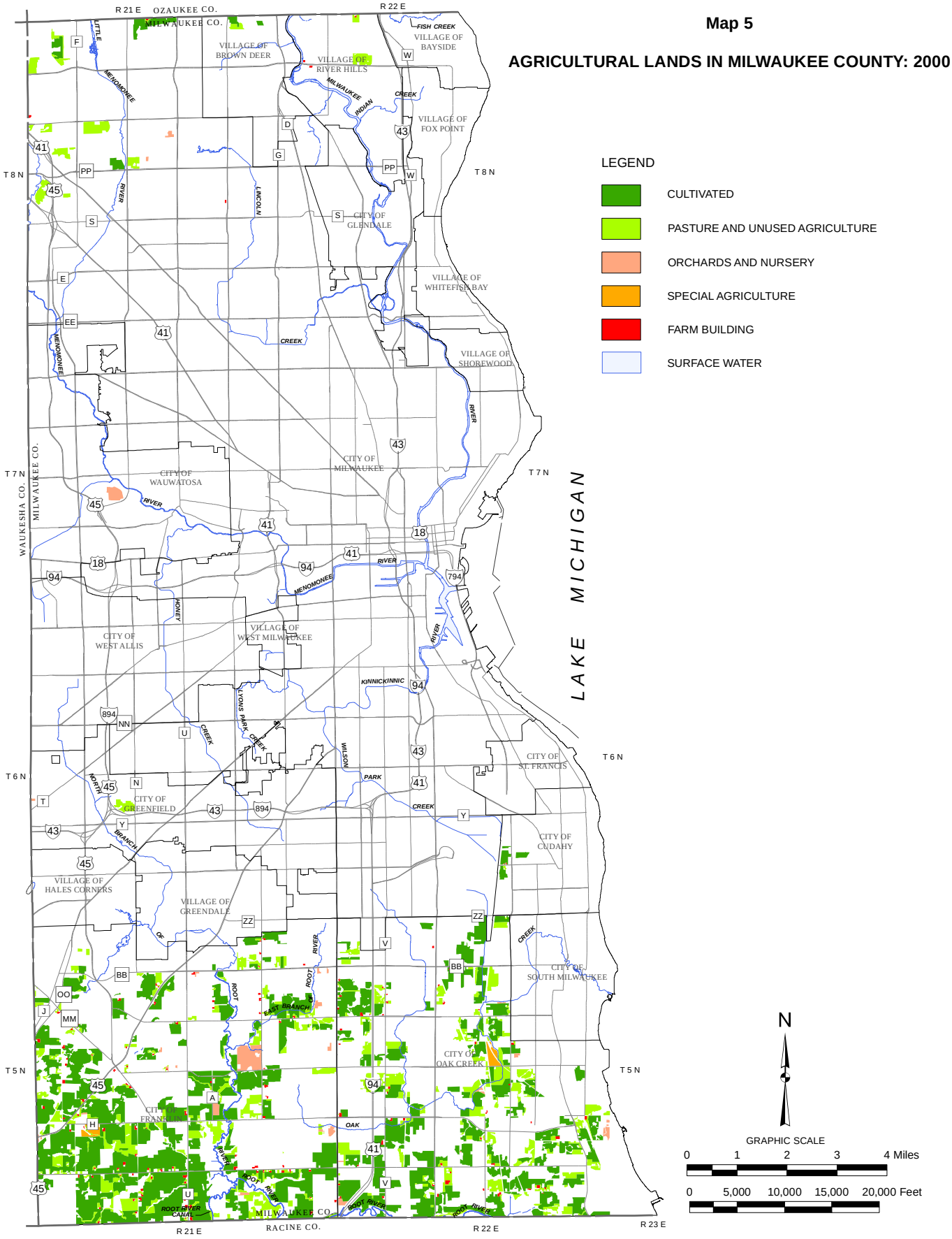
EXISTING AGRICULTURAL LANDS IN MILWAUKEE COUNTY: 2000

Civil Division	Cultivated Lands (acres)	Percent of Agricultural Lands	Pasture Land and Unused Agricultural Lands (acres)	Percent of Agricultural Lands	Orchards and Nurseries (acres)	Percent of Agricultural Lands	Specialty Crops (acres)	Percent of Agricultural Lands	Farm Buildings (acres)	Percent of Agricultural Lands	Total Agricultural Lands (acres)
City of Cudahy	67.6	95.9	2.1	3.0	- -	- -	- -	- -	0.8	1.1	70.5
City of Franklin	5,716.8	77.0	1,335.9	18.0	225.5	3.0	44.0	0.6	105.0	1.4	7,427.2
City of Glendale	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	0.0
City of Greenfield	- -	- -	43.2	95.4	2.4	4.6	- -	- -	- -	- -	45.6
City of Milwaukee	166.4	35.4	287.3	61.2	11.7	2.5	- -	- -	4.4	0.9	469.8
City of Oak Creek	3,361.6	70.7	1,246.4	26.2	45.1	0.9	45.3	1.0	55.6	1.2	4,754.0
City of St. Francis	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	0.0
City of South Milwaukee	0.1	100.0	- -	- -	- -	- -	- -	- -	- -	- -	0.1
City of Wauwatosa	- -	- -	- -	- -	45.7	100.0	- -	- -	- -	- -	45.7
City of West Allis	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	0.0
Village of Bayside	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	0.0
Village of Brown Deer	24.8	58.8	17.4	41.2	- -	- -	- -	- -	- -	- -	42.2
Village of Fox Point	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	0.0
Village of Greendale	<0.1	100.0	- -	- -	- -	- -	- -	- -	- -	- -	<0.1
Village of Hales Corners	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	0.0
Village of River Hills	- -	- -	62.8	96.8	- -	- -	- -	- -	3.1	3.2	65.9
Village of Shorewood	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	0.0
Village of West Milwaukee	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	0.0
Village of Whitefish Bay	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	0.0
Milwaukee County Total	9,337.3	72.3	2,995.1	23.2	330.4	2.5	89.3	0.7	168.9	1.3	12,921.0
Percent of Total Lands	6.0	- -	1.9	- -	0.2	- -	<0.1	- -	0.1	- -	8.2

Source: SEWRPC.

Map 5

AGRICULTURAL LANDS IN MILWAUKEE COUNTY: 2000



Source: SEWRPC.

Farm Production and Revenue

Farm production and revenue inventory data[5,6] are useful in determining the economic impact of agriculture in Milwaukee County and the major types of agricultural products. Agricultural sectors in the County and State in 2007, and the amount and percentage of revenue associated with each sector, are set forth in Table 5. Horticulture was the predominant source of agricultural revenue in the County in 2007, accounting for about 75 percent of agricultural revenue. A much lower percentage, about 2.7 percent, of agricultural revenue Statewide was based on horticulture. The relative importance of the horticultural industry in the County compared to the State is likely a response to the demand for landscaping material for urban development in the County and the Milwaukee metropolitan area.

Vegetables were the second-largest source of agricultural revenue in Milwaukee County in 2007, accounting for about 12 percent of sales. Statewide, vegetables accounted for just 4.7 percent of sales. Grain crops were the third-largest source of agricultural revenue in Milwaukee County in 2007, accounting for about 8 percent of the total.

Table 6 sets forth total value of sales in 2007 for farms in Milwaukee County.[7] There were 18 farms, or about 19 percent of all farms in Milwaukee County, that had total value in sales of less than $2,500. A much higher percentage, about 39 percent, of farms Statewide had a total value in sales less than $2,500. There were 16 farms, or about 17 percent of farms in the County, with total value in sales of $100,000 or more, compared to about 21 percent of State farms with total value in sales of $100,000 or more.

Average net income from farm operations in the County in 2007 was $21,195, which was lower than the State average of $34,909. Farming was the principal occupation of the farm operator on 66 farms, or about 69 percent, and was not the primary occupation of the farm operator on the remaining 30 farms, or 31 percent. Statewide, farming was the principal occupation of the farm operator on about 47 percent of farms and was not the principal occupation of the farm operator on the remaining 53 percent of farms.

Number and Size of Farms

Table 7 sets forth the number of farms by size category in Milwaukee County and Wisconsin. As noted earlier, there were 96 farms in the County in 2007. The average farm size was 57 acres, and the median farm size was 12 acres. This compares to 194 acres and 95 acres, respectively, for farms in the State. The largest percentages of farms in the County, about 42 percent, were less than 10 acres, and an additional 30 percent of farms were between 10 and 49 acres. Only about 1 percent of farms in the County were more than 500 acres in size.

Milwaukee County Parks Agricultural Land Lease

The Milwaukee County Department of Parks, Recreation and Culture leases approximately 1,000 acres of undeveloped parkland for agricultural uses. As of January 2010, 18 individuals rent Milwaukee County parklands for agricultural uses. While most of the leased land lies along the Root River and Oak Creek corridors, there are several parcels in Bender and Franklin Parks, as well as in the northern portions of the County. All of the County-owned parcels leased for agricultural uses are located within proposed recreational areas or in primary or secondary environmental corridors.

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[5]*Data included in this section are 2007 data for Milwaukee County from the National Agricultural Statistics Service. Data are reported at the County level, and are not available for local governments.*

[6]*The USDA defines a farm as any place from which $1,000 or more of agricultural products (crops and livestock) were sold or normally would have been sold during the year under consideration.*

[7]*The total value of sales is equal to the gross market value before taxes and production expenses for all agricultural products sold.*

Table 5

AGRICULTURAL SECTORS IN MILWAUKEE COUNTY AND WISCONSIN: 2007

Value of Sales	Milwaukee County		State of Wisconsin	
	2007 Sales (in thousands)	Percent of Total Agricultural Revenue	2007 Sales (in thousands)	Percent of Total Agricultural Revenue
Livestock, Poultry, and their Products[a]	$ 249	2.5	$6,298,032	70.2
Horticulture	7,475	75.3	244,216	2.7
Grains (crops)	809	8.1	1,643,341	18.3
Vegetables	1,229	12.4	422,639	4.7
Other	165	1.7	359,130	4.1
Total	$9,927	100.0	$8,967,358	100.0

[a]*This includes poultry and eggs; cattle and calves; milk and other dairy products from cows; hogs and pigs; and sheep, goats, and their products.*

Source: U.S. Department of Agriculture National Agricultural Statistics Service, 2007 Census of Agriculture.

Table 6

FARMS IN MILWAUKEE COUNTY AND WISCONSIN BY VALUE OF SALES: 2007

Value of Sales	Milwaukee County		State of Wisconsin	
	Number	Percent	Number	Percent
Less than $2,500	18	18.8	30,296	38.6
$2,500 to $4,999	8	8.3	5,955	7.6
$5,000 to $9,999	12	12.5	6,732	8.6
$10,000 to $24,999	21	21.8	7,732	9.8
$25,000 to $49,999	12	12.5	5,704	7.3
$50,000 to $99,999	9	9.4	5,397	6.9
$100,000 or More	16	16.7	16,647	21.2
Total	96	100.0	78,463	100.0

Source: U.S. Department of Agriculture National Agricultural Statistics Service, 2007 Census of Agriculture.

Table 7

FARM SIZE IN MILWAUKEE COUNTY AND WISCONSIN: 2007

Size (acres)[a]	Milwaukee County		State of Wisconsin	
	Number	Percent	Number	Percent
Less than 10	40	41.7	4,861	6.2
10 to 49	29	30.2	19,895	25.4
50 to 179	16	16.7	29,765	37.9
180 to 499	10	10.4	17,837	22.7
500 to 999	1	1.0	5,548	7.1
1,000 or More	0	0.0	557	0.7
Total	96	100.0	78,463	100.0

[a]*These data include land owned by the farmer, not lands that the farmer may rent.*

Source: U.S. Department of Agriculture National Agricultural Statistics Service, 2007 Census of Agriculture.

NATURAL RESOURCES

Topography and Geology

The landforms and physical features of Milwaukee County, such as topography and drainage patterns, are an important determinant of growth and development. The physiography of the area not only must be considered in sound land use and supporting transportation, utility, and community facility planning and development, but it also contributes directly to the natural beauty and overall quality of life in the County. Milwaukee County varies from gently rolling glacial plains in the eastern half to steeper hills in the western half. The County is adjacent to Lake Michigan, one of the five Great Lakes. A steep escarpment is present along the Lake Michigan shore at the north and south ends of the County, away from the confluence of the Milwaukee River with Lake Michigan. In addition, the subcontinental divide, which separates the Mississippi River Basin and the Great Lakes-St. Lawrence River Basin, traverses the extreme southwestern portion of the County, in the City of Franklin.

Glaciations have largely determined the physiography and topography, as well as the soil within the County. Generalized landforms and topographic characteristics are shown on Map 6. Land surface elevations range from about 580 feet above National Geodetic Vertical Datum, 1929 adjustment (NGVD 29) at the mouth of the Milwaukee River to about 850 feet above NGVD 29 in the City of Greenfield. Most of the County is covered by gently sloping ground moraine consisting of heterogeneous material deposited beneath the ice of the glaciers, moraines consisting of material deposited at the forward margins of the ice sheet, and outwash plains formed by the action of flowing glacial meltwater.

The bedrock formations that underlie the unconsolidated surficial deposits of Milwaukee County consist of Silurian and Devonian dolomite. The uppermost bedrock unit throughout most of the County is Silurian dolomite, primarily Niagara dolomite underlain by a relatively impervious layer of Maquoketa shale. In northeastern Milwaukee County it is primarily Devonian dolomite and shale of the Milwaukee Formation. In addition, in some of the pre-Pleistocene valleys in the southwestern portion of the County, the Niagara dolomite has been removed by erosion, and the uppermost bedrock unit is Maquoketa shale. All of these rock units dip toward the east.

The advances of glacial ice sheets resulted in a wide range of glacial deposits over the bedrock. As shown on Map 7, the most substantial glacial deposits, as represented by depth from the land surface to bedrock, are 200 to 400 feet thick, and located mostly in the southern portion of the County. Areas where the depth to bedrock ranges from zero to 100 feet are found in the north central portion of the County and along much of the western boundary of the County.

Lake Michigan Bluff and Ravine Areas

Shoreline erosion and bluff stability conditions are important considerations in planning for the protection and sound development and redevelopment of lands located along the Lake Michigan shoreline. Shoreline erosion and bluff stability conditions in southeastern Wisconsin were surveyed in 1977[8] and 1997,[9] and in the City of

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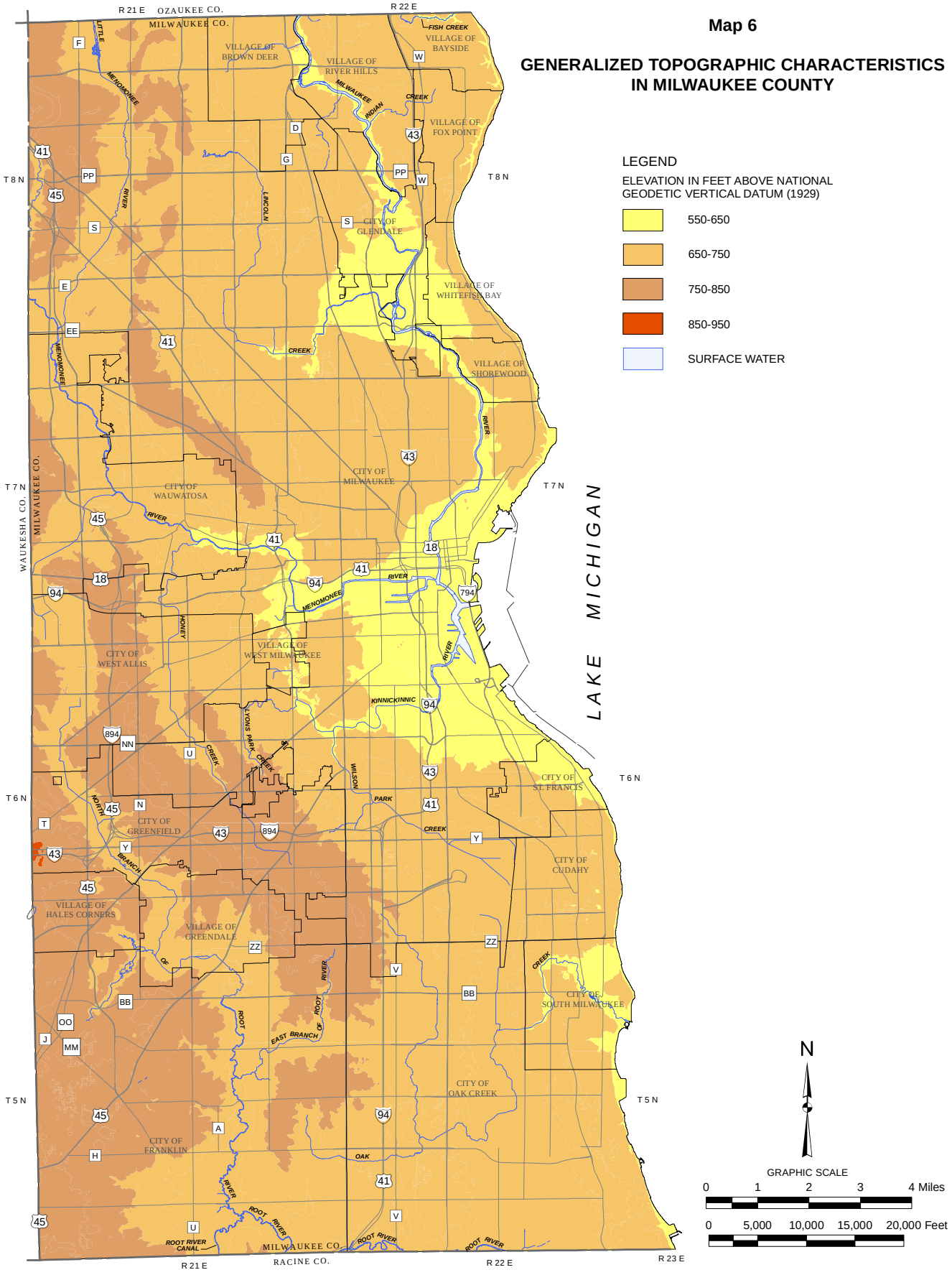
[8]*D.M. Mickelson, L. Acomb, N. Brouwer, T.B. Edis, C. Fricke, B. Haas, D. Hadley, C. Hess, R. Klauk, N. Lasca, and A.F. Schneider, Shore Erosion Study, Technical Report,* Shoreline Erosion and Bluff Stability Along Lake Michigan and Lake Superior Shorelines of Wisconsin, *Wisconsin Coastal Management Program, February 1977.*

[9]*SEWRPC Technical Report No. 36,* Lake Michigan Shoreline Recession and Bluff Stability in Southeastern Wisconsin: 1995, *December 1997.*

Map 6

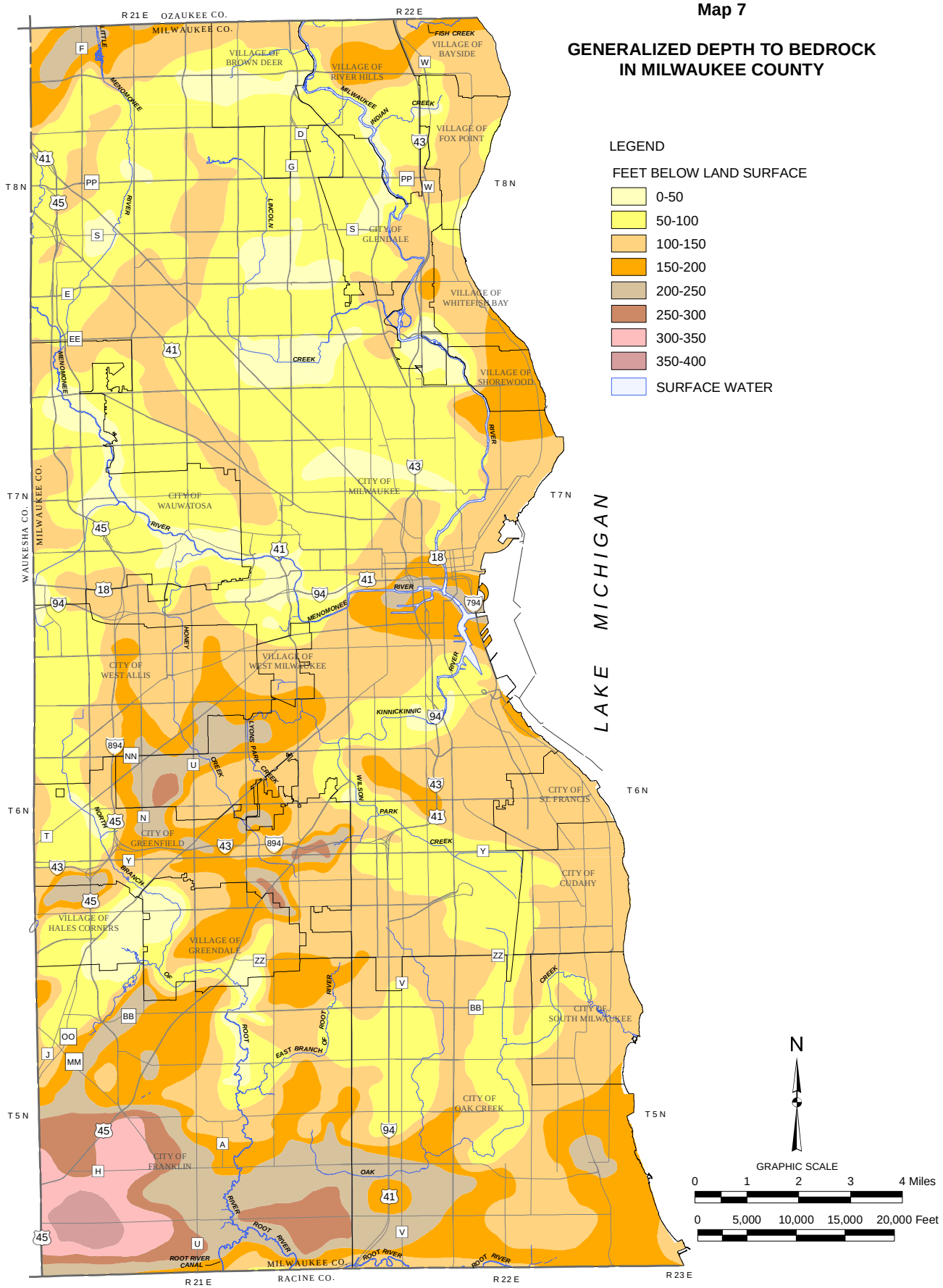
GENERALIZED TOPOGRAPHIC CHARACTERISTICS IN MILWAUKEE COUNTY



Source: SEWRPC.

Map 7

GENERALIZED DEPTH TO BEDROCK IN MILWAUKEE COUNTY



Source: University of Wisconsin-Extension, Wisconsin Geological and Natural History Survey, and SEWRPC.

Milwaukee in 1978[10] and 1982.[11] In addition, bluff stability conditions were surveyed in Warnimont Park in 2001[12] and Lake Park in 2002.[13] Such conditions can change over time since they are related, in part, to changes in climate, water levels, the geometry of the onshore beach and nearshore areas, the extent and condition of shore protection measures, the type and extent of vegetation, and the type of land uses in shoreland areas, among other related factors. As of 2010, water levels in Lake Michigan remain below average. While these water levels have the effect of reducing shoreline erosion due to scour at the base, there are other situations where the shoreline can be negatively affected by low levels. In addition, the cyclic nature of the Great Lakes indicates a return to higher lake levels in the future.

The 1997 Lake Michigan coastal erosion and bluff stability study in southeastern Wisconsin included evaluations of lands along the Lake Michigan shoreline in Kenosha, Racine, Milwaukee, and Ozaukee Counties that directly affect, or are directly affected by shoreline erosion, bluff recession, and storm damage processes. This relatively narrow strip of land along the Lake Michigan shoreline extends approximately 89 miles from the Wisconsin-Illinois state line to the Ozaukee-Sheboygan county line, including the shoreline along Milwaukee County. For analytical purposes, the Lake Michigan shoreline was divided into 17 reaches, including five reaches within, or partially within, Milwaukee County, as shown on Map 8. These reaches were selected so as to have relatively uniform beach and bluff characteristics. These reaches generally correspond to those utilized in the 1977 shoreline erosion study, with some refinement to reflect current conditions.

During 1995, field surveys were conducted to measure the geometry of the bluff slope at 192 sites in southeastern Wisconsin, including several sites within, or adjacent to, Milwaukee County. These measurements provided a basis for site-specific assessments of the bluff conditions at the selected locations. In addition, beach and near-shore lakebed conditions were measured for selected sites in Milwaukee County.

Based upon the data collected and the assessment and analysis of that data, bluff stability and shoreline erosion conditions were developed. These are summarized by reach in Table 8 and are shown graphically on Map 8. Within northern Milwaukee County, many bluffs were generally found to be stable based upon conditions during the 1995 survey; however, bluffs in two areas were found to be unstable. One of these areas was located along shoreline in the Village of Bayside. The other was located along the shoreline in the Villages of Fox Point and Whitefish Bay. In central Milwaukee County, the 1995 survey found that bluffs were generally stable. The 1995 survey found that bluffs in several areas in the southern part of the County were unstable. These areas are located along the shoreline in the Cities of Cudahy, South Milwaukee, and Oak Creek.

In 2002, bluff stability conditions were assessed within Lake Park in the City of Milwaukee.[14] While the bluff stability analysis conducted as part of this study found that most bluffs in the park were stable, it concluded that bluffs in the southern portion of the park were marginally stable and less stable than bluffs in the other portions of the park. In addition, this study found evidence of active recession of the bluffs in the southern portion of the park, including evidence of top recession.

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[10]*J.P. Keillor and R. DeGroot,* Recent Recession of Lake Michigan Shorelines in the City of Milwaukee, Wisconsin, *University of Wisconsin Sea Grant Program, 1978.*

[11]*SEWRPC Community Assistance Planning Report No. 163,* A Lake Michigan Coastal Erosion Management Study for the City of Milwaukee, Wisconsin, *October 1989.*

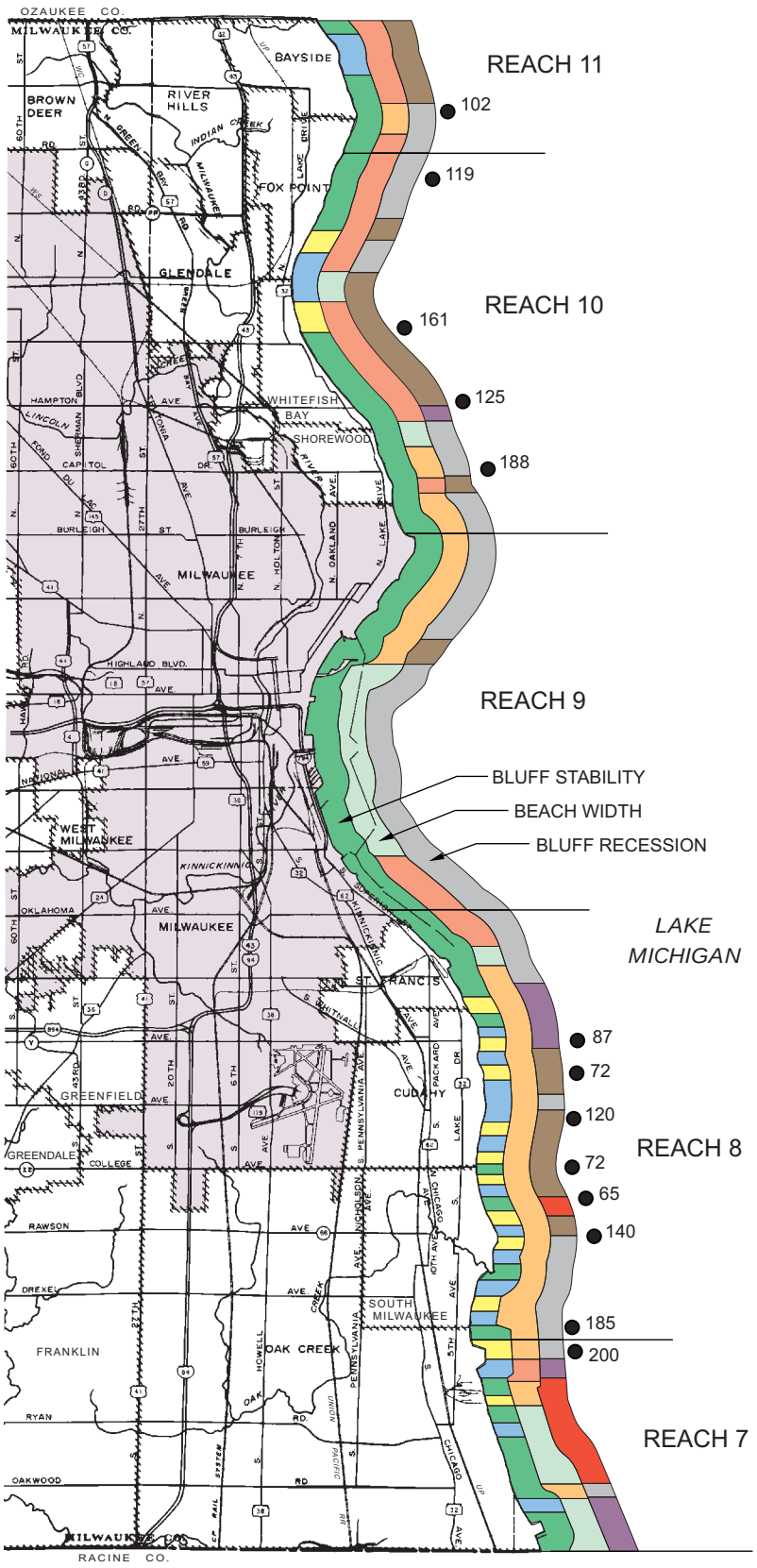
[12]*STS Consultants, LTD.,* Shoreline Erosion Study for Warnimont Park in the City of Cudahy, Wisconsin, *December 2002.*

[13]*SEWRPC Memorandum Report No. 156,* Lake Park Bluff Stability and Plant Community Assessment: 2003, Milwaukee County, Wisconsin, *September 2004.*

[14]Ibid.

Map 8

SUMMARY OF LAKE MICHIGAN SHORELINE EROSION AND BLUFF STABILITY ANALYSES IN MILWAUKEE COUNTY: 1995



BLUFF STABILITY
- STABLE
- MARGINALLY STABLE
- UNSTABLE

BEACH WIDTH
- LESS THAN 20 FEET
- 20 - 50 FEET
- GREATER THAN 50 FEET

BLUFF RECESSION
- LESS THAN 0.5 FOOT PER YEAR
- 0.5 - 1.0 FOOT PER YEAR
- 1.1 - 2.0 FEET PER YEAR
- GREATER THAN 2.0 FEET PER YEAR

● 87 APPROXIMATE DISTANCE IN FEET FROM SHORELINE TO FIVE - FOOT BATHYMETRIC DEPTH AT INDICATED LOCATIONS

EROSION ANALYSIS REACH LIMITS

4 EROSION ANALYSIS REACH NUMBER

CITY OF MILWAUKEE

GRAPHIC SCALE
0 7000 14000 FEET

Source: T.B. Edil, D.M. Mickelson, J.A. Chapman, and SEWRPC.

Table 8

BLUFF STABILITY AND SHORELINE RECESSION ALONG LAKE MICHIGAN IN MILWAUKEE COUNTY: 1995

Shoreline Analysis Reach (see Map 8)	Bluff Heights (feet)	Deterministic Bluff Stability Safety Factor		Shoreline Recession Data 1963-1995		Estimated Beach Width (feet)	
		1995 Conditions	1977 Conditions	Total (feet)	Annual Average (feet per year)	1995 Conditions	1977 Conditions
Reach 7	60-125	0.08-1.59	0.54-1.43	10-400	0.3-12.5	0-150	0-20
Reach 8	25-110	0.74-1.95	0.33-1.69	10-330	0.3-10.3	0-600	0-20
Reach 9	0-25	2.40	1.21	20-70	0.6-2.2	0-200	0-20
Reach 10	70-120	0.95-1.62	0.45-2.97	-90-80	-2.8-2.5	0-150	10-30
Reach 11[a]	80-100	1.07-2.34	0.85-1.71	10-70	0.3-2.1	5-170	15-30

[a]*Data is presented for only that portion of Reach 11 that is in Milwaukee County.*

Source: SEWRPC.

In 2001, bluff stability and erosion conditions were assessed along approximately 2,000 linear feet of bluff in Warnimont Park.[15] This study found visible evidence of erosion along the toe of the bluffs; evidence of recent bluff failures, including translational slides and rotational slumps; and visible water seeps at mid-bluff levels, some exhibiting relatively rapid discharge of water during field investigation.

Staff from the County Department of Parks, Recreation and Culture has also indicated that in 2010 they observed major areas of erosion on bluffs in several County Parks along Lake Michigan. These parks include Bender, Grant, Juneau, Lake, and Warnimont Parks. The County staff noted that the erosion they observed at Lake Park appears to be associated with the major rainfall events that occurred during July 2010. These field observations were made in the course of management activities, rather than as part of a systematic study of bluff conditions.

While analysis of Lake Michigan shoreline conditions indicate relatively stable conditions in many areas along the County's Lake Michigan shoreline, there are areas where there is the potential for shoreline and bluff erosion to occur. In addition, during severe climatic conditions, such as high water levels or saturated ground conditions, large episodic bluff erosion events could occur.

Nonmetallic Mineral Resources

Nonmetallic minerals include, but are not limited to, crushed stone (gravel), dimension stone, peat, clay, topsoil, asbestos, beryl, diamond, coal, feldspar, talc, and sand. Nonmetallic mines (quarries) in southeastern Wisconsin provide sand, gravel and crushed limestone or dolomite for road building; peat for gardening and horticulture; and dimension stone for use in buildings, landscaping, and monuments. Nonmetallic minerals are important economic resources that should be taken into careful consideration whenever land is being considered for development. If an adequate supply of stone and sand is desired for the future, wise management of nonmetallic mineral resources and access to them is important. Existing sand and gravel mining operations in Milwaukee County are shown on Map 9. In 2003, there were six of these operations in the County. The Lakeshore Sand mining site along the Milwaukee Harbor estuary closed in 2005.

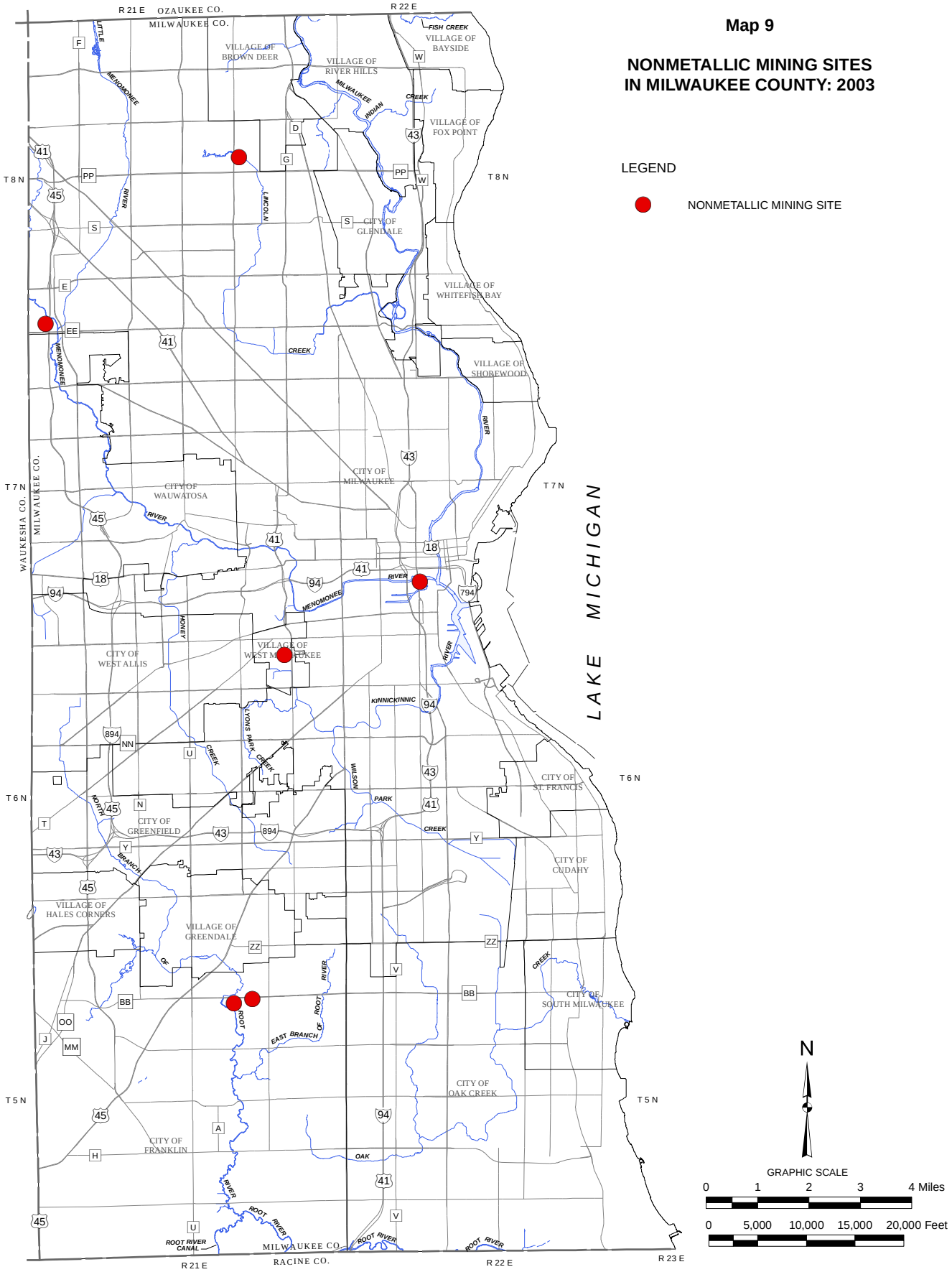
Areas Suitable for Sand and Gravel Extraction

Map 10 shows the location of potential commercially workable sand deposits and the location of potential commercially workable gravel deposits in the County, as identified by the NRCS. The NRCS rates each soil

[15]*STS Consultants,* op. cit.

Map 9

NONMETALLIC MINING SITES IN MILWAUKEE COUNTY: 2003

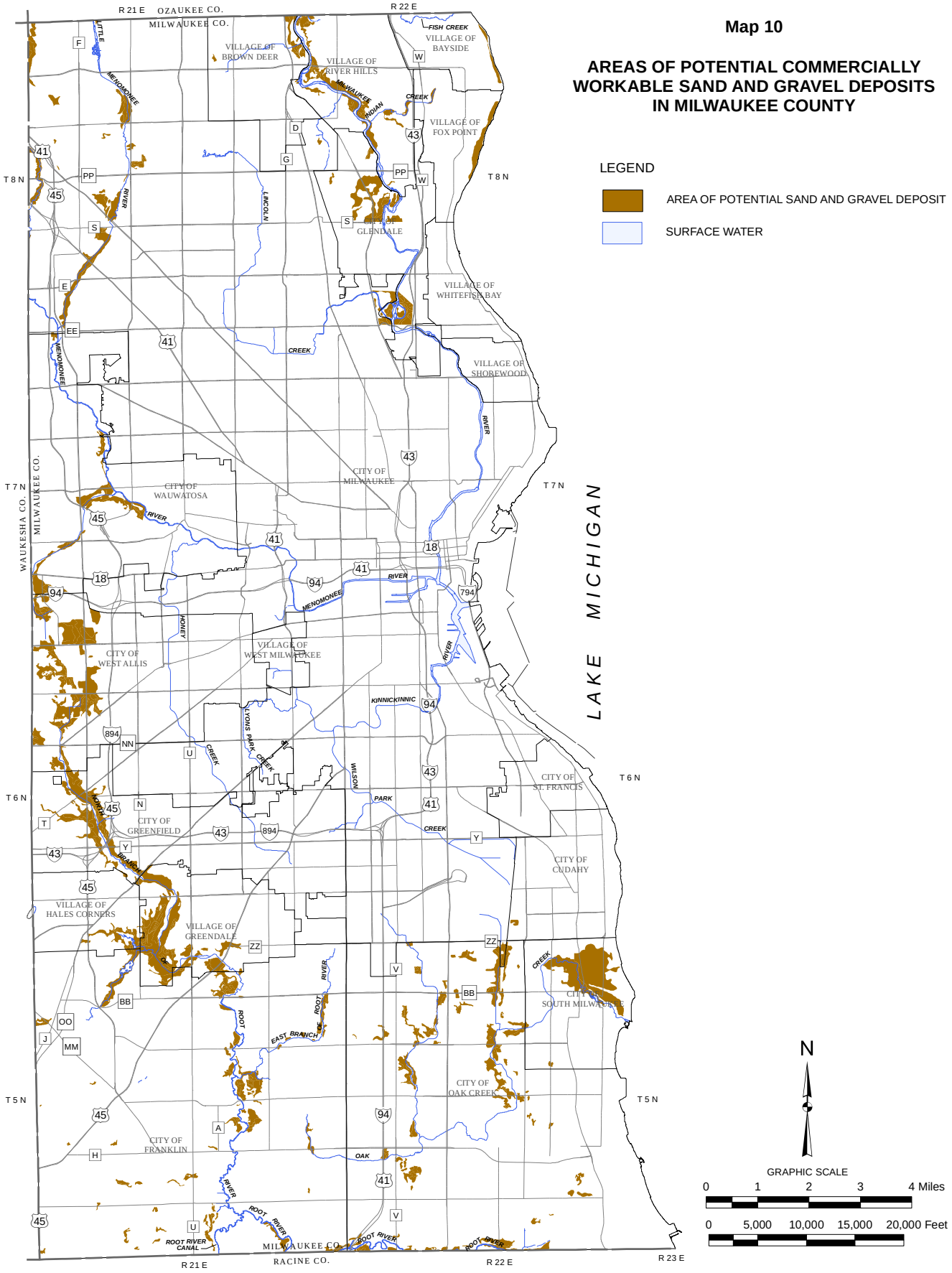


NOTE: As of 2005, the Lakeshore Sand mining site at 515 W. Canal Street is no longer in operation.

Source: Wisconsin Department of Natural Resources and SEWRPC.

Map 10

AREAS OF POTENTIAL COMMERCIALLY WORKABLE SAND AND GRAVEL DEPOSITS IN MILWAUKEE COUNTY



Source: U.S. Department of Agriculture Natural Resources Conservation Service and SEWRPC.

mapping unit as probable or improbable sources of sand or gravel. Milwaukee County has some probable sand and gravel deposits. These are mostly located in alluvial deposits along major streams and rivers and in glacial outwash areas where the washing action of glacial meltwaters has sorted the sand and gravel into somewhat homogeneous deposits. In addition, there are other small deposits scattered throughout other portions of the County. Most of these probable deposits are located in floodplains, environmental corridors, or urbanized areas and are therefore in areas unsuited for extractive activities. The occurrence of such deposits is extremely variable, and onsite investigations are necessary to determine the suitability of any given site for sand and gravel or rock extraction purposes.

Surface Water Resources

Surface water resources, consisting of streams and lakes and their associated wetlands, floodplains, and shorelands, form a particularly important element of the natural resource base. Surface water resources provide recreational opportunities, influence the physical development of the County, and enhance its aesthetic quality. Watersheds, subwatersheds, and the subcontinental divide within the County are shown on Map 11. Both surface water and groundwater are interrelated components of a single hydrologic system. The groundwater resources are hydraulically connected to the surface water resources inasmuch as the former provide the base flow of streams and contribute to inland lake levels.

Watersheds

The extreme southwest corner of Milwaukee County is traversed by the subcontinental divide that separates the Great Lakes-St. Lawrence River drainage basin from the Mississippi River drainage basin. That divide carries with it legal constraints that, with some exceptions, prohibit the diversion of any substantial quantities of Lake Michigan water across the divide. As shown on Map 11, there are seven watersheds within Milwaukee County. With the exception of the Fox River watershed, all of the watersheds in the County are part of the Great Lakes-St. Lawrence River drainage system. The Fox River watershed covers the extreme southwestern portion of the City of Franklin and ultimately discharges into the Mississippi River system.

The portion of the Fox River watershed within the County encompasses 1.3 square miles, or 0.5 percent of the County. The Kinnickinnic River watershed, which is entirely contained within Milwaukee County, encompasses 24.5 square miles, or 10.1 percent of the County. Much of the Menomonee River watershed is contained in Milwaukee County. The portion within the County encompasses 55.3 square miles, or 22.8 percent of the County. The lower portion of the Milwaukee River watershed that is contained in Milwaukee County encompasses 57.7 square miles, or 23.8 percent of the County. The Oak Creek watershed, which is entirely contained within Milwaukee County, encompasses 27.4 square miles, or 11.2 percent of the County. Most of the upper portion of the Root River watershed is contained within Milwaukee County. The portion within the County encompasses 57.7 square miles, or 23.8 percent of the County. A seventh watershed encompasses those areas adjacent to Lake Michigan which drain directly into the Lake through small perennial or intermittent streams or overland flow. This watershed encompasses 18.9 square miles, or 7.8 percent of the County. The Regional Planning Commission has developed comprehensive watershed plans for all of these watersheds except for the Lake Michigan direct drainage area.[16]

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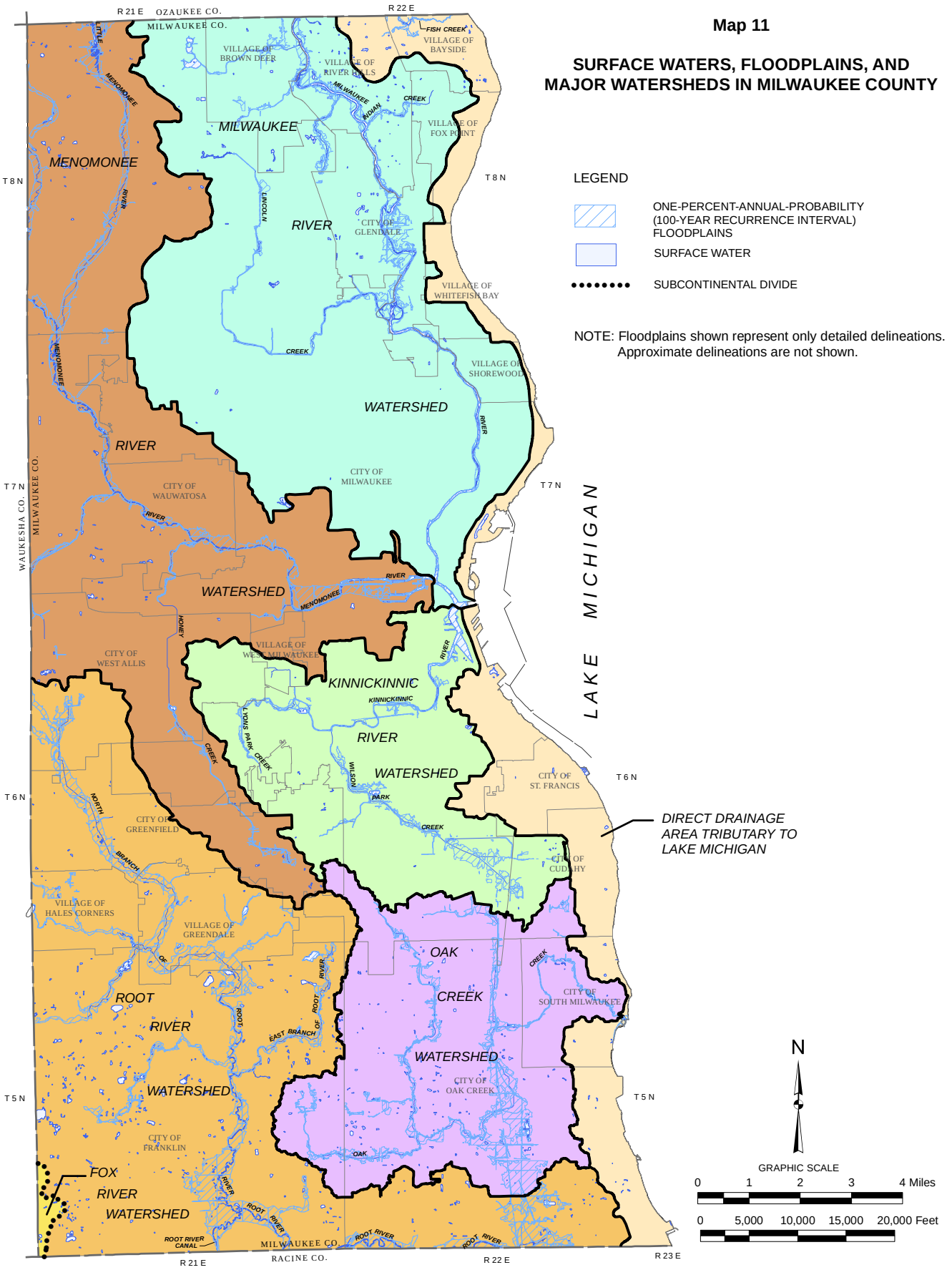
[16]*SEWRPC Planning Report No. 9,* A Comprehensive Plan for the Root River Watershed, *July 1966; SEWRPC Planning Report No. 12,* A Comprehensive Plan for the Fox River Watershed, *Volume One,* Inventory Findings and Forecasts, *April 1969, Volume Two,* Alternative Plans and Recommended Plan, *February 1970; SEWRPC Planning Report No. 13,* A Comprehensive Plan for the Milwaukee River Watershed, *Volume One,* Inventory Findings and Forecasts, *December 1970, Volume Two,* Alternative Plans and Recommended Plan, *October 1971; SEWRPC Planning Report No. 26,* A Comprehensive Plan for the Menomonee River Watershed, *Volume One,* Inventory Findings and Forecasts, *October 1976, Volume Two,* Alternative Plans and Recommended Plan, *October 1976; SEWRPC Planning Report No. 32,* A Comprehensive Plan for the Kinnickinnic River Watershed, *December 1978; and SEWRPC Planning Report No. 36,* A Comprehensive Plan for the Oak Creek Watershed, *August 1986.*

Map 11

SURFACE WATERS, FLOODPLAINS, AND MAJOR WATERSHEDS IN MILWAUKEE COUNTY



Source: SEWRPC.

Streams

Perennial rivers and streams are defined as those which maintain, at a minimum, a small continuous flow throughout the year except under unusual drought conditions. There were 103 miles of named perennial rivers and streams in Milwaukee County reported by the WDNR in their 1964 surface water inventory for the County.[17] As noted above, the County includes portions of seven watersheds. No major streams in the Fox River watershed are located in Milwaukee County. Streams in the Kinnickinnic River watershed, which is located in the central portion of the County, include the Kinnickinnic River, Wilson Park Creek, S. 43rd Street Ditch, Lyons Park Creek, Villa Mann Creek, Cherokee Park Creek, and Holmes Avenue Creek. Streams in the Milwaukee County portion of the Menomonee River watershed, which includes the area in the northwestern portion of the County, include the Menomonee River, Woods Creek, Honey Creek, Underwood Creek, Grantosa Creek, and the Little Menomonee River. Streams in the Milwaukee County portion of the Milwaukee River watershed, which includes the area in the northeastern portion of the County, include the Milwaukee River, Lincoln Creek, Wahl Creek, Brown Deer Park Creek, Southbranch Creek, Beaver Creek, and Indian Creek. Streams in the Oak Creek watershed, which is located in the southeastern portion of the County, include Oak Creek, the Mitchell Field Drainage Ditch, and North Branch Oak Creek. Streams in the Milwaukee County portion of the Root River watershed, which includes the area in the southern and southwestern portions of the County, include the Root River, Crayfish Creek, the Root River Canal, Ryan Creek, East Branch Root River, Legend Creek, Dale Creek, Tess Corners Creek, Whitnall Park Creek, Wildcat Creek, and Hale Creek. The Lake Michigan direct drainage area is located along the eastern margins of the County. Fish Creek is the only major stream located in the Milwaukee County portion of this watershed. Major streams in Milwaukee County are shown on Map 11.

Water Use Objectives

Pursuant to the Federal Clean Water Act, the State of Wisconsin, through the Natural Resources Board and the WDNR, has developed standards, or criteria, for the following water use objectives or classifications relating to fish and aquatic life: 1) Great Lakes communities, 2) coldwater community, 3) warmwater sportfish community, 4) warmwater forage fish community, 5) limited forage fish, and 6) limited aquatic life. It is important to note that establishment of a stream water use objective other than coldwater or warmwater fish and aquatic life is not necessarily an indication of reduced water quality, since such stream reaches may be limited by flow or size, but may still be performing well relative to other functions. For the most part, identical water quality criteria are applicable to the warmwater sport fish community and warm water forage fish community objectives. Because of this, these water use objectives are sometimes referred to as warmwater fish and aquatic life (FAL) waters. The WDNR has also developed standards, or criteria, for two recreational use classifications: 1) full recreational use and 2) limited recreational use, and it has developed standards, or criteria, for public health and welfare and wildlife protection.

These water use objectives and water quality standards supporting these objectives are set forth in Chapters NR 102 through NR 105 of the *Wisconsin Administrative Code*. In addition, Chapter NR 106 establishes procedures for calculating water quality-based effluent limitations for toxic and organoleptic substances. In addition Chapter NR 102 sets forth special variances for specific waters, including some located in Milwaukee County.

The applicable water quality standards for all water uses designated in Milwaukee County are set forth in Table 9. The water quality standards are statements of the physical, chemical and biological characteristics of the water that must be maintained if the water is to be suitable for the specified uses. Chapter 281 of the *Wisconsin Statutes*, recognizes that different standards may be required for different waters or portions thereof. According to the Chapter, in all cases the "standards of quality shall be such as to protect the public interest, which includes the protection of public health and welfare and the present and prospective future use of such waters for public and

[17] *Wisconsin Department of Natural Resources (Wisconsin Conservation Department),* Surface Water Resources of Milwaukee County, *1964.*

Table 9

APPLICABLE WATER USE OBJECTIVES AND WATER QUALITY CRITERIA AND GUIDELINES FOR LAKES AND STREAMS WITHIN MILWAUKEE COUNTY: 2007

Water Quality Parameter	Combinations of Water Use Objectives Adopted for Planning Purposes[a,b]					Source
	Warmwater Fish and Aquatic Life Communities	Limited Forage Fish Community (variance category)	Limited Aquatic Life Community (variance category)	Special Variance Category A[c]	Special Variance Category B[d]	
Recreational Use	Full	Full	Full	Limited	Limited	- -
Maximum Temperature (^{o}F)[e,f]	89.0	89.0	- -	89.0[g]	89.0	NR 102.04(4)[h]
Dissolved Oxygen (mg/l)[e]	5.0 minimum	3.0 minimum	1.0 minimum	2.0 minimum	2.0 minimum	NR 102.04(4) NR 104.02(3)
pH Range (S.U.)	6.0-9.0	6.0-9.0	6.0-9.0	6.0-9.0[g]	6.0-9.0[g]	NR 102.04(4)[i] NR 104.02(3)
Fecal Coliform (MFFCC)[j]						NR 102.04(5)
Geometric Mean	200	200	200	1,000	1,000	NR 104.06(2)
Maximum	400	400	400	2,000	- -	
Ammonia Nitrogen (mg/l)	- -[k]	- -[k]	- -[k]	- -[k]	- -[k]	NR 105 Tables 2c and 4b
Total Phosphorus (mg/l)						Regional water quality management plan
Maximum for Streams	0.1[l]	0.1[l]	0.1[l]	0.1[l]	0.1[l]	
Maximum for Lakes during Spring Turnover	0.02	0.02	0.02	- -	- -	

[a] *NR 102.04(1) All waters shall meet the following minimum standards at all times and under all flow conditions: substances that will cause objectionable deposits on the shore or in the bed of a body of water, floating or submerged debris, oil, scum, or other material, and material producing color, odor, taste, or unsightliness shall not be present in amounts found to be of public health significance, nor shall substances be present in amounts which are acutely harmful to animal, plant, or aquatic life.*

[b] *There are no streams classified as Coldwater Community in Milwaukee County.*

[c] *As set forth in Chapter NR 104.06(2)(a) of the* Wisconsin Administrative Code*.*

[d] *As set forth in Chapter NR 104.06(2)(b) of the* Wisconsin Administrative Code*.*

[e] *Dissolved oxygen and temperature standards apply to continuous streams and the upper layers of stratified lakes and to unstratified lakes; the dissolved oxygen standard does not apply to the hypolimnion of stratified inland lakes. However, trends in the period of anaerobic conditions in the hypolimnion of deep inland lakes should be considered important to the maintenance of their natural water quality.*

[f] *Effective October 1, 2010, the State of Wisconsin implemented new water quality standards for temperature. Under the new rule water temperatures in waterbodies classified as limited aquatic life communities that are not classified as wastewater effluent channels are not to exceed 86^{o}F. For waterbodies classified as fish and aquatic life or limited forage fish communities, the new rule created three criteria, an ambient temperature, a sublethal water quality criterion, and an acute water quality criterion. The numerical values and application of these criteria are dependent on the designated use and size of the stream, as measured by the unidirectional 7Q10 stream flow (the lowest stream flow for seven consecutive days that would be expected to occur once in 10 years), and the month of the year. In addition, the new rule includes provisions and procedures for the development of site-specific thermal water quality criteria.*

[g] *Not specifically addressed within the* Wisconsin Administrative Code*. These values are considered to apply for planning purposes only.*

[h] *NR 102.04(4) There shall be no temperature changes that may adversely affect aquatic life. Natural daily and seasonal temperature fluctuations shall be maintained. The maximum temperature rise at the edge of the mixing zone above the natural temperature shall not exceed 5^{o}F for streams.*

[i] *The pH shall be within the stated range with no change greater than 0.5 unit outside the estimated seasonal maximum and minimum.*

[j] *NR 102.04(5)(a)The membrane filter fecal coliform count may not exceed 200 per 100 ml as a geometric mean based on not less than five samples per month, nor exceed 400 per 100 ml in more than 10 percent of all sample during any month.*

[k] *The values of the acute toxicity and chronic toxicity criteria for ammonia nitrogen are dependent upon ambient temperature and pH conditions.*

[l] *In 2010, the State of Wisconsin developed water quality criteria for concentrations of total phosphorus. For most streams in the State, the new rule establishes a criterion of 0.075 mg/l. For specified streams and rivers, including downstream portions of the Kinnickinnic, Menomonee, and Milwaukee Rivers, the new rule establishes a criterion of 0.10 mg/l. For lakes the rule establishes criteria ranging from 0.015 mg/l to 0.040 mg/l, depending upon the drainage and stratification characteristics of the lake. For the nearshore and open water areas of Lake Michigan, the rule establishes a criterion of 0.007 mg/l. Ephemeral streams, lakes and reservoirs with a surface area of less than five acres, and waterbodies classifies as limited aquatic life communities are specifically exempted from the rule. In addition, the new rule includes provisions and procedures for the development of site-specific total phosphorus water quality criteria. The rule has been approved by the Wisconsin Natural Resources Board and is anticipated to become effective by January 1, 2011.*

Source: Wisconsin Department of Natural Resources.

private water supplies; propagation of fish and aquatic life and wildlife; domestic and recreational purposes; and agricultural, commercial, industrial, and other legitimate uses."[18]

The water use objectives applicable to streams in Milwaukee County are shown on Map 12. There are no streams classified as coldwater community waters in Milwaukee County. Most of the stream reaches in the County are classified as warmwater fish and aquatic life waters. The portion of Tess Corners Creek and most of Whitnall Park Creek in Milwaukee County are classified for limited forage fish. The East Branch Root River, the New Berlin Memorial Hospital Tributary, and a small portion of Whitnall Park Creek in the County are classified as limited aquatic life waters. The mainstem of the Kinnickinnic River; the downstream reaches of the Menomonee and Milwaukee Rivers; Honey, Indian, and Lincoln Creeks; and the portion of Underwood Creek in Milwaukee County are all subject to special variances under Chapter NR 102 of the *Wisconsin Administrative Code*.

Water Quality Conditions in Milwaukee County Streams

Existing water quality conditions in streams in Milwaukee County were assessed as part of the 2007 update to the regional water quality management plan for the Greater Milwaukee Watersheds.[19] As part of this assessment, the achievement of water use objectives was assessed for all streams in Milwaukee County through comparison of the available water quality data collected during the study's baseline period to the water quality criteria supporting the applicable water designated water use objective.[20] The baseline period was initially set as 1998 to 2001. During the course of the study, more recent data were incorporated into analyses as they became available. The baseline period used for these assessments in the Kinnickinnic River, Menomonee River, and Oak Creek watersheds was 1998 to 2001. Because more recent data were available when the analyses were conducted, the baseline period used for these assessments in the Milwaukee River and Root River watersheds and the Lake Michigan direct drainage area was 1998 to 2004. While this study did not assess the achievement of water use objectives in the Fox River watershed, it is important to note that there are no major surface waterbodies in the portion of this watershed that are in Milwaukee County.

During the baseline period, the designated water use objectives were only being partially achieved in much of Milwaukee County. Table 10 shows the results of comparisons of water quality data from the baseline period to the supporting water quality standards that were in effect at the time that the analyses were conducted for the mainstems of the Kinnickinnic, Menomonee, Milwaukee, and Root Rivers, Oak Creek, and those tributary streams for which data existed to assess achievement of water use objectives. Review of the data shows the following:

- Ammonia concentrations in almost all samples collected from the mainstems of the Kinnickinnic, Menomonee, Milwaukee, and Root Rivers, Oak Creek, and nine tributary streams to those Rivers or Lake Michigan were below the acute toxicity criterion for fish and aquatic life, indicating compliance with the standard.

- Dissolved oxygen concentrations from the vast majority of samples collected from stations along the mainstem of the Kinnickinnic, Menomonee, and Milwaukee Rivers were at or above the relevant standard in the vast majority of samples, indicating substantial compliance with the standard. Dissolved oxygen concentrations at most stations along the mainstem of Oak Creek were at or above

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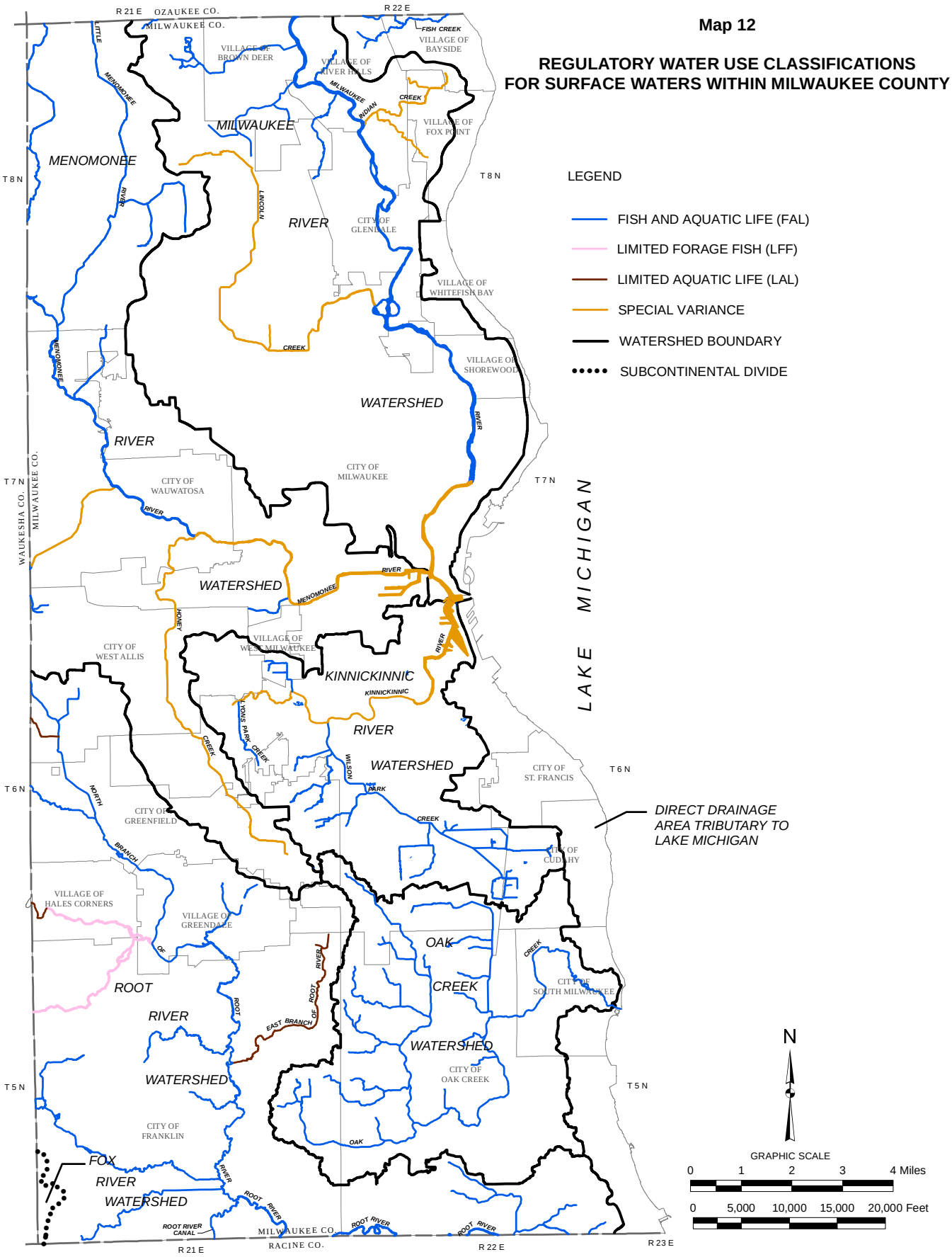
[18]Wisconsin Statutes, *Section 281.15(1).*

[19]*SEWRPC Planning Report No. 50,* A Regional Water Quality Management Plan Update for the Greater Milwaukee Watersheds, *December 2007.*

[20]*SEWRPC Technical Report No. 39,* Water Quality Conditions and Sources of Pollution in the Greater Milwaukee Watersheds, *November 2007.*

Map 12

REGULATORY WATER USE CLASSIFICATIONS FOR SURFACE WATERS WITHIN MILWAUKEE COUNTY



Source: Wisconsin Department of Natural Resources and SEWRPC.

Table 10

CHARACTERISTICS OF STREAMS IN MILWAUKEE COUNTY: 1998-2001[a]

Stream Reach	Stream Length (river miles)	Percent of Samples Meeting Water Quality Standards and Criteria[b]						Macroinvertebrate Biotic Index Rating (HBI)[b,e]	303(d) Impairments[f]
		Dissolved Oxygen	Temperature	Ammonia[c]	Total Phosphorus[d]	Fecal Coliform Bacteria	Fish Biotic Index Rating[b,e]		
Kinnickinnic River Watershed									
Mainstem									
Kinnickinnic River above S. 27th Street	3.1	100.0 (67)[g]	100.0 (67)	100.0 (55)	29.9 (67)	30.3 (66)[h]	Very poor (1)	- -	Bacteria
Kinnickinnic River between S. 7th Street and S. 27th Street	2.1	98.4 (63)[g]	98.4 (63)	100.0 (46)	56.2 (64)	50.8 (63)[h]	- -	Fair (1)	Bacteria-
Kinnickinnic River between S. 1st Street and S. 7th Street[i]	1.4	94.1 (68)[g]	100.0 (68)	100.0 (64)	58.8 (68)	58.2 (67)[h]	- -	- -	Aquatic toxicity, bacteria, dissolved oxygen, fish consumption advisory[i]
Kinnickinnic River between Greenfield Avenue (extended) and S. 1st Street	0.8	100.0 (58)[g]	100.0 (58)	100.0 (56)	74.1 (58)	75.4 (57)[h]	- -	- -	Aquatic toxicity, bacteria, dissolved oxygen, fish consumption advisory
Kinnickinnic River between Jones Island Ferry and Greenfield Avenue (extended)	0.4	100.0 (58)[g]	100.0 (58)	100.0 (57)	74.1 (58)	77.2 (57)[h]	- -	- -	Aquatic toxicity, bacteria, dissolved oxygen, fish consumption advisory
Tributary Streams									
Lyons Park Creek	1.5	- -	- -	- -	- -	- -	- -	- -	Bacteria
South 43rd Street Ditch	1.1	- -	- -	- -	- -	- -	- -	- -	Bacteria
Edgerton Ditch	1.4	- -	- -	- -	- -	- -	- -	- -	- -
Holmes Avenue Creek	1.8	- -	- -	- -	- -	- -	- -	- -	Bacteria
Villa Mann Creek	1.3	- -	- -	- -	- -	- -	- -	- -	Bacteria
Cherokee Park Creek	1.6	- -	- -	- -	- -	- -	- -	- -	Bacteria
Wilson Park Creek Tributary Upstream of Conduit	- -	- -	- -	100.0 (22)	78.6 (42)	- -	- -	- -	- -
Wilson Park Creek Tributary Downstream of Conduit	- -	- -	- -	96.0 (25)	70.5 (44)	- -	- -	- -	- -
Wilson Park Creek	5.5	- -	- -	100.0 (22)	70.5 (44)	- -	- -	- -	Bacteria

Table 10 (continued)

Stream Reach	Stream Length (river miles)	Percent of Samples Meeting Water Quality Standards and Criteria[b]						Macroinvertebrate Biotic Index Rating (HBI)[b,e]	303(d) Impairments[f]
		Dissolved Oxygen	Temperature	Ammonia[c]	Total Phosphorus[d]	Fecal Coliform Bacteria	Fish Biotic Index Rating[b,e]		
Menomonee River Watershed									
Mainstem									
Menomonee River between N. 124th Street and County Line Road	10.0	100.0 (89)	100.0 (63)	100.0 (28)	67.4 (89)	24.4 (90)	Poor (4)	Fair (1)	- -
Menomonee River between W. Hampton Avenue and N. 124th Street	1.0	98.7 (76)	100.0 (61)	100.0 (21)	59.1 (77)	26.0 (77)	- -	- -	- -
Menomonee River between N. 70th Street and W. Hampton Avenue	4.5	100.0 (117)	100.0 (71)	100.0 (44)	43.1 (102)	39.3 (117)	Very poor (9)[j]	Good-very good (3)[j]	- -
Menomonee River between N. 25th Street and N. 70th Street	6.2	100.0 (64)[k]	100.0 (64)	100.0 (18)	31.7 (63)	62.5 (64)[l]	Very poor (9)[j]	Good-very good (3)[j]	Aquatic toxicity, bacteria, dissolved oxygen, fish consumption advisory[m]
Menomonee River between Muskego Avenue and N. 25th Street	0.9	100.0 (66)[k]	100.0 (60)	100.0 (21)	36.9 (65)	71.8 (64)[l]	Very poor (1)[j]	- -	Aquatic toxicity, bacteria, dissolved oxygen, fish consumption advisory
Menomonee River between Burnham Canal and Muskego Avenue	0.1	100.0 (62)[k]	93.5 (62)	100.0 (16)	63.7 (61)	85.2 (61)[l]	Very poor (1)[j]	- -	Aquatic toxicity, bacteria, dissolved oxygen, fish consumption advisory
Menomonee River between S. 2nd Street and Burnham Canal	0.8	100.0 (114)[k]	100.0 (67)	100.0 (30)	32.7 (113)	59.6 (111)[l]	Very poor (1)[j]	- -	Aquatic toxicity, bacteria, dissolved oxygen, fish consumption advisory
Tributary Streams									
Little Menomonee River	11.2	100.0 (5)	100.0 (6)	100.0 (6)	83.3 (6)	100.0 (1)	Very poor (5)	Good-very good (1)	Aquatic toxicity, bacteria
South Branch of Underwood Creek[n]	1.0	71.9 (32)	100.0 (32)`	100.0 (32)	43.3 (30)	21.9 (32)	- -	- -	- -
Underwood Creek from confluence with the Menomonee River to Juneau Boulevard[m]	1.5	100.0 (48)[k]	100.0 (48)	100.0 (48)	68.2 (44)	70.8 (48)[l]	- -	Poor-fairly poor (1)	- -
Honey Creek	10.0	94.6 (92)[k]	100.0 (80)	100.0 (92)	33.8 (77)	32.6 (92)[l]	- -	- -	Bacteria

Table 10 (continued)

Stream Reach	Stream Length (river miles)	Percent of Samples Meeting Water Quality Standards and Criteria[b]						Macroinvertebrate Biotic Index Rating (HBI)[b,e]	303(d) Impairments[f]
		Dissolved Oxygen	Temperature	Ammonia[c]	Total Phosphorus[d]	Fecal Coliform Bacteria	Fish Biotic Index Rating[b,e]		
Milwaukee River Watershed[o]									
Mainstem									
Milwaukee River between Pioneer Road near Cedarburg and Brown Deer Road	11.3	100.0 (87)	100.0 (88)	100.0 (70)	44.8 (87)	30.7 (88)	- -	- -	Bacteria, fish consumption advisory
Milwaukee River between E. Brown Deer Road and E. Silver Spring Drive	6.5	100.0 (81)	100.0 (81)	100.0 (64)	42.5 (80)	38.3 (81)	Excellent (4)	Fair to good (3)	Bacteria, fish consumption advisory
Milwaukee River between E. Silver Spring Drive and N. Port Washington Road	1.6	94.1 (85)	100.0 (85)	100.0 (69)	42.9 (84)	30.6 (85)	- -	- -	Bacteria, fish consumption advisory
Milwaukee River between N. Port Washington Road and Estabrook Park	0.3	100.0 (75)	100.0 (76)	100.0 (76)	42.4 (92)	54.5 (11)	- -	Poor to good (3)	Bacteria, fish consumption advisory
Milwaukee River between Estabrook Park and former North Avenue Dam	3.6	98.6 (71)	100.0 (71)	100.0 (62)	37.1 (70)	19.7 (71)	Good to excellent (5)	Fair to good (9)	Bacteria, fish consumption advisory
Milwaukee River between former North Avenue Dam and Walnut Street	0.9	100.0 (87)	100.0 (87)	100.0 (74)	39.5 (86)	65.1 (83)	Very poor (1)	- -	Aquatic toxicity, bacteria, dissolved oxygen, fish consumption advisory
Milwaukee River between E. Walnut Street and E. Wells Street	0.8	100.0 (84)	100.0 (84)	100.0 (75)	38.6 (83)	69.9 (83)	- -	- -	Aquatic toxicity, bacteria, dissolved oxygen, fish consumption advisory
Milwaukee River between E. Wells Street and N. Water Street	0.6	100.0 (88)	100.0 (88)	100.0 (86)	37.5 (88)	68.2 (88)	- -	- -	Aquatic toxicity, bacteria, dissolved oxygen, fish consumption advisory
Milwaukee River between N. Water Street and Union Pacific Railroad	0.3	100.0 (76)	100.0 (76)	100.0 (73)	64.5 (76)	77.3 (75)	- -	- -	Aquatic toxicity, bacteria, dissolved oxygen, fish consumption advisory
Milwaukee River between Union Pacific Railroad and Confluence with Lake Michigan	0.4	100.0 (2)	100.0 (2)	100.0 (2)	75.0 (4)	100.0 (3)	- -	- -	Aquatic toxicity, bacteria, dissolved oxygen fish consumption advisory
Tributary Streams									
Beaver Creek	2.6	- -	- -	- -	- -	- -	- -	- -	Aquatic toxicity
Southbranch Creek above W. Bradley Road	0.1	100.0 (30)	100.0 (30)	100.0 (32)	3.3 (30)	38.7 (31)	- -	- -	- -

Table 10 (continued)

Stream Reach	Stream Length (river miles)	Percent of Samples Meeting Water Quality Standards and Criteria[b]						Macroinvertebrate Biotic Index Rating (HBI)[b,e]	303(d) Impairments[f]
		Dissolved Oxygen	Temperature	Ammonia[c]	Total Phosphorus[d]	Fecal Coliform Bacteria	Fish Biotic Index Rating[b,e]		
Milwaukee River Watershed[o] (continued)									
Tributary Streams (continued)									
Southbranch Creek between W. Bradley Road and N. 55th Street	0.2	100.0 (39)	100.0 (34)	100.0 (32)	12.1 (33)	32.4 (34)	- -	- -	- -
Southbranch Creek between N. 55th Street and N. 47th Street	0.5	100.0 (36)	100.0 (36)	100.0 (30)	11.4 (35)	22.2 (36)	- -	- -	- -
Southbranch Creek between N. 47th Street and Teutonia Avenue	0.5	91.4 (35)	100.0 (35)	100.0 (28)	29.4 (34)	8.6 (35)	- -	- -	- -
Brown Deer Park Creek	2.2	- -	- -	- -	- -	- -	- -	- -	- -
Indian Creek	1.9	100.0 (32)	100.0 (32)	100.0 (28)	75.0 (28)	71.9 (32)	Very poor (1)	- -	Aquatic toxicity, degraded habitat, dissolved oxygen, temperature[p]
Wahl Creek	0.5	- -	- -	- -	- -	- -	- -	- -	- -
Lincoln Creek above N. 60th Street	0.9	100.0 (81)	100.0 (81)	100.0 (74)	57.5 (80)	76.3 (80)	- -	- -	Aquatic toxicity, degraded habitat, dissolved oxygen, temperature
Lincoln Creek between N. 60th Street and N. 51st Street	1.5	100.0 (79)	100.0 (80)	100.0 (65)	77.2 (79)	47.5 (80)	- -	- -	Aquatic toxicity, degraded habitat, dissolved oxygen, temperature
Lincoln Creek between N. 51st Street and N. 55th Street	1.1	100.0 (61)	100.0 (61)	100.0 (56)	81.7 (60)	73.3 (60)	- -	- -	Aquatic toxicity, degraded habitat, dissolved oxygen, temperature
Lincoln Creek between N. 55th Street and N. 47th Street	2.5	100.0 (100)	100.0 (100)	100.0 (83)	37.6 (93)	34.5 (84)	Very poor (1)	- -	Aquatic toxicity, degraded habitat, dissolved oxygen, temperature
Lincoln Creek between N. 47th Street and Green Bay Avenue	2.9	97.6 (83)	100.0 (422)	100.0 (78)	14.6 (82)	37.3 (83)	Very poor (2)	- -	Aquatic toxicity, degraded habitat, dissolved oxygen, temperature

Table 10 (continued)

Stream Reach	Stream Length (river miles)	Percent of Samples Meeting Water Quality Standards and Criteria[b]						Macroinvertebrate Biotic Index Rating (HBI)[b,e]	303(d) Impairments[f]
		Dissolved Oxygen	Temperature	Ammonia[c]	Total Phosphorus[d]	Fecal Coliform Bacteria	Fish Biotic Index Rating[b,e]		
Oak Creek Watershed									
Mainstem									
Oak Creek above E. Ryan Road	3.73	56.9 (51)	100.0 (52)	100.0 (52)	75.0 (52)	15.7 (51)	- -	- -	Aquatic toxicity
Oak Creek between STH 38 and E. Ryan Road	0.83	98.1 (53)	100.0 (54)	100.0 (48)	79.2 (53)	15.1 (53)	- -	- -	Aquatic toxicity
Oak Creek between Forest Hill Road and STH 38	2.98	75.0 (52)	100.0 (53)	100.0 (46)	58.5 (53)	25.0 (52)	- -	- -	Aquatic toxicity
Oak Creek between S. Pennsylvania Avenue and Forest Hill Road	1.54	84.6 (53)	100.0 (53)	100.0 (46)	69.2 (52)	18.9 (53)	- -	- -	Aquatic toxicity
Oak Creek between 15th Avenue and S. Pennsylvania Avenue	1.87	100.0 (54)	100.0 (55)	100.0 (52)	63.6 (55)	14.5 (55)	- -	- -	Aquatic toxicity
Oak Creek between Oak Creek Parkway East of STH 32 and 15th Avenue	1.80	100.0 (45)	100.0 (46)	100.0 (37)	72.3 (47)	17.0 (47)	- -	- -	Aquatic toxicity
Oak Creek between Oak Creek Parkway East of S. Lake Drive and Oak Creek Parkway East of STH 32	0.76	100.0 (52)	100.0 (53)	100.0 (48)	75.9 (54)	13.0 (54)	- -	- -	Aquatic toxicity
Tributary Streams									
North Branch Oak Creek	3.31	- -	- -	- -	- -	- -	- -	- -	- -
Mitchell Field Drainage Ditch	5.85	- -	100.0 (1)	100.0 (10)	45.5 (11)	- -	- -	- -	- -
Root River Watershed[o]									
Mainstem									
Root River above W. Cleveland Avenue	1.10	46.4 (28)	100.0 (28)	100.0 (27)	64.3 (28)	21.4 (28)	- -	- -	Dissolved oxygen
Root River between the Intersection of W. National Avenue and W. Oklahoma Avenue and W. Cleveland Avenue	0.50	44.4 (27)	100.0 (27)	100.0 (23)	42.3 (26)	7.4 (27)	- -	- -	Dissolved oxygen
Root River between W. Cold Spring Road and the Intersection of W. National Avenue and W. Oklahoma Avenue	0.80	53.6 (28)	100.0 (28)	100.0 (26)	67.9 (28)	25.0 (28)	Fair (1)	- -	Dissolved oxygen

Table 10 (continued)

Stream Reach	Stream Length (river miles)	Percent of Samples Meeting Water Quality Standards and Criteria[b]						Macroinvertebrate Biotic Index Rating (HBI)[b,e]	303(d) Impairments[f]
		Dissolved Oxygen	Temperature	Ammonia[c]	Total Phosphorus[d]	Fecal Coliform Bacteria	Fish Biotic Index Rating[b,e]		
Root River Watershed[o] (continued)									
Mainstem (continued)									
Root River between W. Grange Avenue and W. Cold Spring Road	2.50	79.5 (39)	100.0 (39)	100.0 (33)	78.9 (38)	16.1 (31)	Very poor (1)	- -	Dissolved oxygen
Root River between W. Ryan Road and W. Grange Avenue	8.70	90.6 (32)	100.0 (32)	100.0 (26)	75.8 (33)	36.7 (30)	Very poor (1)	- -	Dissolved oxygen
Root River between County Line Road and W. Ryan Road	4.20	100.0 (25)	100.0 (26)	100.0 (24)	26.9 (26)	34.6 (26)	Very poor(1)	- -	Dissolved oxygen
Tributary Streams									
Hale Creek	1.00	- -	- -	- -	- -	- -	- -	- -	- -
Wildcat Creek	1.60	- -	- -	- -	- -	- -	- -	- -	- -
Whitnall Park Creek	2.00	- -	- -	- -	- -	- -	Very poor (2)	- -	- -
Tess Corners Creek	4.00	- -	- -	- -	- -	- -	Very poor (1)	Good to very good (2)	- -
Dale Creek	1.40	- -	- -	- -	- -	- -	- -	- -	- -
East Branch of the Root River	4.00	- -	- -	- -	- -	- -	- -	- -	- -
Ryan Creek	6.00	- -	- -	- -	- -	- -	- -	Fair (1)	- -
Legend Creek	3.00	- -	- -	- -	- -	- -	- -	- -	- -
Root River Canal	5.50	77.6 (98)	100.0 (104)	- -	3.9 (51)	60.0 (10)	Very poor (1)	- -	Dissolved oxygen
Crayfish Creek	2.70	- -	- -	- -	- -	- -	Very poor (1)	- -	- -
Lake Michigan Direct Drainage Area[o]									
Fish Creek between N. Port Washington Road and Broadmoor Drive	0.60	97.1 (34)	100.0 (34)	100.0 (33)	51.5 (33)	33.3 (33)	- -	- -	- -

[a] *Except as noted, evaluations of dissolved oxygen, temperature, ammonia, total phosphorus, and fecal coliform bacteria are based on data from 1998-2001.*

[b] *Number in parentheses shows number of samples.*

[c] *Based upon the acute toxicity criterion for ammonia.*

[d] *Total phosphorus is compared to the concentration recommended in the regional water quality management plan.*

[e] *The State of Wisconsin has not promulgated water quality standards or criteria for biotic indices.*

[f] *As listed in the 2008 Wisconsin 303(d) Impaired Waters List.*

Table 10 Footnotes (continued)

[g]A special variance dissolved oxygen standard of 2.0 milligrams per liter applies to the Kinnickinnic River.

[h]A special variance standard for fecal coliform bacteria concentration applies to the Kinnickinnic River. Membrane filter fecal coliform counts shall not exceed 1,000 per 100 ml as a monthly geometric mean based on not less than five samples per month nor exceed 2,000 per 100 ml in more than 10 percent of all samples in any month.

[i]The upstream limit of the 303(d) impairments only extends to Chase Avenue.

[j]The lower Menomonee River upstream from the estuary was evaluated for biotic indices as a single reach.

[k]A special variance dissolved oxygen standard of 2.0 milligrams per liter applies to the Menomonee River downstream from the confluence with Honey Creek, Honey Creek, and Underwood Creek from the confluence with the Menomonee River upstream to Juneau Boulevard.

[l]A special variance standard for fecal coliform bacteria concentration applies to the Menomonee River downstream from the confluence with Honey Creek, Honey Creek, and Underwood Creek from the confluence with the Menomonee River upstream to Juneau Boulevard. Membrane filter fecal coliform counts shall not exceed 1,000 per 100 ml as a monthly geometric mean based on not less than five samples per month nor exceed 2,000 per 100 ml in more than 10 percent of all samples in any month.

[m]The downstream 1.2 miles of this reach are listed as impaired due to aquatic toxicity, bacteria, low dissolved oxygen concentration, and fish consumption advisories. The upstream portion of this reach is not listed as impaired.

[n]Based upon data collected in 2001-2004.

[o]Based upon data collected in 1998-2004.

[o]The natural channel downstream of Interstate Highway 43 is considered impaired. Reaches upstream from Interstate Highway 43 are not considered impaired.

Source: SEWRPC.

the relevant standard for fish and aquatic life waters in the vast majority of samples, indicating substantial compliance with the standard. The major exception to this generalization occurred in the portion of the mainstem upstream from the confluence with the North Branch of Oak Creek (above W. Ryan Road). In this reach, dissolved oxygen concentrations were below the standard in a substantial portion of the samples, indicating substantial noncompliance with the standard. Dissolved oxygen concentrations from sampling stations along the mainstem of the Root River upstream of W. Grange Avenue were commonly below the relevant standard, indicating frequent violation of the standard. Dissolved oxygen concentrations were at or above the relevant standards in the vast majority of samples from two tributary streams, indicating compliance. In three other streams, Fish Creek, Lincoln Creek, and Southbranch Creek, dissolved oxygen concentrations were occasionally below the relevant standard. Dissolved oxygen concentrations in four other streams, the North Branch of Oak Creek, the Root River Canal, the South Branch of Underwood Creek, and Underwood Creek, were commonly-to-frequently below the relevant standard, indicating more frequent violation of the standard.

- Water temperatures in all samples taken from the mainstems of the Milwaukee and Root Rivers and Oak Creek were at or below the relevant standard, indicating substantial compliance with the standard. Water temperatures at two sampling stations along the mainstem of the Kinnickinnic River and one sampling station along the mainstem of the Menomonee River occasionally exceeded the relevant standard during the summer, indicating occasional violation of the standard. Water temperatures in nine tributary streams were always at or below the relevant standard, indicating compliance with the standard.

- Fecal coliform bacteria standards were commonly exceeded at stations along the mainstems of the Kinnickinnic, Menomonee, Milwaukee, and Root Rivers, indicating frequent violation of the standard. Fecal coliform bacteria standards were generally exceeded along the mainstem of Oak Creek, indicating a general violation of the standard. Fecal coliform bacteria concentrations were below the standard in one tributary stream indicating substantial compliance with the standard in these streams. Concentrations of fecal coliform bacteria in eight tributary streams, Fish Creek, Honey Creek, Indian Creek, Lincoln Creek, the Root River Canal, Southbranch Creek, the South Branch of Underwood Creek, and Underwood Creek, commonly exceeded the relevant standard, indicating frequent violation of the standard.

- Concentrations of total phosphorus in the mainstems of the Kinnickinnic, Menomonee, Milwaukee, and Root Rivers and Oak Creek commonly exceeded the recommended levels in the original regional water quality management plan.[21] Total phosphorus concentrations in eight tributary streams commonly exceeded the recommended concentration. Total phosphorus concentrations in four tributary streams occasionally exceeded the recommended concentration. Total phosphorus concentrations in four tributary streams were at or below the recommended levels.[22]

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[21]*SEWRPC Planning Report No. 30,* A Regional Water Quality Management Plan for Southeastern Wisconsin: 2000, *Volume One,* Inventory Findings, *September 1978; Volume Two,* Alternative Plans, *February 1979; and Volume Three,* Recommended Plan, *June 1979.*

[22]*Depending upon the stream, the planning standard recommended by the regional water quality management plan is greater than or equal to the State water quality criteria for total phosphorus that is anticipated to become effective in late 2010 or early 2011. This suggests that, with respect to total phosphorus concentrations, the assessment of whether water quality in these streams met applicable water use objectives that was conducted as part of the update of the regional water quality management plan for the greater Milwaukee watersheds represents a "best case" condition relative to the State's new water quality criteria for phosphorus.*

Thus, during the baseline period for the update of the regional water quality management plan for the greater Milwaukee watersheds, the stream reaches for which data are available only partially achieved the designated water use objectives.

In addition to assessing the achievement of water use objectives, the regional water quality management plan update for the greater Milwaukee watersheds assessed existing conditions of a number of other water quality indicators. For some of these indicators, water quality criteria have not been promulgated.

Table 10 includes evaluations of biological conditions in streams within Milwaukee County during the baseline period. Two metrics were used to conduct these evaluations. The quality of fishery communities was evaluated using the Index of Biotic Integrity, as calibrated for warmwater streams in Wisconsin.[23] The quality of macroinvertebrate communities was evaluated using the Hilsenhoff Biotic Index.[24] It is important to note that the generalizations made here are, in some cases, based upon limited data. Within Milwaukee County, the Kinnickinnic River; Oak Creek; and Root River watersheds, with the possible exception of the Whitnall Park Creek subwatershed, contain very poor fisheries. These fish communities contain relatively few species of fishes, are trophically unbalanced, contain few or no top carnivores, and are dominated by tolerant fishes. The quality of the macroinvertebrate communities in these watersheds range from very poor in the Kinnickinnic River watershed to poor to fair in the Oak Creek and Root River watersheds. These communities are depauperate and dominated by tolerant taxa. The portion of the Menomonee River watershed in Milwaukee County has a relatively poor fishery. The fish community contains relatively few species of fishes, is trophically unbalanced, contains few or no top carnivores, and is dominated by tolerant fishes. By contrast, the Milwaukee County portion of this watershed has a fair to very good macroinvertebrate community. This community is trophically balanced and is not dominated by tolerant taxa. With the exception of the communities in Indian and Lincoln Creeks, the fish and macroinvertebrate communities in the Milwaukee County portion of the Milwaukee River watershed are of a better quality than those communities in the other watersheds of the County. The fish community in portions of the mainstem of the Milwaukee River contains a high abundance of warmwater species of fishes, seems trophically balanced in the highest quality areas, contains a good percentage of top carnivores (except for those species stocked), and is not dominated by tolerant fishes. Similarly, the macroinvertebrate communities are classified as fair to good-very good at present and are also generally trophically balanced and not dominated by tolerant taxa. For the Kinnickinnic River watershed and the portion of the Menomonee River watershed that is located in Milwaukee County, more recent examinations of biological conditions have mostly confirmed these findings.[25] The Kinnickinnic River watershed contains poor quality biological communities. The quality of the fishery in the portion of the Menomonee River watershed in Milwaukee County is generally very poor to fair. By contrast the macroinvertebrate communities in this portion of the watershed tend to be fair to good.

In some areas, water quality and habitat may be limiting the biological communities in these streams. It is also important to note there are several other factors that are likely limiting the aquatic community, including but not limited to 1) periodic stormwater loads; 2) decreased base flows; 3) continued fragmentation due to culverts, drop structures, and concrete lined channels, enclosed conduits, and a dam; 4) past channelization; and/or 5) increased water temperatures due to urbanization.

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[23]*John Lyons, "Using the Index of Biotic Integrity (IBI) to Measure Environmental Quality in Warmwater Streams in Wisconsin," U.S. Department of Agriculture,* General Technical Report NC-149, *1992.*

[24]*William L. Hilsenhoff,* Rapid Field Assessment of Organic Pollution with Family-Level Biotic Index, *University of Wisconsin-Madison, 1988.*

[25]*SEWRPC Memorandum Report No. 194,* Stream Habitat Conditions and Biological Assessment of the Kinnickinnic and Menomonee River Watersheds: 2000-2009, *January 2010.*

The biological condition of waterbodies in Milwaukee County is also affected by the presence of aquatic invasive species. Table 11 lists aquatic invasive species that have been reported as being present in inland waterbodies in Milwaukee County. Rusty crayfish, a crustacean species native to the Ohio River watershed, has been detected in streams within four watersheds in Milwaukee County. This species tends to displace native crayfish species and can substantially reduce aquatic macrophyte populations in waters that it has invaded. Round goby, a fish species native to the Caspian Sea and Black Sea regions of Eurasia, has been detected in the portion of the Milwaukee River downstream of Estabrook Dam. This species feeds heavily on the eggs and fry of other fish species and may also displace native forage fish species. In addition, all streams tributary to Lake Michigan are considered viral hemorrhagic septicemia waters, although the presence of this fish disease has not been verified in streams in Milwaukee County.

One important indicator that was assessed was total suspended solids (TSS). Suspended solids consist of particles of sand, silt, and clay; planktonic organisms; and fine organic and inorganic debris. The composition of these solids varies with characteristics of the watershed and the number and types of pollution sources present. Sources of suspended solids include point sources, urban and nonurban nonpoint pollution, erosion of streambeds and streambanks, and resuspension of sediment present in the beds of waterbodies. High concentrations of suspended solids can cause several impacts in waterbodies, including reductions in photosynthesis in aquatic communities, increases in water temperature, and alterations of nutrient and pollutant transport. In addition, deposition of this material may alter the substrate, making it unsuitable as habitat for aquatic organisms or changing channel conditions.

Concentrations of TSS in the mainstems of the major rivers and streams of Milwaukee County from the baseline period of the regional water quality management plan update for the greater Milwaukee watersheds are summarized in Table 12. Within Milwaukee County, concentrations ranged from below the limit of detection to 1,200 milligrams per liter (mg/l). Mean concentrations within the County's rivers ranged from 20.1 mg/l in the Kinnickinnic River to 35.4 mg/l in Oak Creek. Within the Kinnickinnic, Menomonee, and Milwaukee Rivers, TSS concentrations tended to be lower in the portions of the Rivers that were within the Milwaukee Harbor estuary than in the portions of the Rivers upstream from the estuary.[26] This reflects the fact that portions of the estuary act as a settling basin in which material suspended in water sink and fall out into the sediment.

It is important to distinguish between instream water quality during dry weather conditions and during wet weather conditions. Differences between wet-weather and dry-weather instream water quality reflect differences between the dominant sources and loadings of pollutants associated with each condition. Dry-weather instream water quality reflects the quality of ground water discharge to the stream plus the continuous or intermittent discharge of various point sources, for example, industrial cooling or process waters, and leakage or other unplanned dry-weather discharges from sanitary sewers or private process water systems. While instream water quality during wet weather conditions includes the above discharges, and in extreme instances discharges from separate and/or combined sanitary sewer overflows, the dominant influence, particularly during major rainfall or snowmelt runoff events, is likely to be the soluble or insoluble substances carried into streams by direct land surface runoff. That direct runoff moves from the land surface to the surface waters by overland routes, such as drainage swales, street and highway ditches, and gutters, or by underground storm sewer systems.

Table 12 also presents estimated mean daily average loads of TSS under wet-weather and dry-weather conditions for the mainstems of the major rivers and streams of Milwaukee County based upon flow and water quality data. A water quality sample was assumed to represent wet-weather conditions when daily mean flow was in the upper 20th percentile of the flow duration curve for the relevant flow gauge. This includes flows that are high due to

[26]*The Milwaukee Harbor estuary includes the Kinnickinnic River below the Chase Avenue bridge, the Menomonee River below the site of the former Falk Dam, and the Milwaukee River below the site of the former North Avenue Dam.*

Table 11

AQUATIC INVASIVE SPECIES DETECTED IN INLAND WATERBODIES IN MILWAUKEE COUNTY

Waterbody	Species
Streams and Rivers	
Indian Creek	Rusty crayfish
Little Menomonee River	Rusty crayfish
Menomonee River	Rusty crayfish
Milwaukee River	Rusty crayfish, round goby
Oak Creek	Rusty crayfish
Root River	Rusty crayfish
Root River Canal	Rusty crayfish
Ryan Creek	Rusty crayfish
Lakes and Ponds	
Brown Deer Park Pond	Curly-leaf pondweed
Greenfield Golf Course Pond	Eurasian water milfoil
Greenfield Park Pond	Eurasian water milfoil
Holler Park Pond	Eurasian water milfoil
Humboldt Park Pond	Curly-leaf pondweed, Eurasian water milfoil
Juneau Park Lagoon	Curly-leaf pondweed, Eurasian water milfoil
McCarty Park Pond	Curly-leaf pondweed
McGovern Park Pond	Eurasian water milfoil
Mitchell Park Pond	Curly-leaf pondweed , Eurasian water milfoil
Scout Lake	Curly-leaf pondweed , Eurasian water milfoil
Sheridan Park Pond	Curly-leaf pondweed, Eurasian water milfoil
Upper Kelly Lake	Curly-leaf pondweed, Eurasian water milfoil
Washington Park Pond	Eurasian water milfoil
Wilson Park Pond	Eurasian water milfoil

Source: Milwaukee County, Wisconsin Department of Natural Resources, and SEWRPC.

Table 12

CONCENTRATIONS OF TOTAL SUSPENDED SOLIDS IN STREAMS AND RIVERS IN MILWAUKEE COUNTY

Stream	Evaluation Period	Total Suspended Solids Concentration (mg/l)			Mean Daily Average Total Suspended Solids Load (pounds)[a]	
		Minimum	Maximum	Mean	Wet Weather	Dry Weather
Kinnickinnic River	1998-2001	0.8	1,200	20.1	85,060	398
Menomonee River	1998-2001	1.6	570	26.0	400,300	3,020
Milwaukee River	1998-2004	2.0	480	28.9	415,400	20,240
Oak Creek	1998-2001	1.2	410	35.4	17,210	552
Root River	1998-2004	0.0	390	20.6	122,000	1,418

[a]*TSS loads were calculated by multiplying streamflow data from U.S. Geological Survey streamflow gages by TSS concentrations in samples collected at the site of the gage. Wet weather was defined as flows in the upper 20th percentile of the flow duration curve for the relevant streamflow gage. Assessment locations were: the Kinnickinnic River at S. 7th Street, the Menomonee River at N. 70th Street, the Milwaukee River at N. Port Washington Road, Oak Creek at 15th Avenue, and the Root River at W. Ryan Road.*

Source: SEWRPC.

rainfall events, runoff from snowmelt, or a combination of rainfall and snowmelt. On dates when daily mean flow was in the lower 80th percentile of the flow duration curve for the relevant flow gauge, the corresponding water quality samples were considered to reflect dry-weather conditions. Daily average pollutant loads were estimated by appropriately combining daily average flow and pollutant ambient concentration.[27] For all five of these streams, the estimated loads of TSS occurring during wet-weather periods were considerably higher than the estimated loads of TSS occurring during dry-weather periods. It should also be noted that the maximum estimated daily average loads of TSS in these streams were on the order of five to 10 times higher than the mean estimated daily average load, suggesting that a small number of wet-weather events may be responsible for a considerable fraction of the TSS load in these streams.

Stream Channel and Corridor Conditions

The conditions of the bed and bank of a stream are greatly affected by the flow of water through the channel. The great amount of energy possessed by flowing water in a stream channel is dissipated along the stream length by turbulence, streambank and streambed erosion, and sediment resuspension. Sediments and associated substances delivered to a stream may be stored, at least temporarily, on the streambed, particularly where obstructions or irregularities in the channel decrease the flow velocity or act as particle traps or filters. On an annual basis or a long-term basis, streams may exhibit net deposition, net erosion, or no net change in internal sediment transport, depending on tributary land uses, watershed hydrology, precipitation, and geology. From 3 to 11 percent of the annual sediment yield in a watershed in southeastern Wisconsin may by contributed by streambank erosion.[28] In the absence of mitigative measures, increased urbanization in a watershed may be expected to result in increased streamflow rates and volumes, with potential increases in streambank erosion and bottom scour, and flooding problems. In communities in Milwaukee County, the requirements of MMSD Chapter 13, "Surface Water and Storm Water," are applied to mitigate instream increases in peak rates of flow that could occur due to new urban development without runoff controls.

Milwaukee County commissioned an assessment of stability and fluvial geomorphic character of streams within four watersheds in the County. These included the Kinnickinnic River, Milwaukee River, Oak Creek, and Root River watersheds.[29] This study, conducted in fall 2003, examined channel stability in about 60 miles of stream channel along the mainstems of these rivers and several of their tributaries. In addition, a major goal of the study was to create a prioritized list of potential project sites related to mitigation of streambank erosion and channel incision, responses to channelization, and maintenance of infrastructure integrity. In addition, the MMSD commissioned a study of sediment transport in the Menomonee River watershed.[30] This study, conducted in 2000, examined sediment transport in about 63 miles of stream channel along the mainstem of the River and several of its tributaries. Included among the factors assessed in this study were the characterization of channel bed and bank material composition, the evaluation of bed and bank stability, the examination of the integrity of the Works Progress Administration (WPA) walls lining portions of the channel, and the examination of bed and bank stability at road crossings. Data exist on channel conditions for only one stream in the Lake Michigan direct drainage area. The MMSD commissioned an assessment of geomorphic, hydrologic, and hydraulic conditions for

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[27]*Flow duration curves and additional information on determinations of load are presented in SEWRPC Technical Report No. 39,* op. cit.

[28]*SEWRPC Technical Report No. 21,* Sources of Water Pollution in Southeastern Wisconsin: 1975, *September 1978.*

[29]*Inter-Fluve, Inc.,* Milwaukee County Stream Assessment, Final Report, *September 2004.*

[30]*Inter-Fluve, Inc.,* Menomonee River Watershed Sediment Transport Study Summary Report, *MMSD Contract No. W021-PE001, February 2001.*

Fish Creek and its watershed.[31] This study, conducted in 2000 to 2001, examined geomorphic and sediment characteristics and hydrologic and hydraulic conditions for about 3.5 miles of stream channel along Fish Creek, including reaches outside of Milwaukee County. Major goals of this study were to evaluate the mechanisms driving flood control, erosion, valley stability, and environmental management for the Creek and to identify engineering and management options to be considered in future studies.

Map 13 shows channel bed conditions in streams within Milwaukee County. Much of the stream network has been modified throughout the County. Many stream reaches have been channelized and straightened. Some stream reaches have been enclosed in conduit, including sections of Cherokee Park Creek, Edgerton Ditch, Holmes Avenue Creek, Lyons Park Creek, the South 43rd Street Ditch, Villa Mann Creek, and Wilson Park Creek in the Kinnickinnic River watershed; sections of Grantosa Creek, Honey Creek, and Woods Creek in the Menomonee River watershed; sections of Beaver Creek, Brown Deer Park Creek, Southbranch Creek, and unnamed tributaries to Indian Creek and Southbranch Creek in the Milwaukee River watershed; sections of the Mitchell Field Drainage Ditch, and tributaries to the Mitchell Field Drainage Ditch and North Branch of Oak Creek in the Oak Creek watershed; and small sections of Legend Creek and the New Berlin Memorial Hospital Tributary in the Root River watershed. In addition, some sections of stream channel have been concrete lined. These include substantial portions of the mainstem of the Kinnickinnic River and Wilson Park Creek and small reaches of Holmes Avenue Creek, Lyons Park Creek, and Villa Mann Creek in the Kinnickinnic River watershed; portions of Honey Creek, Underwood Creek, and Woods Creek in the Menomonee River watershed; reaches of Beaver Creek, Brown Deer Park Creek, Indian Creek, Lincoln Creek, Southbranch Creek, and Wahl Creek in the Milwaukee River watershed; and reaches along the mainstem of Oak Creek and a tributary to the North Branch of Oak Creek watershed. Table 13 summarizes streambed conditions in each of the watersheds in the County.

Alluvial streams within urbanizing watersheds often experience rapid channel enlargement. As urbanization occurs, the fraction of the watershed covered by impervious surfaces increases. This can result in profound changes in the hydrology in the watershed. As a result of runoff being conveyed over impervious surfaces to storm sewers which discharge directly to streams, peak flows become higher and more frequent and streams become "flashier," with flows increasing rapidly in response to rainfall events. The amount of sediment reaching the channel often declines. Under these circumstances and in the absence of armoring, the channel may respond by incising. This leads to an increase in the height of the streambank, which continues until a critical threshold for stability is exceeded. When that condition is reached, mass failure of the bank occurs, leading to channel widening. Typically, incision in an urbanizing watershed proceeds from the mouth to the headwaters.[32] Lowering of the downstream channel bed increases the energy gradient upstream and in the tributaries. This contributes to further destabilization. Once it begins, incision typically follows a sequence of channel bed lowering, channel widening, and deposition of sediment within the widened channel. Eventually, the channel returns to a stable condition characteristic of the altered channel geometry.

Map 14 summarizes bank stability for streams within Milwaukee County. Degrading channels and eroding banks are common in Milwaukee County. Most of the alluvial reaches that were examined in the Kinnickinnic River, Oak Creek, and Root River watersheds appeared to be degrading and actively eroding. While most of the reaches were found to be stable in the Menomonee and Milwaukee River watersheds, limited active areas of erosion were detected. Table 14 summarizes bank conditions in the watersheds of the County.

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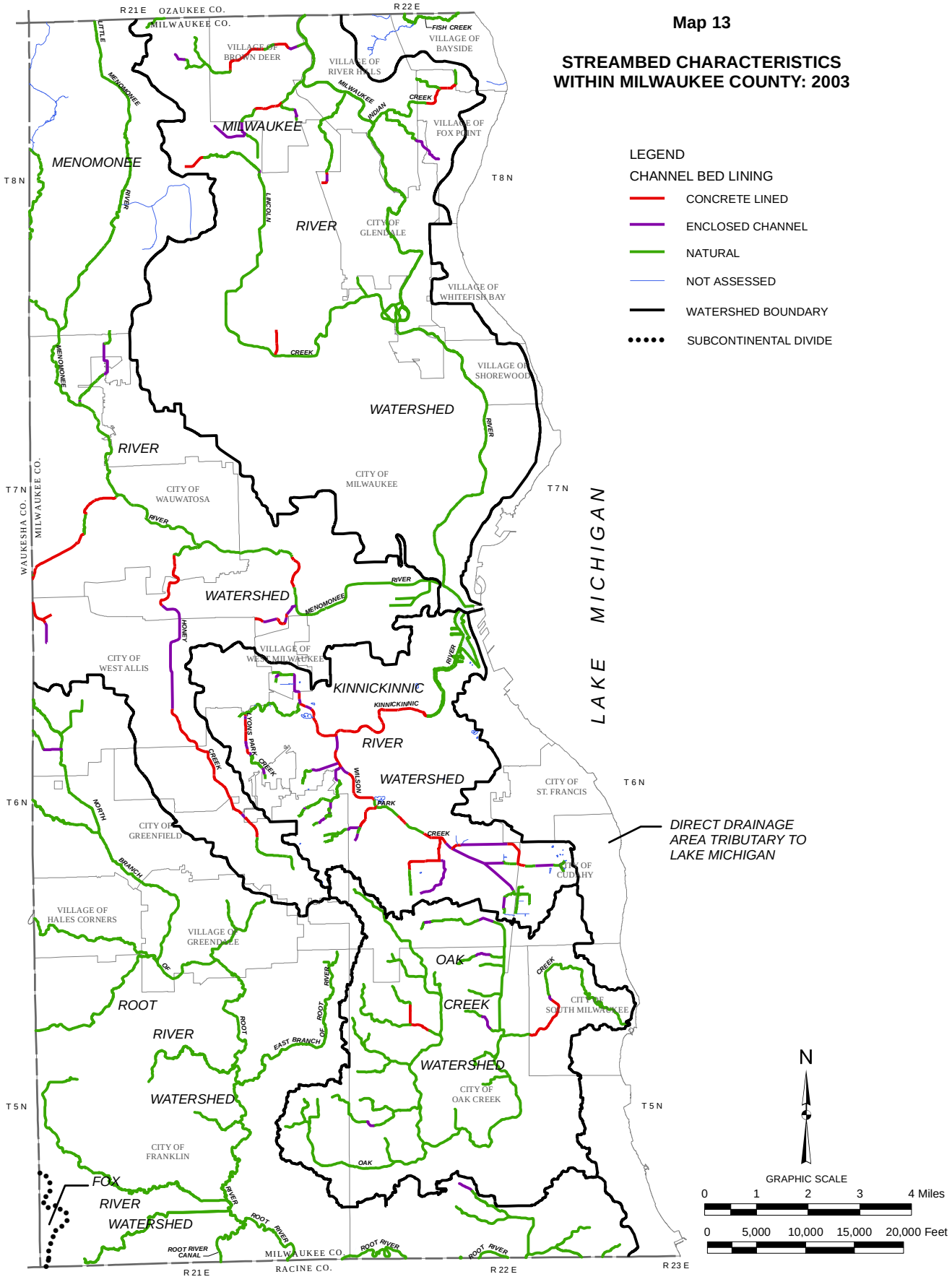
[31] *W.F. Baird & Associates,* Fish Creek Geomorphic Study: Final Study Report, *January 2002.*

[32] *S.A. Schumm, "Causes and Controls of Channel Incision," In: S.E. Darby and A. Simon (eds.),* Incised River Channels: Processes, Forms, Engineering and Management, *John Wiley & Sons, New York, 1999.*

Map 13

STREAMBED CHARACTERISTICS WITHIN MILWAUKEE COUNTY: 2003



Source: Milwaukee Metropolitan Sewerage District, Inter-Fluve, Inc., and SEWRPC.

Table 13

STREAMBED CHARACTERISTICS WITHIN MILWAUKEE COUNTY WATERSHEDS: 2003

Streambed Characteristic	Percent of Stream System in the Watershed					
	Kinnickinnic River Watershed	Menomonee River Watershed[a]	Milwaukee River Watershed	Oak Creek Watershed	Root River Watershed	Lake Michigan Direct Drainage Area[b]
Natural Channel.....	44.9	57.7	86.4	92.8	99.0	37.8
Concrete-Lined	21.5	17.8	8.2	4.4	0.0	0.0
Enclosed Channel	18.8	8.9	5.3	2.8	1.0	0.0
Not Assessed.....	14.8	15.6	- -	- -	- -	62.2
Total	100.0	100.0	100.0	100.0	100.0	100.0

[a]*Streams in the Menomonee River watershed were assessed in 2000.*

[b]*Fish Creek in the Lake Michigan direct drainage area was assessed during 2000 and 2001.*

Source: Inter-Fluve, Inc. W.F. Baird & Associates, and SEWRPC.

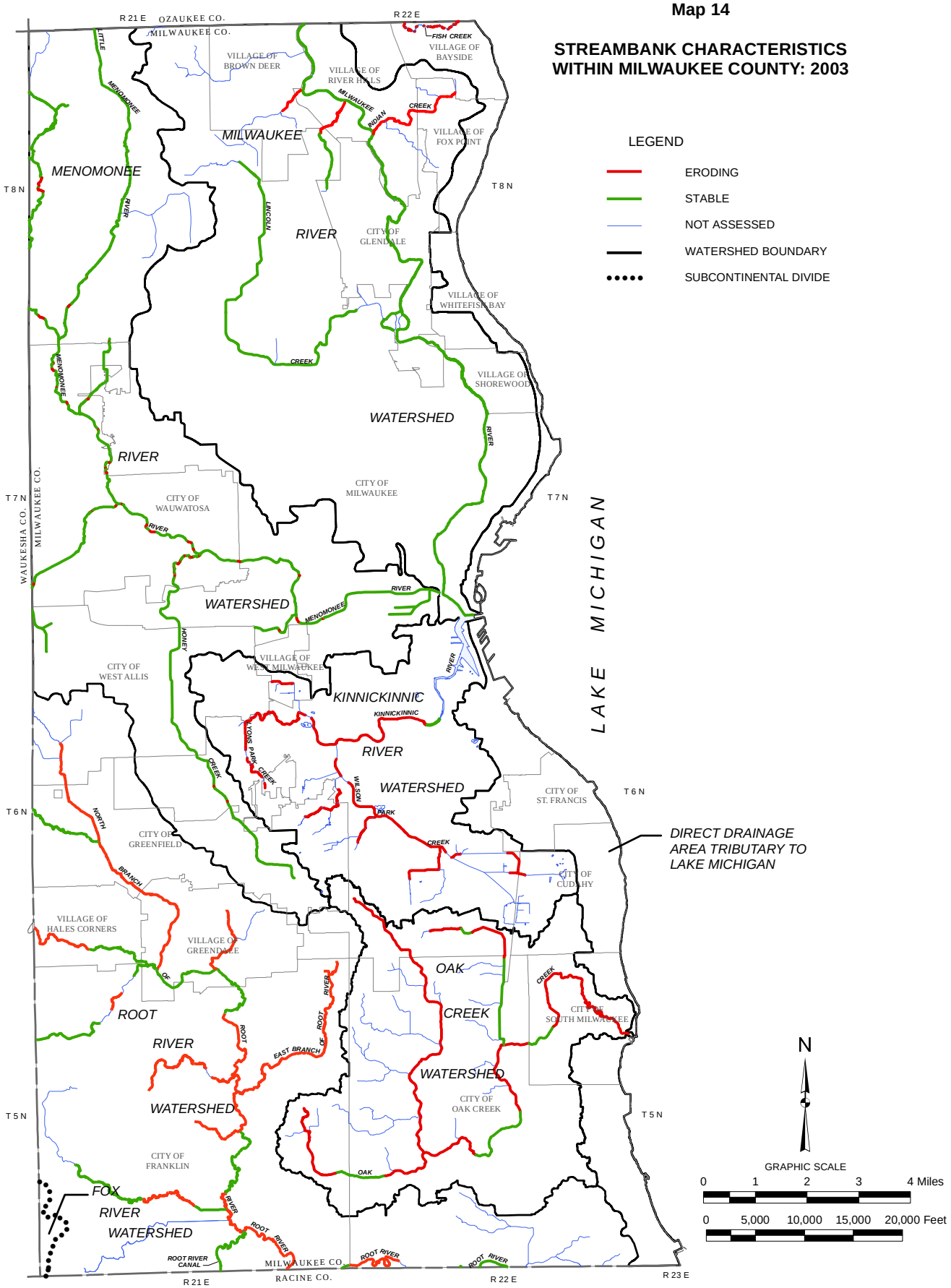
In Milwaukee County, stream corridor protection has been focused on public acquisition of the lands adjacent to the streambanks and their preservation as river parkways. These lands are frequently incorporated into public parks and other natural areas. The provision of buffer strips around waterways represents an important intervention that addresses anthropogenic sources of contaminants, with even the smallest buffer strip providing environmental benefit.[33] Map 15 and Table 15 show the current status of riparian buffers along streams in Milwaukee County. Enclosed conduits, which comprise small portions of the stream systems in the Milwaukee River watershed, Oak Creek watershed, and Root River watershed stream systems and more substantial portions of the Kinnickinnic River watershed and Menomonee River watershed stream systems, offer limited opportunity for installation of buffers.

Table 15 shows the current status of buffer widths ranging from less than 25 feet, 25 to 50 feet, 50 to 75 feet, and greater than 75 feet among each of the major Milwaukee County watersheds. In the Milwaukee River, Oak Creek, and Root River watersheds, buffers greater than 75 feet in width are the most common category of buffer, accounting for about 42 percent, 38 percent, and 62 percent, respectively, of the buffer widths in these watersheds. This width category represents the second most common category of buffer in the portion of the Menomonee River watershed in Milwaukee County, accounting for about 34 percent of the buffer widths in this watershed. By contrast, buffers greater than 75 feet in width are rare in the Kinnickinnic River watershed, accounting for less than 10 percent of the buffer widths in this watershed. In the Kinnickinnic River and Menomonee River watersheds, buffer widths less than 25 feet was the most common category of buffer, accounting for about 59 percent and 37 percent, respectively, of the buffer widths in these watersheds. In the Milwaukee River, Oak Creek, and Root River watersheds, buffer widths less than 25 feet were the second most common category of buffer, accounting for 39 percent, 33 percent, and 15 percent, respectively, of the buffer widths in these watersheds.

[33]*Southeastern Wisconsin Regional Planning Commission,* Managing the Water's Edge: Making Natural Connections, *May 2010; A. Desbonnet, P. Pogue, V. Lee, and N. Wolff, "Vegetated Buffers in the Coastal Zone – a Summary Review and Bibliography,"* CRC Technical Report No. 2064, *Coastal Resources Center, University of Rhode Island, 1994.*

Map 14

STREAMBANK CHARACTERISTICS WITHIN MILWAUKEE COUNTY: 2003



Source: Milwaukee Metropolitan Sewerage District, Inter-Fluve, Inc., and SEWRPC.

Table 14

STREAMBANK CHARACTERISTICS WITHIN MILWAUKEE COUNTY WATERSHEDS: 2003

Bank Characteristic	Percent of Stream System in the Watershed					
	Kinnickinnic River Watershed	Menomonee River Watershed[a]	Milwaukee River Watershed	Oak Creek Watershed	Root River Watershed	Lake Michigan Direct Drainage Area[b]
Stable.....	33.4	87.0	60.0	12.6	25.2	24.0
Eroding	1.4	8.7	8.7	44.8	43.0	13.8
Not Assessed[c].....	65.2	31.3	31.3	42.6	31.8	62.2
Total	100.0	100.0	100.0	100.0	100.0	100.0

[a]*Streams in the Menomonee River watershed were assessed in 2000.*

[b]*Fish Creek in the Lake Michigan direct drainage area was assessed during 2000 and 2001.*

[c]*Includes enclosed or concrete-lined channels.*

Source: Inter-Fluve, Inc. W.F. Baird & Associates, and SEWRPC.

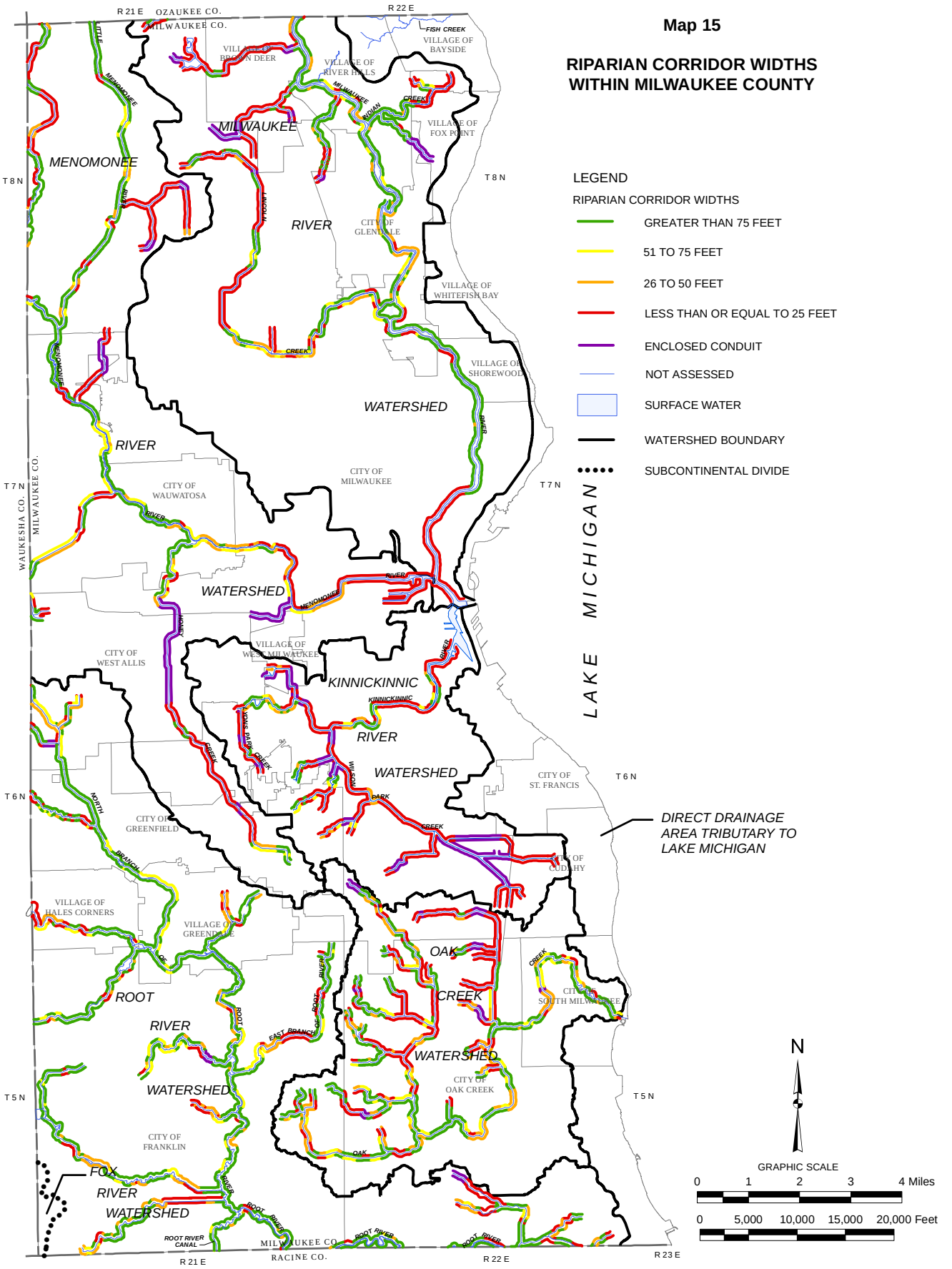
Impaired Waters

Section 303(d) of the Clean Water Act requires that the states periodically submit a list of impaired waters to the USEPA for approval. The WDNR revises the list of impaired waters every two years. While Wisconsin most recently submitted this list in 2010, the most recent USEPA-approved list is the one submitted in 2006. Map 16 graphically depicts, and Table 10 lists, stream reaches in Milwaukee County that are classified as being impaired waters on the most recently approved list.

One section of the mainstem of the Kinnickinnic River is listed as impaired. The 2.5-mile-reach of variance water between the confluence with the Milwaukee River and S. Chase Avenue is considered impaired due to aquatic toxicity, bacterial contamination, fish consumption advisories necessitated by high concentrations of PCBs in the tissue of fish collected from this reach, and lack of compliance with standards for dissolved oxygen concentration. Bacteria, metals, phosphorus, and PCBs from contaminated sediment and a combination of point and nonpoint sources are cited as factors contributing to the impairment of this section of the River.

One section of the mainstem of the Menomonee River is listed as impaired. The 3.0-mile-reach of variance water between the confluence with the Milwaukee River and the site of the former Falk dam is considered impaired due to aquatic toxicity, bacterial contamination, fish consumption advisories necessitated by high concentrations of PCBs in the tissue of fish collected from this reach, and lack of compliance with standards for dissolved oxygen concentration. Bacteria, metals, phosphorus, and PCBs from contaminated sediment and a combination of point and nonpoint sources are cited as factors contributing to the impairment of this section of the River. One tributary in the Menomonee River watershed, the Little Menomonee River, is considered impaired due to aquatic toxicity related to the presence of PAHs in contaminated sediment. It is also considered to have recreational impairments due to high bacteria concentrations.

Two sections of the mainstem of the Milwaukee River within Milwaukee County are listed as impaired. The section of the River upstream from the site of the former North Avenue dam is considered impaired due to bacterial contamination and fish consumption advisories necessitated by high concentrations of PCBs in the tissue of fish collected from this reach. This reach extends beyond the Milwaukee-Ozaukee county line up to Lime Kiln Dam in the City of Grafton. The 3.1-mile-long reach of variance water between the confluence with Lake Michigan and the site of the former North Avenue dam is considered impaired due to aquatic toxicity, bacterial contamination, fish consumption advisories necessitated by high concentrations of PCBs in the tissue of fish



Source: SEWRPC.

Table 15

RIPARIAN CORRIDOR BUFFER WIDTHS ALONG STREAMS IN MILWAUKEE COUNTY: 2000

Buffer Width Category (feet)	Percent of Assessed Bank Length Associated with a Given Buffer Width				
	Kinnickinnic River Watershed	Menomonee River Watershed	Milwaukee River Watershed	Oak Creek Watershed	Root River Watershed
0-25	58.5	37.3	38.8	33.1	15.1
25-50	5.6	8.4	8.3	15.9	11.8
50-75	3.8	9.9	5.7	9.5	10.2
Greater than 75	9.6	34.1	41.5	37.5	61.6
Enclosed Channel	22.5	10.3	5.7	4.0	1.3
Total	100.0	100.0	100.0	100.0	100.0

Source: SEWRPC.

collected from this reach, and lack of compliance with standards for dissolved oxygen concentration. Bacteria, metals, phosphorus, and PCBs from contaminated sediment and a combination of point and nonpoint sources are cited as factors contributing to the impairment of this section of the River. In addition, three tributary streams within Milwaukee County are also listed as impaired. Beaver Creek is considered impaired due to aquatic toxicity related to nonpoint source pollution. Indian Creek downstream from IH 43, which is classified as a variance water, is considered impaired due to aquatic toxicity, degraded habitat, lack of compliance with standards for dissolved oxygen concentration, and high temperatures. Metals, phosphorus, and sedimentation related to nonpoint source pollution are cited as contributing to the impairment of this section of stream. Lincoln Creek, which is classified as a variance water, is considered impaired due to aquatic toxicity, degraded habitat, lack of compliance with standards for dissolved oxygen concentration, and high temperatures. Metals, PAHs, phosphorus, and sedimentation from undetermined sources are cited as factors contributing to the impairment of this stream.

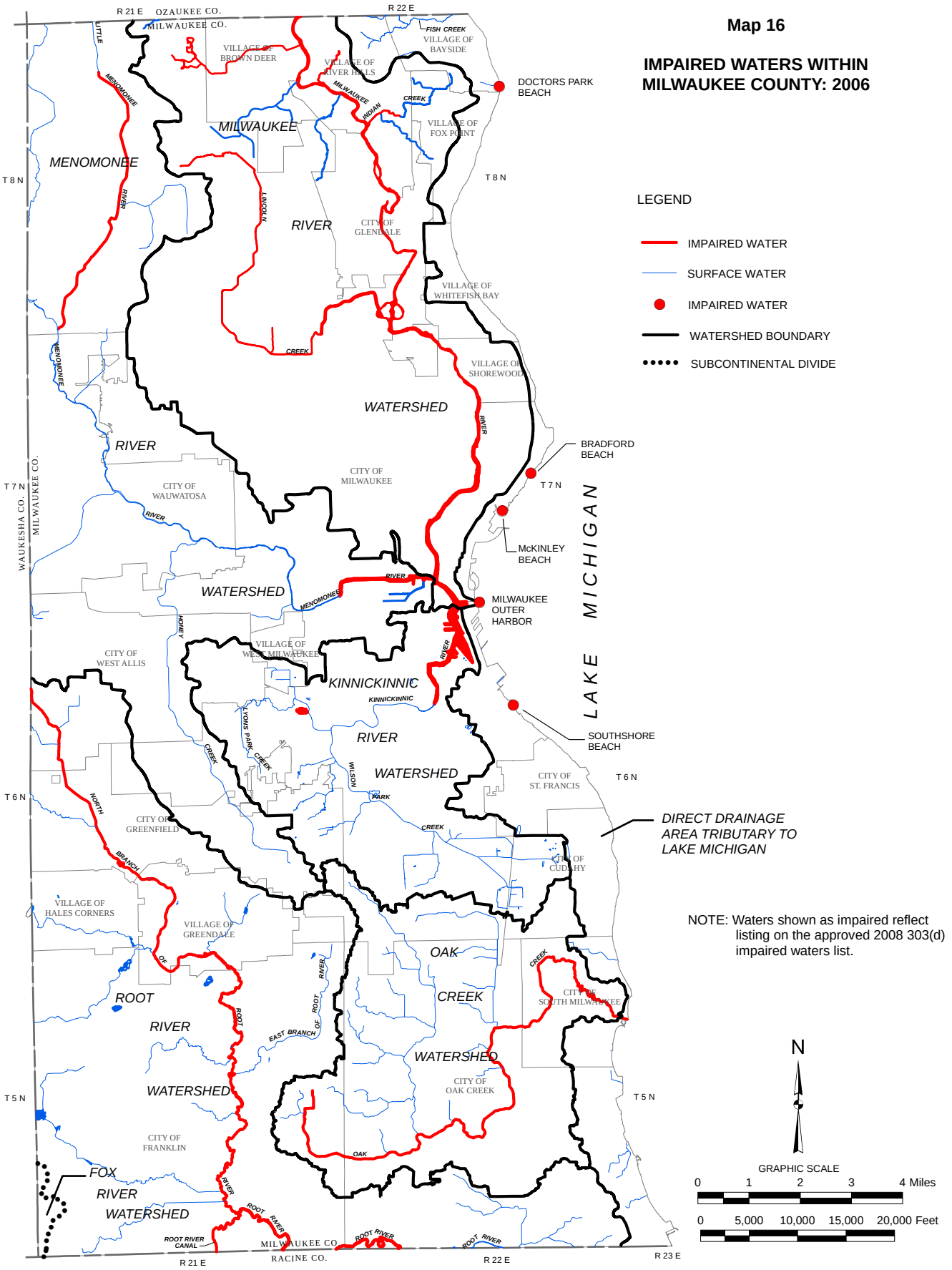
The entire 13.0-mile-length of the mainstem of Oak Creek is listed as being impaired due to aquatic toxicity related to undetermined pollutants. A combination of point and nonpoint sources is cited as factors contributing to the impairment of the Creek.

The sections of the mainstem of the Root River that are located in Milwaukee County are considered impaired due to lack of compliance with standards for dissolved oxygen concentration. Phosphorus and sedimentation from a combination of point and nonpoint sources are cited as factors contributing to the impairment of this section of the River. In addition, the Root River Canal is considered impaired due to lack of compliance with standards for dissolved oxygen concentration. Phosphorus and sedimentation mostly from nonpoint sources are cited as factors contributing to the impairment of this stream.

The Milwaukee Harbor estuary and outer harbor are classified as being impaired waters. As described above, the portions of the Kinnickinnic, Menomonee, and Milwaukee Rivers in the estuary are listed as impaired due to aquatic toxicity, high bacteria concentrations, low concentrations of dissolved oxygen, and fish consumption advisories necessitated by high concentrations of PCBs in the tissue of fish collected from this area. Bacteria, metals, phosphorus, and PCBs from contaminated sediment and a combination of point and nonpoint sources are cited as factors contributing to the impairment of the estuary. The outer harbor is listed as impaired due to aquatic toxicity, high bacteria concentrations, and fish consumption advisories necessitated by high concentrations of PCBs in the tissue of fish collected from this area. Bacteria, metals, and PCBs from contaminated sediment and a combination of point and nonpoint sources are cited as factors contributing to the impairment of the outer harbor. Four public beaches along the Lake Michigan shore in the Lake Michigan direct drainage area are also listed as being impaired. Bradford Beach, Doctors Park Beach, McKinley Beach, and South Shore Beach are considered impaired due to bacteria counts exceeding standards from the Beach Act of 2000.

Map 16

IMPAIRED WATERS WITHIN MILWAUKEE COUNTY: 2006



NOTE: Waters shown as impaired reflect listing on the approved 2008 303(d) impaired waters list.

Source: Wisconsin Department of Natural Resources and SEWRPC.

The proposed 2010 list that the State submitted to the USEPA would add several streams in Milwaukee County to the 303(d) list of impaired waters. Under the proposed list Cherokee Creek, Holmes Avenue Creek, the South 43rd Street Ditch, and the section of the mainstem of the Kinnickinnic River upstream S. Chase Avenue in the Kinnickinnic River watershed and Honey Creek in the Menomonee River watershed would be considered impaired due to high concentrations of fecal coliform bacteria.

Lakes and Ponds

While Milwaukee County contains no major lakes with surface areas over 50 acres, it has a number of small lakes, pond, and lagoons. Most of these waterbodies have less than 10 acres of surface area. Many of them are located within the County parks system. The lakes, ponds, and lagoons in the County are listed in Table 16.

Lakes are readily susceptible to degradation through improper land use development and management. Water quality can be degraded by excessive pollutant loads, including nutrient loads, which enter from malfunctioning and improperly located onsite waste treatment systems, from sanitary sewer overflows, from construction and other urban runoff, and from careless agricultural practices. The water quality of lakes may also be adversely affected by the excessive development of riparian areas and by the filling of peripheral wetlands, which remove valuable nutrient and sediment traps while adding nutrient and sediment sources. It is important that existing and future development in riparian areas be managed carefully to avoid further water quality degradation and to enhance the recreational and aesthetic values of surface water resources.

The trophic status of the lakes, ponds, and lagoons in Milwaukee County is set forth in Table 16. Trophic status is an indicator of overall water quality. In 2003 and 2004, the trophic status of 16 lakes, ponds, and lagoons, was evaluated as part of the development of the County's pond and lagoon management plan.[34] The trophic status of a seventeenth waterbody, Upper Kelly Lake, was assessed in 2005 as part of the updating of its lake protection plan.[35] Of the lakes, ponds, and lagoons for which data were available, two were classified as mesotrophic, one was classified as meso-eutrophic, five were classified as eutrophic, eight were classified as eutrophic-hypertrophic, and two were classified as hypertropic. The tendency toward eutrophy and hypertrophy in the lakes, ponds, and lagoons for which data exist suggests that many of these waterbodies are experiencing considerable nutrient enrichment.

Aquatic invasive species have also been detected in several lakes and ponds in Milwaukee County. Table 11 lists those lakes and ponds in which invasive species have been reported as being present.

Wetlands

Wetlands are important resources for the ecological health and diversity of the County. Wetlands form the transition between surface water and groundwater resources and land resources. Wetlands are areas that are inundated or saturated by surface water or groundwater at a frequency, and with duration sufficient to support, and that under normal circumstance do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally occur in depressions and near the bottom of slopes, particularly along lakeshores and streambanks, and on large land areas that are poorly drained. Wetlands may, however, under certain conditions, occur on slopes and even on hilltops. They provide essential breeding, nesting, sanctuary, and feeding grounds, as well as offer escape cover for many forms of fish and wildlife. In addition, wetlands perform an important set of natural functions which include: water quality protection; stabilization of lake levels and streamflows; reduction in stormwater runoff by providing areas for floodwater impoundment and storage; and protection of shorelines from erosion.

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[34]*Milwaukee County Environmental Services,* Milwaukee County Park & Lagoon Management Plan, *June 2005.*

[35]*SEWRPC Memorandum Report No. 135 (2nd Edition),* A Lake Protection Plan for the Kelly Lakes, Milwaukee and Waukesha Counties, Wisconsin, *April 2007.*

Table 16

LAKES AND PONDS WITHIN MILWAUKEE COUNTY

Lake	Surface Area (acres)	Maximum Depth (feet)	Mean Depth (feet)	Lake Type[a]	Trophic Status
Aviary Ponds	<1	- -	- -	- -	- -
Boerner Botanical Garden Pond No. 1[b]	2	3	- -	Drainage	- -
Boerner Botanical Garden Pond No. 2[c]	1	4	- -	Drainage	- -
Boerner Botanical Garden Pond No. 3[d]	8	5	- -	Drainage	- -
Brown Deer Golf Course Lagoon Hole No. 1	<1	- -	- -	- -	- -
Brown Deer Golf Course Lagoon Hole No. 16	<1	- -	- -	Drainage	- -
Brown Deer Golf Course Lagoon Hole No. 18	<1	- -	- -	Drainage	- -
Brown Deer Park Pond	6	6	4	Drainage	Eutrophic
County Grounds Pond No. 1[e]	2	8	- -	- -	- -
County Grounds Pond No. 2[e]	1	8	- -	- -	- -
County Grounds Pond No. 3[e]	<1	8	- -	- -	- -
County Grounds Pond No. 10	1	- -	- -	- -	- -
Dineen Park Pond	2	5	- -	Drainage	Meso-eutrophic
Dumkes Lake	7	11	- -	Seepage	- -
Estabrook Park Lagoon	1	6	- -	Drainage	- -
General Mitchell International Airport Parking Structure Pond	<1	<1	- -	- -	- -
Grant Park Golf Course Pond	<1	4	- -	- -	- -
Grant Park Lagoon—Central	<1	- -	- -	- -	- -
Grant Park Pond—North	1	6	- -	Seepage	- -
Greenfield Golf Course Pond	<1	3	- -	- -	- -
Greenfield Park Lagoon—North Pond East of Baseball Diamond	<1	6	- -	- -	- -
Greenfield Park Lagoon—South Pond East of Baseball Diamond	<1	- -	- -	- -	- -
Greenfield Park Lagoon by Park Entrance	<1	- -	- -	- -	- -
Greenfield Park Pond	7	6	4	Seepage	Eutrophic-hypertrophic
Hansen Park Golf Course Pond	<1	- -	- -	- -	- -
Holler Park Pond	1	5	- -	Drainage	- -
Humboldt Park Lily Pond	<1	- -	- -	- -	- -
Humboldt Park Pond	4	3	2	Drainage	Meso-eutrophic
Jackson Park Pond	8	8	5	Drainage	Hypertrophic
Jacobus Park Pond	1	5	- -	Drainage	Eutrophic
Juneau Park Lagoon[f]	15	6	4	Drainage	- -
Koepmier Lake	8	35	- -	Seepage	- -
Kosciuszko Park Pond	3	4	3	Seepage	- -
Lincoln Park Lagoon	21	- -	- -	- -	- -
Linden Pond	2	15	- -	Seepage	- -
Little Menomonee River Parkway Pond[g]					- -
McCarty Park Pond	4	9	- -	Drainage	Eutrophic-hypertrophic

Table 16 (continued)

Lake	Surface Area (acres)	Maximum Depth (feet)	Mean Depth (feet)	Lake Type[a]	Trophic Status
McGovern Park Pond	5	5	3	Drainage	Eutrophic-hypertrophic
Menomonee Parkway Pond	2	4	- -	Drainage	- -
Milwaukee County Zoo—Monkey Island Pond	<1	- -	- -	- -	- -
Mitchell Park Pond	2	6	5	Seepage	Eutrophic
Monastery Lake	12	30	- -	Seepage	- -
Moose Yard Pond	<1	- -	- -	- -	- -
Mud Lake[h]	4	21	- -	Seepage	- -
New Zoo Pond[i]	5	11	- -	Seepage	Eutrophic-hypertrophic
North Golf Course Pond No. 1[j]	1	4	- -	Drainage	- -
North Golf Course Pond No. 2[k]	1	4	- -	Drainage	- -
North Golf Course Pond No. 3[l]	3	8	- -	Drainage	- -
Noyes Pond	1	1	- -	Drainage	- -
Oak Creek Parkway Pond	5	8	5	Drainage	- -
Oak Creek Parkway Pond	3	10	- -	- -	- -
Oakwood Golf Course Pond—Central	2	- -	- -	- -	- -
Oakwood Golf Course Pond—North	2	- -	- -	- -	- -
Oakwood Golf Course Pond—South	1	- -	- -	- -	- -
Research Park Pond	2	- -	- -	- -	- -
Root River Parkway Pond[m]	8	17	- -	Seepage	- -
Root River Parkway Pond	1	17	- -	- -	- -
Root River Parkway Pond	6	- -	- -	- -	- -
Saveland Park Pond	1	6	- -	Drainage	Eutrophic
Schroedel Pond	5	8	- -	Seepage	- -
Scout Lake	8	19	6	Seepage	Mesotrophic
Sheridan Park Pond	1	8	4	Seepage	Eutrophic
Timmerman Airfield Basin	6	- -	- -	- -	- -
Ueihlein Pond	1	7	-	Drainage	- -
Underwood Creek Detention Pond	2	- -	- -	- -	- -
Upper Kelly Lake	12	9	- -	Spring	Eutrophic
Warnimont Golf Course Pond	<1	- -	- -	- -	- -
Washington Park Pond	11	5	3	Drainage	Hypertrophic
Whitnall Park Pond	15	10	6	Drainage	Eutrophic
Whitnall Park Golf Course Pond—No. 13 Fairway	<1	- -	- -	- -	- -
Wilson Park Pond	9	5	3	Drainage	Eutrophic
Wisconsin Avenue Park Pond No. 7	1	- -	- -	- -	- -
Wood Hospital Pond	1	4	- -	Drainage	- -

Table 16 Footnotes

[a]Drainage lakes are lakes having both a defined inlet and a defined outlet. These waterbodies are commonly referred to as flow-through lakes. Seepage lakes are lakes without either a defined inlet or defined outlet. These waterbodies are sometimes referred to as internally drained lakes. Spring lakes are lakes that have no defined inlet, but have a defined outlet.

[b]This pond is also known as Whitnall Park Arboretum Pond.

[c]This pond is also known as Whitnall Park Arboretum Pond—North of Drive.

[d]This pond is also known as Whitnall Park Arboretum Pond—South of Drive.

[e]This pond consists of three basins in a series.

[f]This pond is also known as Veterans Park Lagoon.

[g]This pond is also known as North Lake.

[h]This pond is also known as Grobschmidt Park Pond.

[i]This pond is also known as Lake Evinrude.

[j]This pond is also known as Dretzka Park Golf Course Pond-N.

[k]This pond is also known as Dretzka Park Golf Course Pond-S.

[l]This pond is also known as Dretzka Park Golf Course Pond-C.

[m]This pond is also known as Anderson Lake.

Source: Milwaukee County, Wisconsin Department of Natural Resources, and SEWRPC.

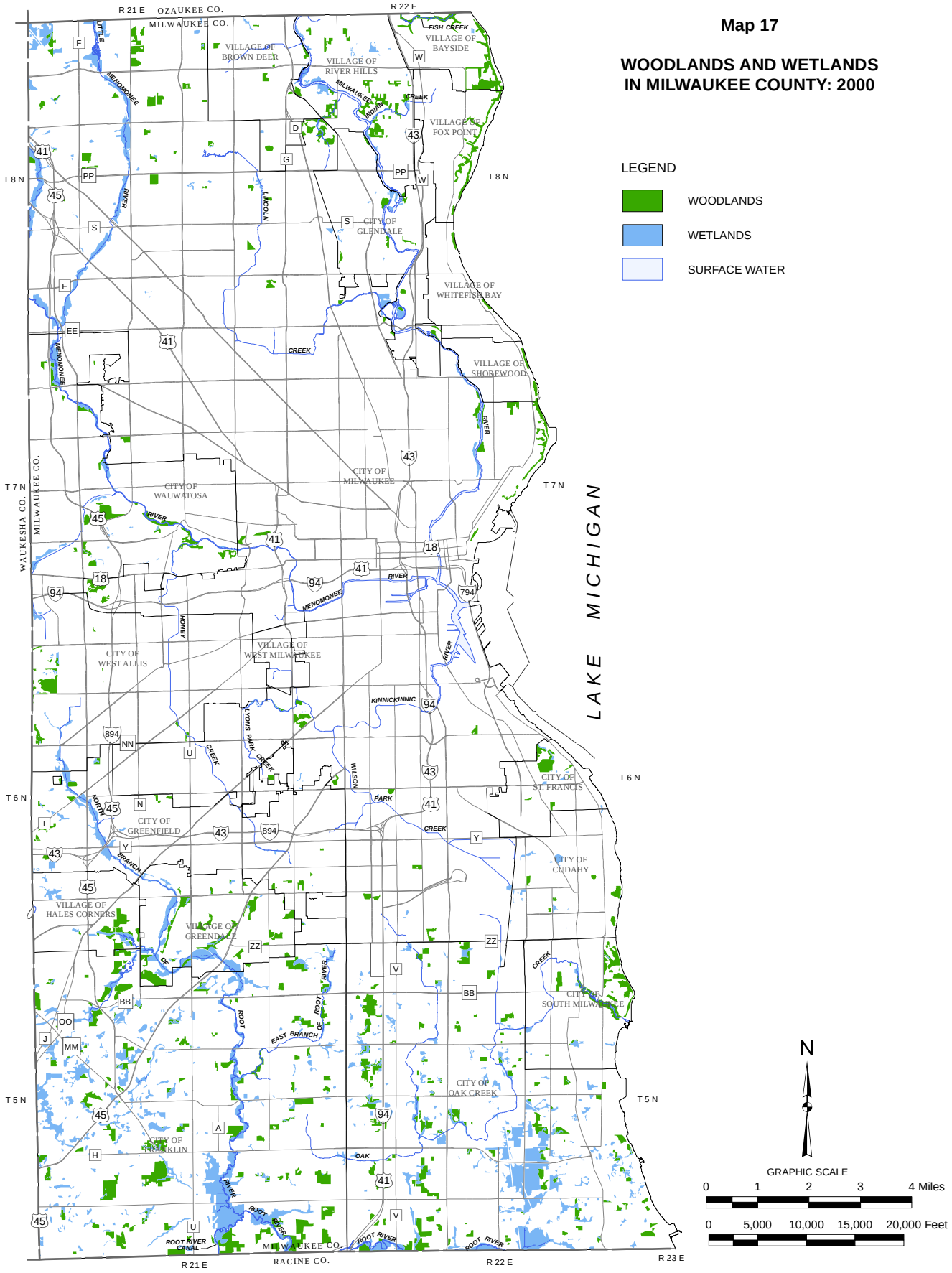
The location and extent of wetlands in Milwaukee County are shown on Map 17. These wetlands are based upon the Wisconsin Wetlands Inventory completed in the Region in 1982, updated to the year 2000 as part of the regional land use inventory. The land area covered by wetlands within cities and villages in the County is presented in Table 17. In total, the County's wetlands encompassed about 5,279 acres (8.2 square miles), or 3.4 percent of the County area, in 2000. These wetlands are classified predominantly as potholes, fresh meadows, shallow marshes, deep marshes, shrub swamps, timber swamps, and bogs.

It should be noted that wetlands are constantly changing in response to changes in drainage patterns and climatic conditions. While wetland inventory maps provide a sound basis for areawide planning, they should be viewed as providing a point of departure to be supplemented with detailed field investigations for regulatory purposes.

A number of invasive plant species have been detected in wetlands in Milwaukee County. DPRC personnel have reported expending considerable efforts in controlling these species in parklands and natural areas. DPRC conducts control efforts for over 30 species of invasive terrestrial plants, including wetland species such as glossy buckthorn, purple loosestrife, reed canary grass, phragmites, and narrow-leaf cattail.

Shoreland and Floodplain

Shorelands are defined by the *Wisconsin Statutes* as lands within the following distances from the ordinary high water mark of navigable waters: 1,000 feet from a lake, pond, or flowage; 300 feet from a river or stream; or to the landward side of the floodplain, whichever is greater. Because all of the municipalities in Milwaukee County are incorporated, local regulation of shorelands and floodplains is conducted by the cities and villages within the County.



Source: SEWRPC.

Table 17

WOODLANDS, SURFACE WATER, WETLANDS, AND ONE-PERCENT-ANNUAL-PROBABILITY (100-YEAR RECURRENCE INTERVAL) FLOODPLAINS IN MILWAUKEE COUNTY

Civil Division	Woodlands (acres)	Surface Water (acres)	Wetlands (acres)	One-Percent-Annual-Probability Floodplain (acres)
City of Cudahy	44.2	2.7	36.2	71.8
City of Franklin	1,283.0	240.8	1,907.0	2,072.8
City of Glendale	50.3	132.5	54.3	506.5
City of Greenfield	87.1	9.9	198.9	438.0
City of Milwaukee	662.9	590.1	846.2	3,075.3
City of Oak Creek	829.2	57.0	1,419.1	2,163.6
City of St. Francis	75.4	0.0	15.1	0.0
City of South Milwaukee	219.4	6.2	38.9	88.3
City of Wauwatosa	229.1	62.6	172.5	580.3
City of West Allis	106.5	15.3	73.5	294.2
Village of Bayside	198.8	3.1	2.4	37.2
Village of Brown Deer	42.8	7.3	8.9	172.5
Village of Fox Point	113.0	0.9	0.0	8.6
Village of Greendale	268.8	13.4	303.6	613.4
Village of Hales Corners	103.8	7.6	76.1	130.9
Village of River Hills	208.9	143.0	121.0	487.9
Village of Shorewood	23.3	1.1	5.4	10.9
Village of West Milwaukee	0.0	0.0	0.0	0.0
Village of Whitefish Bay	18.2	0.2	0.0	0.0
Total	4,564.4	1,293.4	5,279.1	10,752.1

Source: SEWRPC.

Floodplains in Milwaukee County as identified by the Federal Emergency Management Agency (FEMA) under the National Flood Insurance Program are shown on Map 11. In total, one-percent-annual-probability (100-year recurrence interval) floodplains shown on Map 11 encompass about 10,750 acres or about 7 percent of the County. The area of floodplains for cities and villages in the County is presented in Table 17. FEMA has completed updating of floodplain maps for Milwaukee County under its Map Modernization Program. The updated maps have an effective date of September 26, 2008. It is important to note that Map 11 shows only detailed floodplain delineations. The Commission staff continues to prepare updated, digital floodplain and floodway maps for all of Milwaukee County and portions of Ozaukee, Washington, and Waukesha Counties that are adjacent to Milwaukee County. The project is being performed for the Milwaukee County Automated Land Information System (MCAMLIS) Steering Committee and the MMSD.

Groundwater Resources

Groundwater resources constitute another key element of the natural resource base. Groundwater not only sustains lake levels and wetlands and provides the base flows of streams, but also comprises a source of water supply for domestic, municipal, and industrial water users.

There are three major aquifers within Milwaukee County, which contain the usable groundwater of the County. The surficial sand and gravel aquifer and the Niagara dolomite aquifer are often treated as a single aquifer commonly referred to as the “shallow” aquifer due to its proximity and intimate hydraulic interconnection to the land surface. The third, accordingly, is commonly identified as the “deep” aquifer since it underlies the shallow aquifer. The sand and gravel aquifer consists of unconsolidated sand and gravel deposits in glacial drift and

alluvium. These deposits occur over the majority of the County, either at the land surface or buried beneath less permeable drift such as glacial till. This aquifer interacts extensively with the surface water system of the County. The Niagara dolomite aquifer in Milwaukee County consists of Devonian and Silurian Age dolomite, which overlie the Maquoketa shale stratum throughout the entire County. The Maquoketa shale separates the Niagara and sandstone aquifers. The shale layer has very low permeability, which restricts the vertical movement of water and largely confines water within the sandstone aquifer. The sandstone aquifer includes all sedimentary bedrock below the Maquoketa shale stratum. The bottom of the sandstone aquifer is the surface of the impermeable Precambrian rocks. This aquifer is continuous throughout the County and is a part of the larger regional aquifer that is used as a source of water supply for major concentrations of urban development throughout southeastern Wisconsin and northeastern Illinois. This aquifer is relatively unimportant in terms of its influence on the surface water resources of the County since it does not intersect surface water features.

Recharge of the aquifers underlying Milwaukee County is derived largely by precipitation. The groundwater in the shallow aquifer typically originates from precipitation that has fallen within a radius of about 20 miles or less from where it is found. The deep aquifer is recharged mostly by infiltration of precipitation beyond the western limits of the Maquoketa shale to the west of the County.

Like surface water, groundwater is susceptible to depletion in quantity and to deterioration in quality as a result of contamination and over-usage. The depth to the shallow water table in Milwaukee County is illustrated on Map 18. The vulnerability of groundwater to contamination is a combination of several factors, including soil type, subsurface material characteristics, and depth to groundwater levels. As shown on Map 18, areas of the County with a depth of less than 25 feet to groundwater are chiefly associated with the valleys of rivers and streams. This shallowness to groundwater, in combination with the stratified sand and gravel characteristics of glacial outwash soils, makes these areas the most sensitive to contamination. Thus, land use planning must appropriately consider the potential impacts of urban and rural development on this important resource. Land use planning must also take into account, as appropriate, natural conditions which may limit the use of groundwater as a source of water supply.

It should be noted that the Regional Planning Commission, working with the U.S. Geological Survey, Wisconsin Geological and Natural History Survey, the University of Wisconsin-Milwaukee, and the WDNR, recently completed major groundwater studies for the Region that are important resources for regional and local planning. These studies include a regional groundwater inventory and analysis, the development of a regional groundwater aquifer simulation model, the identification of important groundwater recharge areas, and a regional water supply system plan, utilizing the results of the inventory and analysis work and the aquifer model. In addition, the WDNR, in conjunction with local water utilities, has undertaken an effort to identify areas of contribution to municipal wells that can be used for well protection planning. More-detailed information on groundwater conditions in the Southeastern Wisconsin Region, including Milwaukee County is set forth in SEWRPC Technical Report No. 37, *Groundwater Resources of Southeastern Wisconsin,* June 2002; SEWRPC Technical Report No. 41, *A Regional Aquifer Simulation Model for Southeastern Wisconsin,* June 2005; SEWRPC Technical Report No. 47, *Groundwater Recharge in Southeastern Wisconsin Estimated by a GIS-Based Water-Balance Model,* July 2008 and SEWRPC Planning Report No. 52, *A Regional Water Supply Plan for Southeastern Wisconsin*, December 2010.

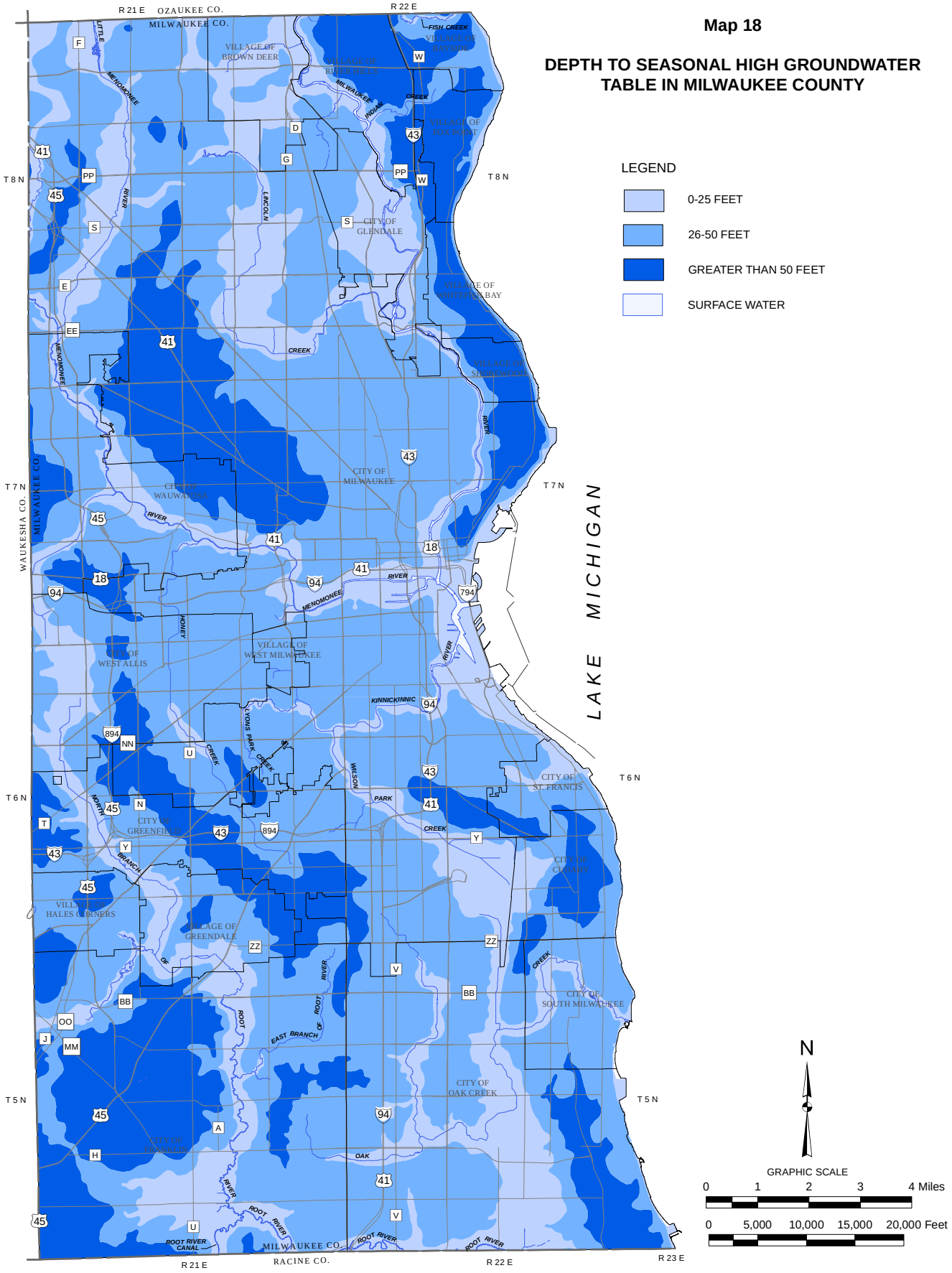
Forest Resources

Woodlands

With sound management, woodlands can serve a variety of beneficial functions. In addition to contributing to clean air and water and regulating surface water runoff, woodlands help maintain a diversity of plant and animal species. The destruction of woodlands, particularly on hillsides, can contribute to excessive stormwater runoff, siltation of lakes and streams, and loss of wildlife habitat. Woodlands identified under the 2000 SEWRPC land use inventory are shown on Map 17. Woodlands are defined as upland areas of one acre or more in area, having 17 or more trees measuring at least four inches in diameter 4.5 feet above the ground per acre and having canopy

Map 18

DEPTH TO SEASONAL HIGH GROUNDWATER TABLE IN MILWAUKEE COUNTY



Source: SEWRPC.

coverage of 50 percent or greater. Coniferous tree plantations and reforestation projects are also classified as woodlands. Table 17 lists the number of acres of woodlands in the County and each civil division. In 2000, woodlands encompassed 4,564 acres, or about 3 percent of the County.[36]

A number of invasive plant species have been detected in woodlands in Milwaukee County. DPRC personnel have reported expending considerable efforts in controlling these species in parklands and natural areas. DPRC conducts control efforts for over 30 species of invasive terrestrial plants, including woodland species such as common buckthorn, garlic mustard, and honeysuckle.

Natural Areas and Critical Species Habitat Sites

A comprehensive inventory of "natural areas" and "critical species habitat sites" in the Southeastern Wisconsin Region was completed by the Regional Planning Commission in 1994.[37] The inventory identified the most significant remaining natural areas—essentially, remnants of the pre-European settlement landscape—as well as other areas vital to the maintenance of endangered, threatened, and rare plant and animal species in the Region. A recent amendment to this plan has added natural areas and critical species sites that have been identified since the publication of the initial plan.[38]

Natural Areas

Natural areas are tracts of land or water so little modified by human activity, or sufficiently recovered from the effects of such activity, that they contain intact native plant and animal communities believed to be representative of the landscape before European settlement. Natural areas are classified into one of three categories: natural areas of statewide or greater significance (NA-1), natural areas of countywide or regional significance (NA-2), and natural areas of local significance (NA-3). Classification of an area into one of these three categories is based upon consideration of the diversity of plant and animal species and community types present; the structure and integrity of the native plant or animal community; the extent of disturbance from human activity; the commonness of the plant or animal community; the uniqueness of the natural features; the size of the site; and the educational value.

As illustrated on Map 19, and indicated in Table 18, a total of 55 known natural areas were identified in Milwaukee County as part of the updated inventory. In combination, these sites encompassed about 2,891 acres (4.5 square miles) or 1.9 percent of the total area of the County.

Critical Species Habitat Sites and Aquatic Sites

Critical species habitat sites consist of areas, exclusive of identified natural areas, which are important for their ability to support State-designated endangered, threatened, or rare plant or animal species. Such areas constitute "critical" habitat considered to be important to the survival of a species or group of species of special concern. As shown on Map 19 and described in Table 18 a total of 55 critical species habitat sites were identified in Milwaukee County as part of the updated inventory. Together, these critical species habitat sites encompassed about 796 acres (1.2 square miles), or 0.5 percent of the County.

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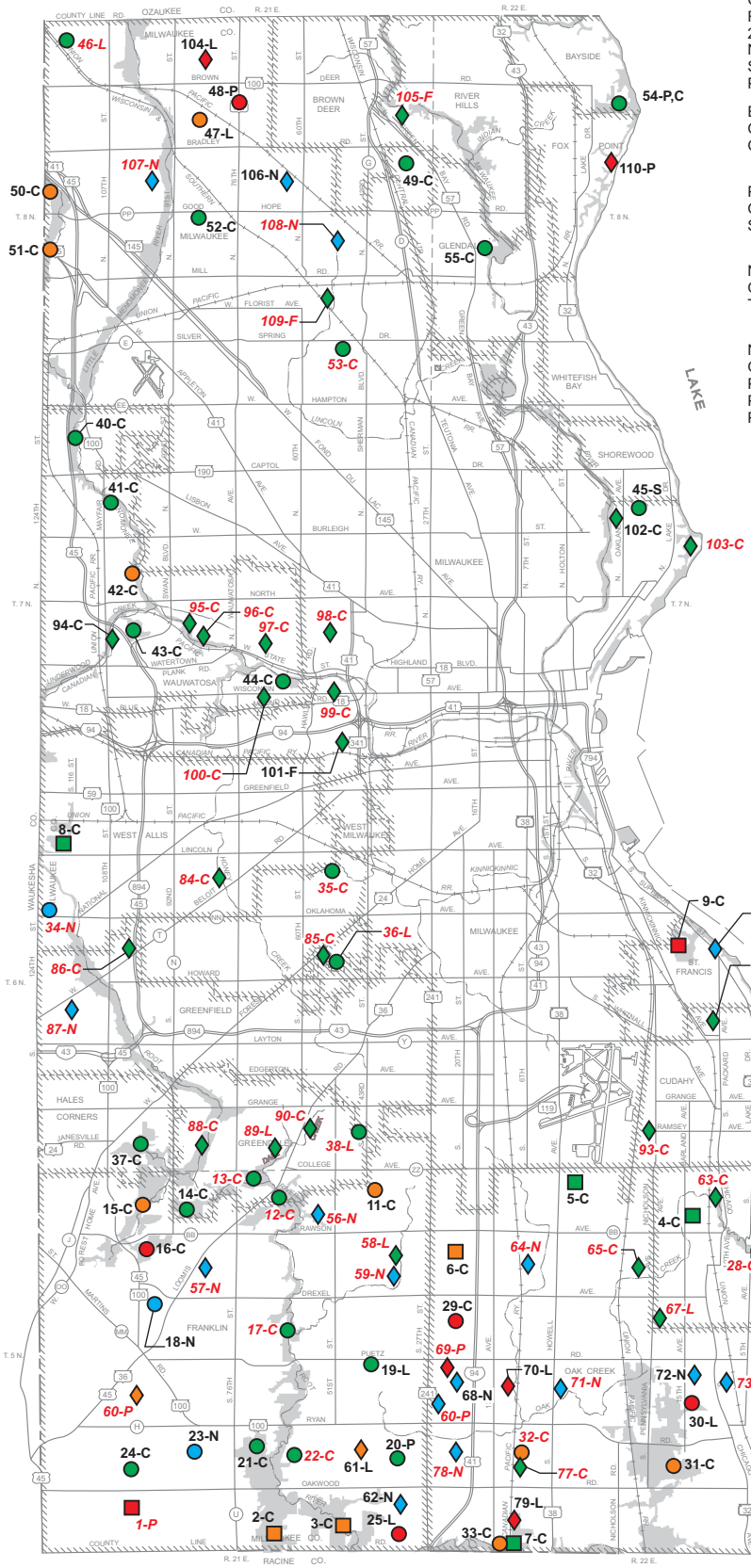
[36]*These data include upland woods only, not lowland woods, such as tamarack swamps, which are classified as wetlands.*

[37]*SEWRPC Planning Report No. 42,* A Regional Natural Areas and Critical Species Habitat Protection and Management Plan for Southeastern Wisconsin, *September 1997.*

[38]*SEWRPC,* Amendment to the Natural Areas and Critical Species Habitat Plan for the Southeastern Wisconsin Region, *December 2010.*

Map 19

NATURAL AREAS AND CRITICAL SPECIES HABITAT SITES IN MILWAUKEE COUNTY: 2009



CURRENT STATUS AND PLAN RECOMMENDATION UNDER THE 2010 AMENDMENT TO SEWRPC NATURAL AREAS AND CRITICAL SPECIES HABITAT MANAGEMENT PLAN	NA-1 SITE	NA-2 SITE	NA-3 SITE	CRITICAL SPECIES HABITAT
ENTIRELY UNDER PROTECTIVE OWNERSHIP/PROTECTIVE OWNERSHIP TO BE RETAINED	(NONE)	■	●	♦
PARTIALLY UNDER PROTECTIVE OWNERSHIP/REMAINDER OF SITE TO BE ACQUIRED	(NONE)	■	●	♦
NOT UNDER PROTECTIVE OWNERSHIP/ENTIRE SITE TO BE ACQUIRED	(NONE)	■	●	♦
NOT UNDER PROTECTIVE OWNERSHIP/TO BE PRESERVED TO EXTENT PRACTICABLE WITHOUT PROTECTIVE OWNERSHIP	(NONE)	(NONE)	●	♦

RECOMMENDED OWNERSHIP KEY:

F-FEDERAL GOVERNMENT
S-STATE GOVERNMENT
C- COUNTY GOVERNMENT
L-LOCAL GOVERNMENT
P-PRIVATE CONSERVANCY ORGANIZATION
N-NO PROTECTIVE OWNERSHIP RECOMMENDED

27-SITE REFERENCE NUMBER (SEE TABLE 18)

28-NEWLY IDENTIFIED SITE REFERENCE NUMBER (SEE TABLE 18)

PRIMARY ENVIRONMENTAL CORRIDORS

NOTE: Newly identified sites are those identified in the 2010 amendment to the regional natural areas and critical species habitat protection and management plan.

GRAPHIC SCALE
0 1 2 MILE
0 4,000 8,000 12,000 16,000 FEET

Source: SEWRPC.

Table 18

KNOWN NATURAL AREAS AND CRITICAL SPECIES HABITAT SITES IN MILWAUKEE COUNTY: 2009

Number on Map 19	Area Name	Classification Code	Location	Ownership	Size (acres)	Description and Comments
1	Adams Prairie	NA-2	T5N, R21E Section 32 City of Franklin	Private	37	Species-rich, high-quality wet-mesic prairie and sedge meadow complex
2	Root River Canal Woods	NA-2	T5N, R21E Section 34 City of Franklin T4N, R21E Section 3 Town of Raymond	Milwaukee County and private	152 (plus 163 in Racine County)	A mixture of good-quality dry-mesic and lowland hardwood forest along the Root River Canal. One of the largest intact forested tracts in this part of the Region. Extends south into Racine County
3	Root River Wet-Mesic Woods—West	NA-2	T5N, R21E Sections 35, 36 City of Franklin	Milwaukee County and private	273	Mixture of medium-aged lowland and upland hardwoods that is recovering well from past disturbance. The ground flora is particularly rich and diverse, including good populations of several rare species. This is an important part of the Root River environmental corridor
4	Rawson Park Woods	NA-2	T5N, R22E Section 2 City of South Milwaukee	Milwaukee County and City of Milwaukee	23	Despite heavy human use, especially from the adjacent high school, this site contains probably the best remaining example of beech-maple forest in Milwaukee County. The north half is in best condition. The rich ground flora contains a good population of blue-stemmed goldenrod (*Solidago caesia*), a State-designated endangered species
5	Cudahy Woods	NA-2 (SNA)	T5N, R22E Section 4 City of Oak Creek	Milwaukee County	47	An upland hardwood forest containing two major forest types separated by a small stream. To the north is a dry-mesic forest of oak, cherry, and hickory; southward is an old-growth mesic forest of sugar maple, beech, and red oak. One of the best forests of its kind in the vicinity; there is a history of past scientific research
6	Falk Park Woods	NA-2	T5N, R22E Section 7 City of Oak Creek	Milwaukee County and private	78	This is a diverse, relatively large north-south stand of woods. Consists mostly of good-quality dry-mesic uplands, with mesic stands of beech and sugar maple at the north end, and low areas of ephemeral ponds, wet-mesic hardwoods, and streams interspersed throughout. Past disturbances appear minimal
7	Root River Wet-Mesic Woods—East	NA-2	T5N, R22E Section 32 City of Oak Creek T4N, R22E Section 5 Village of Caledonia	Milwaukee County and Racine County	50 (plus two in Racine County)	Wet-mesic and mesic woods bordering a gravel-bottom stream that is tributary to the Root River. Contains a rich, diverse flora, including several rare species
8	Greenfield Park Woods	NA-2	T6N, R21E Section 6 City of West Allis	Milwaukee County	52	A good stand of southern dry-mesic hardwoods dominated by red and white oaks, sugar maple, and basswood. Includes ephemeral ponds and a lowland hardwood swamp

Table 18 (continued)

Number on Map 19	Area Name	Classification Code	Location	Ownership	Size (acres)	Description and Comments
9	St. Francis Seminary Woods	NA-2	T6N, R22E Sections 14, 15 City of St. Francis	St. Francis Seminary	52	This southern mesic forest features mature basswood, sugar maple, beech, red oak, and paper birch. The site is divided by a gravel road, a small tributary to Lake Michigan, and numerous trails. The relatively diverse ground flora includes the State-designated endangered blue-stemmed goldenrod (*Solidago caesia*)
10	Warnimont Park Fens	NA-2 (SNA)	T6N, R22E Section 36 City of Cudahy	Milwaukee County	2	Clay bluffs with spring seepages along Lake Michigan support calcareous fens which contain an unusual flora. Regionally uncommon plants include buffaloberry (*Shepherdia canadensis*), variegated scouring-rush (*Equisetum variegatum*), Ohio goldenrod (*Solidago ohioensis*), small fringed gentian (*Gentianopsis procera*), and false asphodel (*Tofieldia glutinosa*), a State-designated threatened species
11	Grobschmidt Park Wetlands and Upland Woods	NA-3	T5N, R21E Sections 1, 2 City of Franklin	Milwaukee County and private	83	A combination of moderate-quality deep and shallow marsh, sedge meadow, shrub-carr, and disturbed dry-mesic woods. Site contains a restored prairie
12	Bike Trail Marsh	NA-3	T5N, R21E Section 3 City of Franklin	Milwaukee County	3	Good-quality shallow marsh
13	Root River Low and Upland Woods	NA-3	T5N, R21E Section 3 City of Franklin	Milwaukee County	76	Primarily wet-mesic and floodplain woods along Root River, with upland dry-mesic forest at north end
14	Root River Parkway Woods	NA-3	T5N, R21E Section 4 Village of Greendale	Milwaukee County	64	Dry-mesic forest on undulating topography, dominated by relatively large red oaks. Ground layer is sparse. The woods contains hiking and ski trails
15	Whitnall Park Woods—South	NA-3	T5N, R21E Sections 5, 8 City of Franklin T6N, R21E Section 32 Village of Hales Corners	Milwaukee County and private	145	Site consists of several more-or-less connected stands of dry-mesic upland woods. The area of highest quality is surrounded by golf links. Here, mature red oaks and sugar maples provide a canopy over a representative ground flora that includes two State-designated species: American gromwell (*Lithospermum latifolium*) and black haw (*Viburnum prunifolium*)
16	Monastery Lake Wetlands	NA-3	T5N, R21E Section 8 City of Franklin	Private	48	A diverse wetland plant community complex consisting of deep and shallow marsh, sedge meadow, fresh (wet) meadow, shrub-carr, and the last tree-size tamaracks in Milwaukee County
17	Root River Bike Trail Woods	NA-3	T5N, R21E Section 15 City of Franklin	Milwaukee County	108	Relatively diverse combination of wet-mesic and dry-mesic woods bordering Root River
18	Mission Hills Wetlands	NA-3	T5N, R21E Sections 16, 17 City of Franklin	Private	38	Complex of sedge meadow, shallow marsh, and wet prairie

Table 18 (continued)

Number on Map 19	Area Name	Classification Code	Location	Ownership	Size (acres)	Description and Comments
19	Franklin (Puetz Road) Woods	NA-3	T5N, R21E Sections 23, 24 City of Franklin	City of Franklin	34	Situated along the headwaters of Oak Creek, this site consists of mature dry-mesic hardwoods, lowland hardwoods, and stands of younger growth. The rich and diverse flora includes black haw (*Viburnum prunifolium*), a State-designated special concern species
20	Fitzsimmons Road Woods	NA-3	T5N, R21E Section 25 City of Franklin	Milwaukee County and Milwaukee Area Land Conservancy	39	The south and east portions of this dry-mesic woods are mostly second-growth; the west portion is less disturbed, with larger, mature trees. In the northwest are several ephemeral ponds where the State-designated endangered hop-like sedge (*Carex lupuliformis*) is found
21	Root River Parkway Prairie	NA-3	T5N, R21E Section 27 City of Franklin	Milwaukee County	51	Wet-mesic prairie located within the Root River Parkway wetland complex. Characteristic species include big bluestem, saw-toothed sunflower, Virginia mountain mint, prairie cordgrass, leadplant, azure aster, bottle gentian, prairie dock, and slender ladies'-tresses orchid. It is the largest prairie remaining in Milwaukee County
22	60th Street Woods	NA-3	T5N, R21E Section 27 City of Franklin	Milwaukee County	11	Small, but species-rich upland woods
23	Ryan Creek Woods	NA-3	T5N, R21E Section 28 City of Franklin	Private	102	One of the larger woodlots remaining in Milwaukee County, this is a dry-mesic woods of varying quality that is recovering from past disturbance. An east-west stream crosses the south end
24	Franklin Oak Woods and Oak Savanna	NA-3 (SNA)	T5N, R21E Section 29 City of Franklin	Milwaukee County	79	The entire site is former oak savanna, but only the north portion retains this appearance. Here are large, scattered, open-grown bur oaks, but the understory consists mainly of weeds, with a few prairie species persisting. The south portion has degraded further into a dense shrubland. Recent restoration efforts, including cutting and burning, are attempting to restore this site to more of a pre-settlement condition
25	Elm Road Woods	NA-3	T5N, R21E Section 36 City of Franklin	Private	20	A small, mostly second-growth woodlot of southern mesic forest and lowland hardwoods. American beech is present at the western edge of its range. Contains two populations of two State-designated special concern species: American gromwell (*Lithospermum latifolium*) and black haw (*Viburnum prunifolium*)

Table 18 (continued)

Number on Map 19	Area Name	Classification Code	Location	Ownership	Size (acres)	Description and Comments
26	Grant Park Woods—Old Growth	NA-3	T5N, R22E Section 1 City of South Milwaukee	Milwaukee County	42	Dissected by ravines, this site has long been used as a park. Despite the heavy human influence, this beech-maple woods, which is a remnant of the original Lake Michigan forest, retains some of its pre-settlement character. The rich ground flora includes the State-designated endangered blue-stemmed goldenrod (*Solidago caesia*)
27	Grant Park Woods—South	NA-3	T5N, R22E Section 1, 12 City of South Milwaukee	Milwaukee County	45	A remnant of the once more-widespread beech-maple mesic woods along Lake Michigan, this is a narrow wooded strip of moderate quality in Grant Park. Bordered on the west by golf course
28	Oak Creek Parkway Woods	NA-3	T5N, R22E Sections 11, 12 City of Oak Creek	Milwaukee County	24	Dry-mesic woods along Oak Creek
29	Esch-Honadel Woods	NA-3	T5N, R22E Section 18 City of Oak Creek	Private	64	A patchy mix of low woods, second-growth upland forest, and relatively undisturbed beech woods. Integrity of the woods is threatened by encroaching residential development
30	Wedge Woods	NA-3	T5N, R22E Section 23 City of Oak Creek	Private	17	A small, disturbed woods consisting of lowland hardwoods at the low, wet west end, and dry-mesic woods at the drier east end. Contains one of the largest populations of the State-designated endangered blue-stemmed goldenrod (*Solidago caesia*) in the State. Threatened by residential development
31	Oak Creek Low Woods	NA-3	T5N, R22E Section 26, 27 City of Oak Creek	Milwaukee County and private	68	Moderate-quality wet-mesic woods, with small areas of mesic woods
32	Ryan Road Woods	NA-3	T5N, R22E Section 29 City of Oak Creek	Milwaukee County and private	42	Dry-mesic woods containing critical species
33	Root River Riverine Forest	NA-3	T5N, R22E Sections 31, 32, 33, 34 City of Oak Creek T4N, R22E Sections 3, 4, 5, 6 Village of Caledonia	Milwaukee County, Racine County, Wisconsin Department of Transportation, and private	147 (plus 184 in Racine County)	A significant portion of the Root River corridor. Extends south into Racine County
34	West Branch Root River Woods	NA-3	T6N, R21E Section 7 City of West Allis	Private	12	Small remnant of native forest in highly developed area
35	Mitchell's Woods	NA-3	T6N, R21E Section 11 City of Milwaukee	Milwaukee County	37	Mixed-quality woods bordering Kinnickinnic River
36	Glenwood School Woods	NA-3	T6N, R21E Section 14 City of Milwaukee	Glenwood School	7	Relatively good-quality dry-mesic woods on school grounds
37	Whitnall Park Woods—North	NA-3	T6N, R21E Section 32 Village of Hales Corners	Milwaukee County	82	Stands of dry-mesic and lowland hardwoods within Whitnall Park. Contains forked aster (*Aster furcatus*), a State-designated threatened species
38	Grootemaat Woods	NA-3	T6N, R21E Section 35 City of Greenfield	City of Greenfield	20	Dry-mesic woods with ephemeral ponds

Table 18 (continued)

Number on Map 19	Area Name	Classification Code	Location	Ownership	Size (acres)	Description and Comments
39	Warnimont Park Woods	NA-3	T6N, R22E Section 36 City of Cudahy	Milwaukee County	47	Mix of mesic and dry-mesic woods located on bluffs along Lake Michigan, traversed by ravines which provide cooler and moister micro-habitats
40	Menomonee River Swamp—South	NA-3	T7N, R21E Section 6 City of Wauwatosa	Milwaukee County, City of Milwaukee, and Wisconsin Department of Transportation	99	A portion of the Menomonee River bordered by lowland hardwood forest and dry-mesic upland woods. Contains American gromwell (*Lithospermum latifolium*) and heart-leaved skullcap (*Scutellaria ovata*), both State-designated special concern species
41	Currie Park Low Woods	NA-3	T7N, R21E Section 8 City of Wauwatosa	Milwaukee County	27	A portion of the Menomonee River bordered by disturbed lowland hardwoods and upland dry-mesic woods. The ground flora is rich, including such rare species as the State-designated threatened forked aster (*Aster furcatus*)
42	Blue Mound Country Club Woods	NA-3	T7N, R21E Section 17 City of Wauwatosa	Milwaukee County and private	17	A small patch of southern dry-mesic woods containing critical species habitat
43	Wil-O-Way Woods	NA-3	T7N, R21E Section 20 City of Wauwatosa	Milwaukee County	41	Moderate-quality southern dry-mesic hardwoods containing a representative ground flora
44	Jacobus Park Woods	NA-3	T7N, R21E Section 27 City of Wauwatosa	Milwaukee County	11	A small remnant of the original southern dry-mesic forest on bluffs overlooking the Menomonee River. Contains several populations of the State-designated threatened forked aster (*Aster furcatus*), as well as other regionally rare species
45	Downer Woods	NA-3	T7N, R22E Section 10 City of Milwaukee	University of Wisconsin—Milwaukee	11	A disturbed southern dry-mesic hardwood forest where scattered large oaks and smaller ashes and basswoods dominate the tree stratum. There is a thick shrub layer of natives and exotics. One of the few undeveloped woods within this part of the County
46	Granville Low Woods	NA-3	T8N, R21E Section 6 City of Milwaukee	Milwaukee Metropolitan Sewerage District	50	Good quality wet-mesic woods supporting critical species habitat
47	Bradley Woods	NA-3	T8N, R21E Section 9 City of Milwaukee	City of Milwaukee and private	34	An old-growth southern mesic forested island, dominated by sugar maple, beech, and basswood. One of the few remnants of the original forest remaining in northern Milwaukee County. The western portion, owned by the County, is least disturbed
48	Convent Woods	NA-3	T8N, R21E Section 10 City of Milwaukee	Private	9	Small though floristically diverse mesic forest remnant
49	Brown Deer Park Woods	NA-3	T8N, R21E Section 13 Village of Brown Deer	Milwaukee County	43	Small islands of remnant southern mesic hardwoods within a golf-course matrix, dominated by beech and sugar maple

Table 18 (continued)

Number on Map 19	Area Name	Classification Code	Location	Ownership	Size (acres)	Description and Comments
50	Harbinger Woods	NA-3	T8N, R21E Sections 18 City of Milwaukee T8N, R20E Section 13 Village of Menomonee Falls	Milwaukee County and private	34 (plus 12 in Waukesha County)	Mesic upland woods and lowland hardwoods bordering the Menomonee River that extend into Waukesha County. The spring flora of the mesic woods is rich and diverse, including American gromwell (*Lithospermum latifolium*), a State-designated special concern species. Also present are several chinkapin oaks (*Quercus muehlenbergii*), a State-designated special concern tree species.
51	Menomonee River Swamp—North	NA-3	T8N, R21E Sections 19, 30 City of Milwaukee T8N, R20E Section 24 Village of Menomonee Falls	Milwaukee County and private	75 (plus four in Waukesha County)	Discontinuous patches of disturbed floodplain forest bordering the Menomonee River
52	Haskell Noyes Park Woods	NA-3	T8N, R21E Section 21 City of Milwaukee	Milwaukee County	20	Disturbed southern mesic hardwood forested island with a substantial amount of beech. Best old-growth remnant is near center of woods. Pond and wetlands are present at south end
53	McGovern Park Woods	NA-3	T8N, R21E Section 35 City of Milwaukee	Milwaukee County	14	Remnant woodland within urban park
54	Schlitz Audubon Center/Doctors Park Woods and Beach	NA-3	T8N, R22E Sections 9, 10 Village of Bayside	Schlitz Audubon Center and Milwaukee County	72	Mesic and dry-mesic woods on bluffs and in steep ravines along Lake Michigan. Site includes lake sand beach
55	Kletzsch Park Woods	NA-3	T8N, R22E Section 19 City of Glendale	Milwaukee County	13	A remnant of southern mesic to dry-mesic forest on the west bank of the Milwaukee River. The diversity of habitats (upland woods, ravine, floodplain, and slope) has resulted in a diverse ground flora, including the State-designated threatened forked aster (*Aster furcatus*)
56	Russell Avenue Woods	CSH	T5N, R21E Section 2 City of Franklin	Private	9	Woodland that supports a population of red trillium (*Trillium recurvatum*), a State-designated special concern species
57	Loomis Road Woods	CSH	T5N, R21E Section 9 City of Franklin	Private	13	Small woodland in residential area contains two State-designated special concern species: red trillium (*Trillium recurvatum*) and American gromwell (*Lithospermum latifolium*)
58	Countryside Woods	CSH	T5N, R21E Section 12 City of Franklin	City of Franklin and Metropolitan Milwaukee Sewerage District	26	A wooded mix of lowlands and uplands contains populations of two State-designated special concern species: red trillium (*Trillium recurvatum*) and black haw (*Viburnum prunifolium*)
59	35th Street Woods	CSH	T5N, R21E Section 12 City of Franklin	Private	14	Upland and lowland wooded site, containing black haw (*Viburnum prunifolium*), a State-designated special concern species
60	Shooting Star Prairie and Shrubland (Carity Prairie)	CSH	T5N, R21E Section 20 City of Franklin	Milwaukee Area Land Conservancy and private	18	Upland prairie remnant, dominated by shooting star, and associated shrub thicket

Table 18 (continued)

Number on Map 19	Area Name	Classification Code	Location	Ownership	Size (acres)	Description and Comments
61	Oakwood Park Oak Woods	CSH	T5N, R21E Section 25, 26 City of Franklin	Milwaukee County and private	8	Upland woodlot, formerly of NA-3 status, now downgraded because of extensive development of industrial park
62	Elm Road Woods—North	CSH	T5N, R21E Section 36 City of Franklin	Private	32	Disturbed dry-mesic woods
63	Oak Creek Parkway Bike Trail Woods	CSH	T5N, R22E Section 2 City of South Milwaukee	Milwaukee County	2	Small wooded patch containing the State-designated endangered blue-stemmed goldenrod (*Solidago caesia*)
64	Industrial Park Mesic Woods	CSH	T5N, R22E Section 8 City of Oak Creek	Private	5	Mesic forest remnant within industrial park supporting goldenseal (*Hydrastis canadensis*), a State-designated special concern species
65	Camelot Park Woods	CSH	T5N, R22E Section 10 City of Oak Creek	Milwaukee County	15	A small population of the State-designated endangered blue-stemmed goldenrod (*Solidago caesia*) is located within this upland woodlot
66	Oak Creek Bluffs and Beach—North	CSH	T5N, R22E Section 12 City of South Milwaukee	Milwaukee County	4	Seepage areas on eroding clay banks along Lake Michigan support two State-designated special concern species: Ohio goldenrod (*Solidago ohioensis*) and false asphodel (*Tofieldia glutinosa*)
67	Blakewood School Woods	CSH	T5N, R22E Section 15 City of South Milwaukee	Blakewood School	1	Small mesic woodlot on school grounds
68	Meyers Woods	CSH	T5N, R22E Section 19 City of Oak Creek	Private	10	Woodland that has recently lost acreage due to residential development, yet still supports black haw (*Viburnum prunifolium*), a State-designated special concern species
69	Puetz Road Woods	CSH	T5N, R22E Section 19 City of Oak Creek	Private	22	A wooded mix of lowlands and uplands contains populations of two State-designated special concern species: red trillium (*Trillium recurvatum*) and black haw (*Viburnum prunifolium*)
70	Wood Creek Woods	CSH	T5N, R22E Section 20 City of Oak Creek	Private	27	Upland and lowland woodlot, formerly of NA-3 status, now downgraded because of extensive residential development
71	Howell Avenue Woods	CSH	T5N, R22E Section 21 City of Oak Creek	Private	21	Mixed-quality woodlot, threatened by development
72	Fittshur Wetland	CSH	T5N, R22E Section 23 City of Oak Creek	Private	6	A population of the State-designated endangered blue-stemmed goldenrod (*Solidago caesia*) is located in the wooded upland border
73	Schmidt/Johnson Woods	CSH	T5N, R22E Section 23 City of Oak Creek	Private	6	Small woodland containing black haw (*Viburnum prunifolium*), a State-designated special concern species
74	Bender Park Stream and Meadow	CSH	T5N, R22E Section 25 City of Oak Creek	Milwaukee County	2	Open lowlands adjacent to a small stream support waxy meadow rue (*Thalictrum revolutum*), a State-designated special concern species

Table 18 (continued)

Number on Map 19	Area Name	Classification Code	Location	Ownership	Size (acres)	Description and Comments
75	Bender Park Woods—North	CSH	T5N, R22E Section 25 City of Oak Creek	Milwaukee County	11	Small woodlot along Lake Michigan, at north end of Bender Park
76	Bender Park Woods—South	CSH	T5N, R22E Section 25 City of Oak Creek	Milwaukee County	5	Small woodlot in Bender Park with a relatively rich ground flora, including the State-designated endangered blue-stemmed goldenrod (*Solidago caesia*)
77	Ryan Road Upland Woods—East	CSH	T5N, R22E Section 29 City of Oak Creek	Milwaukee County	4	Disturbed dry-mesic woodlot
78	Truck Stop Woods	CSH	T5N, R22E Section 30 City of Oak Creek	Private	11	Disturbed mix of upland and lowland woods and shrubland
79	PPG Woods	CSH	T5N, R22E Section 32 City of Oak Creek	Private	19	Disturbed dry-mesic woodlot
80	Bender Clay Banks and Ravine—South	CSH	T5N, R22E Section 36 City of Oak Creek	Milwaukee County	2	Seepage areas on the clay banks along Lake Michigan support slender bog arrow-grass, (*Triglochin palustre*), a State-designated special concern species
81	Clay Ravine Woods	CSH	T5N, R22E Section 36 City of Oak Creek	WE Energies	12	Wooded ravine cut through the Lake Michigan clay bluffs contains a population of the State-designated endangered blue-stemmed goldenrod (*Solidago caesia*)
82	Oak Creek Bluffs and Beach—South	CSH	T5N, R22E Section 36 T5N, R23E Section 31 City of Oak Creek	Milwaukee County	24	A stretch of Lake Michigan that supports sea rocket (*Cakile edentula*), a State-designated special concern species found on open, sandy beaches
83	Oak Creek Power Plant Woods	CSH	T5N, R22E Section 36 City of Oak Creek	WE Energies	16	Upland mesic woodlot on the grounds of the Oak Creek power plant supports a population of the State-designated endangered blue-stemmed goldenrod (*Solidago caesia*)
84	Honey Creek Parkway Woods	CSH	T6N, R21E Section 9 City of West Allis	Milwaukee County	5	Woodland within an urban park that supports a population of red trillium (*Trillium recurvatum*), a State-designated special concern species
85	Lyons Park Woods	CSH	T6N, R21E Section 14 City of Milwaukee	Milwaukee County	6	Woodland within an urban park that supports a population of red trillium (*Trillium recurvatum*), a State-designated special concern species
86	Holt Park Woods	CSH	T6N, R21E Section 17 City of Greenfield	Milwaukee County	8	Woodland within an urban park that supports a population of red trillium (*Trillium recurvatum*), a State-designated special concern species
87	Cold Spring Road Thicket	CSH	T6N, R21E Section 19 City of Greenfield	Private	2	Upland shrubland contains small population of American gromwell (*Lithospermum latifolium*), a State-designated special concern species
88	Grange Avenue Woods	CSH	T6N, R21E Section 33 Village of Greendale	Milwaukee County	14	Disturbed dry-mesic woods with hoptree (*Ptelea trifoliata*), a State-designated special concern species, found along border

Table 18 (continued)

Number on Map 19	Area Name	Classification Code	Location	Ownership	Size (acres)	Description and Comments
89	Westway Woods	CSH	T6N, R21E Section 34 Village of Greendale	Village of Greendale	9	Suburban woodland that supports a population of red trillium (*Trillium recurvatum*), a State-designated special concern species
90	Scout Lake Park Woods	CSH	T6N, R21E Section 35 Village of Greendale	Milwaukee County	43	Upland woods surrounding Scout Lake contain a small population of American gromwell (*Lithospermum latifolium*), a State-designated special concern species
91	Trestle Ravine Woods	CSH	T6N, R22E Section 14 City of St. Francis	WE Energies	3	A small woodland containing the State-designated endangered blue-stemmed goldenrod (*Solidago caesia*)
92	Greene Park Woods	CSH	T6N, R22E Section 23 City of Cudahy	Milwaukee County	7	A small woodland within a park containing the State-designated endangered blue-stemmed goldenrod (*Solidago caesia*)
93	Cudahy Park Woods	CSH	T6N, R22E Section 34 City of Cudahy	Milwaukee County	4	Small woodland within urban park
94	Underwood Parkway Woods	CSH	T7N, R21E Section 20 City of Wauwatosa	Milwaukee County	16	Woodland above Underwood Creek, adjacent to parkway
95	County Grounds Woods	CSH	T7N, R21E Section 21 City of Wauwatosa	Milwaukee County	10	Remnant dry-mesic woods containing forked aster (*Aster furcatus*), a State-designated threatened species
96	Harwood Avenue Woods	CSH	T7N, R21E Section 21 City of Wauwatosa	Milwaukee County	46	Woodlands bordering Menomonee River
97	Hart Park/Psychiatric Hospital Woods	CSH	T7N, R21E Section 22 City of Wauwatosa	Milwaukee County	41	Woodland along Menomonee River supports populations of one threatened plant species and five special concern plant species
98	Hawthorn Glen	CSH	T7N, R21E Section 23 City of Milwaukee	Milwaukee County	16	Woodland supports two State-designated special concern species: American gromwell (*Lithospermum latifolium*) and hoptree (*Ptelea trifoliata*)
99	Doyne Park Woodland	CSH	T7N, R21E Section 26 City of Milwaukee	Milwaukee County	4	Woodland bordering Menomonee River contains small population of hoptree (*Ptelea trifoliata*), a State-designated special concern species
100	Menomonee River PCA No. 10	CSH	T7N, R21E Section 27 City of Wauwatosa	Milwaukee County	3	Small wooded area along the Menomonee River contains hoptree (*Ptelea trifoliata*), a State-designated special concern species
101	Stadium Bluff Woods	CSH	T7N, R21E Section 35 City of Milwaukee	Zablocki Veterans Affairs Medical Center	6	Wooded bluff located between Veterans Center and Miller Park parking area supports a population of forked aster (*Aster furcatus*), a State-designated threatened species. This site is also identified as GA-1, a geological site significant in the history of science

Table 18 (continued)

Number on Map 19	Area Name	Classification Code	Location	Ownership	Size (acres)	Description and Comments
102	Cambridge Avenue Woods	CSH	T7N, R22E Section 9 City of Milwaukee	Milwaukee County	17	Relatively diverse stretch of primarily upland dry-mesic woods on east side of Milwaukee River that contains several populations of forked aster (*Aster furcatus*), a State-designated threatened species
103	Lake Park Woods	CSH	T7N, R22E Sections 14, 15 City of Milwaukee	Milwaukee County	46	Dry-mesic forest remnants along the wooded ravines of Lake Park
104	Research Center Woods	CSH	T8N, R21E Section 4 City of Milwaukee	Private	22	Remnant dry-mesic forest containing a small population of the State-designated endangered blue-stemmed goldenrod (*Solidago caesia*)
105	Silver Maple Island	CSH	T8N, R21E Section 12 Village of Brown Deer	Bureau of Land Management	1	Wooded island in Milwaukee River contains a population of sweet Indian plantain (*Hasteola suaveolens*), a State-designated special concern species
106	Brynwood Country Club Woods	CSH	T8N, R21E Section 15 City of Milwaukee	Private	5	Small wooded patch within golf course
107	West Granville Mesic Woods	CSH	T8N, R21E Section 17 City of Milwaukee	Private	8	Remnant dry-mesic woods within residential area
108	Greentree Road Woods	CSH	T8N, R21E Section 23 City of Milwaukee	Private	5	Upland woodland contains a population of American gromwell (*Lithospermum latifolium*), a State-designated special concern species
109	Army Reserve Woods	CSH	T8N, R21E Section 26 City of Milwaukee	U.S. Army	11	Small woodland containing a population of the State-designated endangered blue-stemmed goldenrod (*Solidago caesia*)
110	Fox Point Bluffs and Ravines	CSH	T8N, R22E Sections 9, 16, 21, 28 Village of Fox Point	Private	93	Wooded bluffs and ravines along Lake Michigan that, though disturbed, support a relatively diverse native flora

NOTE: Shaded areas indicate sites added in the 2010 amendment to the regional natural areas and critical species habitat protection and management plan.

Source: SEWRPC.

The regional natural areas plan also identified several critical aquatic habitat areas in the County. These areas were identified because they either support rare fish, herptile, or mussel species or bisect terrestrial natural areas. These areas include the portion of the mainstem of the Menomonee River upstream from the confluence with Underwood Creek; the portion of the mainstem of the Milwaukee River upstream from Walnut Street; the mainstem of the Root River downstream from W. Ryan Road; and Fish Creek, the Root River Canal, Tess Corners Creek, and Whitnall Park Creek.

Wisconsin Legacy Places

In 2006, the WDNR completed an inventory intended to identify the places believed to be most critical to meet the State's conservation and recreation needs over the next 50 years.[39] The resulting report provides background information for use by landowners, nonprofit conservation groups, local governments, State and Federal agencies, and other interests in decision-making about land protection and management in the vicinity of the identified legacy places. A total of 229 such legacy places were identified statewide.

The inventory identified six legacy places in Milwaukee County. As identified in the report, the following six legacy sites are part of the Southeast Glacial Plains and Southern Lake Michigan Coastal Landscape areas located wholly or partially within Milwaukee County: Havenwoods State Forest Preserve, the Menomonee and Little Menomonee Rivers, the Milwaukee River, Oak Creek, the Root River, and Seminary Woods-St. Francis Lake-shore. In addition to the statewide legacy sites, the study also identified "other areas of interest," including Fitzsimmons Woods, the Milwaukee County Grounds, Ryan Creek, and the Whitnall Park Woods.

Environmental Corridors and Isolated Natural Resource Areas

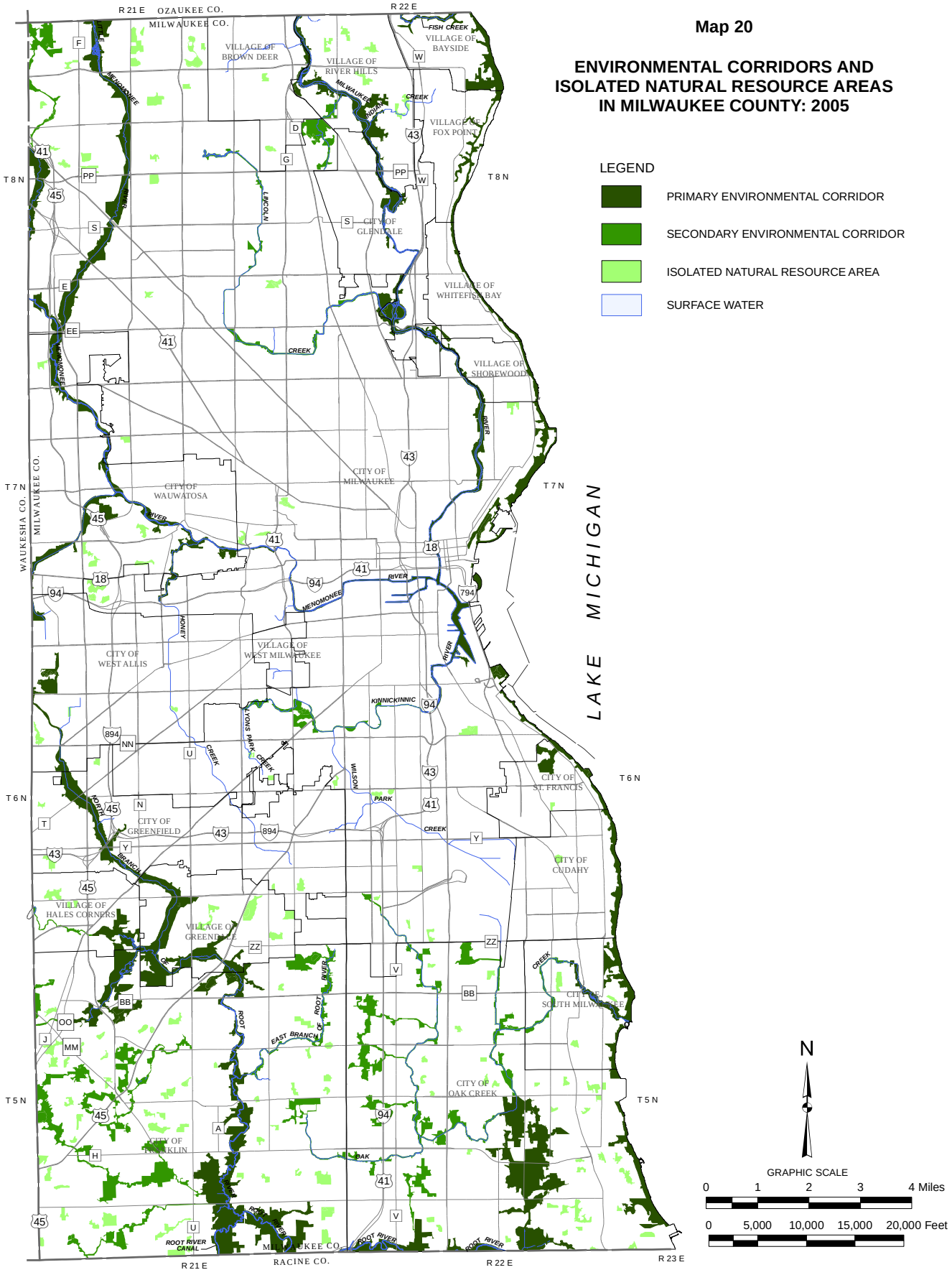
One of the most important tasks completed under the regional planning program for southeastern Wisconsin has been the identification and delineation of those areas in which concentrations of the best remaining elements of the natural resource base occur. It has been recognized that preservation of these areas is essential to both the maintenance of the overall environmental quality of the Region and to the continued provision of the amenities required to maintain a high quality of life for residents.

Seven elements of the natural resource base are considered essential to the maintenance of the ecological balance and the overall quality of life in the Region, and served as the basis for identifying the environmental corridor network. These seven elements are: 1) lakes, rivers, and streams and associated shorelands and floodplains; 2) wetlands; 3) woodlands; 4) prairies; 5) wildlife habitat areas; 6) wet, poorly drained, and organic soils; and 7) rugged terrain and high relief topography. In addition, there are certain other features which, although not a part of the natural resource base, are closely related to the natural resource base and were used to identify areas with recreational, aesthetic, ecological, and natural value. These features include existing park and open space sites, potential park and open space sites, historic sites, scenic areas and vistas, and natural areas.

These natural resource elements and resource-related features, when mapped on the landscape, concentrate in an essentially linear pattern of relatively narrow, elongated areas that have been termed "environmental corridors" by the Regional Planning Commission. Primary environmental corridors include a wide variety of the most important natural resources and are at least 400 acres in size, two miles long, and 200 feet wide. Secondary environmental corridors serve to link primary environmental corridors, or encompass areas containing concentrations of natural resources between 100 and 400 acres in size. Where secondary environmental corridors serve to link primary corridors, no minimum area or length criteria apply. Secondary environmental corridors that do not connect primary corridors must be at least 100 acres in size and one mile long. An isolated concentration of natural resource features, encompassing at least five acres but not large enough to meet the size or length criteria for primary or secondary environmental corridors, is referred to as an isolated natural resource area. Environmental corridors and isolated natural resource areas in Milwaukee County in 2000 are shown on Map 20.

The primary environmental corridors in the Milwaukee County planning area are primarily located along major stream valleys and along the Lake Michigan shoreline. These primary environmental corridors contain almost all of the best remaining woodlands, wetlands, and wildlife habitat areas in the County planning area, and represent a composite of the best remaining elements of the natural resource base. Primary environmental corridors encompassed about 9,057 acres (14.2 square miles), or about 5.8 percent of the County, in 2000. Secondary

[39] *Wisconsin Department of Natural Resources,* Wisconsin Land Legacy Report: An Inventory of Places to Meet Wisconsin's Future Conservation and Recreational Needs, *2006.*



Source: SEWRPC.

environmental corridors are generally located along the small perennial and intermittent streams within the County. Secondary environmental corridors also contain a variety of resource elements, often remnant resources from primary environmental corridors which have been developed for intensive urban or agricultural purposes. Secondary environmental corridors facilitate surface-water drainage, maintain pockets of natural resource features, and provide corridors for the movement of wildlife, as well as for the movement and dispersal of seeds for a variety of plant species. In 2000, secondary environmental corridors encompassed about 3,421 acres (5.3 square miles), or about 2.2 percent of the County. In addition to the primary and secondary environmental corridors, other smaller pockets of wetlands, woodlands, surface water, or wildlife habitat exist within the Region. These pockets are isolated from the environmental corridors by urban development or agricultural use, and although separated from the environmental corridor network, these isolated natural resource areas have significant value. They may provide the only available wildlife habitat in an area, usually provide good locations for local parks, and lend unique aesthetic character and natural diversity to an area. Widely scattered throughout the County (see Map 20), isolated natural resource areas encompassed about 1,966 acres (3.1 square miles), or about 1.3 percent of the County, in 2000.

The preservation of environmental corridors and isolated natural resource areas in essentially natural, open uses can help reduce flood flows, reduce noise pollution, and maintain air and water quality. Corridor preservation is important to the movement of wildlife and for the movement and dispersal of seeds for a variety of plant species. In addition, because of the many interacting relationships between living organisms and their environment, the destruction and deterioration of any one element of the natural resource base may lead to a chain reaction of deterioration and destruction. For example, the destruction of woodland cover may result in soil erosion and stream siltation, more rapid stormwater runoff and attendant increased flood flows and stages, as well as destruction of wildlife habitat. Although the effects of any single environmental change may not be overwhelming, the combined effects will eventually create serious environmental and developmental problems. These problems include flooding, water pollution, deterioration and destruction of wildlife habitat, reduction in groundwater recharge, as well as a decline in the scenic beauty of the County. The importance of maintaining the integrity of the remaining environmental corridors and isolated natural resource areas thus becomes apparent.

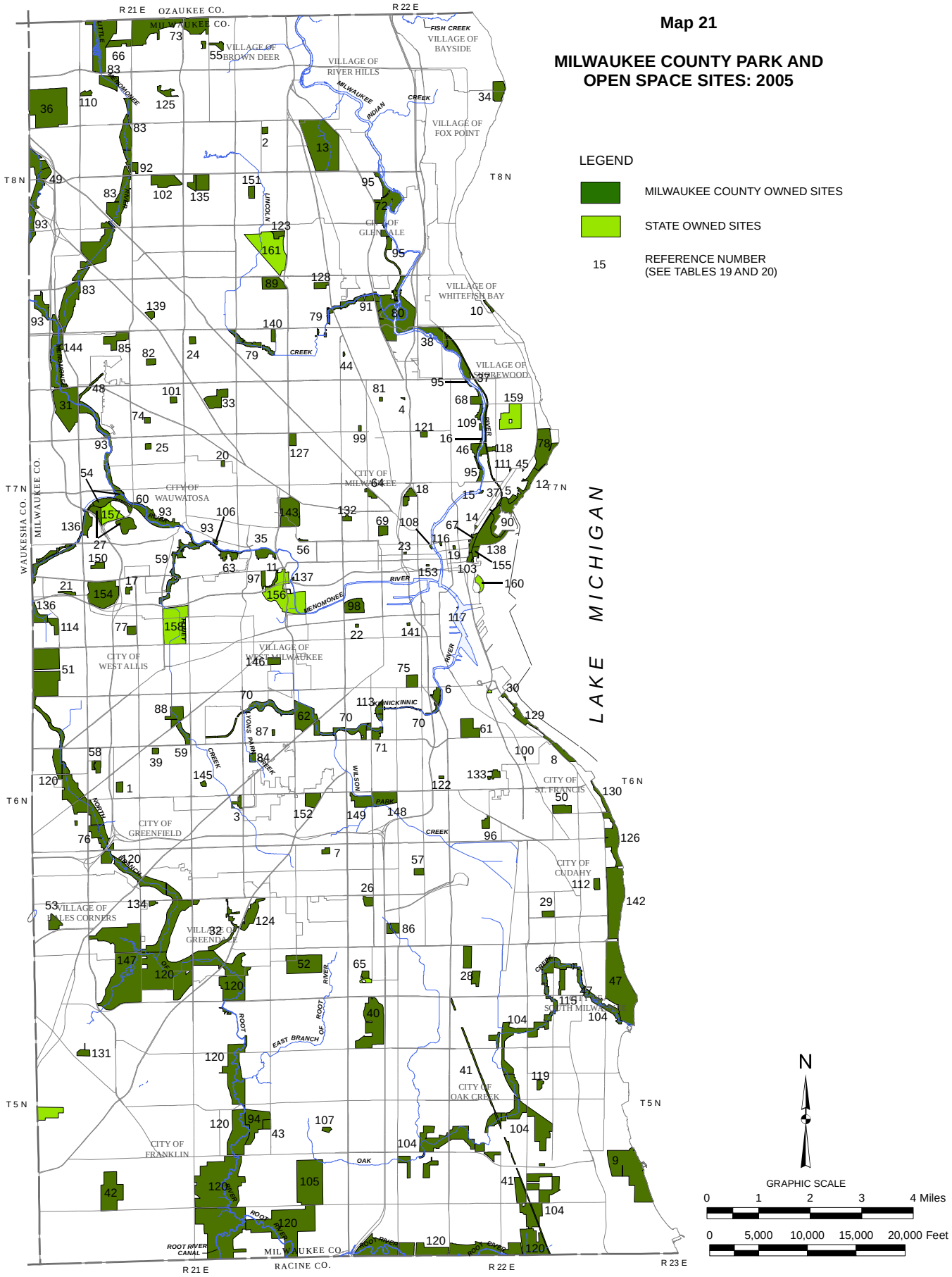
Park and Open Space Sites

A comprehensive regionwide inventory of park and open space sites was conducted in 1973 under the initial regional park and open space planning program conducted by SEWRPC. The inventory is updated periodically. The inventory identified all park and open space sites owned by a public agency, including Federal, State, County, and local units of government and school districts. The inventory also included privately owned outdoor recreation sites such as golf courses, campgrounds, boating access sites, hunting clubs, group camps, and special use outdoor recreation sites. As of 2006, there were 717 sites encompassing 20,809 acres of park and open space land in Milwaukee County.

Park and Open Space Sites Owned by Milwaukee County

Park and open space sites owned by Milwaukee County in 2005 are shown on Map 21 and listed in Table 19. In 2005 Milwaukee County owned 155 such sites. Of these sites, 153 were under the jurisdiction of the DPRC. These sites encompassed 14,835 acres. These sites include 15 major parks, and 10 major parkways.[40] Two sites, encompassing 185 acres, were not under DPRC jurisdiction.

[40]*Major parks are defined as large, publicly owned outdoor recreation sites containing significant natural resource amenities which provide for opportunities for such resource-oriented activities as camping, golfing, picnicking, and swimming. Major parks included those classified as regional parks, which have an area of 250 acres or more, and metropolitan parks, which have an area of generally 100 to 250 acres.*



Source: SEWRPC.

Table 19

PARK AND OUTDOOR RECREATION SITES OWNED BY MILWAUKEE COUNTY: 2005

Number on Map 21	Site Name	County Classification[a]	Location[b]	Size (acres)
1	Alcott Park	NP	T6N, R21E, Section 17	17
2	Algonquin Park	NP	T8N, R21E, Section 14	9
3	Armour Park	NP	T6N, R21E, Section 22	15
4	Atkinson Triangle	SNP	T7N, R22E, Section 8	1
5	Back Bay[c]	NP	T7N, R22E, Section 22	11
6	Baran Park	SMP	T6N, R22E, Section 8	23
7	Barnard Park	NP	T6N, R21E, Section 25	10
8	Bay View Park[d]	SRP	T6N, R22E, Section 14	37
9	Bender Park	SRP	T5N, R22E, Section 25	299
10	Big Bay Park	SRP	T8N, R22E, Section 33	8
11	Bluff Park	SNP	T7N, R21E, Section 26	12
12	Bradford Beach[c]	SRP	T7N, R22E, Section 15	31
13	Brown Deer Park	SRP	T8N, R21E, Section 13	363
14	Burns Commons	GS	T7N, R22E, Section 21	2
15	Caesar's Park	SNP	T7N, R22E, Section 21	2
16	Cambridge Woods	Nat Pres	T7N, R22E, Section 9	34
17	Cannon Park	SCP	T7N, R21E, Section 29	9
18	Carver Park	SCP	T7N, R22E, Section 20	27
19	Cathedral Square	BDP	T7N, R22E, Section 28	2
20	Center Street Park	NP	T7N, R21E, Section 15	5
21	Chippewa Park	NP	T7N, R21E, Section 30	11
22	Clarke Square	SNP	T7N, R22E, Section 31	2
23	Clas Park	BDP	T7N, R22E, Section 29	1
24	Columbus Park	NP	T7N, R21E, Section 3	10
25	Cooper Park	SCP	T7N, R21E, Section 16	8
26	Copernicus Park	NP	T6N, R22E, Section 31	20
27	County Grounds	Nat Pres	T7N, R21E, Section 20	75
28	Cudahy Nature Preserve	Nat Pres	T5N, R22E, Section 4	42
29	Cudahy Park	NP	T6N, R22E, Section 34	18
30	Cupertino Park[d]	SRP	T6N, R22E, Section 10	7
31	Currie Park	SRP	T7N, R21E, Section 7	196
32	Dale Creek Parkway	NPW	T6N, R21E, Section 34	45
33	Dineen Park	CP	T7N, R21E, Section 10	64
34	Doctors Park	SRP	T8N, R22E, Section 10	51
35	Doyne Park	SMP	T7N, R21E, Section 26	35
36	Dretzka Park	SRP	T8N ,R21E, Section 7	326
37	Eastside Bike Trail	MPW	T7N, R22E, Section 5	53
38	Estabrook Park	MP	T7N, R22E, Section 4	109
39	Euclid Park	NP	T6N, R21E, Section 16	9
40	Falk Park	MP	T5N, R22E, Section 7	216
41	Former North Shore R.O.W	CPW	T5N, R22E, Section 9	71
42	Franklin Park	MP	T5N, R21E, Section 29	165
43	Froemming Park	CP	T5N, R21E, Section 23	19
44	Garden Homes Square	SNP	T7N, R22E, Section 6	2
45	Gilman Triangle	GS	T7N, R22E, Section 15	1
46	Gordon Park	SCP	T7N, R22E, Section 16	18
47	Grant Park[d]	SRP	T5N, R22E, Section 1	380
48	Grantosa Parkway	NPW	T7N, R21E, Section 8	23
49	Granville Dog Park	SCP	T8N, R21E, Section 18	26
50	Greene Park	SCP	T6N, R22E, Section 23	36
51	Greenfield Park	SRP	T6N, R21E, Section 6	282
52	Grobschmidt Park	MP	T5N, R21E, Section 1	152
53	Hales Corners Park	SCP	T6N, R21E, Section 31	33
54	Hansen Park	CP	T7N, R21E, Section 20	55
55	Hanson A.C. Park	NP	T8N, R21E, Section 3	14

Table 19 (continued)

Number on Map 21	Site Name	County Classification[a]	Location[b]	Size (acres)
56	Highland Park	SNP	T7N, R21E, Section 25	3
57	Holler Park	SMP	T6N, R22E, Section 29	15
58	Holt Park	SCP	T6N, R21E, Section 17	21
59	Honey Creek Parkway	CPW	T7N, R21E, Section 28	114
60	Hoyt Park	CP	T7N, R21E, Section 21	20
61	Humboldt Park	CP	T6N, R22E, Section 9	71
62	Jackson Park	MP	T6N, R21E, Section 12	113
63	Jacobus Park	SCP	T7N, R21E, Section 27	26
64	Johnsons Park	NP	T7N, R22E, Section 19	13
65	Johnstone Park	NP	T5N, R22E, Section 6	13
66	Joseph Lichter Park		T8N, R21E, Section 5	34
67	Juneau Park[c]	SRP	T7N, R22E, Section 28	18
68	Kern Park	SCP	T7N, R22E, Section 9	27
69	King Park	SCP	T7N, R22E, Section 19	21
70	Kinnickinnic River Parkway	MPW	T6N, R21E, Section 11	200
71	KK Sports Center	SNP	T6N, R22E, Section 7	20
72	Kletzsch Park	MP	T8N, R22E, Section 19	119
73	Kohl Park	MP	T8N, R21E, Section 3	273
74	Kops Park	NP	T7N, R21E, Section 9	8
75	Kosciuszko Park	CP	T6N, R22E, Section 5	34
76	Kulwicki Park	CP	T6N, R21E, Section 19	28
77	La Follette Park	SCP	T7N, R21E, Section 32	18
78	Lake Park[c]	SRP	T7N, R22E, Section 15	134
79	Lincoln Creek Parkway	CPW	T8N, R22E, Section 31	127
80	Lincoln Park	SRP	T8N, R22E, Section 31	303
81	Lingbergh Park	SNP	T7N, R22E, Section 7	3
82	Lindsay Park	NP	T7N, R21E, Section 4	13
83	Little Menomonee River Parkway	MPW	T8N, R21E, Section 31	862
84	Lyons Park	NP	T6N, R21E, Section 14	12
85	Madison Park	CP	T7N, R21E, Section 5	59
86	Maitland Park	SMP	T6N, R22E, Section 31	27
87	Manitoba Park	NP	T6N, R21E, Section 11	4
88	McCarty Park	CP	T6N, R21E, Section 9	52
89	McGovern Park	CP	T8N, R21E, Section 35	61
90	McKinley Park[c,e]	SRP	T7N, R22E, Section 22	98
91	Meaux Park	SCP	T8N, R22E, Section 31	24
92	Melody View Preserve	NP	T8N, R21E, Section 16	14
93	Menomonee River Parkway	MPW	T7N, R21E, Section 6	598
94	Milwaukee County Sports Complex	SCP	T5N, R21E, Section 23	114
95	Milwaukee River Parkway	MPW	T8N, R22E, Section 19	100
96	Mitchell Airport Park	NP	T6N, R22E, Section 21	19
97	Mitchell Boulevard	SCP	T7N, R21E, Section 26	16
98	Mitchell Park	SRP	T7N, R22E, Section 31	61
99	Moody Park	SCP	T7N, R22E, Section 7	4
100	Morgan Triangle	GS	T6N, R22E, Section 15	1
101	Nash Park	NP	T7N, R21E, Section 9	9
102	Noyes Park	CP	T8N, R21E, Section 21	72
103	O'Donnell Park[c]	SRP	T7N, R22E, Section 28	9
104	Oak Creek Parkway	MPW	T5N, R22E, Section 10	1,078
105	Oakwood Park	SRP	T5N, R21E, Section 25	277
106	Park Maintenance	SA	T7N, R21E, Section 27	4
107	Park Site 59 (Southwood Glen)	NP	T5N, R21E, Section 24	9
108	Pere Marquette Park	BDP	T7N, R22E, Section 29	2
109	Pleasant Valley Park	SNP	T7N, R22E, Section 9	17
110	Popuch Park	NP	T8N, R21E, Section 8	12
111	Prospect Triangle	GS	T7N, R22E, Section 15	1
112	Pulaski Park (Cudahy)	NP	T6N, R22E, Section 26	16

Table 19 (continued)

Number on Map 21	Site Name	County Classification[a]	Location[b]	Size (acres)
113	Pulaski Park (Milwaukee)	SNP	T6N, R22E, Section 7	18
114	Rainbow Park	SMP	T7N, R21E, Section 31	26
115	Rawson Park	SCP	T5N, R22E, Section 2	30
116	Red Arrow Park	BDP	T7N, R22E, Section 29	1
117	Riverfront Launch Site	SRP	T7N, R22E, Section 33	1
118	Riverside Park	SCP	T7N, R22E, Section 16	32
119	Riverton Meadows	NP	T5N, R22E, Section 15	8
120	Root River Parkway	RPW	T6N, R21E, Section 7	3,817
121	Rose Park	SCP	T7N, R22E, Section 17	10
122	Saveland Park	SNP	T6N, R22E, Section 17	3
123	Schoenecker Park	SMP	T8N, R21E, Section 26	18
124	Scout Lake Park	SCP	T6N, R21E, Section 35	64
125	Servite Park Preserve	Nat Pres	T8N, R21E, Section 9	20
126	Sheridan Park[d]	SRP	T6N, R22E, Section 25	106
127	Sherman Park	SCP	T7N, R21E, Section 13	21
128	Smith Park	SCP	T8N, R21E, Section 36	19
129	South Shore Park[d,f]	SRP	T6N, R22E, Section 10	39
130	St. Francis Property	SRP	T6N, R22E, Section 23	22
131	St. Martin's Park	NP	T5N, R21E, Section 7	19
132	Tiefenthaler Park	SCP	T7N, R22E, Section 19	11
133	Tippecanoe Park	NP	T6N, R22E, Section 16	17
134	Trimborn Farm	SRP	T6N, R21E, Section 33	7
135	Uihlein Soccer Park	SCP	T8N, R21E, Section 22	67
136	Underwood Creek Parkway	MPW	T7N, R21E, Section 20	168
137	Valley Park	SNP	T7N, R21E, Section 25	2
138	Veteran's Park[c]	SRP	T7N, R22E, Section 28	105
139	Vogel Park	NP	T8N, R21E, Section 33	12
140	Wahl Park	NP	T7N, R21E, Section 2	12
141	Walker Square	SNP	T7N, R22E, Section 32	2
142	Warnimont Park[d]	SRP	T6N, R22E, Section 36	248
143	Washington Park	MP	T7N, R21E, Section 23	129
144	Webster Park	NP	T7N, R21E, Section 6	5
145	Wedgewood Park	NP	T6N, R21E, Section 15	6
146	West Milwaukee Park	SCP	T6N, R21E, Section 2	21
147	Whitnall Park	RP	T5N, R21E, Section 5	625
148	Wilson Park	MP	T6N, R22E, Section 19	77
149	Wilson Recreation Center	SMP	T6N, R22E, Section 19	52
150	Wisconsin Avenue Park	SNP	T7N, R21E, Section 29	18
151	Wyrick Park	NP	T8N, R21E, Section 23	18
152	Zablocki Park	SMP	T6N, R21E, Section 24	45
153	Zeidler Union Square	BDP	T7N, R22E, Section 29	1
	Subtotal—153 Sites	- -	- -	14,835
Other County Sites Not under Jurisdiction of the Department of Parks, Recreation and Culture				
154	Milwaukee County Zoo	- -	T7N, R21E, Section 29	168
155	War Memorial and Art Center	- -	T7N, R22E, Section 28	17
	Subtotal—Two Sites	- -	- -	185
	Total—155 Sites	- -	- -	15,020

Table 19 Footnotes

[a]*The Milwaukee County Department of Parks, Recreation and Culture has placed each county park and parkway site in one of the following classifications:*

NP = Neighborhood Park: Eight to 25 acres; "walk-to" playground-park for day-to-day family recreation activities, both active and passive
CP = Community Park: 25 to 100 acres; playfield-park serving both community and neighborhood park functions including playground and playfield
MP = Metropolitan Park: 100 to 249 acres; serving county population with both intensive and extensive use areas including neighborhood
RP = Regional Park: 250 acres and over; serving more than county population with unique or special facilities having a wide area of influence
NPW = Neighborhood Parkway
CPW = Community Parkway
MPW = Metropolitan Parkway
RPW = Regional Parkway: 200 feet wide or the width of the floodplain; linear parks following streams and Lake Michigan shoreline providing continuity for trail-oriented recreation activities
SNP = Special Neighborhood Park
SCP = Special Community Park
SMP = Special Metropolitan Park
SRP = Special Regional Park: Acreage varies; single or limited use parks
Nat Pres = Nature Preserve: Acreage varies; preserved areas of natural resources
BDP = Central Business District Park
GS = Greenspot
SA = Service Area: Miscellaneous open space

[b]*Indicates location given in U.S. Public Land Survey Township, Range, and Section.*

[c]*Back Bay, Bradford Beach, Juneau Park, Lake Park, McKinley Park, O'Donnell Park, and Veteran's Park comprise Lake Michigan North. The total area of these seven sites is 387 acres. This site is classified as a regional parkway (RPW).*

[d]*Bay View Park, Cupertino Park, Grant Park, Sheridan Park, South Shore Park, St. Francis Property, and Warnimont Park comprise Lake Michigan South. The total area of these seven sites is 835 acres. This site is classified as a regional parkway (RPW).*

[e]*Includes Milwaukee Yacht Club, which is privately owned.*

[f]*Includes South Shore Yacht Club, which is privately owned.*

Source: Milwaukee County Department of Parks, Recreation and Culture and SEWRPC.

The existing major parks are Bender Park, Brown Deer Park, Currie Park, Dretzka Park, Estabrook Park, Falk Park, Grobschmidt Park, Jackson Park, Kletzsch Park, Kohl Park, Oakwood Park, Washington Park, Whitnall Park, and Wilson Park. The existing major parkways include the Eastside Bike Trail, the Kinnickinnic River Parkway, the Lake Michigan Parkway North, the Lake Michigan Parkway South, the Little Menomonee River Parkway, the Menomonee River Parkway, the Milwaukee River Parkway, the Oak Creek Parkway, the Root River Parkway, and the Underwood Creek Parkway. In addition to the existing major parks, the County also owns the Milwaukee County Zoo and the War Memorial and Art Center.

The County-owned park and open space sites in Milwaukee County encompass about 9.7 percent of the area of the County.

Park and Open Space Sites Owned by the State of Wisconsin

As indicated in Table 20 and shown on Map 21, in 2005 there were six State-owned park and open space sites in Milwaukee County, encompassing 768 acres, or about 0.5 percent of the County. Of these sites, three sites encompassing 308 acres were owned by the WDNR; one site, encompassing 204 acres, was owned by the Wisconsin State Fair Park Board; one site, encompassing 231 acres, was owned by the Southeast Wisconsin Professional Baseball Park District; and one site, encompassing 25 acres, was owned by the University of Wisconsin.

Table 20

STATE OF WISCONSIN RECREATION AND OPEN SPACE LANDS IN MILWAUKEE COUNTY: 2005

Number on Map 21	Site Name	Location[a]	Size (acres)
156	Miller Park[b]	T7N, R21E, Section 26	231
157	Forestry Education Center	T7N, R21E, Section 20	67
158	State Fairgounds	T7N, R21E, Section 33	204
159	University of Wisconsin-Milwaukee	T7N, R22E, Section 10	25
160	Lake Shore State Park	T7N, R22E, Section 33	19
161	Havenwoods State Forest	T8N, R21E, Section 26	222
- -	Total–Six Sites	- -	768

[a]*Indicates location given in U.S. Public Land Survey Township, Range, and Section.*

[b]*Owned by the Southeast Wisconsin Professional Baseball Park District, a special purpose district established by the State.*

Source: SEWRPC.

WDNR-owned sites include the Forestry Education Center, Lakeshore State Park, and Havenwoods Environmental Education Center. The Wisconsin State Fair Park Board owns State Fair Park. The Southeast Wisconsin Professional Baseball Park District owns Miller Park, which consists of the Miller Brewers Baseball Club stadium and surrounding lands. The University of Wisconsin owns the grounds and facilities of the University of Wisconsin-Milwaukee.

Park and Open Space Sites Owned by Local Units of Government, Public School Districts, and the Milwaukee Metropolitan Sewerage District

In addition to County and State-owned park and open space sites, there were 427 park and open space sites owned by local governments, public schools, or other public agencies in Milwaukee County in 2001, the most recent year for which data were available. Those sites encompassed about 2,942 acres, or about 2 percent of the County. These sites are listed in Table 21 and shown on Map 22. The area attributed to school district sites includes only those portions of the site used for recreational purposes or in open space.

In addition to sites owned by local units of government, the MMSD has acquired several sites in Milwaukee County as part of its Greenseams program. Greenseams is a flood management program that permanently protects key lands that store floodwaters. The program makes voluntary purchases of undeveloped, privately owned properties in areas expected to have major growth in the next 20 years and open space along streams, shorelines and wetlands. All land acquired will remain undeveloped, protecting water and providing the ability to store floodwaters. Wetlands maintenance and restoration at these sites will provide further water storage. As of 2010, MMSD had acquired 17 Greenseams sites in Milwaukee County encompassing about 672 acres. In addition, the program had acquired easements on four sites encompassing about 33 acres.

Private, Commercial, and Organizational Park and Open Space Sites

In 2001, the most recent year for which data were available, there were 129 park and open space sites owned by organizations and/or owned for commercial purposes encompassing about 2,079 acres, or about 1.3 percent of the County. These sites include privately owned golf courses, schools, subdivision parks, hunting clubs, campgrounds, boat access sites, horse stables, and soccer parks. These sites are listed in Table 22 and are shown on Map 23.

Table 21

PARK AND OPEN SPACE SITES OWNED BY CITIES, VILLAGES, OR SCHOOL DISTRICTS IN MILWAUKEE COUNTY: 2001

Number on Map 22	Site Name	Ownership[a]	Location[b]	Acreage
1	College Park School	08	52122	6
2	Country Dale Elementary School	08	52172	6
3	Market Square	04	52174	1
4	Robinwood Elementary School	08	52183	3
5	Mission Hills Neighborhood Wetlands	04	52183	14
6	Pleasant View Elementary School	08	521114	11
7	Pleasant View Park	04	521114	24
8	Glenn Meadows Park	04	521122	1
9	Jack E. Workman Park	04	521132	12
10	Friendship Park	04	521133	2
11	Franklin High School	08	521141	63
12	Cascade Creek Park	04	521142	9
13	Lion's Legend Park	04	521162	41
14	Forest Park Middle School and Environmental Education Center	08	521164	22
15	Ernie Lake Park	04	521172	14
16	Meadowlands Park	04	521212	14
17	Franklin Woods Nature Center	04	521242	39
18	Southwood Glen Elementary School	08	521244	3
19	Ollie Pederson Field	04	521282	20
20	South Milwaukee High and Rawson Schools	08	52223	12
21	South Milwaukee Middle School and E.W. Luther Schools	08	52224	5
22	Hickory Park	08	52231	5
23	Chapel Hills Park	04	52233	12
24	MATC South Campus	08	52251	53
25	Jewel Playfield	04	52261	6
26	Cedar Hills School	08	52262	4
27	Little League Complex	04	52284	19
28	Manor Marquette Park	04	52293	9
29	Greenlawn Park	04	52293	9
30	Lakeview School	08	522114	6
31	Little League Park	04	522114	7
32	South Milwaukee Yacht Club	04	522123	9
33	Blakewood School	08	522151	15
34	Abendschein Park	04	522161	67
35	Miller Park	04	522163	8
36	Edgewood/Oak Creek High School	08	522163	36
37	Early Childhood Education Center	08	522164	1
38	Willow Heights Park	04	522172	8
39	Oak Creek West Middle School	08	522184	15
40	South Hills Playground	04	522192	1
41	South Hills Park	04	522193	12
42	Oak Leaf Park	04	52221	11
43	Oak Creek East Middle School	08	522214	22
44	Carollville Playground	04	522231	7
45	Carollton School/Park	08	522232	9
46	Otjen Playground	04	522234	4
47	Shepard Hills School/Park	08	522282	8
48	Mardeand Park	04	522321	8
49	Meadowview School/Park	08	522331	6
50	Scanlan Park	04	522351	9
51	Haas Park	04	522363	7
52	Burnham Playfield	04	62111	13
53	Walker Middle School	08	62111	2
54	Nancy Elizabeth Trowbridge Square	04	62112	1
55	Greenfield School	08	62113	1

Table 21 (continued)

Number on Map 22	Site Name	Ownership[a]	Location[b]	Acreage
56	S. 36th and Rogers Playlot	04	62113	3
57	Grant School	08	62114	2
58	Rogers Playfield	04	62114	6
59	35th and Lincoln	04	62114	1
60	S. 56th Street Playground	04	62123	1
61	58th and Beloit Mini-park	04	62131	1
62	Liberty Heights Park	04	62131	7
63	Veterans Memorial Park	04	62132	2
64	Rogers Park	04	62133	1
65	Jefferson School	08	62133	3
66	Longfellow School	08	62134	2
67	Dewey Junior H.S./Lincoln Schools	08	62141	2
68	Railroad Park	04	62141	1
69	Radtke Park	04	62141	1
70	Wilson School	08	62142	1
71	West Allis Central High School	08	62143	3
72	Franklin School	08	62143	4
73	Honey Creek Park	04	62143	4
74	Reservoir Park	04	62151	15
75	Irving School	08	62153	5
76	Nathan Hale H.S. and Playfield	08	62171	36
77	Parkway School	08	62174	1
78	General Mitchell School	08	62183	4
79	Wright Middle School	08	62184	9
80	West Allis/West Milwaukee Recreation Center	04	62111	5
81	Klentz Park	04	62112	6
82	Fairview School and Playfield	08	62114	10
83	Milwaukee Spanish Immersion School	08	621113	4
84	S. 51st and Stack Totlot	04	621113	1
85	Manitoba School	08	621123	6
86	Curtin School	08	621131	5
87	Audubon Junior High School	08	621132	5
88	Glenwood School	08	621144	10
89	River Bend	04	621152	1
90	Hamilton High School and Playfield	08	621154	13
91	Bell Middle School /Honey Creek School	08	621154	6
92	Milwaukee French Immer. School and Playfield	08	621163	6
93	Academy of Accelerated Learning and S. 78th Street	08	621164	12
94	Alcott School	08	621174	8
95	Wildcat Creek Nature Corridor	04	621192	7
96	Greenfield School District Administration	08	621213	10
97	Maple Grove School	08	621223	5
98	Whitman School and Playfield	08	621231	8
99	Honey Bear Park	04	621233	1
100	Pond View Park	04	621241	7
101	Haker Park	04	621243	4
102	Greenfield Middle School	08	621251	12
103	Elmdale School	08	621253	5
104	Konkel Park	04	621261	31
105	Edgewood School	08	621261	5
106	Creekwood Park	04	621261	2
107	Greenfield High School	08	621262	32
108	Dan Jansen Park	04	621272	3
109	Ambruster School	08	621273	9
110	Brookside Meadow Drive Park Site	04	621291	15
111	Whitnall High School	08	621301	29
112	Whitnall Middle School	08	621302	8
113	Schoetz Park	05	621303	21
114	Edgerton School	08	621303	4

Table 21 (continued)

Number on Map 22	Site Name	Ownership[a]	Location[b]	Acreage
115	Hales Corners School	08	621311	4
116	Cobb Park	05	621314	7
117	Potter's Forest	04	621321	51
118	Bentwood Hill Park	05	621341	1
119	Lions Park	05	621342	3
120	Greendale Middle School and Canterbury	08	621342	17
121	Sherwood Heights Park	05	621343	10
122	Greendale High School	08	621343	27
123	Cantebury Woodlands	05	621343	7
124	Village Green	05	621351	27
125	College Park	05	621353	45
126	Village Green Park	05	621354	7
127	Highland View School	08	621354	10
128	Wisconsin Conservancy of Life Long Learning	08	621361	5
129	Gra-Ram Playfield	04	621361	5
130	Allis Street Totlot	04	62243	1
131	Zillman Park	04	62243	1
132	Allen-Field School	08	62252	2
133	Kosciuszko Middle School and South Stadium	08	62253	8
134	Lincoln Field	04	62254	6
135	Forest Home Avenue School	08	62261	2
136	South Division High School	08	62261	2
137	S. 13th and Lapham Totlot	04	62261	1
138	Mitchell School	08	62262	1
139	Reiske Park/ Southside Health Center	04	62262	4
140	Becher Fieldhouse and Playground	04	62263	2
141	S. 21st Street and Rogers Totlot	04	62263	1
142	S. 20th and Vilter Lane Totlot	04	62263	1
143	Lincoln Avenue School	08	62271	2
144	Pulaski High School and Stadium	08	62273	17
145	Riley School	08	62281	1
146	Cleveland Playground	04	62282	4
147	Hayes School	08	62282	1
148	Zablocki School	08	62283	2
149	Bay View Basketball	04	62291	1
150	Lewis Playfield	04	62291	5
151	Dover School	08	62292	2
152	Bay View High School	08	62293	5
153	Fritsche Middle School	08	62293	7
154	Sijan Playfield/ Beulah Brinton Playfield	04	62294	15
155	Trowbridge School	08	62213	1
156	Ellen Park	04	622152	5
157	Fernwood School	08	622152	3
158	Elizabeth Street Playground	04	622153	1
159	Deer Creek Elementary	08	622154	4
160	Humbolt Park School	08	622162	2
161	Emigh Playfield	04	622163	11
162	Clement Avenue School	08	622164	3
163	Ohio Playground	04	622172	4
164	Warnimont Playground	04	622174	4
165	Holt Playground	04	622181	4
166	Southlawn Playground	04	622182	2
167	Morgandale School	08	622184	1
168	Lowell School and Playfield	08	622194	8
169	Whittier School and Playfield	08	622204	6
170	Tippencanoe School	08	622212	1
171	Burdick School	08	622213	2
172	Willow Glen School	08	622221	6

Table 21 (continued)

Number on Map 22	Site Name	Ownership[a]	Location[b]	Acreage
173	Citizens Municipal Park	04	622221	1
174	Milton Veteran Municipal Park	04	622231	5
175	St. Francis High School	08	622231	20
176	Lincoln School	08	622234	2
177	Cudahy High School	08	622252	20
178	Kosciuszko School	08	622264	2
179	16th and Edgerton	04	622301	1
180	Sholes Middle School	08	622302	10
181	Cooper School and Playfield	08	622303	7
182	Garland School	08	622311	3
183	Victory School and Playfield	08	622313	3
184	S. 15th and Kimberly Playlot	04	622314	1
185	Uncas Playground	04	622324	3
186	Parkview School	08	622341	8
187	General Mitchell School	08	622344	4
188	J.E. Jones School	08	622351	2
189	Cudahy Middle School	08	622352	3
190	N. 35th St. School	08	72112	1
191	Clemens School and Playfield	08	72113	4
192	Congress School	08	72122	3
193	Dr. Benjamin Carson Academy of Science	08	72124	1
194	Parklawn Playground	04	72124	7
195	Congress South Campus	08	72124	2
196	Marshall High School	08	72134	7
197	Morse Middle School and Playfield	08	72142	9
198	Emerson School	08	72142	2
199	Craig School	08	72144	2
200	N. 78th and Fiebrantz Playlot	04	72144	2
201	Madison School	08	72151	8
202	N. 95th Street School and Playfield	08	72181	4
203	Milwaukee German Immer. School	08	72191	7
204	Milwaukee School of Languages	08	72193	5
205	N. 65th Street School and Playfield	08	72111	5
206	N. 45th and W. Keefe Totlot	04	721111	1
207	N. 53rd Street School and Playfield	08	721112	6
208	29th and Melvina	04	721121	1
209	Robinson Middle School	08	721123	3
210	Townsend School	08	721123	2
211	30th and Cawker	04	721131	1
212	N. 38th Street School	08	721133	1
213	Butterfly Park	04	721133	2
214	Clarke Street School and Playfield	08	721134	3
215	29th and Meinecke	04	721134	1
216	Metcalfe Playfield	04	721134	2
217	Sherman School	08	721142	2
218	Marcus DeBack Playground	04	721143	1
219	Steuben Middle School	08	721143	2
220	Washington High School	08	721144	5
221	68th Street School	08	721151	1
222	Enderis Playfield	04	721152	9
223	Roosevelt School	08	721153	2
224	N. 81st Street School	08	721161	3
225	McKinley School	08	721163	2
226	Longfellow Junior High School	08	721164	6
227	Whitman Junior High School	08	721181	15
228	Wauwatosa West High School	08	721181	18
229	Eisenhower School	08	721182	1
230	Oak Ridge Subdivision Open Space	04	721183	1

Table 21 (continued)

Number on Map 22	Site Name	Ownership[a]	Location[b]	Acreage
231	Fisher School and Athletic Field	08	721192	15
232	Lincoln School	08	721214	1
233	Washington School	08	721221	1
234	Wauwatosa East High School	08	721222	7
235	Hart Park	04	721223	17
236	Hi-Mount School	08	721231	2
237	Neeskara School	08	721233	3
238	N. 49th and Juneau Totlot	04	721234	1
239	Wick Playfield	04	721234	30
240	Westside Academy I School	08	721241	2
241	31st and Lloyd	04	721241	1
242	Westside Academy II School	08	721242	1
243	N. 37th Street School	08	721243	1
244	30th and Galena	04	721244	1
245	Wisconsin Avenue School	08	721251	1
246	Story School	08	721252	2
247	Merrill Park Playfield	04	721253	12
248	Hawthorne Glen Outdoor Education Center	04	721262	22
249	Hawley Environmental School	08	721262	1
250	Jefferson School	08	721272	1
251	Juneau Junior and Senior High Schools	08	721274	2
252	Juneau Playfield	04	721274	8
253	N. 65th and Stevenson Totlot	04	721274	3
254	Wilson School	08	721281	1
255	Dyer Playfield	04	721284	7
256	Underwood School	08	721301	7
257	Walker School	08	721313	4
258	Madison School	08	721323	2
259	Burbank School and Playfield	08	721341	8
260	McKinley Playground	08	721343	3
261	Kopperud Park (East and West)	04	721343	3
262	64th and Greenfield Mini-Park	04	721344	1
263	West Milwaukee High School	08	721353	3
264	Roosevelt School	08	721353	1
265	Pershing School	08	721354	2
266	Doefler School	08	721364	1
267	S. 35th and Pierce Playlot	04	721364	2
268	Atwater School	08	72233	5
269	Atwater Park and Beach	05	72234	7
270	Cumberland School	08	72241	8
271	Lake Bluff School	08	72241	8
272	Triangle Park	05	72244	1
273	Garden Homes School and Playfield	08	72262	7
274	N. 20th St. and Olive Playlot	04	72264	4
275	King High School	08	72264	8
276	Phillipp School	08	72264	2
277	Douglas Community Academy	08	72271	2
278	Keefe School	08	72271	2
279	Franklin School	08	72272	1
280	Auer Avenue School	08	72273	4
281	21st and Keefe	04	72273	1
282	5th and Randolph	04	72281	1
283	Green Bay Playfield	04	72282	2
284	Green Bay Ave. School	08	72282	3
285	Lafollette School	08	72283	2
286	Martin Luther King Jr. School	08	72284	1
287	Shorewood Jr. and H.S.	08	72291	13
288	Hubbard Park	05	72291	6
289	River Park	05	72291	8

Table 21 (continued)

Number on Map 22	Site Name	Ownership[a]	Location[b]	Acreage
290	Fratney School	08	72293	2
291	Gaenslen School	08	72294	3
292	Nature Preserve	05	72211	7
293	Menlo Park	05	72212	1
294	Humble Park	05	72212	1
295	Library Park	05	72212	1
296	Hartford University School	08	72213	2
297	Maryland Avenue School	08	722153	2
298	Pumping Station Playfield	04	722161	13
299	Riverside High School and Playfield	08	722161	5
300	Bremen Street Totlot	04	722162	1
301	Franklin School	08	722162	2
302	Holmes School	08	722163	3
303	Malcom X Academy	08	722171	2
304	Community Health Center	08	722171	1
305	Lee School	08	722173	2
306	N. 12th and Wright Playlot	04	722173	1
307	North Division High School	08	722173	2
308	1st and Wright	04	722174	1
309	Columbia Playground	04	722181	3
310	N. 21st Street School	08	722182	3
311	N. 26th and Medford Totlot	04	722183	1
312	Wheatley School	08	722184	2
313	Franklin Square Playground	04	722184	2
314	Sharon Jr. Academy	08	722184	4
315	17th and Vine	04	722191	1
316	Lloyd Street School	08	722191	5
317	Lloyd Street Playfield	04	722191	7
318	Brown Street School	08	722192	2
319	Starms School	08	722192	1
320	Urban Waldorf School	08	722192	3
321	N. 27th Street School	08	722193	1
322	Siefert School	08	722194	2
323	Palmer School	08	72221	2
324	Garfield Avenue School	08	72221	1
325	Roosevelt Middle School and Lapham Park Playground	08	72222	8
326	Elm Creative Arts School	08	72223	3
327	Meir School	08	72224	1
328	Pulaski Street Playfield	04	722211	3
329	Reservoir Park	04	722212	37
330	Cass Street Playground	04	722213	2
331	Lincoln Middle School	08	722213	1
332	Urban Park	04	722283	5
333	Scott Middle School	08	722301	2
334	MacDowell School	08	722301	2
335	Joy House Playground	04	722301	2
336	Milwaukee High School of the Arts	08	722302	2
337	Longfellow School	08	722313	3
338	S. 18th and Washington Totlot	04	722314	1
339	Vieau Playground	04	722321	2
340	Milwaukee Trade and Technical High School	08	722321	2
341	Kagel School	08	722323	3
342	Vieau School	08	722324	1
343	4th and Mineral	04	722324	1
344	Maier Festival Park	04	722331	72
345	Fairy Chasm Park	05	82122	10
346	Village Park	05	82124	11
347	Granville School	08	82154	8
348	Goodrich School	08	82183	6
349	Bradley Woods Natural Area	04	82193	20

Table 21 (continued)

Number on Map 22	Site Name	Ownership[a]	Location[b]	Acreage
350	Happy Hill School	08	82112	5
351	Granville Woods Natural Area	04	82113	16
352	Brown Deer Public Schools	08	821113	73
353	Algonquin School	08	821141	5
354	Thoreau School and Playfield	08	821142	6
355	66th and Port	04	821151	6
356	Vincent High School and Playfield	08	821171	39
357	Maple Tree School and Playfield	08	821203	8
358	Stuart School	08	821212	3
359	Bruce School and Playfield	08	821213	5
360	N. 84th and Burbank Playlot	04	821213	1
361	Milwaukee Sign Language School	08	821214	1
362	Burroughs Middle School and Playfield	08	821214	8
363	N. 67th and Spokane Playlot	04	821221	2
364	Clovernook Playfield	04	821223	7
365	Barton School and Playfield	08	821232	5
366	Webster Middle School	08	821232	17
367	Darien and Kiley Playlot	04	821242	3
368	Hawthorn School	08	821242	3
369	Berryland Playground	04	821252	2
370	40th and Douglas	04	821252	1
371	Carleton School	08	821253	3
372	Thurston Woods Campus	08	821254	3
373	Carmen Playfield	04	821273	4
374	Richard Kluge School	08	821274	4
375	90th and Bender	04	821282	3
376	84th and Florist	04	821283	1
377	Bryant School and Playfield	08	821283	11
378	Madison University High School	08	821284	5
379	N. 97th and Thurston Playlot	04	821294	1
380	River Trail School	08	821303	6
381	Parkview School and Playfield	08	821314	5
382	Browning School and Playfield	08	821331	5
383	Engleburg School	08	821333	2
384	Grantosa School	08	821334	5
385	Byron Kilbourn School	08	821341	3
386	Westlawn Playground	04	821341	5
387	John Muir Middle School	08	821342	5
388	Lancaster School and Playfield	08	821343	5
389	Hampton School and Playfield	08	821353	10
390	Custer High School and Stadium	08	821354	19
391	Custer Playfield	04	821362	5
392	Edison Middle School	08	821362	1
393	Stark Playfield	04	821363	5
394	Bayside Middle School	08	82243	5
395	Ellsworth Park	05	82243	8
396	Village Hall Open Space	05	82254	14
397	Indian Hill School	08	82282	4
398	Mapledale School	08	82284	6
399	Indian Creek Park	05	82284	7
400	Open Space	05	82292	5
401	Bradley Road-Lake Drive Park	05	822162	1
402	Longacre Park South	05	822163	4
403	Stormonth School	08	822163	9
404	Longacre Pavilion and Park	05	822163	5
405	Dunwood School	08	822171	7
406	Good Hope Elementary School	08	822192	7
407	Glen Hills School	08	822193	10

Table 21 (continued)

Number on Map 22	Site Name	Ownership[a]	Location[b]	Acreage
408	Nicolet High School	08	822201	20
409	Village Swimming Pool	05	822212	6
410	Richards School	08	822283	4
411	Silver Spring Park	05	822283	1
412	Klode Park	05	822283	11
413	Water Tower Park	05	822291	6
414	City Hall Park	04	822301	7
415	Glendale Recreational Complex	04	822302	35
416	Parkway School	08	822304	7
417	Long Island Drive Totlot	04	822311	1
418	McNair Academy School and Playfield	08	822313	5
419	Silver Spring School	08	822314	3
420	Lydell School	08	822321	4
421	Whitefish Bay Armory	05	822331	4
422	Whitefish Bay Middle School	08	822331	2
423	School House Park	05	822332	1
424	Cahill Square (East Half)	05	822333	5
425	Cahill Square (West Half)	08	822333	4
426	Buckley Park	05	822334	2
427	Whitefish Bay High School	08	822334	8
- -	Total–427 Sites	- -	- -	2,942

[a]*The ownership code numbers signify the following: 04-City, 05-Village, 06-Town, and 08-School District.*

[b]*The location numbers represent the U.S. Public Land Survey Township, Range, and Section in which the site is located.*

Source: SEWRPC.

CULTURAL RESOURCES

Cultural resources are evidence of past human activities and they are unique and nonrenewable. Cultural resources encompass historic buildings, structures and sites; and archaeological sites. Cultural resources in Milwaukee County have important recreational and educational value. Cultural resources help to provide the County and each of its distinct communities with a sense of heritage, identity, and civic pride. Resources such as historical and archaeological sites and historic districts can also provide economic opportunities through tourism.

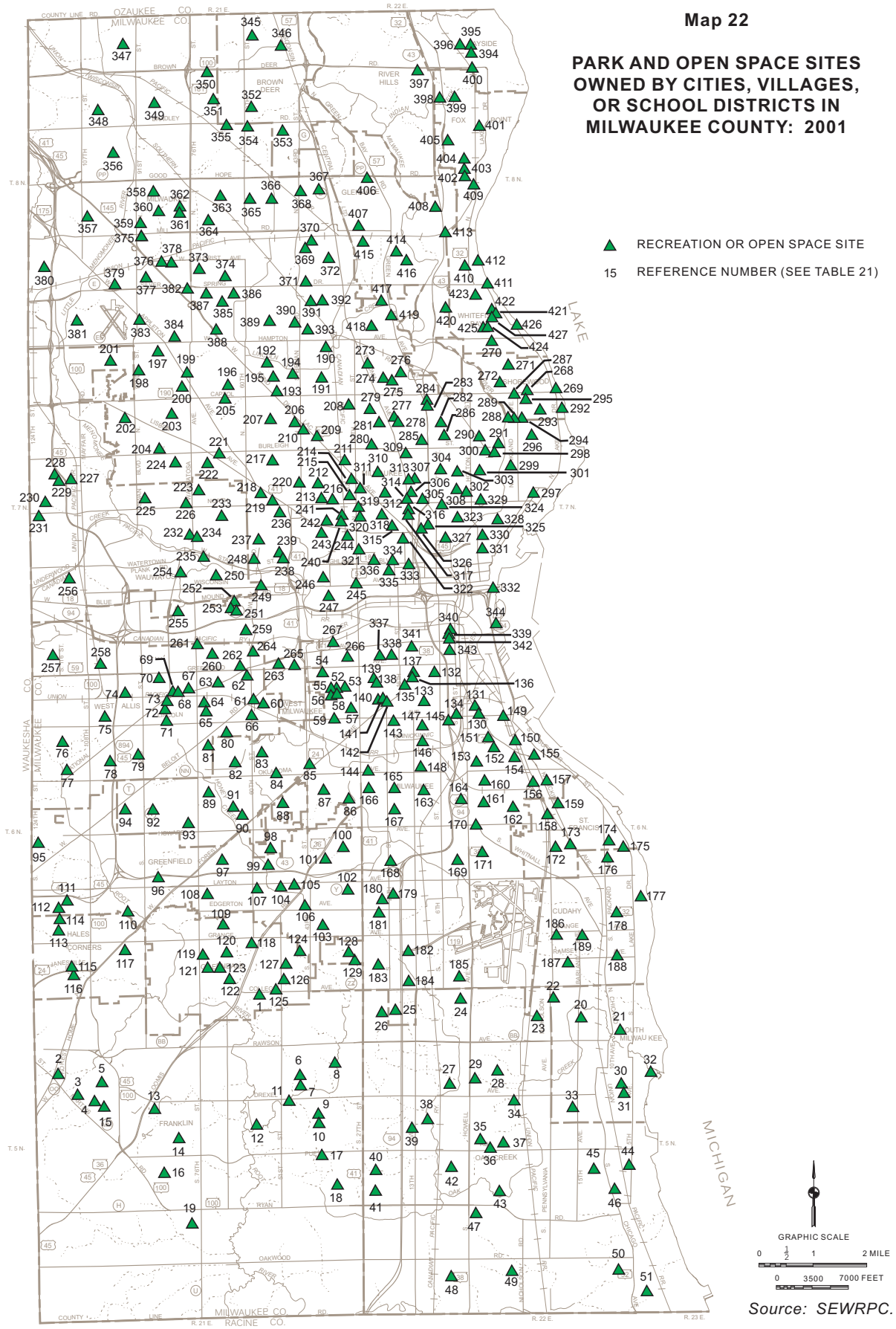
The NRCS is specifically required by the National Historical Preservation Act, the National Environmental Policy Act, and various other State and Federal laws to consider the impacts its conservation programs may have on cultural resources. To insure protection, NRCS may require a cultural resource inventory as part of the conservation planning process. A qualified professional cultural resource consultant will prepare an inventory and report, which is submitted to the Wisconsin State Historic Preservation Office (SHPO). SHPO determines the eligibility of historical or archaeological site(s). The U.S. Army Corps of Engineers is also required by Federal law to protect cultural resources and cannot permit a wetland disturbance without a cultural resource assessment. New development, therefore, requires a detailed description of all structures or areas of archaeological or historic interest on the proposed site, and a detailed explanation of how the development will affect such structures or areas. To protect and preserve cultural resources, recommendations are made during the preliminary planning process to move roads, redesign structures, or change practices to avoid adverse effects to cultural resources.

Historical Resources

In 2010 there were 246 historic places and districts in the County listed on the National Register of Historic Places and the State Register of Historical Places. Of the 246 historic places and districts listed on the National

Map 22

PARK AND OPEN SPACE SITES OWNED BY CITIES, VILLAGES, OR SCHOOL DISTRICTS IN MILWAUKEE COUNTY: 2001



Source: SEWRPC.

Table 22

PRIVATE OUTDOOR RECREATION AND OPEN SPACE SITES IN MILWAUKEE COUNTY: 2001

Number on Map 23	Site Name	Ownership[a]	Location[b]	Acreage
1	St. Paul's Lutheran Church and School	10	52123	4
2	Parkway Stables, Inc.	11	52142	6
3	Hales Corners Speedway	11	52161	45
4	Quarry View Park	10	521104	5
5	St. James Catholic Church and Preschool	10	521121	5
6	Tuckaway Country Club	12	521151	226
7	St. Martin of Tours Parish School	10	521182	7
8	Polonia Club Park	10	521202	22
9	Croatian Park	10	521223	19
10	Jubilee Christian Church and School	10	521243	3
11	St. Sylvester School	10	522021	5
12	St. Mary School	10	522112	1
13	Zion School	10	522142	3
14	Grace Lutheran School	10	522153	6
15	American Legion Park	10	522213	20
16	St. Matthews School	10	522234	5
17	St. John's Lutheran School	10	522312	3
18	Oak Hills Golf Course	11	522332	35
19	Woodland Golf Course	11	522341	31
20	Parkway Christian Academy	10	522343	2
21	St. Aloysius School	10	62151	1
22	Woodlawn Lutheran School	10	62154	1
23	Holy Trinity Lutheran School	10	62173	2
24	Mary Queen of Heaven School	10	62182	1
25	Jordan Evangelical Lutheran School	10	62193	1
26	Gethsemane School	10	621124	1
27	Alverno College Grade School	10	621132	22
28	Oklahoma Avenue Lutheran School	10	621142	1
29	United Serbian Soccer Club	10	621142	13
30	St. Gregory the Great Parish School	10	621151	4
31	St. Matthias School	10	621171	3
32	YMCA-Southern Branch	10	621191	18
33	Faith Bible Church	10	621192	1
34	St. John's Catholic School	10	621212	9
35	St. John's Lutheran School	10	621222	5
36	Willows Golf Range	11	621241	11
37	Edgerton Park	12	621274	16
38	Martin Luther High School	10	621284	19
39	St. Mary School	10	621294	2
40	Hales Corners Lutheran School	10	621304	1
41	St. Alphonsus School	10	621341	3
42	Village Club	12	621343	10
43	Greendale Community Center	12	621343	20
44	Jaycee Park	10	621344	5
45	Our Father Lutheran School	10	621364	4
46	St. Vincent de Paul School	10	62262	1
47	St. Adalbert School	10	62264	1
48	Immaculate Conception School	10	62291	1
49	St. Augustine School	10	62292	1
50	St. Francis De Sales College	10	622142	20
51	Sacred Heart of Jesus School	10	622154	1
52	Thomas Moore High School	10	622154	12
53	Centennial Lutheran School	10	622183	1
54	St. Roman School	10	622191	3
55	St. Paul's Lutheran School	10	622234	1

Table 22 (continued)

Number on Map 23	Site Name	Ownership[a]	Location[b]	Acreage
56	St. Joseph School	10	622261	1
57	Ladish Little League Park	10	622352	3
58	YMCA	10	622353	13
59	Atonement Lutheran School	10	72112	1
60	Our Lady of Sorrow School	10	72134	2
61	Northwest Lutheran School	10	72144	4
62	Milwaukee Lutheran High School	10	72151	14
63	Divine Savior/Holy Angels High School	10	72153	9
64	Gloria Dei-Bethesda School	10	72154	1
65	St. Aemilian, Rose, and Mary Schools	10	72192	10
66	St. Matthew School	10	72192	1
67	St. Anne School	10	721133	1
68	St. Catherine School	10	721143	1
69	Mother of Good Counsel School	10	721152	3
70	St. Pius X School	12	721153	2
71	Pilgrim Lutheran School	10	721154	1
72	Christ King School	10	721163	1
73	Mount Mary College	10	721171	75
74	Bluemound Country Club	12	721172	194
75	St. Joseph's School	10	721182	6
76	Our Redeemer Lutheran School	10	72122	1
77	St. Johns Evangelical Lutheran School	12	721214	1
78	Revere Drive Park	12	721221	1
79	St. Bernard School	12	721223	1
80	Washington Highlands Parkway	12	721224	5
81	St. Sebastian School	10	721232	1
82	Marquette Stadium	10	721253	9
83	St. Rose School	10	721254	1
84	Sacred Heart School	10	721261	1
85	Holy Cross School	10	721263	3
86	St. Jude's School	10	721281	1
87	Wisconsin Lutheran High School	10	721284	7
88	Heritage Christian School	10	721314	1
89	Good Shepard School	10	721323	1
90	St. Florian's School	10	721354	1
91	Gospel School	10	72271	1
92	Urban Day School	10	72282	2
93	Saints Peter and Paul School	10	722153	1
94	Marquette University Athletic Fields	10	722304	13
95	YMCA Aquatic Center	10	82112	46
96	North Ridge Lakes	12	82132	55
97	St. Mark Lutheran School	10	821101	1
98	St. Catherine School	10	821102	2
99	River Tennis Club	12	821121	5
100	Shoreland Community Church	10	821122	3
101	Tripoli Country Club	12	821144	152
102	Johnsons Park	11	821153	6
103	Brynwood Golf Course	12	821154	184
104	Joy Farm Riding Club	11	821192	33
105	Salem Lutheran School	10	821202	5
106	St. Bernadette School	10	821211	10
107	St. Peter's Lutheran School	10	821214	4
108	Our Lady of Good Hope School	10	821242	4
109	North Trinity Lutheran School	10	821251	2
110	Christ Memorial School	10	821254	1
111	Northwest Little League	10	821322	13
112	Corpus Christi School	10	821333	4
113	St. Philip Neri School	10	821342	4
114	Mt. Lebanon School	10	821344	2
115	Mother of Perpetual Help School	10	821353	2

Table 22 (continued)

Number on Map 23	Site Name	Ownership[a]	Location[b]	Acreage
116	University School	12	82262	22
117	Milwaukee Country Club	12	82273	202
118	Schlitz Audubon Center	10	82291	167
119	Town Club	12	822162	8
120	St. Eugene School	10	822171	4
121	St. John's Lutheran School	10	822171	2
122	Le Club	12	822191	9
123	Cardinal Stritch College	10	822201	16
124	Karl Jewish Community Campus	10	822291	16
125	St. Monica School/Whitefish Bay Dominican H.S.	10	822294	4
126	Glendale Little League Park	10	822304	5
127	Eastbrook School	10	822311	1
128	Bavarian Club Grounds	12	822322	19
129	Holy Family Parish School	10	822334	2
- -	Total–129 Sites	- -	- -	2,079

[a]*The ownership code numbers signify the following: 10-Organizational; 11-Commercial; 12-Private.*

[b]*The location numbers represent the U.S. Public Land Survey Township, Range and Section in which the site is located.*

Source: SEWRPC.

and State Registers, 189 are historic buildings or structures, 47 are historic districts, and 10 are historic sites. Sites and districts listed on the National and State Registers of Historic Places have an increased measure of protection against degradation and destruction. Listing on the National or State Register requires government agencies to consider the impact of their activities, such as the construction or reconstruction of a highway, or a permit which they issue, on the designated property. If the property would be adversely affected, the agency must work with the State Historic Preservation Officer to attempt to avoid or reduce adverse effects.

The 246 historic places and districts listed on the National and State registers of historic places are only a small fraction of the buildings, structures, and districts listed in the Wisconsin Architecture and History Inventory. The Wisconsin Architecture and History Inventory is a database administered by the State Historical Society of Wisconsin that contains historical and architectural information on approximately 120,000 properties statewide. The listed sites have architectural or historical characteristics that may make them eligible for listing on the National and State registers of historic places. In 2010 there were 23,360 properties in Milwaukee County included in the Wisconsin Architecture and History Inventory. The inventory can be accessed through the State of Wisconsin Historical Society website at *www.wisconsinhistory.org/ahi.*

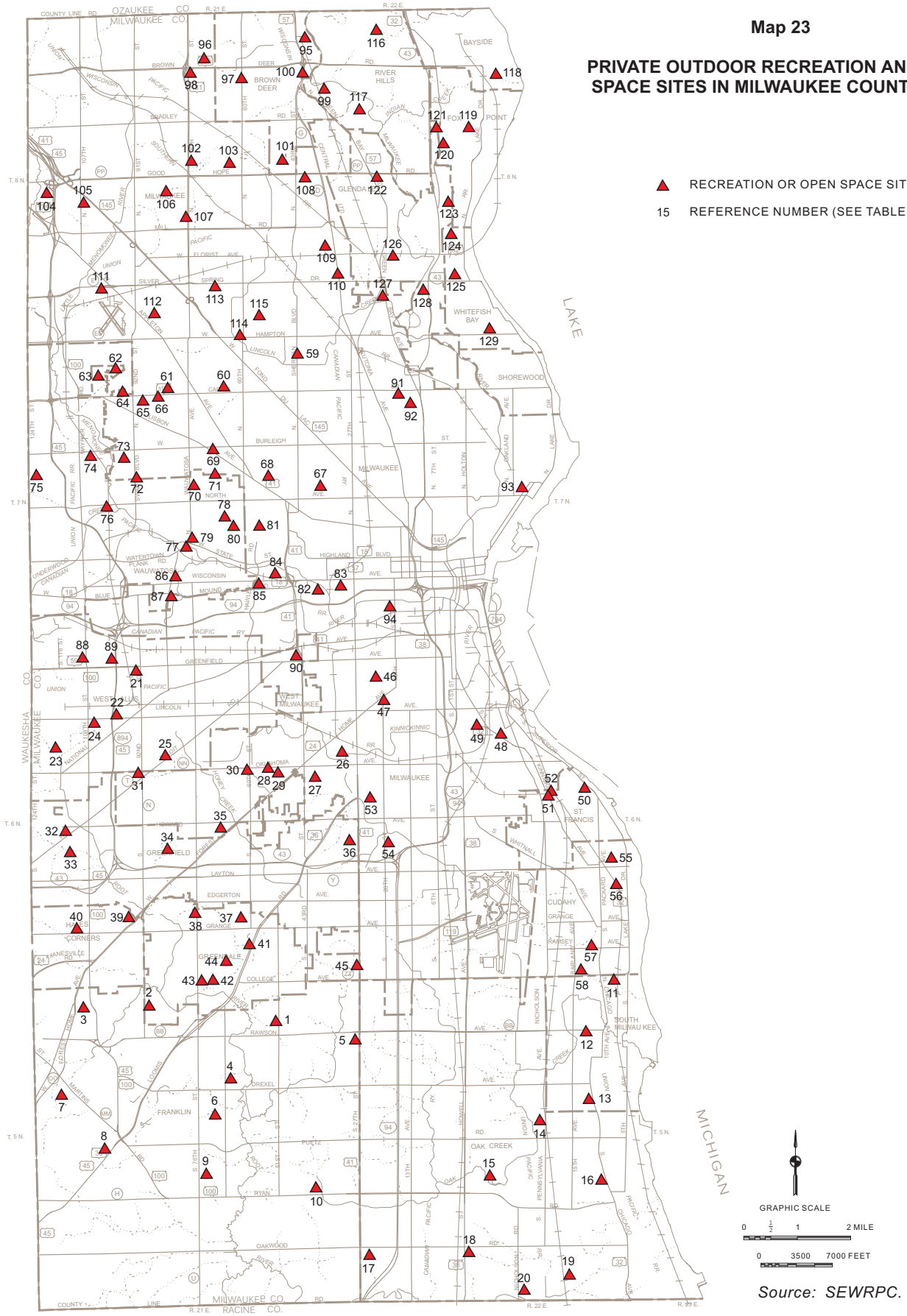
Archaeological Resources

Preservation of archaeological resources is also important in preserving the cultural heritage of Milwaukee County. Like historical sites and districts, significant prehistoric and historic archaeological sites provide the County and each of its communities with a sense of heritage and identity, which can provide for economic opportunities through tourism if properly identified and preserved. Archaeological sites found in Milwaukee County fall under two categories: prehistoric sites and historic sites. Prehistoric sites are defined as those sites which date from before written history. Historic sites are sites established after history began to be recorded in written form (the State Historical Society of Wisconsin defines this date as A.D. 1650).

As of October 2010, there were 589 known prehistoric and historic archaeological sites in Milwaukee County listed in the State Historical Society's Archaeological Sites Inventory, including prehistoric and historic camp sites, villages, and farmsteads; marked and unmarked burial sites; and Native American mounds.

Map 23

PRIVATE OUTDOOR RECREATION AND OPEN SPACE SITES IN MILWAUKEE COUNTY: 2001



Source: SEWRPC.

DEMOGRAPHICS AND LAND USE

Demographics

The historical and current population of Milwaukee County is set forth in Table 23. Between 1850 and 1890, the total population in Milwaukee County increased rapidly from 31,077 to 236,101 residents. The County experienced less rapid growth rates in the decades between 1890 and 1930, with population gains during these decades being between about 25 percent and almost 40 percent. Growth stagnated during the 1930s Depression Era, but picked up again during the decades from 1940 to 1960, including a population gain of almost 19 percent from 1950 to 1960. Rapid growth during this period can be attributed to both the migration of new residents to Milwaukee County and the natural increase of the existing population (more births than deaths). After World War II, the existing population grew as soldiers returned home and began families, creating the baby-boom generation. Federal subsidies for home ownership led to suburban migration, as families sought newer single-family homes outside the central city. Federal legislation adopted in 1956 led to the construction of a new network of freeways and expressways, providing convenient highway access between suburbs and central city areas. The County‘s growth slowed between 1960 and 1970 to a rate of about 2 percent. In each of the decades between 1970 and 2010, the population of the County has decreased. Between 1970 and 1980, the decrease was greater than 8 percent. In the each of the decades since 1980, the decreases were 2 percent or less. The Wisconsin Department of Administration (DOA) estimates that the County population in January 2010 was 928,449 residents.

The historical growth and development of Milwaukee County is depicted on Map 24. As shown on that map, urban development in the County was largely confined to the City of Milwaukee area along Lake Michigan and the Menomonee and Milwaukee Rivers before 1850. Over the next 50 years, from 1850 to 1900, as public water and sewer systems, electricity, telephone, and gas used for cooking and heating became available, growth continued in the City of Milwaukee area. Additional growth also occurred away from the historic downtown center of Milwaukee with an emergence of small urban, centers in the Cities of Cudahy, Wauwatosa, and South Milwaukee and the Villages of Hales Corners and Whitefish Bay. Between 1900 and 1950, urban development continued to expand outward from the City of Milwaukee as well as around the smaller urban centers. During the period between 1950 and 1963, significant growth was experienced adjacent to existing urban areas and in scattered enclaves in the southern part of the County. In the decades after 1963, scattered urban development continued to occur throughout the County, particularly in the southern and northwestern portions of the County.

Land Use

Soil erosion problems, water pollution problems, land use conflicts, including recreational use and the risk of damage to the environment, as well as the ultimate means for abatement of these problems, are primarily a function of human activities within the County, and of the ability of the underlying natural resource base to sustain those activities. This becomes especially significant in areas that are in close proximity to lakes, wetlands, and streams. Accordingly, the land uses and attendant population levels in the County are important considerations in the development of Milwaukee County’s land and water resource management plan. The Regional Planning Commission’s land use inventory delineates and quantifies the area devoted to various urban and nonurban land uses throughout the Southeastern Wisconsin Region. The initial regional land use inventory was completed in 1963, while the most recent inventory was completed in 2000. Existing land uses in the County in 2000 are shown on Map 25 and are quantitatively summarized in Table 24.

Urban Land Uses

Urban land uses consist of residential; commercial; industrial; governmental and institutional; and transportation, communication, and utility uses. As indicated in Table 24 and on Map 25, urban land uses encompassed about 115,057 acres, or about 74 percent of the County, in 2000. Residential land uses comprised the largest urban land use category in the County, encompassing 50,834 acres, or about 44 percent of all urban land and about 33 percent of all land in the County. Commercial land uses encompassed about 7,100 acres or about 6 percent of all urban land and about 5 percent of all land in the County. Industrial land uses encompassed about 7,604 acres or about 7 percent of all urban land and about 5 percent of all land in the County. Land used for transportation, utilities, and communications facilities encompassed about 33,549 acres, or about 29 percent of all

Table 23

HISTORICAL POPULATION OF MILWAUKEE COUNTY: 1850-2010

Year	Population	Change from Preceding Census	
		Number	Percent
1850	31,077	- -	- -
1860	62,518	31,441	101.2
1870	89,930	27,412	43.8
1880	138,538	48,608	54.1
1890	236,101	97,563	70.4
1900	330,017	93,916	39.8
1910	433,187	103,170	31.3
1920	539,449	106,262	24.5
1930	725,263	185,814	34.4
1940	766,885	41,622	5.7
1950	871,047	104,162	13.6
1960	1,036,041	164,994	18.9
1970	1,054,249	18,208	1.8
1980	964,249	-89,261	-8.5
1990	959,275	-5,713	-0.6
2000	940,164	-19,111	-2.0
2010	928,449[a]	-11,715	-1.2

[a]*Wisconsin Department of Administration estimate for January 1, 2010.*

Source: U.S. Bureau of the Census and SEWRPC.

urban land and about 22 percent of all land in the County. Land used for government and institutional uses encompassed about 8,222 acres, or about 7 percent of all urban land and about 5 percent of all land in the County. Intensively used recreational land encompassed about 7,748 acres, or about 7 percent of all urban land and about 5 percent of all land in the County.

Nonurban Land Uses

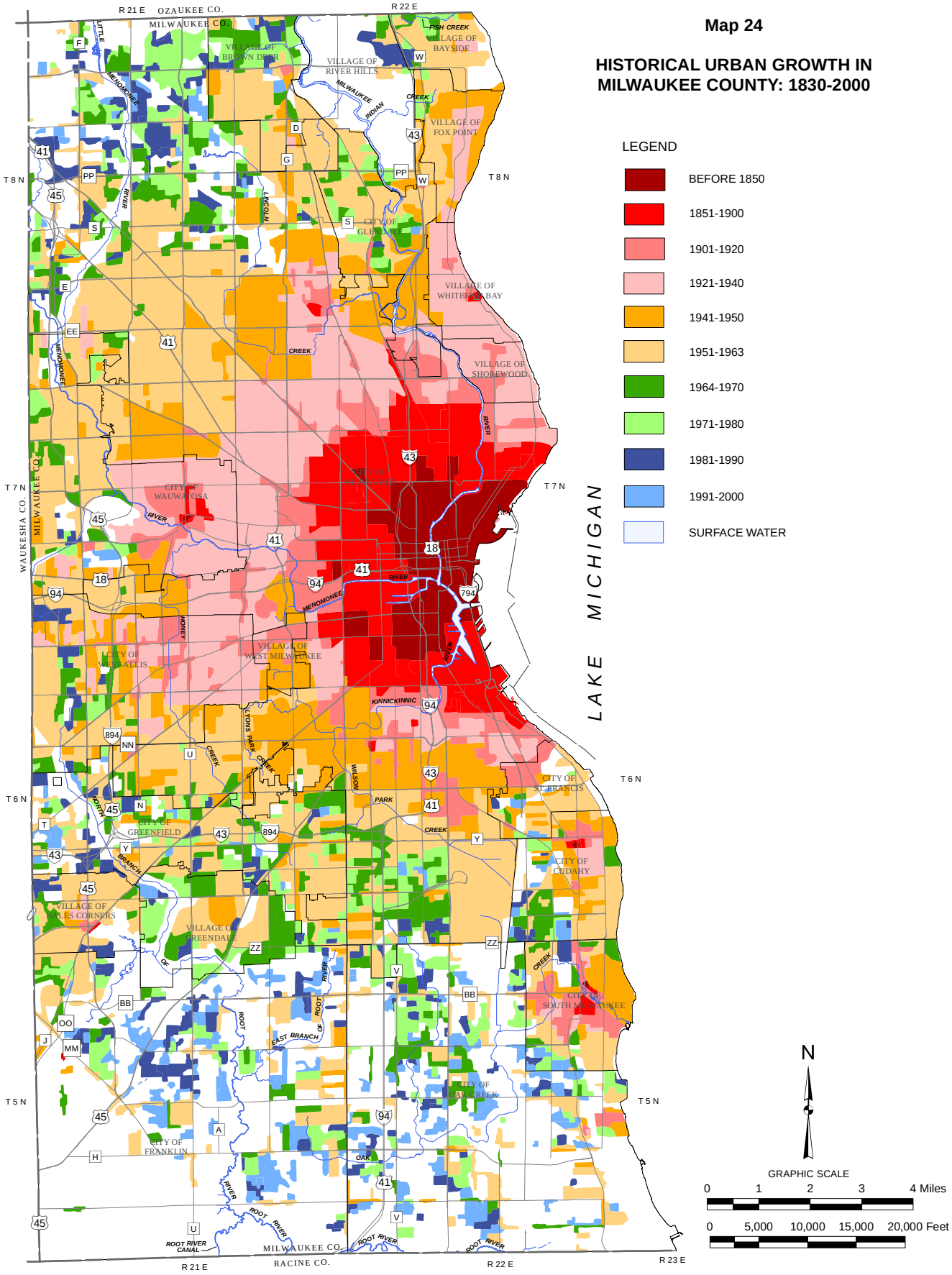
Nonurban land uses consist of agricultural lands; natural resource areas, including surface waters, wetlands, and woodlands; quarries and landfills; and open land. As indicated in Table 24 and on Map 25, nonurban land uses encompassed about 40,285 acres, or about 26 percent of the County in 2000. Agricultural land encompassed 12,921 acres, or about 32 percent of nonurban land uses and about 8 percent of all land in the County. As indicated on Map 25, most of the existing agricultural land is located in the Cities of Franklin and Oak Creek. Agricultural lands include all croplands, pasture lands, orchards, nurseries, and nonresidential farm buildings.

Natural resource areas, consisting of surface water, wetlands, and woodlands, encompassed 11,142 acres, or about 28 percent of nonurban land uses and about 7 percent of all land in the County in 2000. Natural resource areas are located in the southern and northern portions of the County and along major streams and rivers. In 2000, Milwaukee County contained 5,279 acres of wetland, representing about 13 percent of nonurban land uses and about 3 percent of all land in the County, and 4,565 acres of woodland, representing about 11 percent of nonurban land uses and about 3 percent of all land in the County. The remaining 1,298 acres of natural resource areas consisted of surface water, which represented about 3 percent of nonurban land uses and less than 1 percent of all land in the County.

The remaining 16,222 acres consisted of a combination of quarries and other extractive lands, landfills, and open lands. In 2000, these lands represented about 40 percent of nonurban land uses and about 10 percent of all land in the County.

Map 24

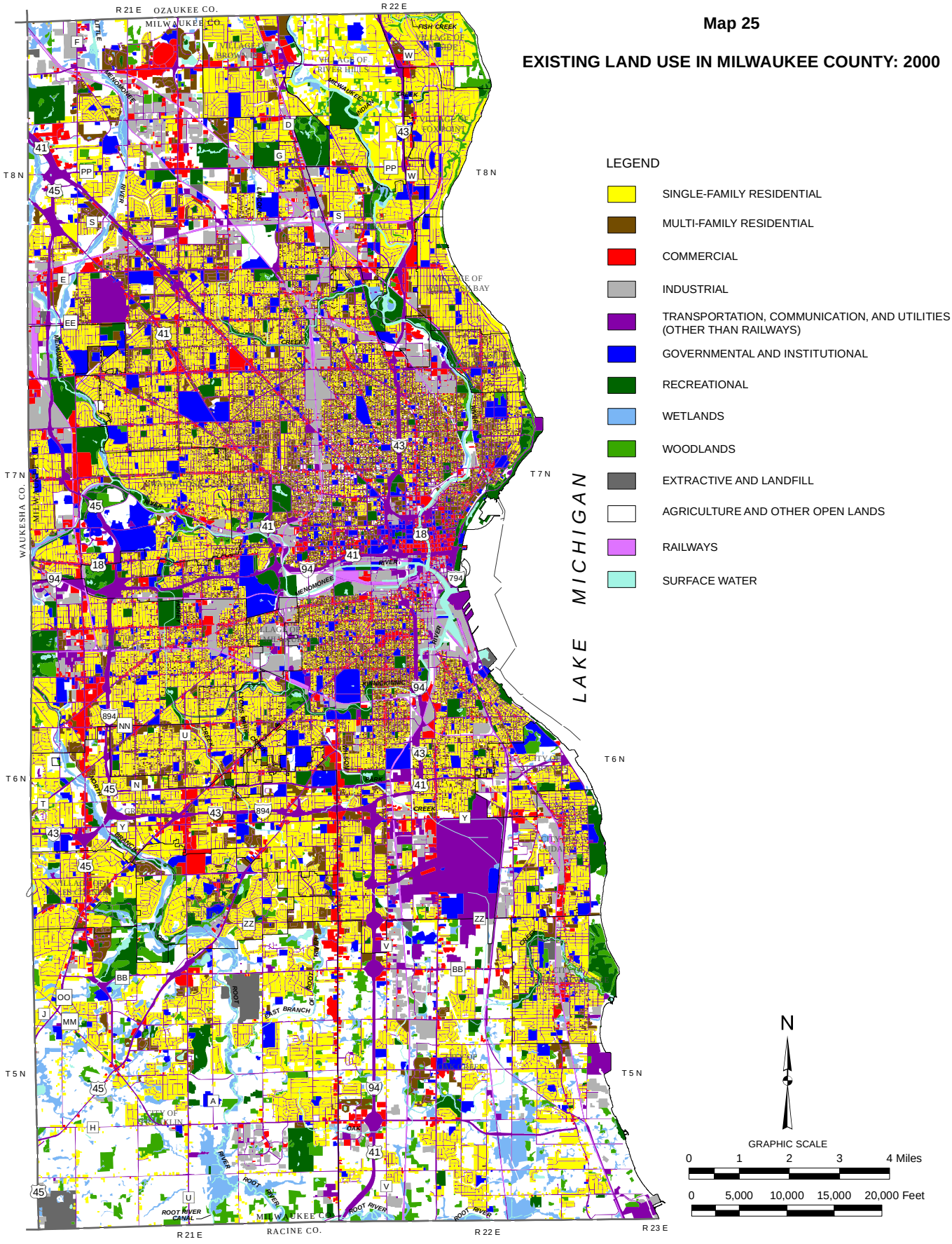
HISTORICAL URBAN GROWTH IN MILWAUKEE COUNTY: 1830-2000



Source: SEWRPC.

Map 25

EXISTING LAND USE IN MILWAUKEE COUNTY: 2000



Source: SEWRPC.

Table 24

LAND USE IN MILWAUKEE COUNTY: 2000

Land Use Category[a]	Area (acres)	Percent of Subtotal (urban or nonurban)	Percent of Total
Urban			
Residential	50,834	44.2	32.8
Commercial	7,100	6.2	4.6
Industrial	7,604	6.6	4.9
Transportation, Communication, and Utilities	33,549	29.2	21.6
Governmental and Institutional[b]	8,222	7.1	5.3
Recreational[c]	7,748	6.7	5.0
Urban Subtotal	115,057	100.0	74.2
Nonurban			
Agricultural	12,921	32.1	8.3
Woodlands	4,565	11.3	2.9
Wetlands	5,279	13.1	3.4
Surface Water	1,298	3.2	0.8
Extractive, Landfills, and Open Lands	16,222	40.3	10.4
Nonurban Subtotal	40,285	100.0	25.8
Total	155,342	- -	100.0

[a]*Off-street parking is included in associated land use areas.*

[b]*Includes public and private schools, government offices, police and fire stations, libraries, cemeteries, religious institutions, hospitals, nursing homes, and similar facilities.*

[c]*Includes only land which is intensively used for recreational purposes.*

Source: SEWRPC.

Chapter III

RELATED PLANS, REGULATIONS, AND PROGRAMS

The updated Milwaukee County land and water resource management plan is built upon the initial plan and its previous update and complements other planning and resource management efforts and programs linking local level planning with regional and watershed level plans. The plan, therefore, provides an integrated framework within which Milwaukee County will conduct activities to protect and rehabilitate the land and water resource base of the County and contribute to the environmentally sound management of these valuable resources in a coordinated manner that is compatible with watershedwide needs and resource management programs. One of the first steps to be undertaken in the land and water resource management planning program is the inventory, collation, and review of the recommendations of relevant previously prepared reports and plans.

There are a number of plans which focus on the natural resources of Milwaukee County. These plans include programs which address the interconnection of the natural resources of Milwaukee County with those of the related watersheds and the Southeastern Wisconsin Region, as well as the importance of natural resources at the County and community level. The plans collated and reviewed for input into this current planning program were generally most relevant to actions undertaken by the County or potentially to be undertaken by the County. In addition, selected plans prepared at the local level, including local land use plans, park and open space plans, lake and water quality management plans, and sewer service area plans prepared for individual communities or for special-purpose units of government were considered. All of these documents provide the basis for developing an integrated scheme for the sustainable management of the natural resources of Milwaukee County through the coordinated efforts of Federal, State, County, and local governments, special-purpose units of government, and community groups. The land and water resource management plan provides an opportunity to promote detailed action at the local level while achieving strategic objectives within the boundaries of Milwaukee County, its watersheds, and the Southeastern Wisconsin Region. This plan takes into account planning objectives identified by local officials and also those reflected in locally adopted land use plans and ordinances. Accordingly, an important step in the planning process was a review of the existing framework of areawide and local plans and related land use regulations. This chapter presents a summary of that review.

REGIONAL PLANS

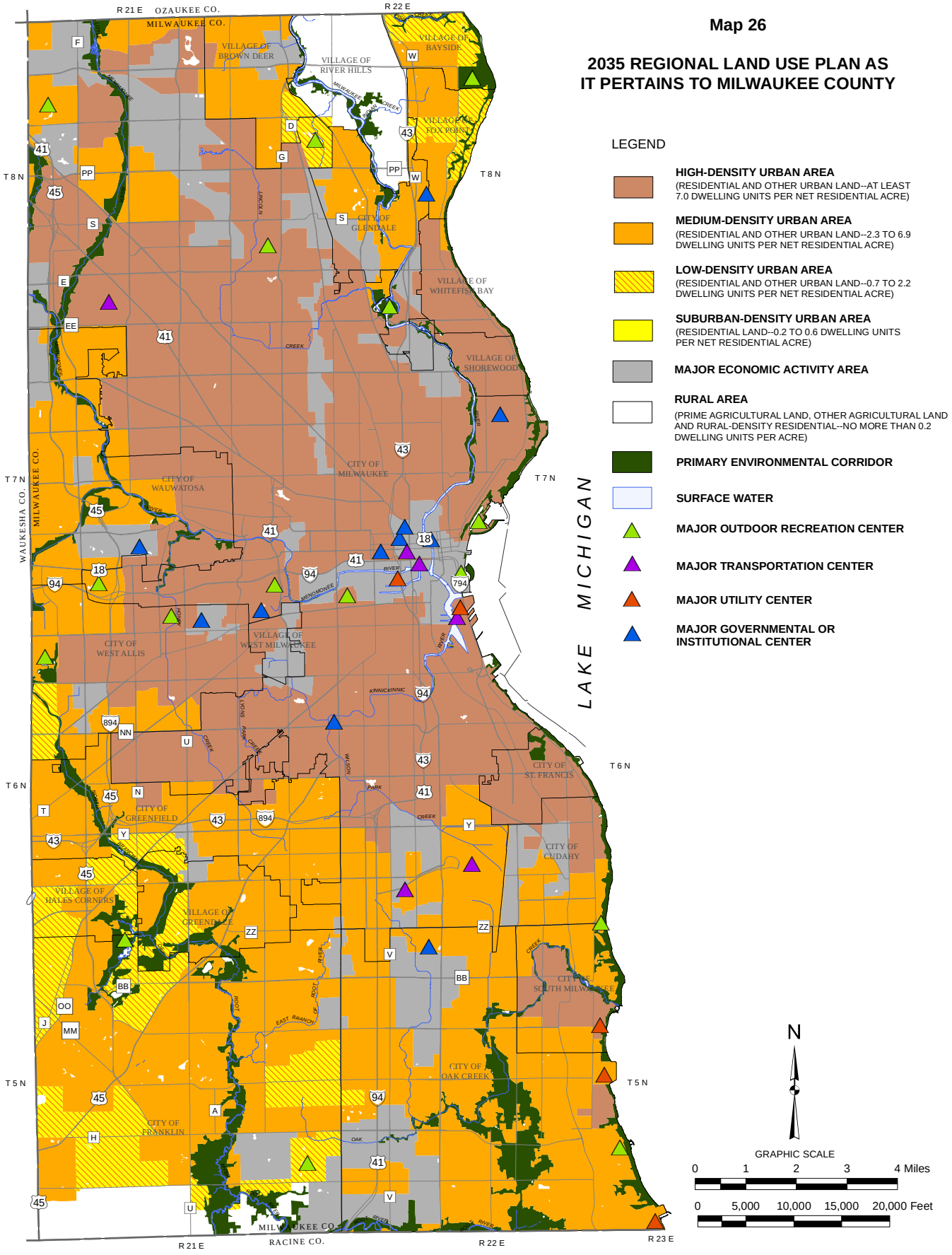
Regional Land Use Plan

The regional land use plan sets forth the fundamental concepts that are recommended to guide the development of the seven-county Southeastern Wisconsin Region. Recommended 2035 land uses in Milwaukee County are shown on Map 26.[1] The key recommendations of the regional land use plan include:

[1]*SEWRPC Planning Report No. 48,* A Regional Land Use Plan for Southeastern Wisconsin: 2035, *June 2006.*

Map 26

2035 REGIONAL LAND USE PLAN AS IT PERTAINS TO MILWAUKEE COUNTY



LEGEND

- **HIGH-DENSITY URBAN AREA** (RESIDENTIAL AND OTHER URBAN LAND--AT LEAST 7.0 DWELLING UNITS PER NET RESIDENTIAL ACRE)
- **MEDIUM-DENSITY URBAN AREA** (RESIDENTIAL AND OTHER URBAN LAND--2.3 TO 6.9 DWELLING UNITS PER NET RESIDENTIAL ACRE)
- **LOW-DENSITY URBAN AREA** (RESIDENTIAL AND OTHER URBAN LAND--0.7 TO 2.2 DWELLING UNITS PER NET RESIDENTIAL ACRE)
- **SUBURBAN-DENSITY URBAN AREA** (RESIDENTIAL LAND--0.2 TO 0.6 DWELLING UNITS PER NET RESIDENTIAL ACRE)
- **MAJOR ECONOMIC ACTIVITY AREA**
- **RURAL AREA** (PRIME AGRICULTURAL LAND, OTHER AGRICULTURAL LAND AND RURAL-DENSITY RESIDENTIAL--NO MORE THAN 0.2 DWELLING UNITS PER ACRE)
- **PRIMARY ENVIRONMENTAL CORRIDOR**
- **SURFACE WATER**
- **MAJOR OUTDOOR RECREATION CENTER**
- **MAJOR TRANSPORTATION CENTER**
- **MAJOR UTILITY CENTER**
- **MAJOR GOVERNMENTAL OR INSTITUTIONAL CENTER**

Source: SEWRPC.

Environmental Corridors
The regional land use plan recommends that development within primary environmental corridors be limited to transportation and utility facilities, compatible outdoor recreational facilities, and, on a limited basis, rural density housing located at the fringes of upland environmental corridor using conservation design principles at a maximum density of one dwelling unit per five acres. The plan further recommends the preservation, to the extent practicable, of the remaining secondary environmental corridors and isolated natural resource areas, as determined through county and local planning efforts. Primary environmental corridors are shown on Map 20 in Chapter II of this report. The regional land use plan recommends preservation of the remaining primary environmental corridors in essentially natural and open land uses.

Urban Development
The regional land use plan recommends a centralized regional settlement pattern within defined urban service areas. New urban development is encouraged to occur largely as infill in existing urban centers and in urban growth areas emanating outward from existing urban centers. The regional plan also recommends that existing developed areas be conserved and enhanced; that new urban development occur at densities which can efficiently and effectively support public sanitary sewerage, water supply, and other services; and that urban development occur only in those areas that are covered by soils suitable for such development and which are not subject to special hazards such as flooding or erosion.

Prime Agricultural Land
The regional land use plan recommends that prime agricultural land be preserved for long-term agricultural use and not be converted to either urban development or to other forms of rural development. An exception is prime agricultural land located adjacent to existing urban centers and within planned urban growth/sewer service areas, which is proposed to be converted to urban use to provide for orderly growth of those urban centers. The regional plan defers to county plans to identify prime agricultural land. The park and open space plan[2] for Milwaukee County calls for the preservation of the identified prime agricultural lands in Milwaukee County, all of which are located in the southern portion of the City of Franklin. Prime agricultural land is identified under the Milwaukee County park and open space plan, which was adopted in 1992.

Other Agricultural and Rural-Density Residential Lands
In addition to preserving prime agricultural lands and environmental corridors, the regional land use plan seeks to maintain the rural character of other lands located outside planned urban service areas. The plan encourages continued agricultural and other open space uses in such areas. The plan seeks to limit development in such areas primarily to rural-density residential development, with an overall density of no more than one dwelling unit per five acres. Where rural residential development is accommodated, the regional plan encourages the use of conservation design, with homes grouped together on relatively small lots surrounded by permanently preserved agricultural, recreational, or natural resource areas such as woodlands, wetlands, or prairies sufficient to maintain the maximum recommended density of no more than one home per five acres.

Regional Transportation System Plan
The regional transportation system plan[3] is intended to provide a vision for, and guide to, transportation system development in the Region for 20 or more years into the future. It is a multimodal plan of recommended transportation actions designed to address existing and anticipated future transportation problems and needs. The 2035 regional transportation plan consists of four principal elements: public transit, systems management, bicycle and pedestrian facilities, and arterial streets and highways. Future needs for transit, street and highway, and other

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[2]*SEWRPC Community Assistance Planning Report No. 132,* A Park and Open Space Plan for Milwaukee County, *November 1991. This plan is currently being updated and revised.*

[3]*SEWRPC Planning Report No. 49,* A Regional Transportation System Plan for Southeastern Wisconsin: 2035, *June 2006.*

transportation improvements considered in the regional transportation planning process are derived from the future growth proposed in the regional land use plan.

Regional Natural Areas Plan

The regional natural areas plan[4] as it pertains to Milwaukee County is depicted in Map 19 in Chapter II of this report. The natural areas plan identifies the most significant remaining natural areas, critical species habitats, geological sites, and archaeological sites in the Region, and recommends means for their protection and management. The plan identifies potential sites to be placed in public or private protective ownership, and other sites to be protected, insofar as it is possible, through zoning or other regulatory means without protective ownership. It also recommends that a detailed management plan be prepared and implemented for each site placed under protective ownership. The Milwaukee County Board adopted the natural areas plan in 1998. An inventory of natural areas, critical species habitat sites, and geological areas in the County is included in Chapter II of this report. The regional natural areas plan makes recommendations for the acquisition and protective ownership of several natural areas and critical species habitat sites in Milwaukee County. These recommendations are summarized on Map 19 in Chapter II of this report.

Regional Park and Open Space Plan

The regional park and open space plan consists of two basic elements: an open space preservation element and an outdoor recreation element.[5] The open space preservation element consists of recommendations for the preservation of primary environmental corridors within the Region. The outdoor recreation element consists of a resource-oriented outdoor recreation element which provides recommendations for the number and location of large parks, recreation corridors, and water-access facilities, and an urban outdoor recreation element which provides recommendations for the number and distribution of local parks and outdoor recreational facilities required in urban areas of the Region. For Milwaukee County, this regional plan has been refined, detailed, and extended through the preparation of a County park and open space plan.[6] This plan is currently being updated and revised. In Milwaukee County, the adopted park and open space plan recommends the acquisition of additional parkway along the mainstem of the Root River and Ryan Creek in the City of Franklin and along the mainstem of Oak Creek in the City of Oak Creek.

Regional Water Quality Management Plan

In 1979, SEWRPC completed and adopted a regionwide water quality management plan for southeastern Wisconsin as a guide to achieving clean and healthy surface waters within the seven-county Region. The plan was designed, in part, to meet the Congressional mandate that the waters of the United States be made "fishable and swimmable" to the extent practicable. It is set forth in SEWRPC Planning Report No. 30, *A Regional Water Quality Management Plan for Southeastern Wisconsin: 2000*, Volume One, *Inventory Findings*, September 1978; Volume Two, *Alternative Plans*, February 1979; and Volume Three, *Recommended Plan*, June 1979. Subsequently, SEWRPC completed a report documenting the updated content and implementation status of the regional water quality management plan: SEWRPC Memorandum Report No. 93, *A Regional Water Quality Management Plan for Southeastern Wisconsin: An Update and Status Report*, March 1995. This status report also documents the extent of progress which had been made toward meeting the water use objectives and supporting water quality standards set forth in the regional plan.

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[4]*SEWRPC Planning Report No. 42,* A Natural Areas and Critical Species Habitat Protection and Management Plan for Southeastern Wisconsin, *September 1997. The plan is currently being updated in the following plan amendment: SEWRPC,* Amendment to the Natural Areas and Critical Species Habitat Protection and Management Plan for the Southeastern Wisconsin Region, *December 2010.*

[5]*SEWRPC Planning Report No. 27,* A Regional Park and Open Space Plan for Southeastern Wisconsin: 2000, *November 1977.*

[6]*SEWRPC Community Assistance Planning Report No. 132,* op. cit.

The 2007 regional water quality management plan update for the greater Milwaukee watersheds[7, 8] addressed three major elements of the original regional water quality management plan: the land use element, the point source pollution abatement element, and the nonpoint source pollution abatement element, and it also included consideration of instream and riparian habitat conditions. The regional water quality management plan update planning effort was conducted in conjunction with development of the MMSD 2020 facilities plan.

The original regional water quality management plan and its subsequent updates and status reports include specific recommendations for reduction of nonpoint source pollutant levels. The degree to which the adopted water use objectives for Rivers and streams could be met under recommended plan conditions within the greater Milwaukee watersheds was evaluated based on detailed water quality modeling.

Regional Water Supply Plan

The Commission has conducted a regional water supply study and planning program for the Southeastern Wisconsin Region.[9] The regional water supply plan together with past SEWRPC groundwater inventories and development of a ground water simulation model[10,11] form the basis of the SEWRPC regional water supply management program. These three elements were prepared in collaboration with the U.S. Geological Survey (USGS), the Wisconsin Geological and Natural History Survey, the University of Wisconsin-Milwaukee, the Wisconsin Department of Natural Resources (WDNR), and many of the area's water supply utilities.

The regional water supply plan includes the following major components:

- Identification of water supply service areas to be served by public water utilities,
- Recommendations for source of water supply for identified service areas,
- A recommendation for the implementation of comprehensive water conservation programs, including both supply side efficiency measures and demand side conservation measures with the scope and content of these programs to be determined on a utility-specific basis reflecting the type and sustainability of the source of supply and probable future water supply infrastructure requirements,
- Identification of important groundwater recharge areas and recommendations for the protection and preservation of such recharge areas that are classified as having a high or very high recharge potential,

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[7]*SEWRPC Planning Report No. 50,* A Regional Water Quality Management Plan Update for the Greater Milwaukee Watersheds, *December 2007.*

[8]*The greater Milwaukee watersheds are the Kinnickinnic, Menomonee, Milwaukee and Root River watersheds, the Oak Creek watershed, and the Lake Michigan direct drainage area, each of which is wholly, or partially, contained within Milwaukee County. The water quality plan update study area includes all of Milwaukee County, except for the extreme southwestern portion of the City of Franklin that is within the Fox River watershed.*

[9]*SEWRPC Planning Report No. 52,* A Regional Water Supply Plan for Southeastern Wisconsin, *December 2010.*

[10]*SEWRPC Technical Report No. 37,* Groundwater Resources of Southeastern Wisconsin, *June 2002.*

[11]*SEWRPC Technical Report No. 41,* A Regional Aquifer Simulation Model for Southeastern Wisconsin, *June 2005.*

- Recommendations for the implementation of state-of-the-art stormwater management practices which, to the extent practicable, will maintain the natural recharge of areas committed to urban land use development,

- Recommendations related to the siting of new high capacity-wells, and

- Recommendations for the installation of enhanced rainfall infiltration systems in areas where evaluations conducted in conjunction with the siting of high-capacity wells in the shallow aquifer indicate probable reductions in baseflow on nearby streams or water levels in nearby lakes and wetlands due to the installation and operation of these wells.

The recommendations and guidance given in the plan should be considered by municipalities in Milwaukee County when evaluating the sustainability of proposed developments and in conducting local land use planning.

COUNTY AND MULTI-JURISDICTIONAL PLANS

Milwaukee County Park and Open Space Plan

The Milwaukee County park and open space plan was adopted in 1991 and is currently being revised.[12] That plan consists of both an open space preservation element and an outdoor recreation element, intended to, respectively, protect areas containing important natural resources and to provide major parks, areawide trails, and resource-oriented recreational facilities. Major parks are defined as publicly owned parks at least 100 acres in size providing opportunities for such resource-oriented activities as camping, golfing, picnicking, and swimming. Map 21 in Chapter II of this report shows County and State-owned park and open space sites in Milwaukee County as of 2005.

The regional park and open space plan, as amended by the park and open space plan for Milwaukee County, contains recommendations which, if implemented, would provide residents of Milwaukee County with opportunities to participate in a wide range of resource-oriented outdoor recreation activities. Those recommendations are concerned with the provision of major parks, which provide opportunities for intensive resource-oriented outdoor recreation activities, and recreation corridors, which provide opportunities for various trail-oriented activities. In addition, the plan contains recommendations for the protection and preservation of open space lands, including natural resource features such as woodlands, wetlands, and floodplains, located within environmental corridors and isolated natural resource areas.

Milwaukee County Land and Water Resources Management Plan

A land and water resources management plan was originally adopted by the County Board in 2001 and later updated in 2006. The plan identifies a set of four major goals related to County land and water resources. These goals include improvement of water quality through reduction of sediment and nutrient delivery to surface waters; protection, restoration and enhancement of wetland, grasslands, woodlands, environmental corridors, quality farmland, and natural areas including those located within Milwaukee County-owned parks and open spaces; enhancement of Lake Michigan bluff protection initiatives; and establishment of a land information web portal to distribute geographic data. The plan defines a work plan, which sets forth the objectives and actions to be carried out in order to achieve the goals associated with each issue and identifies the agency or organization responsible for carrying out the listed actions.

Milwaukee County Stream Assessment

As noted in Chapter II of this report, Milwaukee County commissioned an assessment of stability and fluvial geomorphic character of streams within four watersheds in the County. These included streams within the

[12] *SEWRPC Community Assistance Planning Report No. 132,* op. cit.

Table 25

STREAM RESTORATION PROJECT SITES IDENTIFIED IN THE MILWAUKEE COUNTY STREAM ASSESSMENT: 2003

Watershed	Project Sites Identified		
	Mainstem	Tributary	Total
Kinnickinnic River	15	15	30
Menomonee River	10	23	33
Milwaukee River	2	10	12
Oak Creek	12	16	28
Root River	3	33	36
Total	42	97	139

Source: Inter-Fluve, Inc. and SEWRPC.

Kinnickinnic River, Milwaukee River, Oak Creek, and Root River watersheds.[13] This study, which was conducted during fall 2003, examined channel stability, streambank erosion, sediment composition and characteristics, floodplain characteristics, and channel geometry along about 60 miles of stream channel along the Kinnickinnic, Milwaukee, and Root River mainstems and the Oak Creek mainstem, as well as several of their tributaries. A major goal of the study was to create a prioritized list of potential project sites related to mitigation of streambank erosion and channel incision, responses to channelization, and maintenance of infrastructure integrity. The study identified 139 of these project sites. The locations of these sites are summarized by watershed in Table 25. While the study did not include assessments conducted in the Menomonee River watershed, it included identification of potential project sites based upon the findings of an MMSD sediment transport study.[14] The identified projects were prioritized using a rating system developed for the study. This rating system evaluated each project based upon potential project impacts on five factors: the existing threat to public safety, the existing threat to infrastructure, the impact of the project on recreation, the ecological benefit to be gained from the project, and the estimated cost of the project.

Milwaukee County Pond and Lagoon Management Plan

Milwaukee County parklands include 68 lakes, ponds, and lagoons comprising over 120 acres of surface water. These waterbodies enhance park aesthetics while providing a variety of recreational opportunities, including fishing, boating, and ice skating. In addition, some of these lakes, ponds, and lagoons provide stormwater detention, which serves to improve water quality in receiving waters. Concerns about water quality and aesthetics have arisen as degraded conditions along some lagoon shorelines have become more apparent. Residents have also expressed concern over the impacts of poor water quality on fishing and on the health implications to humans of exposure to the water in the ponds. In response to these concerns, Milwaukee County developed a park pond and lagoon management plan.[15] The objectives of this plan were to:

[13] *Inter-Fluve, Inc.,* Milwaukee County Stream Assessment, Final Report, *September 2004.*

[14] *Inter-Fluve, Inc.* Menomonee River Sediment Transport Study Summary Report, *MMSD Contract No. W021-PE001, February 2001.*

[15] *Milwaukee County Environmental Services,* Milwaukee County Pond & Lagoon Management Plan, *June 2005.*

- Evaluate water quality conditions in representative lagoons,
- Identify and prioritize lagoon needs and set long-term goals,
- Identify water quality management objectives,
- Compare observed conditions to water quality objectives, and
- Recommend long-term and short-term actions.

The study identified several problem issues related to the lakes, ponds, and lagoons, including shoreline erosion; the presence of nuisance algae and aquatic plants, related to high nutrient loadings; elevated concentrations of fecal indicator bacteria, such as *E. coli*; litter; the presence of rough fish; and siltation. The plan made three general recommendations for all park lakes, ponds, and lagoons:

- Identify and deploy alternative management strategies to mowing grass to short lengths directly adjacent to these waterbodies,
- Pursue grant funding for shoreline stabilization projects, and
- Continue water quality monitoring of these waterbodies in order to document conditions both before and after restoration projects.

The plan also made specific recommendations for projects for ponds at Dineen, Humboldt, and Jacobus Parks. These recommendations were mostly concerned with shoreline stabilization and aquatic macrophyte management projects.

Milwaukee County Parks Agricultural Lands Resource and Lease Value Analysis
As mentioned in Chapter II of this report, the Milwaukee County Department of Parks, Recreation and Culture (DPRC) leases approximately 1,000 acres of undeveloped parkland to agricultural operators for agricultural uses. Administration and management of this program, including setting of lease rates and terms, are governed in accordance with Milwaukee County's Agricultural Land Lease Policy. This policy was originally established in 1995 and subsequently revised in 2004 and 2009.

In 2004, the County contracted with a consultant to evaluate the status of this leasing program with a focus on whether the leases and farming practices applied on the leased lands were current and the extent to which the program met the goals of the Milwaukee County land and water resource management plan.[16] Specific topics evaluated included:

- Identification of the general farming practices used on the leased lands,
- Identification of any significant erosion problems on these lands,
- Assessment of whether land and water resources were being protected through proper farming practices and adequate buffers,
- Identification of specific issues lessees have with the program or lands, and

[16]*Cedarburg Science, LLC,* Milwaukee County Parks Agricultural Lands Resource & Lease Value Analysis, *June 29, 2004.*

- Assessment of current leasing conditions and rates.

The study presented several findings relative to topics. These findings include the following:

- Though some lessees have conservation practices specified in their leases, conservation plans were not in place for many of the leased parcels;

- All lessees used some form of conservation tillage and many used other practices such as filter strips, grassed waterways, and critical area plantings;

- Only about half of the lessees were submitting the information on crops planted and fertilizer and pesticide use that were required by their leases;

- Most parcels were farmed in a manner that generally conserves the natural resources on the parcels;

- Some lessees were not raising livestock and desired an alternative to hay in their crop rotations;

- Some parcels had buffers along streams and rivers, although not all of these buffers had widths of 75 feet or more;

- Many lessees were addressing drain tile maintenance and surface water issues without the required written permission of the County; and

- Some parcels exhibited moderate to significant erosion due either to steep topography or excess runoff from adjacent parcels.

The study also made several recommendations related to the conservation of land and water resources on the leased parcels. These recommendations include:

- Obtaining and reviewing copies of the conservation plans for those parcels covered under plans that have been approved by the USDA-Farm Services Agency (FSA), and instituting any additional parcel-specific conservation practices that are required to reduce soil loss.

- Developing conservation plans for those parcels that have none. These plans should include an identification of drainageways and wetlands requiring filter strips or buffers, specification of required buffers and buffer widths, and specification of buffer installation and maintenance requirements.

- Contacting lessees to remind them that they are required to submit annual logs of pesticide and fertilizer use and crop rotations.

- Identifying alternatives to hay that provide adequate soil erosion protection for incorporation into lease agreements.

- Implementing conservation practices to address identified erosion problems.

- Conducting annual inspections of leased parcels to ensure compliance with lease requirements and conservation plans and implementation and maintenance of good conservation practices.

- Increasing the opportunities for dialogue between the lessees and County staff.

Comprehensive Watershed and Basin Plans

The Regional Planning Commission has developed comprehensive plans for the Kinnickinnic River watershed,[17] the Menomonee River watershed,[18] the Milwaukee River watershed,[19] the Oak Creek watershed,[20] and the Root River watershed.[21] The Kinnickinnic River watershed encompasses 24.5 square miles, or about 10 percent of the total land area of Milwaukee County. Within the County, the Menomonee River watershed encompasses 55.3 square miles, or about 23 percent of the total land area of the County; the Milwaukee River watershed encompasses 57.7 square miles, or about 24 percent of the total land area of the County; the Oak Creek watershed encompasses 27.4 square miles, or about 11 percent of the total land area of the County; and the Root River watershed encompasses 57.7 square miles, or about 24 percent of the total land area of the County. Together these comprehensive watershed plans cover approximately 92 percent of the County's land area. These plans include delineations of floodplain boundaries along many streams in each watershed. Plan recommendations were developed for land use, park and open space needs, stormwater and floodland management, water quality management, and fisheries management. These watershed plans also recommend the continued maintenance and preservation in open uses of primary and secondary environmental corridors and isolated natural resource areas.

As part of its planning activities related to watershed management, the WDNR has prepared State of the Basin Reports for each basin within the County to provide an overview of land and water resource quality, identify challenges facing these resources, and outline future actions. The State of the Basin reports for Milwaukee County include the Milwaukee Basin, which encompasses the Kinnickinnic River, Menomonee River, and Milwaukee River watersheds and adjacent portions of the Lake Michigan direct drainage area,[22] and the Root-Pike basin, which in Milwaukee County encompasses the Root River and Oak Creek watersheds and adjacent portions of the Lake Michigan direct drainage area.[23] The WDNR has recently updated its water quality plan for the Menomonee River watershed.[24] The WDNR Basin reports have identified high priority issues and actions that will need to be monitored and managed to restore and protect each basin's resources.

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[17]*SEWRPC Planning Report No. 32,* A Comprehensive Plan for the Kinnickinnic River Watershed, *December 1978.*

[18]*SEWRPC Planning Report No. 26,* A Comprehensive Plan for the Menomonee River Watershed, *Volume One,* Inventory Findings and Forecasts, *October 1976; Volume Two,* Alternative Plans and Recommended Plan, *October 1976.*

[19]*SEWRPC Planning Report No. 13,* A Comprehensive Plan for the Milwaukee River Watershed, *Volume One,* Inventory Findings and Forecasts, *December 1970; Volume Two,* Alternative Plans and Recommended Plan, *October 1970.*

[20]*SEWRPC Planning Report No. 36,* A Comprehensive Plan for the Oak Creek Watershed, *August 1986.*

[21]*SEWRPC Planning Report No. 9,* A Comprehensive Plan for the Root River Watershed, *July 1966.*

[22]*Wisconsin Department of Natural Resources,* The State of the Milwaukee River Basin, *PUBL WT-704-2001, August 2001*.

[23]*Wisconsin Department of Natural Resources,* The State of the Root-Pike River Basin, *PUBL WT-700-2002, May 2002.*

[24]*Wisconsin Department of Natural Resources,* Menomonee River Watershed: 2010 Water Quality Management Plan Update, *June 2010.*

Watershed Restoration Plans

The Milwaukee Metropolitan Sewerage District, in collaboration with the Southeastern Wisconsin Watersheds Trust, Inc. (SWWT), has developed watershed restoration plans for the Kinnickinnic and Menomonee River watersheds.[25] These plans were developed within the overall framework provided by the SEWRPC regional water quality management plan update for the greater Milwaukee watersheds, and their primary purpose is to identify specific actions to improve water quality that can be implemented between 2010 and 2015 and to present general recommendations for activity beyond 2015. The recommended actions were identified based upon consideration of many factors, including overall effectiveness, scientific underpinning, regulatory considerations, and stakeholder goals.

Through the stakeholder input of the SWWT, three major focus areas emerged for these watershed restoration plans: bacteria/public health, habitat, and nutrients/phosphorous. These focus areas reflect the linkage between water quality parameters and water use in the Kinnickinnic and Menomonee River watersheds. Relative to these focus areas, the plans identify a set of targets to be achieved over the plan period.

These plans sought to identify management strategies that could be developed to meet the targets in a cost-effective manner. The approach used is predicated on the assumption that the existing regulations for point and nonpoint sources of pollution will be implemented. The analysis used in developing the plans assumes the management strategies recommended to meet these regulations, as identified in the regional water quality management plan update, are in place and would serve as the foundation upon which new management strategies are added to achieve the desired goals. The watershed restoration plans categorize these management strategies, comprised of facilities, policies, operational improvements, and programs into three categories: existing regulatory management strategies, other management strategies in various stages of implementation, and management strategies recommended for implementation under the regional water quality management plan update for the greater Milwaukee watersheds, but which have not yet been implemented.

The plans also prioritize the identified management strategies. As part of this prioritization, they identify as foundational actions those management strategies whose implementation is necessary for the full benefit of other strategies to be achieved.

Milwaukee Metropolitan Sewerage District Stormwater Drainage and Flood Control Plan

The Milwaukee Metropolitan Sewerage District's responsibilities for stormwater management are carried out within explicit policy guidelines set forth by the governing body of the District, as well as within the context of a comprehensive stormwater drainage and flood control system plan consistent with those policies. This plan consists of two parts: a policy plan and a stormwater drainage and flood control systems plan.[26]

The policy plan discusses the District's stormwater management and flood control responsibilities. Major elements include:

- Identification of streams and watercourses for which the MMSD should assume jurisdiction for the resolution of drainage and flood control,

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[25]*Milwaukee Metropolitan Sewerage District,* Kinnickinnic River Watershed Restoration Plan, *April 2010; Milwaukee Metropolitan Sewerage District,* Menomonee River Watershed Restoration Plan, *April 2010.*

[26]*SEWRPC Community Assistance Planning Report No. 130,* A Stormwater Drainage and Flood Control Policy Plan for the Milwaukee Metropolitan Sewerage District, *March 1986; SEWRPC Community Assistance Planning Report No. 152,* A Stormwater Drainage and Flood Control System Plan for the Milwaukee Metropolitan Sewerage District, *December 1990.*

- Recommendations regarding the types of improvements for which the MMSD should assume responsibility, and

- Recommendations regarding how costs are to be shared.

The 1990 stormwater drainage and flood control systems plan identified the types, general locations, and horizontal and vertical alignments of needed drainage and flood control facilities within the District's jurisdiction. The District's jurisdiction includes 28 streams which are wholly or partially within Milwaukee County. These streams include the mainstem of the Edgerton Ditch, Wilson Park Creek, Villa Mann Creek, an unnamed tributary to Villa Mann Creek, Lyons Creek, the South 43rd Street Ditch, and the mainstem of the Kinnickinnic River in the Kinnickinnic River watershed; the Little Menomonee River, Underwood Creek, the South Branch of Underwood Creek, Honey Creek, Woods Creek, and the mainstem of the Menomonee River in the Menomonee River watershed; Beaver Creek, Southbranch Creek, Brown Deer Park Creek, Indian Creek, and Lincoln Creek in the Milwaukee River watershed; the North Branch of Oak Creek, the Mitchell Field Drainage Ditch, and the mainstem of Oak Creek in the Oak Creek watershed; an unnamed tributary to the Root River identified as the 104th Street Branch, Whitnall Park Creek, including the North and Northwest Branches of Whitnall Park Creek, Tess Corners Creek, East Branch Root River, Crayfish Creek, including the Caledonia Branch of Crayfish Creek, and the mainstem of the Root River in the Root River watershed; and Fish Creek in the Lake Michigan direct drainage area.

Milwaukee Metropolitan Sewerage District Watercourse System Planning Program
In the year 2000, MMSD published phase 1 watercourse management plans for the streams under its jurisdiction in the Kinnickinnic,[27] Menomonee,[28] and Root River[29] watersheds; the Milwaukee River tributaries[30] and Fish Creek;[31] and the Oak Creek[32] watershed. Those studies included updating of the hydrologic and hydraulic models developed under the 1990 MMSD drainage and flood control plan prepared by SEWRPC and the development of alternative and recommended plans for flood mitigation. In the Kinnickinnic and Menomonee River watersheds, the phase 1 planning efforts were followed by preparation of phase 2 watercourse plans in 2005 and 2002, respectively.[33] Many of the stream reaches studied under the MMSD watercourse plans are located within Milwaukee County park lands.

Since completion of the phase 1 and 2 plans, MMSD has undertaken advanced planning efforts for several streams and has implemented recommended flood mitigation projects along Grantosa Creek, Underwood Creek, and the Menomonee River in the Menomonee River watershed; along Indian, Lincoln, and Southbranch Creeks in the Milwaukee River watersheds; along the main stem of Oak Creek; and along the Root River. The Indian,

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[27]*Camp, Dresser & McKee, Inc.,* Kinnickinnic Phase I Watercourse System Management Plan, *August 2000.*

[28]*Camp, Dresser & McKee, Inc.,* Menomonee River Phase I Watercourse System Management Plan, *August 2000.*

[29]*Camp, Dresser & McKee, Inc.,* Root River Phase I Watercourse System Management Plan, *August 2000.*

[30]*Camp, Dresser & McKee, Inc.,* Milwaukee River Watershed Phase I Watercourse System Management Plan, *August 2000.*

[31]*Camp, Dresser & McKee, Inc.,* Lake Michigan Direct Drainage Area Phase I Watercourse System Management Plan, *August 2000.*

[32]*Camp, Dresser & McKee, Inc.,* Oak Creek Phase I Watercourse System Management Plan, *August 2000.*

[33]*MWH Americas, Inc.,* Kinnickinnic River Phase 2 Watercourse Management Plan, *May 2005; Tetra Tech, Inc.,* Menomonee River Phase 2 Watercourse Management Plan, *July 2002.*

Lincoln, and Southbranch Creek projects generally combined structural mitigation measures, such as the provision of floodwater storage and bridge/culvert capacity improvements, with removal of concrete channel lining and stream rehabilitation. The Menomonee River main stem/Underwood Creek project included a combination of structural flood mitigation measures (e.g., earthen levees, concrete floodwalls, overbank lowering, and floodwater storage), nonstructural measures (acquisition and demolition of about 80 floodprone buildings), and removal of concrete channel lining along with stream rehabilitation. The Root River project involved acquisition and demolition of buildings, while the other projects included acquisition and demolition of buildings and/or structural flood control measures.

In October of 2006, the MMSD assumed jurisdiction for the reach of the Milwaukee River main stem in Milwaukee County from the upstream end of the Milwaukee Harbor estuary to the Milwaukee-Ozaukee County line. A watercourse system plan for the Milwaukee River was subsequently prepared by SEWRPC.[34] The recommended plan calls for a combination of floodproofing, elevation, and acquisition and demolition of 393 buildings located within the one-percent-annual-probability floodplain in the Cities of Glendale (384 buildings affected) and Milwaukee (three buildings affected) and the Villages of Brown Deer (three buildings affected) and River Hills (three buildings affected).

As of the date of publication of this report, MMSD had initiated programs to purchase floodprone buildings along the Kinnickinnic River and to remove a section of the concrete channel lining in the Menomonee River upstream of IH 94, and they were conducting additional flood mitigation planning activities for Villa Mann Creek and the Villa Mann Creek Tributary, the North Branch of Oak Creek, and Honey Creek.

Milwaukee Metropolitan Sewerage District Conservation Plan

The Milwaukee Metropolitan Sewerage District (MMSD), with the assistance of the Conservation Fund staff, completed and adopted a conservation plan that identifies land parcels which are recommended to be protected for multiple purposes, including flood reduction potential and stormwater management benefits, as well as wildlife habitat, water quality, and recreational benefits.[35] This plan identified 165 sites, including 42 high-priority sites, for protection through public acquisition or conservation easements, throughout the Menomonee River, Root River, and Oak Creek watersheds within the District. Many of these sites are located within Milwaukee County.

Many of the sites identified in the conservation plan consisted of isolated parcels. In order to provide greenway corridors connecting these parcels, the MMSD and Regional Planning Commission staffs developed a greenway connection plan for the District.[36] This plan identified potential greenway corridors connecting, and typically downstream of, the isolated parcels identified in the MMSD Conservation Plan. It also synthesized the results of other related open space planning efforts undertaken in the MMSD area to date, resulting in a comprehensive Districtwide greenway connection plan having flood mitigation benefits as well as a wide range of other environmental benefits.

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[34]*SEWRPC Memorandum Report No. 172,* A Watercourse System Plan for the Milwaukee River in Milwaukee County Upstream of the Milwaukee Harbor Estuary, *December 2010.*

[35]*The Conservation Fund; Applied Ecological Services, Inc.; Heart Lake Conservation Associates; Velasco and Associates; and K. Singh and Associates,* Conservation Plan, Technical Report Submitted to the Milwaukee Metropolitan Sewerage District, *October 31, 2001.*

[36]*SEWRPC Memorandum Report No. 152,* A Greenway Connection Plan for the Milwaukee Metropolitan Sewerage District, *December 2002.*

CITY AND VILLAGE PLANS

Local Land Use, Master, and Comprehensive Plans

Section 62.23 of the *Wisconsin Statutes* grants cities and villages the authority to prepare and adopt local master plans or plan elements, such as a community land use plan. In 1999, the Wisconsin Legislature enacted legislation that greatly expanded the scope and significance of comprehensive plans within the State. The legislation, often referred to as the State's "Smart Growth" law, provides a new framework for the development, adoption, and implementation of comprehensive plans by regional planning commissions and by county, city, village, and town units of government. The law is set forth in Section 66.1001 of the *Wisconsin Statutes*. This section of the *Statutes* also defines elements that a comprehensive plan must contain. The law has been amended periodically, most recently in June 2010 through enactment of 2009 Wisconsin Act 372.

The law does not require the adoption of county and local comprehensive plans; however, Section 66.1001(3) of the *Statutes* requires that county and local general zoning ordinances; county, city, and village shoreland and floodplain zoning ordinances; county and local subdivision ordinances; and local official mapping ordinances enacted or amended on or after January 1, 2010, be consistent with the comprehensive plan adopted by the unit of government enacting or amending an ordinance.

All of the municipalities in Milwaukee County are incorporated as cities or villages. Because of this, the County has not prepared or adopted a comprehensive plan. As of November 1, 2010, all but three of the municipalities in Milwaukee County had prepared and adopted comprehensive plans. As of the same date, the Cities of Glendale and West Allis and the Village of Shorewood were in the process of preparing independent comprehensive plans.

COUNTY AND LOCAL ORDINANCES

Good community development depends not only on quality planning at all levels of government, but on practical implementation measures as well. Land use and development regulations affect the type of uses allowed, as well as the detailed design and site layout of proposed developments. Because Milwaukee County contains no unincorporated areas, many of these regulations are promulgated and enforced by the cities and villages in the County. The following presents a summary of regulations adopted by the County and local governments.

General Zoning

Zoning is a tool used to regulate the use of land in Milwaukee County in a manner that serves to promote the general welfare of its citizens, the quality of the environment, and the conservation of its resources. Zoning also is used to implement a land use plan. Zoning involves the delineation of areas or zones into specific districts which provides uniform regulations and requirements that govern the use, placement, spacing, and size of land and buildings. Each city and village in Milwaukee County has adopted and enforces its own zoning ordinance.

Floodland Zoning Ordinance

Section 87.30 of the *Wisconsin Statutes* requires that cities, villages, and counties, with respect to their unincorporated areas, adopt floodland zoning to preserve the floodwater conveyance and storage capacity of the floodplain areas and to prevent the location of new flood damage-prone development in flood hazard areas. The minimum standards that such ordinances must meet are set forth in Chapter NR 116 of the *Wisconsin Administrative Code.* The required regulations govern filling and development within a regulatory floodplain, which is defined as the area subject to inundation by the one-percent-annual-probability (100-year recurrence interval) flood event. Under Chapter NR 116, local floodland zoning regulations must prohibit nearly all forms of development within the floodway, which is that portion of the floodplain required to convey the one-percent-probability peak flood flow. Local regulations must also restrict filling and development within the flood fringe, which is that portion of the floodplain located outside of the floodway that would be covered by floodwater during the one-percent-probability flood. Permitting the filling and development of the flood fringe area, however, reduces the floodwater storage capacity of the natural floodplain, and may thereby increase downstream flood flows and stages. All cities and villages in the County have adopted floodland zoning ordinances, except for the Village of West Milwaukee.

This Village currently has no officially identified flood hazard areas within its boundaries. The existing floodplains in the County are illustrated on Map 11 in Chapter II of this report.

Shoreland and Shoreland-Wetland Zoning
Under Sections 62.231 and 61.351, respectively, of the *Wisconsin Statutes* cities and villages in Wisconsin are required to place wetlands five acres or larger and located in statutory shorelands into a shoreland-wetland conservancy zoning district to ensure their preservation. Minimum standards for city and village shoreland-wetland zoning ordinances are set forth in Chapter NR 117 of the *Wisconsin Administrative Code*.

It should be noted that the basis for identification of wetlands to be protected under Chapters NR 115 and NR 117 of the *Wisconsin Administrative Code* is the Wisconsin Wetlands Inventory. Mandated by the State Legislature in 1978, the Wisconsin Wetlands Inventory resulted in the preparation of wetland maps covering each U.S. Public Land Survey Township in the State. The inventory was completed for counties in southeastern Wisconsin in 1982, the wetlands being delineated by the Regional Planning Commission on 1980, one inch equals 2,000 feet scale, aerial photographs.

The Cities of Cudahy, Franklin, Glendale, Greenfield, Milwaukee, Oak Creek, South Milwaukee, Wauwatosa, and West Allis and the Villages of Greendale, Hales Corners, and River Hills, have adopted their own shoreland-wetland zoning ordinances pursuant to Sections 62.231 and 61.351, respectively, of the *Wisconsin Statutes*. The City of St. Francis and the Villages of Bayside, Brown Deer, Fox Point, Shorewood, West Milwaukee, and Whitefish Bay did not contain shoreland wetlands and were thus not required to adopt such ordinances.

Subdivision Regulations
Chapter 236 of the *Wisconsin Statutes* requires the preparation of a subdivision plat whenever five or more lots of 1.5 acres or less in area are created either at one time or by successive divisions within a period of five years. The *Statutes* set forth requirements for surveying lots and streets, for plat review and approval by State and local agencies, and for recording approved plats. Section 236.45 of the *Statutes* allows any city, village, town, or county that has established a planning agency to adopt a land division ordinance, provided the local ordinance is at least as restrictive as the State platting requirements. Local land division ordinances may include the review of other land divisions not defined as "subdivisions" under Chapter 236, such as when fewer than five lots are created or when lots larger than 1.5 acres are created.

With the exception of the Village of Whitefish Bay, each of the municipalities in Milwaukee County has adopted its own subdivision control ordinance.

STATE NONPOINT SOURCE POLLUTION CONTROL STANDARDS AND PROHIBITIONS

Construction Site Erosion Control
Sections 62.234 and 61.354 of the *Wisconsin Statutes* grant authority to cities and villages, respectively, to adopt ordinances for the prevention of erosion from construction sites and the management of stormwater runoff from lands within their jurisdiction.

While Milwaukee County does not have a construction site erosion control and stormwater management ordinance, all of the municipalities within the County have adopted such ordinances. These ordinances require persons engaging in land disturbing activities to apply erosion control practices, as set forth in the WDNR "Storm Water Management and Post-Construction Technical Standards,"[37] which specify the minimum requirements needed to plan, design, install, and maintain a wide array of conservation practices aimed at controlling erosion from construction sites, abating urban nonpoint source pollution, and promoting infiltration of stormwater.

[37]*The WDNR technical standards can be accessed at:* http://www.dnr.state.wi.us/runoff/stormwater/techstds.htm

State and County Standards and Regulations for Control of Nonpoint Source Pollution

Through 1997 Wisconsin Act 27, the State Legislature required the WDNR and Wisconsin Department of Agriculture, Trade, and Consumer Protection (DATCP) to develop performance standards for controlling nonpoint source pollution from agricultural and nonagricultural land and from transportation facilities.[38] The performance standards are set forth in Chapter NR 151, "Runoff Management," of the *Wisconsin Administrative Code*, which became effective on October 1, 2002, and was revised in July 2004. NR 151 was also revised in 2010, with revisions taking effect December 1, 2010. Because the process of promulgation of the rule revisions is occurring concurrently with preparation of this land and water resource management plan, the information presented herein reflects the proposed rule revisions. Below is a summary of the standards and prohibitions that apply to the Milwaukee County land and water resource management plan:

Agricultural Performance Standards and Prohibitions

Performance standards relate to four areas of agriculture: cropland soil erosion control, soil loss from riparian lands, manure management, and nutrient management.

The agricultural performance standards are:

- Soil erosion rates on all cropland (and pastures beginning on July 1, 2012) must be maintained at or below "T" (Tolerable Soil Loss);

- Starting in 2005 for high priority areas such as impaired waters, outstanding or exceptional resource waters, or source water protection areas, and 2008 for all other areas, application of manure or other nutrients to croplands must be done in accordance with a nutrient management plan, designed to meet State standards for limiting the entry of nutrients into groundwater or surface water resources (this standard does not apply to applications of industrial waste, municipal sludge, or septage regulated under other WDNR programs, provided that the material is not comingled with manure prior to application);

- Clean water runoff must be diverted away from contacting feedlots, manure storage facilities, and barnyards in water quality management areas (areas within 300 feet of a stream, 1,000 feet from a lake, or areas susceptible to groundwater contamination); and

- All new or substantially altered manure storage facilities must meet current engineering design standards and margin of safety requirements to prevent surface or groundwater pollution. In addition, inactive or unused manure storage facilities shall be properly closed and existing manure storage facilities that are failing or leaking shall be properly upgraded, replaced, or properly closed.

[38]*The State performance standards are set forth in the Chapter NR 151, "Runoff Management," of the* Wisconsin Administrative Code. *Additional code chapters that are related to the State nonpoint source pollution control program include: Chapter NR 152, "Model Ordinances for Construction Site Erosion Control and Storm Water Management," Chapter NR 153, "Targeted Runoff Management and Notice of Discharge Grant Programs," Chapter NR 154, "Best Management Practices, Technical Standards and Cost-Share Conditions," Chapter NR 155 "Urban Nonpoint Source Water Pollution Abatement and Storm Water Management Grant Program", and Chapter ATCP 50 "Soil and Water Resource Management." Those chapters of the* Wisconsin Administrative Code *became effective in October 2002. Chapter NR 120, "Priority Watershed and Priority Lake Program," and Chapter NR 243, "Animal Feeding Operations," were repealed and recreated in October 2002.*

The manure management prohibitions are:

- No direct runoff from animal feedlots to "waters of the state,"
- No overflowing manure storage facilities,
- No unconfined manure piles in shoreland areas (areas within 300 feet of a stream and 1,000 feet from lakes), and
- No unlimited livestock access to "waters of the state" where the livestock prevent sustaining an adequate vegetative cover.

In general, for land that does not meet the NR 151 standards and that was cropped or enrolled in the U.S. Department of Agriculture Conservation Reserve or Conservation Reserve Enhancement Programs as of October 1, 2002, agricultural performance standards are only required to be met if cost sharing funds are available. Existing cropland that met the standards as of October 1, 2002, must continue to meet the standards. New cropland must meet the standards, regardless of whether cost share funds are available.

The 2010 revision to NR 151 adds new agricultural performance standards. The new performance standards include:

- A five- to 20-foot setback from the top of a surface water channel in agricultural fields within which no tillage is allowed for the purpose of maintaining streambank integrity and avoiding soil deposits into State waters;
- A limit on the amount of phosphorus that may run off croplands as measured by a phosphorus index;
- A prohibition against significant discharge of process water from milk houses, feedlots, and other similar sources; and
- A standard that requires crop and livestock producers to reduce discharges if necessary to meet a load allocation specified in an approved Total Maximum Daily Load (TMDL) by implementing targeted performance standards specified for the TMDL area using best management practices, conservation practices, and performance standards specified in Chapter ATCP 50 of the *Wisconsin Administrative Code*.

Under Chapter NR 216, "Stormwater Discharge Permits," of the *Wisconsin Administrative Code*, agriculture is not exempt from the requirement to submit a notice of intent (NOI) for one or more acres of land disturbance for the construction of structures such as barns, manure storage facilities or barnyard runoff control systems. Construction of an agricultural building or facility must follow an erosion and sediment control plan consistent with Section NR 216.46 of the *Wisconsin Administrative Code*, including meeting the performance standards of Section NR 151.11 of the *Wisconsin Administrative Code*. Agriculture is exempt from this requirement for activities such as planting, growing, cultivating and harvesting crops for human or livestock consumption and pasturing of livestock as well as for sod farms and tree nurseries. NR 216 establishes the criteria and procedure for issuance of stormwater discharge permits to limit the discharge of pollutants carried by stormwater runoff into waters of the State.

Nonagricultural (Urban) Performance Standards

The nonagricultural performance standards set forth in Chapter NR 151 encompass two major types of land management. The first includes standards for areas of new development and redevelopment and the second includes standards for developed urban areas. The performance standards address the following areas:

- Construction sites for new development and redevelopment,
- Post construction stormwater runoff for new development and redevelopment,
- Developed urban areas, and
- Nonmunicipal property fertilizing.

Chapter NR 151 requires counties and local units of government in urbanized areas, which are identified based on population density, to obtain a WPDES stormwater discharge permit as required under Chapter NR 216.02. As a result of these requirements, Milwaukee County and all of the municipalities in the County have applied for and been issued these permits.

Chapter NR 151 requires permit holders to reduce the amount of total suspended solids in stormwater runoff from areas of existing development that were in place as of October 2004 to the maximum extent practicable, according to the following standards:

- By March 10, 2008, the NR 151 standards call for a 20 percent reduction, and
- By October 1, 2013, the standards call for a 40 percent reduction; however, the 2010 revisions to Chapter NR 151 provide for a process for permitted municipalities to follow if they are unable to meet the required 40 percent reduction by 2013. The process identifies the stormwater management plan submittal process, the departmental review process, and an allowance for up to 10 additional years to comply with the standard, as long as the stormwater management plan is followed.

Permitted municipalities are required to implement the following 1) public information and education programs relative to specific aspects of nonpoint source pollution control; 2) municipal programs for collection and management of leaf and grass clippings; and 3) site-specific programs for application of lawn and garden fertilizers on municipally controlled properties with over five acres of pervious surface. Under the requirements of Chapter NR 151, by March 10, 2008, incorporated municipalities with average population densities of 1,000 people or more per square mile that were not required to obtain municipal stormwater discharge permits were required to have implemented those same three programs.

In addition, regardless of whether a municipality is required to have a stormwater discharge permit under Chapter NR 216, Chapter NR 151 requires that, in general, construction sites that have one acre or more of land disturbance must discharge no more than five tons of sediment per acre per year.[39] With certain limited exceptions, those sites required to have construction erosion control permits must also have post-development stormwater management practices to reduce the total suspended solids (sediment) that would otherwise run off the site by 80 percent for new development, 40 percent for redevelopment, 40 percent for infill development of less than five acres occurring prior to October 1, 2012, and 80 percent for infill development of five acres or greater. After October 1, 2012, all eligible infill development will be required to achieve an 80 percent reduction. If it can be demonstrated that the solids reduction standard cannot be met for a specific site, total suspended solids must be controlled to the maximum extent practicable.

Section NR 151.124 of the *Wisconsin Administrative Code* requires infiltration of post-development runoff from areas developed on or after October 1, 2004, subject to certain specific exclusions and exemptions. For development with less than 40 percent connected imperviousness (“low imperviousness”), 90 percent of the

[39]*This revised sediment reduction standard set forth in the 2010 revision of NR 151 has a two-year delayed implementation to allow development of a methodology to measure compliance. During that two-year time period, which ends on January 1, 2013, the existing standard of an 80 percent reduction in the amount of sediment that runs off the site will still be in effect.*

annual predevelopment infiltration volume is required to be infiltrated. However, no more than 1 percent of the area of the project site is required to be used as an effective infiltration area. For development with connected imperviousness ranging from more than 40 percent up to 80 percent ("moderate imperviousness"), 75 percent of the annual predevelopment infiltration volume is required to be infiltrated. For development with connected imperviousness greater than 80 percent ("high imperviousness"), 60 percent of the annual predevelopment infiltration volume is required to be infiltrated. In the case of moderate and high imperviousness areas, no more than 2 percent of the project site is required to be used as effective infiltration area.

The 2010 revisions of NR 151 also changed the nonagricultural performance standards that address construction site erosion control, post-construction stormwater management, and developed urban areas. These changes include:

- Modification of the construction site performance standard to apply prescriptive standards to construction sites of less than one acre,[40]
- Incorporation of nonnumeric effluent limits promulgated by the USEPA, effective February 1, 2010,
- Removal of the exemption from the total suspended solids performance standards of redevelopment sites with no increase in exposed parking or roads,
- Addition of the one-year, 24-hour design storm for the peak flow control performance standard,[41]
- Revision of the definition of a highly susceptible wetland that requires a 75-foot protective area standard, and
- Clarification of when best management practices may or may not be located in navigable waters.

The nonagricultural performance standards set forth in section NR 151.12 (post-construction performance standard for new development and redevelopment) generally require impervious area setbacks of 50 feet from streams, lakes, and wetlands. This setback distance is increased to 75 feet to protect Chapter NR 102-designated Outstanding or Exceptional Resource Waters or Chapter NR 103-designated wetlands of special natural resource interest. Reduced setbacks of not less than 10 feet from less susceptible wetlands and drainage channels may be allowed. Under the 2010 revisions of NR 151, these performance standards are set forth in NR 151.125.

CONSERVATION PROGRAMS

Coordination with Federal, State, regional, and local agencies is paramount to the protection of the land and water resources of Milwaukee County. The conservation programs mentioned below are vital to the successful implementation of this plan. The positive integration of programs and funding sources administered by the County and its cooperating agencies is essential to accomplishing the workplan objectives set forth in Chapter IV.

Federal Programs

Conservation Reserve Program

The Conservation Reserve Program (CRP) is a voluntary program for agricultural landowners that provides annual rental payments and cost-share assistance to establish long-term, resource-conserving covers on eligible farmland. The CRP goal is to reduce soil erosion, protect the nation's ability to produce food and fiber, reduce sedimentation in streams and lakes, improve water quality, establish wildlife habitat, and enhance forest and

[40]*This change was made to accommodate the transfer of Chapter Comm 60 of the* Wisconsin Administrative Code *to the jurisdiction of the WDNR, effective January 1, 2010.*

[41]*The original peak flow control performance standard calling for control of the two-year, 24-hour design storm peak flow remains in the rule.*

wetland resources. It encourages farmers to convert highly erodible cropland or other environmentally sensitive areas to vegetative cover, such as a prairie-compatible, noninvasive forage mix; wildlife plantings; trees; filter strips; or riparian buffers. Farmers receive an annual rental payment for the term of the multi-year contract based on the agriculture rental value of the land, and up to 50 percent Federal cost sharing is provided to establish vegetative cover. The program is administered by the Farm Services Agency (FSA), an agency of the USDA, with technical assistance provided by NRCS. NRCS works with landowners to develop their application, and to plan, design, and install the conservation practices on the land.

Milwaukee County owns roughly 300 acres of land that are currently enrolled in the CRP. Under the 2008 Federal Farm Bill, however, municipalities are no longer eligible to receive CRP payments, but private landowners remain eligible. The County-owned CRP land enrolled prior to the current Farm Bill will continue to receive an annual rental rate until the CRP contracts for these parcels expire.

Environmental Quality Incentives Program

The Environmental Quality Incentives Program (EQIP) is a voluntary conservation program that supports agriculture and environmental quality as compatible goals. Through EQIP, farmers may receive financial and technical help with structural and management conservation practices on agricultural land. EQIP offers contracts through the NRCS for conservation practice implementation for periods ranging from one to 10 years, and it pays up to 75 percent of the costs of eligible conservation practices. Incentive payments and cost share payments may also be made to encourage a farmer to adopt land management practices such as nutrient management, manure management, integrated pest management, or wildlife habitat management.

Wildlife Habitat Incentives Program

The Wildlife Habitat Incentive Program (WHIP) is a voluntary program for developing or improving high-quality habitat that supports fish and wildlife populations of National, State, Tribal, and local significance. Through WHIP, the NRCS provides technical and financial assistance to private and Tribal landowners for the development of upland, wetland, aquatic, and other types of wildlife habitat. Land eligible for WHIP includes private agricultural land including cropland, grassland, rangeland, pasture, and other land determined by NRCS to be suitable for fish and wildlife habitat development, nonindustrial private forest land including rural land that has existing tree cover or is suitable for growing trees, and Tribal land.

A WHIP plan of operations, which is required for the area covered in the application, becomes the basis for developing the WHIP cost-share agreement. Standard cost-share agreements between NRCS and the participant are for a minimum of one year after completion of the last conservation practice and they can extend up to 10 years. NRCS will reimburse up to 75 percent of the cost to install conservation practices for permanent priority fish and wildlife habitat. Participants are expected to maintain the cost-shared practices for their anticipated lifespans. Up to 25 percent of WHIP funds will be available for long-term cost share agreements with periods of 15 years or longer to protect and restore essential plant and animal habitat. NRCS can pay up to 90 percent of the cost to install conservation practices in these long-term agreements.

Wetlands Reserve Program

The Wetlands Reserve Program (WRP) is a voluntary program through the NRCS that offers landowners the opportunity to protect, restore, and enhance wetlands on their property. It provides landowners with technical assistance and financial incentives and assistance to restore and enhance wetlands in exchange for retiring marginal agricultural land. The program offers landowners three options: permanent conservation easements, 30-year conservation easements, and restoration cost-share agreements of a minimum 10-year duration. For permanent easements, the WRP provides an easement payment of up to the fair market value of the land concerned, and pays 100 percent of the costs of restoration. For 30-year easements, the WRP pays an easement payment of 75 percent of what would be paid for a permanent easement. In addition, the program pays 75 percent of restoration costs. For restoration cost-share agreements, the WRP pays 75 percent of restoration costs. Under the 2008 Federal Farm Bill, municipalities are no longer eligible for payments under WRP, but private landowners remain eligible.

Grasslands Reserve Program

The Grassland Reserve Program (GRP) is a voluntary program through the NRCS for landowners and operators to protect grazing uses and related conservation values by conserving grassland, including rangeland, pastureland, shrubland, and certain other lands. Participants voluntarily limit future development and cropping uses of the land while retaining the right to conduct common grazing practices and operations related to the production of forage and seed. The program offers eligible landowners and operators two options: permanent easements and rental contracts of 10-year, 15-year, or 20-year duration. For permanent easements, the GRP offers compensation up to the fair market value of the land concerned less the grazing value of the land. For rental contracts, the GRP provides annual payments of 75 percent of the grazing value established by the Federal Farm Service Agency, up to $50,000 to a single person or legal entity. Certain grassland easements or rental contracts may also be eligible for cost-share assistance of up to 50 percent of the cost to reestablish grassland functions and values where land has been degraded or converted to other uses. Payments of this cost-share assistance may not exceed $50,000 per year to a single person or legal entity.

Resource Conservation and Development

The Resource Conservation and Development (RC&D) program was established by the Federal Agricultural Act of 1962. This act directs the USDA to help units of government conserve and properly utilize all resources in solving local issues. Wisconsin has seven RC&Ds, covering all Wisconsin counties. Milwaukee County is a member of the Town and Country RC&D area which was organized to cover 13 counties in southeastern Wisconsin. The Town and Country RC&D helps to facilitate the development and coordination of existing and innovative projects, and will assist in finding funding to implement them. Town and Country RC&D has helped promote agricultural, energy, water quality, and educational projects and programs throughout the Region.

The Pittman-Robertson Wildlife Restoration Program

The Pittman-Robertson Wildlife Restoration Program through the U.S. Fish and Wildlife Service provides grants to State fish and wildlife agencies for projects to restore, conserve, manage, and enhance wildlife and wildlife habitat. This program provides 75 percent Federal cost-share assistance for eligible projects and requires a 25 percent match from nonFederal sources. Eligible projects include identification, restoration, and improvement of areas of land or water adaptable as feeding, resting, or breeding places for wildlife.

The State Wildlife Grants Program

The U.S. Fish and Wildlife Service through the State Wildlife Grants Program provides Federal grant funds to State fish and wildlife agencies for the development and implementation of projects for the benefit of fish and wildlife and their habitats, including species that are not hunted or fished. Priority is placed on projects that protect species of greatest conservation concern. Two types of grants are made under this program: planning grants and implementation grants. Planning grants provide up to 75 percent Federal cost-share assistance for eligible projects and require a 25 percent match from nonFederal sources. Implementation grants under this program provide up to 50 percent Federal cost-share assistance for eligible projects and require a 50 percent match from nonFederal sources.

Great Lakes Restoration Initiative

The Great Lakes Restoration Initiative (GLRI) is a multiagency Federal effort that targets the most significant environmental problems affecting the Great Lakes, including toxic substances and areas of concern, aquatic invasive species, and nearshore health and nonpoint source pollution. The 2011 version of the Initiative also is intended to address accountability, education, monitoring, evaluation, communication, and partnerships. Funds are allocated strategically to implement both Federal programs and projects initiated by states, tribes, municipalities, universities, and other organizations. Grant funds are awarded competitively to projects which focus on achieving results in the identified target areas. During 2010, a total of $475 million in Federal funds was appropriated for the GLRI. For 2011, $300 million has been proposed in the President’s budget, with $40 million of that intended to be distributed through the U.S. Environmental Protection Agency (UESPA) competitive grant program.

State and Local Programs

Soil and Water Resource Management Program

DATCP administers Wisconsin's soil and water resource management program (SWRM) under the provisions of Chapter 92 of the *Wisconsin Statutes* and Chapter ATCP 50 of the *Wisconsin Administrative Code.* The Soil and Water Resource Management grant program was developed to support locally led conservation efforts. Counties are awarded grant funds to pay for conservation staff and provide landowner cost-sharing to implement their LWRMP. ATCP 50, as revised in April 2009, relates specifically to agricultural programs and it establishes requirements and/or standards for:

- Soil and water conservation on farms,
- County soil and water programs, including land and water resource management plans,
- Grants to counties to support county conservation staff,
- Cost-share grants to landowners for implementation of conservation practices,
- Design certifications by soil and water professionals,
- Local regulations and ordinances, and
- Cost-share practice eligibility and design, construction, and maintenance.

Wisconsin Department of Natural Resources Targeted Runoff Management and Notice of Discharge Grant Program

The Targeted Runoff Management (TRM) Grant Program, in operation since 1999, was significantly revised effective January 1, 2011. Targeted Runoff Management Grants are administered under Chapters NR 153 and NR 154 of the *Wisconsin Administrative Code*. These grants provide technical and financial assistance to local governments for managing nonpoint source pollution. Most grants address agricultural problems. The agricultural project grants address many types of water resources, including impaired waters in areas with Total Maximum Daily Loads (TMDL), impaired waters outside TMDL areas, high-quality surface waters threatened by degradation and ground water protection and improvement. Agricultural projects can vary in scale, from small-scale projects addressing a single farm to larger-scale projects that address agricultural sources on a watershed basis. Projects that take place outside a TMDL area are required to implement the State's agricultural nonpoint source performance standards and prohibitions contained in Chapter NR 151. Projects designed to implement TMDLs may also implement practices that are not tied directly to achieving State standards and prohibitions as long as the management practices are required to achieve the goals of the TMDL. Targeted Runoff Management Grants also provide funding for a limited number of urban storm water construction projects, but the urban TRM projects are restricted to TMDL areas.[42] Only small-scale projects are available in urban areas.

All TRM grants provide 70 percent cost sharing for construction of management practices, with up to 90 percent cost sharing available for agricultural projects where the farmer qualifies for economic hardship. Large scale TRM projects may also provide limited funding for staff support. Each year, the WDNR establishes caps on grant amounts consistent with available funding.

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[42]*A companion grant program, the Urban Nonpoint Source Storm Water Management Grant Program, which is administered under Chapters NR 154 and NR 155, complements the TRM Program by making grants for urban areas available Statewide for a variety of planning and construction activities. These urban grants are available to address a wide range of water resources including impaired waters in TMDL areas, impaired waters outside TMDL areas, high quality waters that are threatened by stormwater runoff, and groundwater that is threatened or degraded by stormwater runoff.*

Chapter NR 153 is also used to administer Notice of Discharge Grants. Notices of Discharge are issued by the WDNR under Chapter NR 243, "Animal Feeding Operations." WDNR issues Notices of Discharge to small and medium livestock operations that fail to meet Federal point source discharge requirements or that are causing fecal contamination of a drinking water well. In many of these cases, the farmer is required to fix the site regardless of cost sharing. However, the WDNR may decide to offer a grant to help facilitate site clean-up. Problem sites that are not cleaned up are issued WPDES permits or referred directly to the Wisconsin Department of Justice for prosecution. The WDNR and DATCP work jointly to address these sites.

Wisconsin Department of Natural Resources Urban Nonpoint Source and Storm Water Management Grants

The Urban Nonpoint Source and Storm Water Management Grant Program provides cost-share funds for planning and construction activities for controlling nonpoint source pollution from urban areas. Projects funded by this program are site-specific, serve areas smaller than a subwatershed, and are targeted to address high-priority problems. Eligible applicants include cities, villages, towns, counties, regional planning commissions, and special purpose districts such as lake districts, sewerage districts, and sanitary districts. In addition, an urban project area must meet at least one of the following criteria:

- The area has a residential population density of at least 1,000 persons per square mile,
- The area has commercial land use,
- The area is a portion of a privately owned industrial site not covered under a WPDES permit issued under Chapter NR 216 of the *Wisconsin Administrative Code*, or
- The area is a municipally owned industrial site.

The maximum cost-share rate available for planning grants is 70 percent of eligible costs. The cap on the total State share for planning projects is $85,000. The maximum cost-share rate available for construction grants is 50 percent of eligible costs, with a total State share for a construction project of $150,000 and a potential grant of an additional $50,000 for land acquisition, where needed. Planning grants can be used to pay for a variety of eligible activities, including stormwater management planning for existing and new development, related information and education activities, ordinance and utility district development, and enforcement. Construction grants can be used to pay for the construction of best management practices to control stormwater pollution from existing urban areas. Projects may be eligible for funding whether or not they are designed to meet the performance standards identified in Section NR 151.13 of the *Wisconsin Administrative Code*, but the highest priority in selecting projects under this program is given to projects that implement performance standards and prohibitions contained in Chapter NR 151 or that address waterbodies listed on the Federal Section 303(d) list of impaired waters.

Wisconsin Department of Natural Resources Knowles-Nelson Stewardship Program

The Knowles-Nelson Stewardship Program was established to preserve the State's most significant land and water resources for future generations and to provide the land base and recreational facilities needed for quality outdoor experiences. The program achieves these goals by funding the acquisition of land and easements for conservation and recreation purposes, developing and improving recreational facilities, and restoring wildlife habitat. The administrative rules for the program are set forth in Chapters NR 50 and NR 51 of the *Wisconsin Administrative Code*. The program provides 50 percent matching grants to local units of government and qualified nonprofit conservation organizations for the acquisition of land and easements.

Wisconsin Department of Natural Resources Lake Protection Grant and River Protection Grant Programs

The Lake Protection Grant program as set forth in Chapter NR 191 of the *Wisconsin Administrative Code* was designed to assist local governments, lake districts and associations, and other nonprofit organizations in improving and protecting water quality in lakes. A 75 percent State cost-share is available, with a 25 percent local match. Projects that are eligible for cost-share assistance include land acquisition for easement establishment,

wetland restoration, and various lake improvement projects such as those involving pollution prevention and control, diagnostic feasibility studies, and lake restoration.

The River Protection Grant program as set forth in Chapter NR 195 of the *Wisconsin Administrative Code* was designed to assist local governments, lake districts and associations, and other nonprofit organizations in improving and protecting water quality in rivers. A 75 percent State cost-share is available, with a 25 percent local match. Cost-share funding cannot exceed $50,000 for a management project. The types of projects that are eligible for cost-share assistance include management activities such as land acquisition, easement establishment, ordinance development, installation of nonpoint source pollution abatement projects, river restoration projects, and river plan implementation projects.

Wisconsin Department of Natural Resources Municipal Flood Control Grant Program

Under Chapter NR 199, "Municipal Flood Control Grants," of the *Wisconsin Administrative Code* municipalities, including cities, villages, and towns, as well as metropolitan sewerage districts are eligible for cost-sharing grants from the State for projects to minimize flooding and flood-related damages. Projects may include acquisition and removal of structures; floodproofing of structures; riparian restoration projects, including removal of dams and other artificial obstructions, restoration of fish and native plant habitat, erosion control, and streambank restoration projects; acquisition of vacant land to create open-space flood storage areas; constructing structures for the collection, retention, storage, and transmission of stormwater and groundwater for flood control; and preparation of flood insurance studies and other flood mapping projects. Municipalities and metropolitan sewerage districts are eligible for up to 70 percent State cost-share funding for eligible projects, and would have to provide at least a 30 percent local match.

Wisconsin Department of Natural Resources Clean Water Fund Program

The State Clean Water Fund Program (CWFP) provides financial assistance to municipalities for the planning, design, and construction of projects to control and treat urban stormwater runoff. Eligible applicants include cities, towns, villages, counties, town sanitary districts, public inland lake protection and rehabilitation districts, and metropolitan sewerage districts. Projects must be required by either a Wisconsin Pollutant Discharge Elimination System permit, a performance standard, or a plan approved by the WDNR. The primary purpose of an eligible urban runoff project must be to improve water quality. The program provides loans at an interest rate of 65 percent of the current CWFP market rate.

The Clean Water Fund Program also has a Small Loan Program that provides interest rate subsidies to municipalities that have a loan from the State Trust Fund Loan Program for the planning, design, and construction of urban runoff projects with total estimated costs of $1 million or less.

Wisconsin Coastal Management Program

The Wisconsin Coastal Management Program (WCMP) is administered by the Department of Administration, Bureau of Intergovernmental Relations. The WCMP is a voluntary State-Federal partnership that works through a council appointed by the Governor to provide policy coordination among State agencies and to award Federal funds to local governments and other entities for the implementation of initiatives related to the management of coastal zones in the State. The program has identified wetlands protection, habitat restoration, public access, land acquisition, nonpoint source pollution control, land use and community planning, natural hazards, and Great Lakes education projects as current priorities. The program also provides assistance to local governments in the management and protection of shorelands, wetlands, and floodplains through zoning and permitting.

Chapter IV

GOALS, OBJECTIVES, AND WORK PLAN

INTRODUCTION

The Milwaukee County land and water resources management plan incorporates inventory findings, including land use, natural resource data, soil and agricultural assets, and water quality data. Additionally, the plan addresses the principal land and water resource concerns and issues that were identified by the Advisory Committee and several other sources. During the development of the initial land and water resources management plan, the Milwaukee County Department of Transportation and Public Works Environmental Services Unit gathered input from several sources. These sources included:

- The County Parks, Energy & Environment Committee,
- Results from public meetings initiated by the Wisconsin Department of Natural Resources (WDNR) in January and February 2000,
- Information natural resource issues and needs compiled from responses to a questionnaire and citizen survey conducted by the WDNR, and
- Review of the top issues identified and prioritized by Milwaukee River basin conservation professionals.

Based upon a review of the issues identified and the priorities attached to them in the sources described above, four major issues were identified for the purpose of developing goals and objectives for the initial Milwaukee County land and water resource management plan:

- The need for control of nonpoint source pollution;
- The loss of wetlands, woodlands, quality farmland, environmental corridors, and other green space;
- The condition of and access to the Lake Michigan shoreline; and
- The need for a local, publicly available natural resource information and education support program.

As documented in Chapter I of this report, the Milwaukee County Department of Parks, Recreation and Culture (DPRC) Trails and Natural Areas Staff has been expending considerable effort in recent years on the control, management, and elimination of invasive plant and animal species on lands managed by the Milwaukee County park system. In view of this, the Milwaukee County Land and Water Resource Management Plan Advisory

Committee recommended identifying an additional issue for the purpose of developing goals and objectives for this update of the plan:

- Invasive species management and control.

As is also documented in Chapter I of this report, the land information web portal, whose establishment was a goal of the previous update of this plan, became operational in 2009. In recognition of this, the Advisory Committee has recommended modifying the land information goal to reflect the achievement of this portion of the goal.

These concerns and issues were used as a basis for developing the goals, work plan objectives, and planned actions for the Milwaukee County Land and Water Resources Management Plan. Based upon the identified issues, this plan has five goals for the period 2012 through 2016:

1. Improve water quality through the reduction of sediment and nutrient delivery to surface waters in Milwaukee County.

2. Protect, maintain, and restore, land and water resources in Milwaukee County.

3. Enhance Lake Michigan bluff protection initiatives.

4. Maintain the existing information management network and land information web portal.

5. Limit the introduction and reduce the spread of invasive species in Milwaukee County.

To achieve these goals the Milwaukee County Department of Transportation and Public Works—Architectural, Engineering & Environmental Services Division plans to partner with State and Federal agencies, the municipalities within the County, and other interested groups and organizations on a variety of projects and programs.

The recommended goals, work plan objectives, and planned actions for the years 2012-2016 are presented in Table 26. Milwaukee County's land and water resource management plan is a living instrument to plan conservation efforts over a five-year period, therefore, the work plan activities may require amendment due to varying environmental conditions, local priorities and commitments, changing programs and policies, and funding considerations. The general goals of this plan, developed as a part of a public participation process and approved by the Wisconsin Department of Agriculture, Trade, and Consumer Protection (DATCP), will not change and any necessary amendments to work plan activities would only be accomplished with proper approvals from the Milwaukee County Board Parks, Energy & Environment Committee, which acts as the County's land conservation committee, and DATCP.

EDUCATIONAL PROGRAMMING

Developing and implementing sound educational programming is an important component of the land and water resource management plan. Work plan objectives and action items related to educational programming have been integrated into the work plan set forth in Table 26. Work plan objectives related to educational programming include:

- Encourage public awareness of water quality problems and stormwater issues. Ensure that County staff is adequately trained to develop strategies and implement technologies to solve water quality problems (Goal 1).

- Increase public awareness of the value of land and water resources in Milwaukee County (Goal 2).

Table 26

MILWAUKEE COUNTY WORKPLAN: 2012-2016

Workplan Objective	Planned Actions	Status of Planned Actions	Agencies[a]	Priority[b]	Progress Tracking
Goal 1: Improve Water Quality through the Reduction of Sediment and Nutrient Delivery to Surface Waters in Milwaukee County					
Encourage Public Awareness of Water Quality Problems and Stormwater Issues. Ensure that County Staff is Adequately Trained to Develop Strategies and Implement Technologies to Solve Water Quality Problems	Work with local agencies and organizations to hold educational workshops and conferences designed to train consultants, inspectors, municipalities, developers, and County personnel about technologies and regulatory codes related to stormwater and water quality issues	Ongoing	ES, DPRC, UWEX, DATCP, WDNR, MMSD, SWWT	M	- -
	Respond to walk in, telephone, and e-mail inquiries	Ongoing	ES, DPRC	H	As needed
	As requested, give presentations to university classes, public groups, and others on stormwater and water quality issues	Ongoing	ES, DPRC	M	- -
	Cooperate with efforts to develop a watershed restoration plan for the Root River Watershed	Ongoing	EX, DPRC, SWWT, UWEX, SEWRPC	M	- -
Implement NR 216 Stormwater Requirements	Comply with conditions of WPDES NR 216 permit	Ongoing	ES, DPRC, County departments, local governments	H	Compliance with permit
	Conduct dry weather screening at major outfalls	Ongoing	ES	H	Screen all major outfalls annually
	Maintain stormwater pollution prevention plans (SWPPP) for applicable County facilities	Ongoing	ES, County departments	H	Maintain and meet requirements for all required plans
	Inspect for illicit connections in conjunction with SWPPP maintenance activities and other projects	Ongoing	ES, municipalities	H	Twice per year for SWPPPs/as needed for other projects
	Disconnect illicit connections as they are discovered	Ongoing	ES, County departments	H	As needed
	Inspect and maintain County owned, operated, and permitted structural stormwater facilities	Ongoing	ES	H	Inspect twice per year
	Update and maintain County storm sewer map	Ongoing	ES	H	Continually updated
	Assess compliance with 40 percent reduction in total suspended solids required for 2013	Ongoing	ES	H	Assess compliance by modeling once in the planning period

Table 26 (continued)

Workplan Objective	Planned Actions	Status of Planned Actions	Agencies[a]	Priority[b]	Progress Tracking
Goal 1: Improve Water Quality through the Reduction of Sediment and Nutrient Delivery to Surface Waters in Milwaukee County (continued)					
Implement NR 216 Stormwater Requirements (continued)	Work with partners to provide pet litter management supplies and signage in high traffic areas within the park system	Ongoing	ES, DPRC, Friends groups, SWWT	H	Install five to 10 new signs in high pet traffic areas
Work with Partners to Identify and Implement Measures to Prevent Future Beach Closings Resulting from Bacterial Contamination	Assist researchers working to identify sources of bacterial contamination by providing access to pertinent information on research findings	Ongoing	DTPW, MMSD, UWM GLWI	H	Provide available information as requested
	Continue beach grading and grooming	Ongoing	DPRC	H	Maintain established frequency
	Continue gull and goose abatement activities at selected locations with nuisance populations	Ongoing	DPRC	H	Document nuisance conditions biannually at selected locations
	Complete projects recommended by Lake Michigan storm sewer evaluation conducted as required by the County's WPDES NR 216 permit	Ongoing	ES	H	Complete projects as required by permit within permit period
	Comply with conditions of WPDES NR 216 permit	Ongoing	ES, County departments	H	Compliance with permit
Conduct and Promote Streambank Stabilization Projects and Projects Employing Best Management Practices (BMPs) to Reduce Erosion	Work with stakeholders to seek funding for streambank stabilization projects	Ongoing	ES, DPRC, MMSD, SWWT	M	- -
	Work with lessees of County lands and State agencies to install filter strips, riparian buffers, and other appropriate BMPs on agricultural parcels	Ongoing	DPRC, ES, DATCP, WDNR, FSA, NRCS	H	Install one buffer per year
	Install riparian buffers as a part of stormwater and streambank related projects	Ongoing	DTPW, DPRC, MMSD, WDNR, SWWT	H	Install one buffer per year
	Complete high priority projects listed in the County Streambank Assessment Report	Ongoing	DTPW, DPRC, SWWT	M	- -
	Work with stakeholders and project partners to increase public awareness of the causes of streambank erosion and the efforts to correct these problems through press releases, web pages, and /or educational displays	Ongoing	DTPW, DPRC, UWEX, DATCP, WDNR, SWWT	M	- -
	Implement recommendations relating to soil erosion and water quality outlined in the updated Milwaukee County Agricultural Lease Policy	Ongoing	DPRC, ES, DATCP, NRCS, FSA	L	- -

Table 26 (continued)

Workplan Objective	Planned Actions	Status of Planned Actions	Agencies[a]	Priority[b]	Progress Tracking
Goal 1: Improve Water Quality through the Reduction of Sediment and Nutrient Delivery to Surface Waters in Milwaukee County (continued)					
Implement the Recommendations Outlined in the County Pond and Lagoon Management Plan	Continue monitoring of County park ponds and lagoons	Ongoing	DPRC, ES	H	Complete at least annual monitoring of recent projects
	Continue aquatic macrophyte management activities	Ongoing	DPRC	H	Monitor at present level, control as needed
	Conduct additional improvement projects recommended in the Pond and Lagoon Management Plan	Ongoing	DPRC, ES	H	Complete two projects per planning period
	Post multilingual educational signs at the sites of pond and lagoon projects to inform Park visitors about problems at the lagoons and methods for improving water quality	Ongoing	DPRC, ES, UWEX	M	- -
	Initiate consideration of a long-term program to address sediment deposition in County ponds and lagoons	Ongoing	DPRC, ES	H	Program start up
Comply with the NR 151 Agricultural Performance Standards	Annually monitor agricultural fields to ensure compliance with NR 151 standards and prohibitions	Ongoing	ES	H	Annually monitor one field for compliance
	Develop and maintain a database for tracking the status of agricultural fields and operations	Ongoing	ES	H	Develop database for tracking compliance
	Conduct a soil loss survey during the plan period to determine whether the rate of soil loss is under “T,” the tolerable rate of soil loss	Ongoing	ES, TSP	H	Conduct one soil survey every five years
	Identify priority farms and operations and notify noncompliant operators	Ongoing	ES, DATCP, NRCS, WDNR	H	Identify and inventory one priority farm per year
	Provide cost-share and technical assistance to priority farm landowners to implement BMPs. Information may be provided through newsletters, brochures, mailings, and one-on-one meetings	Ongoing	ES, DATCP, NRCS, WDNR	H	Use 100 percent of allotted cost-share funding
Minimize Introductions of Chloride into Surface Waters of the County	Use road deicing best practices in order to reduce introductions of chloride into the environment	Ongoing	DTPW, DPRC, County depart-ments, local governments	H	Work with partners to develop best practices

Table 26 (continued)

Workplan Objective	Planned Actions	Status of Planned Actions	Agencies[a]	Priority[b]	Progress Tracking
Goal 2: Protect, Maintain, and Restore Land and Water Resources in Milwaukee County					
Continue to Manage the Milwaukee County-Owned Natural Areas Using the Latest Advancements in Restoration Ecology	Establish new, and maintain existing, partnerships with local colleges and universities, and community groups	Ongoing	DRPC, Local colleges, Friends groups	H	Work with two universities or colleges annually
	Encourage volunteer efforts by holding volunteer workdays in Milwaukee County natural areas	Ongoing	DPRC, Local colleges, Friends groups	H	Hold at least two volunteer workdays per year
	Working with partner organizations and volunteers, continue to inventory and monitor the Milwaukee County natural resource base	Ongoing	DPRC, ES, Local colleges, Friends groups	M	- -
	Develop natural resource management policies to guide future management	Ongoing	DPRC, ES	H	Develop one natural resource guide annually
	Develop site-specific management plans for DPRC natural areas	Ongoing	DPRC	H	Develop five management plans annually
	Analyze the existing publicly generated hiking trails to determine the most ecologically sustainable trails and stabilize those trails	Ongoing	DPRC	H	Analyze 40 miles during the planning period
	Identify areas in which to minimize mowing adjacent to waterbodies, giving consideration to the control of invasive plants and restoration of native plant communities called for under Goal 5 and accommodating active recreational use of some park lands	Ongoing	DPRC, ES	H	Identify and create the non-mowing zones in 20 acre units
Increase Public Awareness of the Value of Land and Water Resources in Milwaukee County	Develop and update as necessary natural resource management reference material that can be used by partner organizations and private individuals to manage natural resources under their control	Ongoing	DPRC, ES, UWEX, SEWISC, SWWT	M	- -
	Conduct and assist in conducting workshops, lectures, community presentations, and professional publications on Milwaukee County's natural resource management efforts and the value of natural resource management projects to the community	Ongoing	DPRC, ES	M	- -
	Expand partnerships with local universities and colleges to provide training opportunities for natural resource management students	Ongoing	DPRC, ES	H	Work with two universities or colleges annually

Table 26 (continued)

Workplan Objective	Planned Actions	Status of Planned Actions	Agencies[a]	Priority[b]	Progress Tracking
Goal 2: Protect, Maintain, and Restore Land and Water Resources in Milwaukee County (continued)					
Increase Public Awareness of the Value of Land and Water Resources in Milwaukee County (continued)	Develop volunteer resources and provide training for volunteers	Ongoing	DPRC, ES, UWEX, SWWT	M	- -
	Post and distribute multilingual informational materials on land and water resource conservation issues and approaches	Ongoing	DPRC, ES, UWEX, SWWT	M	- -
	Respond to walk in, telephone, and e-mail inquiries	Ongoing	ES, DPRC, UWEX, WDNR	H	As needed
	Report on activities through written reports, short talks, lectures, press releases, and other activities	Ongoing	ES, DPRC	M	- -
Maintain and Acquire High-Quality Natural Areas in Accordance with the Milwaukee County Parks and Open Space Plan	Maintain partnerships with local conservation groups and municipalities for identification and maintenance of high-quality natural areas that should be protected	Ongoing	DPRC, ES	H	As needed
	Work with stakeholders and landowners to acquire natural areas from willing sellers	Ongoing	DPRC, ES, WDNR, SWWT	M	- -
	Seek grant opportunities to for acquiring natural area parcels from willing sellers	Ongoing	DPRC, ES, WDNR	M	- -
Maintain Land in River Corridors for Recreational Use and Access	Maintain and enhance facilities to provide and improve access to river corridors and rivers at appropriate locations	Ongoing	DPRC, DTPW, WDNR	M	- -
	Pursue partnerships on projects to improve access to river corridors and rivers	Ongoing	DPRC, DTPW, WDNR,	M	- -
	Seek grant opportunities for providing and improving access to river corridors and rivers	Ongoing	DPRC, WDNR	M	- -
Manage Contaminated Sediments for Water Quality Benefit	Support efforts to determine best strategies for managing contaminated sediments	Ongoing	USEPA, WDNR, MMSD	M	- -
	Support efforts to implement best strategies for managing contaminated sediments	Ongoing	USEPA, WDNR, MMSD	M	- -
Goal 3: Enhance Lake Michigan Bluff Protection Initiatives					
Continue to Improve and Maintain Lake Michigan Shoreline Protection Measures and Abate Shoreline Erosion Problems in Milwaukee County Parks	Conduct or partner on bluff stabilization and shoreline protection projects	Ongoing	DPRC, DTPW	H	Conduct or partner on one bluff stabilization or shoreline stabilization project

Table 26 (continued)

Workplan Objective	Planned Actions	Status of Planned Actions	Agencies[a]	Priority[b]	Progress Tracking
Goal 3: Enhance Lake Michigan Bluff Protection Initiatives (continued)					
Maintain Lakefront Land for Recreational Use and Access	Seek partnerships on projects to improve lake access	Ongoing	DPRC, DTPW, WDNR	M	- -
	Enhance facilities to provide and improve access	Ongoing	DPRC, DTPW, WDNR	M	- -
Goal 4: Maintain the Existing Information Network and Land Information Web Portal					
Ensure that Mapping and the GIS Infrastructure Are Updated on a Regular Basis	Maintain partnerships with local and State governments to share data	Ongoing	MCLIO, SEWRPC, WDNR, Local governments	H	Meet with at least three local municipal staffs per year
	Update GIS data and layers as new or updated data become available	Ongoing	MCLIO, ES	H	Updates as available
Promote Effective Use of the GIS by County Staff, Natural Resource Professionals, Developers, and Citizens	Conduct GIS training sessions for County staff	Ongoing	MCLIO	M	- -
	Present training related to the County's GIS, available layers, and land information web portal at local workshops and conferences	Ongoing	MCLIO	M	- -
Goal 5: Limit the Introduction and Reduce the Spread of Invasive Species in Milwaukee County					
Provide Information to County Staff and Residents About How to Control Invasive Species	Conduct invasive species training for Milwaukee County employees involved in land and water resource management	Ongoing	DPRC, WDNR, SEWISC	H	One training annually
	Update DPRC's invasive species management guide as new techniques and knowledge become available	Ongoing	DPRC	M	- -
	Conduct invasive species removal workdays in County parks and natural areas for community volunteers and university students	Ongoing	DPRC, Friends groups, colleges and universities	H	Conduct 30 workdays annually
	Post and distribute materials related to invasive species identification and management and respond to direct inquiries and telephone and e-mail inquiries	Ongoing	DPRC, UWEX, WDNR, SEWISC	H	As needed
	Work with partners to develop reference and educational materials related to invasive species identification and management	Ongoing	DPRC, UWEX, WDNR, SEWISC	M	- -

Table 26 (continued)

Workplan Objective	Planned Actions	Status of Planned Actions	Agencies[a]	Priority[b]	Progress Tracking
Goal 5: Limit the Introduction and Reduce the Spread of Invasive Species in Milwaukee County (continued)					
Develop a Comprehensive and Coordinated Approach to the Management of Invasive Species in Milwaukee County	Inventory Milwaukee County-managed property for species listed as prohibited or restricted under NR 40	Ongoing	DPRC	H	Inventory 40 sites
	Establish a task force from applicable County departments to develop an "umbrella" invasive species management policy to guide County invasive species management activities	Ongoing	DPRC, County departments	H	Complete the policy
	Prioritize Milwaukee County-managed properties for the development of site-specific invasive species management plans	Ongoing	DPRC	H	10 sites annually
	Develop site-specific invasive species management plans for Milwaukee County-managed properties	Ongoing	DPRC	H	10 sites annually
	Update DPRC's invasive species management guide as new techniques and knowledge become available	Ongoing	DPRC	M	- -
Manage Infestations of Invasive Species in Milwaukee County-Managed Properties	Conduct invasive species training for Milwaukee County employees involved in land and water resource management	Ongoing	DPRC, UWEX, WDNR, SEWISC	H	One training annually
	Restore native plant communities in infested sites	Ongoing	DPRC	H	10 sites annually
	Conduct invasive species control efforts in accordance with the DPRC quick reference guide	Ongoing	DPRC, Friends groups	H	20 sites annually
	Continue gypsy moth suppression activities in partnership with the WDNR	Ongoing	DPRC, WDNR	H	Once annually
	Monitor for emerald ash borer and manage ash trees on County lands in accordance with the DPRC Emerald Ash Borer Preparedness Plan	Ongoing	DPRC, WDNR	H	As needed

Table 26 (continued)

[a]*Agency acronyms used in this table are defined as follows:*

DATCP	=	*Wisconsin Department of Agriculture, Trade and Consumer Protection*
DPRC	=	*Milwaukee County Department of Parks, Recreation and Culture*
DTPW	=	*Milwaukee County Department of Transportation and Public Works*
ES	=	*Milwaukee County Environmental Services*
FSA	=	*U.S. Department of Agriculture Farm Services Agency*
MCLIO	=	*Milwaukee County Land Information Office*
MMSD	=	*Milwaukee Metropolitan Sewerage District*
NRCS	=	*U.S. Department of Agriculture Natural Resources Conservation Service*
SEWISC	=	*Southeast Wisconsin Invasive Species Consortium*
SEWRPC	=	*Southeastern Wisconsin Regional Planning Commission*
SWWT	=	*Southeastern Wisconsin Watersheds Trust, Inc. (Sweet Water)*
TSP	=	*Technical Services Provider*
UWEX	=	*University of Wisconsin-Extension*
UWM GLWI	=	*University of Wisconsin Great Lakes WATER Institute*
USEPA	=	*U.S. Environmental Protection Agency*
WDNR	=	*Wisconsin Department of Natural Resources*

[b]*Priority symbols are defined as follows:*

H	=	*High priority for implementation*
L	=	*Low priority for implementation*
M	=	*Medium priority for implementation*

Source: Milwaukee County Environmental Services; Milwaukee County Department of Parks, Recreation and Culture; and SEWRPC.

- Promote effective use of GIS by County staff, natural resource professionals, developers, and citizens (Goal 4).

- Provide information to County staff and residents about how to control invasive species (Goal 5).

In addition to the planned actions under these objectives, educational strategies are indicated by some planned actions related to other work plan objectives.

The planned actions presented in Table 26 that are related to educational programming form a framework within which a variety of educational strategies can be utilized in order to promote achievement of the goals of the land and water resource management plan. Specific strategies include developing, posting, and distributing reference and educational materials related to the natural resource issues facing the County and approaches to managing the resources and solving resource-related problems; sponsoring and participating in workshops and conferences related to water quality, stormwater, and land and water conservation issues; and responding to inquiries.

Two of the strategies in the work plan merit additional discussion. First, the maintenance and updating of the County's land information web portal will allow the County to continue to provide the public with access to extensive geographic data necessary for private landowners to design and implement management strategies. Second, by providing training to students and volunteers and involving them in the County's management of parks and natural areas, the plan will encourage broader application of the skills developed that goes beyond the management of County-owned lands.

Much of the County's public educational programming is conducted in collaboration or cooperation with the County's partners in managing land and water resources. These partners include the local governments within the County; State agencies, such as DATCP, WDNR, and the University of Wisconsin-Extension; the Milwaukee Metropolitan Sewerage District; and private organizations, such as the Southeastern Wisconsin Watersheds Trust, Inc. (Sweet Water), the Southeastern Wisconsin Invasive Species Consortium (SEWISC), and local friends groups to the Milwaukee County Parks.

PERFORMANCE STANDARDS IMPLEMENTATION STRATEGY

The goals, work plan objectives and planned activities presented in this chapter represents part of the framework for an annual work plan that will be developed and carried out by Milwaukee County Environmental Services over the next five years. Proposed planned activities were broadly defined in order to meet future changes in the environment, changes in programs and policies, changes in local priorities, and changes in available funding. As required by DATCP, a more detailed list of planned activities is set forth below, as a strategy to implement the nonpoint pollution performance standards and prohibitions under NR 151. Also an estimate of the costs associated with plan implementation is provided.

Implementation Strategy (Agricultural)
To equitably implement the previously noted standards and prohibitions in agricultural areas, a systematic and comprehensive approach will be required. Milwaukee County anticipates entering into a Memorandum of Understanding (MOU) with the WDNR at some point in the future. Specific roles and responsibilities would be negotiated during the framing of the agreement. However, the strategy for implementation detailed below is a likely process for implementation with some need for flexibility as program experience develops and fiscal conditions may dictate. In the following sections, the term "landowner" is used generically to describe the person responsible for compliance with the above-noted standards.

Conduct Information and Education Activities
Milwaukee County Environmental Services will distribute information and educational material prepared by the WDNR and DATCP to appropriate landowners. The information will also be distributed via the County website, public informational meetings, and individual contacts with landowners.

The educational materials will be designed to achieve the following objectives:

- Educate landowners about Wisconsin's agricultural performance standards and prohibitions, applicable conservation practices, and cost-share grant opportunities;
- Promote voluntary implementation of conservation practices necessary to meet the performance standards and prohibitions;
- Inform landowners of compliance procedures and agency roles to be used statewide and locally; and
- Make landowners aware of expectations for compliance and consequences for noncompliance.

Identify and Evaluate Farms for Compliance with Standards and Prohibitions

Milwaukee County Environmental Services will use GIS as a tool to identify priority farms for compliance determinations, track progress on implementing performance standards, and meet reporting requirements. Color digital orthophotography taken in spring of 2010 will be used as a base map for initial screening. Water Quality Management Areas (WQMA) (300 feet from a stream or 1,000 feet from a lake or areas susceptible to groundwater contamination) will be delineated using County digital orthophotography and large-scale topographic maps and available GIS water resource layers. Digital land units from the U.S. Department of Agriculture Farm Service Agency will be used to identify field boundaries. Information from the NRCS soil survey may also be used to identify "potential" locations of runoff or groundwater problems. These data layers combined with a hydrologic data layer will help identify water resources and locate potential problem areas within the WQMA. Agricultural fields and livestock operations within this area can be identified and a list of owners generated from the Land Information System parcel maps. Once the list of landowners is created, Environmental Services staff can conduct a records inventory search for files related to conservation planning for these operations. This would be an initial review to determine potential compliance with the performance standards based on past or present program participation. If no records are found, or if the records are found to be out of date with existing farming operations, an onsite farm visit would be scheduled.

In the initial stages, implementation will focus on high priority areas, WQMA, livestock operations, highly erodible soil areas, and lands not slated for development in the near future. Landowners within these areas will be contacted for compliance evaluation based on initial screening data noted above. Additional onsite review may also be identified through complaints or staff observations. The number of compliance evaluations is limited by existing program efforts and staffing levels.

Document and Report Compliance Status

Following completion of records review and onsite evaluations, an NR 151 Status Report will be prepared and issued to owners of the parcel evaluated. This report will include at a minimum:

- Compliance status of individual parcels with each of the performance standards and prohibitions;
- Corrective measure options and an approximate cost estimate to comply with each of the performance standards and prohibitions for which a parcel is not in compliance;
- Status of eligibility for available cost-share funding;
- Grant funding and technical assistance available from Federal, State, and local government sources and third party service providers;
- An explanation of conditions that apply if public cost share funds are used;
- A timeline for completing corrective measures, if necessary;

- Signature lines indicating landowner agreement or disagreement with report findings;
- Process and procedures for contesting evaluation results to the County; and
- A copy of performance standards, prohibitions, and technical design standards.

All evaluations and compliance status reports will be kept as public record in the office of Milwaukee County Environmental Services. If a landowner agrees with the initial compliance determination and no corrective actions are required, a Letter of NR 151 Compliance would be issued (see Item 5 below) and the site mapped appropriately on the Milwaukee County Land Information System. If a landowner disagrees with the initial compliance determination, the landowner may meet and discuss concerns with Environmental Services staff regarding the compliance determination process and results. If, after discussing the NR 151 Status Report with Environmental Services staff, the landowner still disagrees with conclusions, the landowner may choose to follow the local appeals process to be detailed in the anticipated MOU between the County and the WDNR.

Offer Technical Assistance and Available Cost-Share Funding to Implement Appropriate Best Management Practices

If a site is determined to be out of compliance with the State standards, technical assistance and cost-sharing may be offered to the landowner to bring them into compliance. A list of conservation practices likely to be utilized to meet state performance standards and potential sources of cost-share funding is set forth in Appendix C. State law requires that cost sharing be made available to bring older livestock facilities and cropland practices into compliance with standards and prohibitions. Cost-sharing is not required for new livestock facilities or cropland practices. In addition, once a livestock facility or cropland is brought into compliance with a standard or prohibition, the landowner and all future landowners of those parcels are required to maintain compliance in perpetuity regardless of future cost share availability. When cost sharing is required, a landowner would not be required to comply until such time that cost-sharing becomes available. However, if cost-share funding is offered as part of a formal notice meeting the requirements of sections NR 151.09 or NR 151.09 of the *Wisconsin Administrative Code*, and a landowner refuses to make the corrective actions needed to bring the site into compliance, the landowner will be required to achieve compliance through stepped enforcement and will lose eligibility under some programs to get additional cost sharing to fix the standards violation. In these cases, the landowner will be required to fix the site at his own expense.

Administer Funding and Technical Assistance

Once a landowner agrees to implement the corrective actions to bring the site into compliance with the State standards, and if cost-sharing is involved, the cost-share agreement and schedule for implementation will be executed. If technical assistance is required, it will be arranged through appropriate agencies/staff with the proper engineering credentials or conservation planning certifications.

After the corrective measures are applied, the site will be re-evaluated to determine if the parcel has been brought into compliance with the relevant performance standards or prohibitions. If the site was in compliance, the NR 151 Status Report would be updated to include a Letter of NR 151 Compliance. This would serve as official notification that the site has been determined to be in compliance with applicable performance standards and prohibitions. Under NR 151, once a site is determined to be in compliance, it is required that the site remain in compliance for perpetuity without additional cost sharing being required.

Issue Required Notices and Enforcement Activities

Following compliance status notification and issuance of any notices required by state law, enforcement action may commence if appropriate action is not taken by the landowner/operator according to deadlines set forth in the notice.

Generally, a NR 151 Violation Letter would be sent via certified mail to notify the landowner of the violation and explain possible enforcement action that may follow. It is anticipated that the Environmental Services would refer

certain cases to the WDNR for further enforcement, depending on site-specific circumstances and whether the performance standard violation is also a violation of Milwaukee County ordinances.

Compliance Monitoring and Annual Reporting
Milwaukee County Environmental Services will use GIS and a spreadsheet database to record progress on implementing performance standards and meet reporting requirements. Compliance monitoring may be done as random spot checks or through scheduled inspections of sites previously cost-shared. Annual reports will be compiled to evaluate the progress of administering performance standards and prohibitions and submitted to the WDNR and DATCP.

Implementation Strategy (Nonagricultural)
To implement the standards and prohibitions described in Chapter III of this report fairly in the nonagricultural areas, a systematic and comprehensive approach will be required. Runoff pollution from urban lands can be the leading cause of water quality problems in some areas. As in rural areas, the main pollutant is sediment, or small bits of soil particles washed into streams and lakes. Attached to the soil particles are nutrients such as phosphorus that fuel the growth of algae and weeds in bodies of water. Other pollutants from urban areas include flakes of metal from vehicles, particles from vehicle exhaust, bits of tire and brake linings, soot from smokestacks, lead, zinc, pet waste, leaves, grass clippings, and a variety of chemical compounds.

Because all of the municipalities in the County are incorporated, Milwaukee County has not taken a lead role in stormwater management, general erosion control, and the erosion control measures for development within the shoreland zone, except in those areas addressed by the County municipal separate storm sewer discharge permit. Information on the relevant local ordinances for the municipalities within Milwaukee County was presented in Chapter III of this report. All the cities and villages in the County have stormwater management and construction site erosion control plans or ordinances. All of the municipalities in the County that contain shoreland wetlands have adopted shoreland-wetland zoning ordinances. All of the municipalities in the County with identified flood hazard areas have adopted floodland zoning ordinances.

It should be noted that local erosion control ordinances do not apply to single-family home construction as these are regulated under Comm 21 *Wisconsin Administrative Code*. By State *Statute*, Comm 21 supersedes all local ordinances.

PARTNERSHIP EFFORTS

Milwaukee County has conducted many of its land and water resource conservation activities in cooperation and collaboration with a variety of partners. Notable partners in these efforts during the years 2007 through 2009 are listed in Table 1 in Chapter I of this report. As indicated in the work plan set forth in Table 26, the County will continue to utilize, maintain, and expand these partnerships, as appropriate.

As discussed in Chapter III of this report, the Milwaukee Metropolitan Sewerage District, in collaboration with the Southeastern Wisconsin Watersheds Trust, Inc. (Sweet Water), has developed watershed restoration plans for the Kinnickinnic and Menomonee River watersheds. Sweet Water has recently developed implementation plans and developed lists of priority projects for implementing these watershed restoration plans. In the Kinnickinnic River watershed, Sweet Water is developing potential projects related to stormwater management, riparian buffer installation, and channel enhancement. In the Menomonee River watershed, Sweet Water is developing potential projects related to agricultural runoff, stormwater management, riparian buffer installation, nutrient load reduction, streambank stabilization, and educational outreach related to the management of pet waste. These projects may present opportunities for the County to engage in collaborative efforts in order to meet the goals and objectives of the Milwaukee County land and water resource management plan.

Table 27

ESTIMATED TOTAL COSTS FOR PLAN IMPLEMENTATION: 2012-2016

Cost Category	2012	2013	2014	2015	2016	Five-Year Total Cost
Salary and Benefits[a]	$340,156	$346,959	$353,898	$360,976	$368,196	$1,770,185
Operating Expenses[a]	30,500	31,110	31,732	32,367	33,014	158,723
Landowner Cost-Share Hard Practices[b]	20,000	20,000	20,000	20,000	20,000	100,000
Landowner Cost-Share Soft Practices[b]	5,000	5,000	5,000	5,000	5,000	25,000
Total Annual Costs	$397,668	$405,082	$412,645	$420,358	$428,226	$2,053,909

[a]*Anticipate 2 percent annual increases for salary, benefits, and operating expenses.*

[b]*The costs provided by landowners and other grant recipients would be approximately $7,500 annually.*

Source: Milwaukee County and SEWRPC.

ESTIMATED COSTS OF PLAN IMPLEMENTATION

Since this plan does not have the authority to establish county budget items, the estimated costs provided below are solely intended to satisfy state LWRM planning requirements and do not in any way represent anticipated Milwaukee County Environmental Services budgets. It is also assumed that no additional staff resources will be made available to implement this plan beyond what is currently allocated to land and water conservation programs in the County (approximately three full time employees). The cost estimates contained in Table 27 are based on average annual costs to maintain existing program efforts and staffing levels.

The cost-sharing estimates in Table 27 are based on a statutory requirement of 70 percent cost-sharing and are dependent on the need for landowners to comply with the state performance standards described earlier in this chapter. Agriculture land uses comprise a small portion of the area in Milwaukee County. In addition, Milwaukee County has only a few livestock operations remaining. Therefore, compared to other Wisconsin counties, the costs to meet these requirements should be nominal. Portions of Milwaukee County have, however, been under intensive agriculture for over a hundred years and many of the County's streams have accumulated sediment throughout that period. If a new standard is established for stream buffers, and nutrient management standards are enforced, these costs could be greater. Average salary increases and inflationary costs are included in the increases shown each year. Currently, all cost-share funding is acquired from Federal and State sources, Milwaukee County Environmental Services will continue to apply for grants to supplement those funds. The table assumes that Milwaukee County's current budgeted staffing level of three full time employees is maintained, and it assumes stable segregated and bonding cost-share funds by the State. Conservation practices, such as diversions, riparian buffers, filter strips and building projects such as manure storage facilities, concrete barnyards and roofed feedlots are considered "hard practices." Cropping practices, such as nutrient management and conservation tillage, are known as "soft practices." The projected cost-share needs for installing hard and soft best management practices over the next five years is only an approximate estimate due to uncertain funding levels, changing land use and farm economy, and increasing practice installation costs.

The procedures and cost estimates outlined in this chapter represent the best estimates of Milwaukee County Environmental Services at the time of plan preparation and are all subject to change. No attempt is made to identify the source of funding beyond the assumptions noted above. All of the estimated costs are subject to the annual budget processes at the County, State and Federal levels. Milwaukee County will make every attempt to take advantage of the wide array of grants and partnerships that may be available through public or private sources to implement this plan.

STAFFING

It is reasonable to assume that existing staff will be able to provide a significant portion of the time required for implementation of this plan. If additional manpower is needed, it will be obtained through cooperative ventures with local universities, colleges, and volunteer groups; consultants, and limited-term or seasonal staff increases. As discussed in Chapter I of this report, DPRC has been very successful in its efforts to develop and utilize volunteers in its natural area management activities.

Chapter V

PROGRESS MONITORING AND EVALUATION

MONITORING AND EVALUATION

The monitoring and evaluation of program efforts is important to ensure the effectiveness of the planned activities described in Chapter IV of this plan. The Milwaukee County Environmental Services Division currently employs and plans to expand a variety of methods to monitor and evaluate the progress of program efforts. Those methods include the geographic information system (GIS) database, advisory committees, annual progress reports, and water quality monitoring. Monitoring program effectiveness will be carried out through analyses and quantification of soil erosion and sediment delivery, priority farm compliance, tracking the level of protection of environmentally sensitive lands, and analysis of water quality data. This chapter describes some of these efforts in more detail and how they will be used to monitor and evaluate the success in implementing planned activities.

GIS/Database Tracking System

Milwaukee County's priority farms strategy will involve the identification and evaluation of farmland for compliance with performance standards and prohibitions. Milwaukee County will use GIS as a tool to identify priority farms for compliance determinations, track progress on implementing performance standards, and meet reporting requirements. This database will be designed to inventory parcel ownership, track notices sent to landowners and record conservation measures installed and cost-share funds awarded. In addition, the Environmental Services Division will be able to track progress and compliance of riparian buffer and other best management practice installation accomplished through the U.S. Department of Agriculture Conservation Reserve Program or other programs.

Progress Reporting

Regular meetings are currently held to report progress to the Milwaukee County Board Parks, Energy and Environment Committee (acting as the County's land conservation committee) regarding conservation plans and nutrient management plans, implementation of buffers, contacts made, and educational activities. These meetings are used to evaluate the effectiveness of current practices, to approve and review cost-share contracts, and to change or modify programs to better address current conditions and local priorities.

Water Quality Monitoring

Water quality monitoring is an important means to assess the present condition of water resources and to gauge the effectiveness and progress of land conservation-related activities and best management practices. Unfortunately, due to the high number of variables involved in monitoring water quality, nonstandardized parameters and sampling techniques, and the broad spatial and temporal sampling effort, it is often difficult to interpret the data. As a result of ongoing monitoring efforts by a variety of agencies and groups, considerable water quality monitoring information is available on some streams in Milwaukee County, as described below. Much of the recent data were summarized in Chapter II of this report. Milwaukee County supports citizen-based

monitoring programs such as Water Action Volunteers. The County also plans to continue to work on collecting water quality data in cooperation with conservancy and environmental organizations, State and Federal Agencies, school districts, utility companies, local governments, the Milwaukee Metropolitan Sewerage District (MMSD), and adjacent County and local governments and other groups such as the Southeastern Wisconsin Watersheds Trust, Inc., Milwaukee Riverkeeper, Root-Pike Watershed Initiative Network, and SEWRPC. All of these groups work directly or indirectly, through project funding, to collect water quality data on a regular basis.

Wisconsin Department of Natural Resources (WDNR) Water Quality Monitoring

The WDNR conducts baseline monitoring of streams in Milwaukee County. The Department staff conducts fish collections and habitat assessments and examines macroinvertebrates at a number of locations throughout the County. This information is summarized in periodic State of the Basin reports.

U.S. Geological Survey Monitoring

The U.S. Geological Survey (USGS) is actively collecting surface water resources data at several locations in Milwaukee County and at numerous locations around Wisconsin. Streamflow is monitored at 16 locations in the County that continuously record water-stage and/or record crest stages of larger individual floods. These stations include sites along the mainstem of the Kinnickinnic River, Wilson Park Creek, and a tributary to Holmes Avenue Creek in the Kinnickinnic River watershed; the mainstem of the Menomonee River, the Little Menomonee River, Underwood Creek, and Honey Creek in the Menomonee River watershed; the mainstem of the Milwaukee River and Lincoln Creek in the Milwaukee River watershed; the mainstem of Oak Creek in the Oak Creek watershed; and the mainstem of the Root River in the Root River watershed.

The USGS also monitors water quality both through the use of continuously recording probes and by collecting and analyzing water samples. Many of these stations are located at the sites of streamflow gages. In 2010, continuous data were collected at 11 stations and water quality samples were collected at 25 stations. These stations include sites along the mainstem of the Kinnickinnic River, Edgerton Ditch, Wilson Park Creek, and a tributary to Holmes Avenue Creek in the Kinnickinnic River watershed; the mainstem of the Menomonee River, the Little Menomonee River, Underwood Creek, and Honey Creek in the Menomonee River watershed; the mainstem of the Milwaukee River and Lincoln Creek in the Milwaukee River watershed; the mainstem of Oak Creek in the Oak Creek watershed; and the mainstem of the Root River in the Root River watershed. The type of data collected in the USGS sampling varies depending on program and project scope, but available data include historical and current streamflow on selected waterbodies and water quality. The USGS regularly partners with WDNR, MMSD, SEWRPC, Milwaukee County, and other agencies and local interest groups to collect information on the condition of surface and groundwater resources. More information on the variety of data collected by the USGS and the ability to view real-time stream gage data can be found at the USGS website: *http://wi.water.usgs.gov/*.

MMSD Water Quality Monitoring

The MMSD is actively collecting surface water quality data at over 100 sampling stations along streams within its service area and the associated nearshore areas of Lake Michigan. Most of these sampling stations are located in Milwaukee County. Those sampling stations that are not located in Milwaukee County are located in upstream reaches of streams which flow into the County. The District analyzes samples for about 44 different water quality parameters, including chemical parameters, suspended material, nutrients, and metals. Streams that are currently being monitored include the mainstem of the Kinnickinnic River in the Kinnickinnic River watershed; the mainstem of the Menomonee River, the Little Menomonee River, Underwood Creek, and Honey Creek in the Menomonee River watershed; the mainstem of the Milwaukee River, Southbranch Creek, Indian Creek, and Lincoln Creek in the Milwaukee River watershed; the mainstem of Oak Creek in the Oak Creek watershed; the mainstem of the Root River in the Root River watershed; and Fish Creek in the Lake Michigan Direct drainage area. In partnership with the USGS, the District has also established 10 real-time continuous water quality monitoring stations along streams within its service area. Seven of these stations are located in the County. More information on the data collected by the MMSD and the ability to view real-time stream water quality data can be found at the MMSD website: *http://v3.mmsd.com/*.

Milwaukee Riverkeeper/Water Action Volunteers Water Quality Monitoring

Since 2006, Milwaukee Riverkeeper has conducted a volunteer monitoring program under which trained citizen volunteers monitor streams and rivers within the Milwaukee River basin. In Milwaukee County, this program conducts monitoring on the mainstems and tributaries of the Kinnickinnic, Menomonee, and Milwaukee River watersheds. In the Menomonee and Milwaukee River watersheds, this program also monitors at sites upstream from Milwaukee County. The program trains two levels of volunteers. Level I volunteers measure dissolved oxygen, air and water temperature, turbidity, flow, macroinvertebrates, stream habitat, and streamflow velocity on a monthly basis. The data produced from this monitoring is entered into the Water Action Volunteers database, hosted by UW-Extension. Level II volunteers monitor water quality using equipment from the WDNR. This monitoring includes measurements of pH, dissolved oxygen (DO), turbidity, and temperature using automated data loggers. The data that is collected is entered in the WDNR's SWIMS database.

Lake Michigan Beach Monitoring

The Federal Beach Act was passed in October of 2000, requiring States that border coastal or Great Lakes waters to develop beach monitoring and public notification programs. The Beach Act also authorized the U.S. Environmental Protection Agency (USEPA) to provide grants to States that have beaches bordering these coastal waters for the purpose of developing and implementing monitoring and public notification programs. The WDNR and its partners have participated in this grant program since the 2002 swimming season. The Wisconsin Beach Monitoring Program was developed in accordance with USEPA performance criteria. Several health departments within Milwaukee County adhere to the performance criteria for monitoring, public notification, and reporting. These include the City of Milwaukee Health Department, the North Shore Health Department, the City of Oak Creek Health Department, the City of St. Francis Health Department, the Shorewood/Whitefish Bay Health Department and the City of South Milwaukee Health Department. Milwaukee County beaches that are tested regularly include: Atwater Park Beach, Bay View Park Beach, Bender Beach, Bradford Beach, Grant Park Beach, Klode Park Beach, McKinley Beach, South Shore Beach, South Shore Rocky Beach, Tietjen Beach, and Watercraft Beach. Water quality data are posted daily from Memorial Day to Labor Day. Water quality conditions at the monitored beaches are posted at the beaches and at the State of Wisconsin beach condition website. The State beach condition website is updated daily and, therefore, has the latest available advisories. The State of Wisconsin beach website is: *www.wibeaches.us*.

SUMMARY

Consistent and thorough evaluation and monitoring of conservation efforts is essential to ensure the effectiveness of the Milwaukee County Land and Water Resource Management Plan. An annual progress report will be the primary method used to evaluate progress of implementing the planned activities outlined in Chapter IV of this plan. The progress report will utilize the standardized units of measurement for conservation practices and information and education activities prescribed by DATCP. The progress report will consist of a summary of the annual outcomes and accomplishments of planned activities outlined in the work plan. This summary may include, but is not limited to: completed information and education activities, landowners contacted, BMPs designed and installed, conservation and nutrient management plans written or revised, cost-share agreements developed, compliance monitoring and status, and other planned program results. These annual progress reports will be compiled and forwarded to the Department of Agriculture, Trade and Consumer Protection and the Department of Natural Resources. The results of the monitoring and evaluations described in this chapter, and conducted over the term of this plan (2012 to 2016), will be used to improve the next land and water resource management plan.

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APPENDICES

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Appendix A

ADVISORY COMMITTEE AND PLANNING PROCESS MATERIALS USED IN THE MILWAUKEE COUNTY LAND AND WATER RESOURCE MANAGEMENT PLAN

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Figure A-1

MEMBERS OF THE MILWAUKEE COUNTY LAND AND WATER RESOURCE MANAGEMENT PLAN ADVISORY COMMITTEE

Timothy Detzer, Chairman ..... Environmental Engineer, Milwaukee County Department of Transportation and Public Works
Michael G. Hahn, Secretary ..... Chief Environmental Engineer, Southeastern Wisconsin Regional Planning Commission
Joel Dietl ..... Planning Manager, City of Franklin
Julie Esch ..... Policy Analyst, Milwaukee County
David C. Fowler ..... Senior Project Manager, Milwaukee Metropolitan Sewerage District
Sharon L. Gayan ..... Basin Supervisor, Wisconsin Department of Natural Resources
Jerry L. Hebard ..... District Conservationist, USDA Natural Resources Conservation Service
Stevan M. Keith ..... Sustainability Engineer, Milwaukee County Department of Transportation and Public Works
Jeffrey Martinka ..... Executive Director, Southeastern Wisconsin Watersheds Trust, Inc.
Doug Seymour ..... Director of City Development, City of Oak Creek
Brian Russart ..... Natural Areas Coordinator, Milwaukee County Department of Parks, Recreation, and Culture

Figure A-2

ACTIVITIES OF THE MILWAUKEE COUNTY LAND AND WATER RESOURCE MANAGEMENT PLAN ADVISORY COMMITTEE

PRELIMINARY DRAFT

Milwaukee County Department of Transportation and Public Works
Southeastern Wisconsin Regional Planning Commission

Notice of First Meeting and Agenda

MILWAUKEE COUNTY LAND AND WATER RESOURCE MANAGEMENT PLAN ADVISORY COMMITTEE

DATE: October 7, 2010

TIME: 2:00 to 4:00 p.m.

PLACE: Milwaukee County City Campus
2711 w. Wells Street
Milwaukee, WI

AGENDA:

1. Introductions

2. Review of preliminary draft Chapter I, "Introduction," of SEWRPC Community Assistance Planning Report No. 312 (CAPR No. 312), *A Land and Water Resource Management Plan for Milwaukee County: 2012-2016*

3. Review and discussion of plan goals

4. Next meeting

5. Adjourn

Michael G. Hahn
Secretary

#153659 V1 - MILW CTY L&WRMP ADV COMM 1ST MTG AGENDA 10/07/10
300-1087
MGH/
09/24/10

SUMMARY NOTES OF THE OCTOBER 7, 2010 MEETING OF THE MILWAUKEE COUNTY LAND AND WATER RESOURCE MANAGEMENT PLAN ADVISORY COMMITTEE

INTRODUCTION

The first meeting of the Milwaukee County Land and Water Resource Management Plan Advisory Committee was convened at the Milwaukee County City Campus Building at 2:03 p.m. on October 7, 2010. The meeting was called to order by Mr. Timothy Detzer, Environmental Engineer, Milwaukee County Department of Transportation and Public Works. Attendance was taken by circulating a sign-in sheet.

In attendance at the meeting were the following individuals:

Timothy Detzer, Chairman	Environmental Engineer, Milwaukee County Department of Transportation and Public Works
Michael G. Hahn, Secretary	Chief Environmental Engineer, Southeastern Wisconsin Regional Planning Commission
Joseph E. Boxhorn	Senior Planner, Southeastern Wisconsin Regional Planning Commission
Joel Dietl	Planning Manager, City of Franklin
David C. Fowler	Senior Project Manager, Milwaukee Metropolitan Sewerage District
Sharon L. Gayan	Basin Supervisor, Wisconsin Department of Natural Resources
Jerry L. Hebard	District Conservationist, USDA Natural Resources Conservation Service
Stevan M. Keith	Sustainability Engineer, Milwaukee County Department of Transportation and Public Works
Jeffrey Martinka	Executive Director, Southeastern Wisconsin Watersheds Trust, Inc.
Aaron W. Owens	Research Analyst, Southeastern Wisconsin Regional Planning Commission
Brian Russart	Natural Areas Coordinator, Milwaukee County Parks Department

Mr. Detzer welcomed all those in attendance and thanked them for their participation in this program. He asked Committee members to introduce themselves and then turned the meeting over to Mr. Hahn. Mr. Hahn told the Committee that the plan is being updated to maintain eligibility to receive State funding for land and water resource management programs. Mr. Hahn informed the committee that he anticipated that there would be two additional meetings (the first in early November, and the second in late November). He further informed the Committee that there is a mid-December deadline for the plan to be submitted to the Wisconsin Department of Agriculture and Consumer Protection (DATCP), WDNR, and the U.S. Department of Agriculture Farm Service Agency. Mr. Hahn indicated the Regional Planning Commission staff would prepare detailed minutes and document any changes and additions to the plan.

REVIEW OF PRELIMINARY DRAFT CHAPTER I, "INTRODUCTION", OF SEWRPC COMMUNITY ASSISTANCE PLANNING REPORT NO. 312 (CAPR NO. 312), *A LAND AND WATER RESOURCE MANAGEMENT PLAN FOR MILWAUKEE COUNTY: 2012-2016.*

Mr. Hahn introduced Mr. Boxhorn of the Commission staff, and asked that he review Chapter I, "Introduction". Before reviewing the chapter, Mr. Boxhorn informed the Committee that subsequent chapters will be posted on the SEWRPC website. He also advised the Committee that the website will contain a comments screen where Committee members and the public can submit information, comments, and suggestions electronically. He encouraged Committee members to use this screen.

Mr. Boxhorn began by reviewing the "Overview of Study Area" section of the chapter.

Mr. Dietl suggested that the chapter should contain more specific information about the most important natural resource features, if such information would be helpful with obtaining grants. Mr. Dietl mentioned the Wisconsin Land Legacy Report as an example. He also asked whether a concise, summary version of the plan will be made available. Mr. Boxhorn indicated that specific natural resources will be inventoried and discussed in more detail in Chapter II. He said that the Wisconsin Land Legacy Report will be one of the reports discussed in that chapter and requested that Committee members send him any other relevant reports. He also noted that a plan summary will be prepared as required by the State.

In reference to the plan background and purpose section of the chapter, Mr. Boxhorn asked whether 2001 was the correct publication year for the initial version of the plan. Mr. Detzer confirmed that 2001 is the correct year.

Mr. Hebard noted that the Milwaukee County Land Conservation Committee is abbreviated incorrectly as LWCC in the plan development and participation section. He indicated that the correct abbreviation is LCC. In regards to the same sentence, Mr. Detzer stated that the Milwaukee County Board Parks, Energy & Environment Committee acts as the Land Conservation Committee and suggested that this be footnoted instead of listing them separate entities.

[Secretary's Note: The first sentence of the third paragraph on page 2 was revised to read as follows:

(In this Secretary's Note and in subsequent Notes, unless indicated otherwise, revised and added text is indicated in bold letters for clarification only. The report text will not be bold)

"The Milwaukee County Land and Water Resources Management Plan was developed through a collective effort on the part of a number of agencies and organizations under the overall direction of the Milwaukee County Land Conservation Committee **(LCC).[1]**"

The added footnote should read as follows:

"[1]The members of the Milwaukee County Board Parks, Energy & Environment Committee serve as the Milwaukee County Land Conservation Committee."]

Mr. Martinka noted that in the third paragraph under the plan development and public participation section, Milwaukee Journal Sentinel should not have a hyphen. This correction was made.

Mr. Boxhorn indicated that Committee activities, plan development, and public comment and participation will be documented in Appendix A which will be developed as the plan update proceeds.

Mr. Boxhorn reviewed the section of the chapter on plan implementation activities, noting that subsequent to completion of the draft Chapter, Mr. Detzer provided him with additional information on County activities related to implementation of the 2006 update of the plan. He indicated that this information would be added to the summary of implementation activities and that this addition would be documented in the minutes. Mr. Detzer requested Mr. Russart pass along information on any additional activities of which he is aware.

[Secretary's Note: The following subsection was added after the third paragraph on page 5:

"***Implementation of Recommendations Related to Soil Erosion and Water Quality in Milwaukee County Parks Agricultural Lands***

The County DPRC owns approximately 1,000 acres of undeveloped parkland that can be used for agricultural uses and that are leased to agricultural operations. In

addition, about 300 acres of County parkland are enrolled in the U.S. Department of Agriculture Conservation Reserve Program (CRP). The administration and management of these leases is based upon DPRC's Agricultural Land Lease Policy. This policy recommends terms and conditions upon which DPRC leases lands, including length of leases, rental fees for leases, requirements for conservation plans for leased parcels, and requirements related to the management of leased lands. In 2009, DPRC updated this policy, with the updated version becoming effective in January 2010. The updated policy is described in Chapter III of this report. Included among the elements of the update policy was a reinstatement of the requirements that no annual crops be planted within 75 feet of any river or stream on leased land and that no annual crops or vegetable crops be planted within 30 feet of any field ditch on leased lands."]

In regards to the discussion of stormwater management in the chapter, Mr. Detzer advised the Committee there is no stormwater pollution prevention plan for the Milwaukee County Transit System Fiebrantz Bus Garage. He further explained the County received a No Exposure certification for the property. Mr. Martinka suggested adding discussion of stormwater programs at General Mitchell International Airport. Mr. Detzer stated that General Mitchell has a separate Wisconsin Pollutant Discharge Elimination System (WPDES) permit.

[Secretary's Note: The last two sentences of the first full paragraph on page 4 were revised to read as follows:

"The County has developed and is maintaining stormwater pollution prevention plans for several of its facilities including **General Mitchell International Airport,** Lawrence J. Timmerman Airfield, the Milwaukee County Zoo, and the Milwaukee County Fleet Management Main and North Shops. Maintenance and implementation of these plans has included training for employees and quarterly inspection of the facilities. **In addition, the County has received a certification of no exposure for the Milwaukee County Transit System Fiebrantz Bus Garage. Stormwater from General Mitchell International Airport is covered under a separate WPDES stormwater discharge permit."]**

Mr. Fowler added that General Mitchell International Airport also has a wildlife reduction plan that should be discussed.

[Secretary's Note: Discussion of the Airport's wildlife reduction plan was added to a new section of the chapter entitled "Other Notable Land and Water Resource Conservation Activities in Milwaukee County". This section is attached herein as Exhibit A.]

Mr. Martinka noted several typographical errors in the "Stormwater Management" section. These errors were corrected.

Concerning the discussion on activities to reduce bacterial contamination at Lake Michigan beaches, Mr. Russart informed the Committee that during peak swimming season, Bradford Beach is groomed more frequently than once per week as is stated in the text.

[Secretary's Note: The following sentence will be added at the end of the third paragraph on page 5:

"During peak swimming season, grooming occurs more frequently on this beach."]

Ms. Gayan commented that the City of Milwaukee Health Department conducts extensive water quality testing at Lake Michigan beaches and suggested this be mentioned in the section on beaches. Mr. Fowler mentioned the MMSD also has extensive water quality testing throughout waterways in Milwaukee County.

[Secretary's Note: The following sentences were added after the second sentence in the second full paragraph on page 4:

"The City of Milwaukee Health Department conducts extensive water quality testing at Lake Michigan beaches. In addition, the MMSD conducts extensive water quality testing in waterways throughout Milwaukee County, including within the nearshore Lake Michigan area."]

In reference to the discussion streambank stabilization activities, Mr. Martinka recommended discussing the streambank stabilization work done along the Kinnickinnic River in Jackson Park. Mr. Fowler added that the MMSD along with the U.S. Army Corps of Engineers (USCOE) has completed several streambank stability projects on Milwaukee County property.

[Secretary's Note: Subsequent to the meeting, Mr. Fowler contacted County staff and indicated that he had reconsidered his comment regarding adding discussion of the MMSD/USCOE streambank stabilization projects to Chapter I, deciding that it would not be directly pertinent to County land and water management activities, and asking that it not be included in the project review in Chapter I of the plan.

Mr. Fowler said that stream ecological rehabilitation projects have been completed or are underway for the Milwaukee, Kinnickinnic, and Menomonee Rivers. He noted a final report on a Kinnickinnic River sediment transport study will be completed in December 2010. He indicated that the District has also conducted sediment transport studies for the Root and Menomonee Rivers. He said many of these projects and studies include work done on land owned by Milwaukee County, requiring partnership with the County. Mr. Fowler said he would forward the relevant information on these projects to Mr. Boxhorn for inclusion in the chapter. He also suggested discussing efforts by Milwaukee County to obtain Federal Emergency Management Agency (FEMA) grants to repair bank erosion in County parks as a result of the July 2010 floods.

[Secretary's Note: The following paragraphs addressing stream rehabilitation projects were added to the end of the streambank stabilization subsection on page 5:

"Two stream rehabilitation projects conducted by MMSD involved cooperation with Milwaukee County or occurred on County lands. The Underwood Creek project involved removing the concrete channel lining along the reach of Underwood Creek extending from N. Mayfair Road to USH 45 at the location of the Milwaukee County Grounds detention basin diversion structure. The stream channel was realigned, introducing meanders, riffles, and pools, resulting in a significant ecological improvement of the Creek, and creating a more natural and aesthetically pleasing setting. In conjunction with the construction of the Hart Park detention basin, the MMSD stabilized the banks of the mainstem of the Menomonee River in areas adjacent to the Park.

In 2010, Milwaukee County applied to the Federal Emergency Management Agency for grant funding through the Public Assistance Program to repair streambank erosion in County parks that resulted from the July 2010 floods."

Given that a major focus of the sediment transport studies was the identification of areas of bed and bank erosion and potential projects, these studies will be examined during the development of the work plan that will be documented in Chapter IV. Chapter II of the report will incorporate data from the Menomonee River sediment transport study.]

Mr. Fowler informed the Committee that channel walls built by the Works Progress Administration (WPA walls) throughout the County are in varying states of disrepair. He noted that no one has taken responsibility for maintenance of the walls and ownership is in dispute. He indicated the MMSD legal staff is of the opinion that riparian owners own the walls. The MMSD is concerned that failure of the walls could affect sanitary and combined sewer overflow locations and stormwater outfalls owned by the MMSD and the municipalities. Mr. Fowler believed these walls are located along the Menomonee River, Lincoln Creek, and Honey Creek, and possibly Woods Creek and the Kinnickinnic River.

[Secretary's Note: Clarification of ownership of and responsibility for the WPA walls will be suggested to the County as a potential objective or action item during drafting of the goals, objectives, and action items of the work plan in Chapter IV of the report. The disposition of this item will be reported in subsequent summary notes.]

Ms. Gayan suggested adding a separate subsection under the "Implementation Activities Related to the Goal of Improving Water Quality through the Reduction of Sediment and Nutrient Delivery to Surface Waters" to address the polychlorinated biphenyl (PCB) sediment removal project along Lincoln Creek. She noted planning was underway and sediment removal is to start in April or May of 2011. She said more information about the project can be found on the WDNR website.

[Secretary's Note: Discussion of the PCB sediment removal project along Lincoln Creek was added to a new section of the chapter entitled "Other Notable Land and Water Resource Conservation Activities in Milwaukee County". This section is attached herein as Exhibit A.]

In regards to the section concerning pond and lagoon management measures, Ms. Gayan noted that Milwaukee County received funding from WDNR for aquatic plant management planning related to ponds and lagoons at County Parks. She suggested this chapter note where aquatic plant management activities are occurring. Mr. Keith replied that the grant was for developing the pond and lagoon management plan and required monitoring of the ponds. He indicated that the County continues to conduct monitoring. Ms. Gayan also noted significant aquatic plant management work takes place at McKinley Marina.

[Secretary's Note: The following paragraph was added after the first partial paragraph on page 6:

"The DPRC also conducts aquatic plant management activities at selected park ponds and lagoon in the Milwaukee County Parks System. On an annual basis, the County receives permits from the WDNR to apply herbicide treatments to 15 park ponds and lagoons. In a typical year, only five or six ponds receive treatment. The DPRC also monitors aquatic plant populations at McKinley Marina. Historically, mechanical harvesting and herbicide treatments have been used at this location when populations have reached or exceeded nuisance levels. There has not been a need for treatment at this location since 2005."]

Ms. Gayan requested the Committee consider a subsection dedicated to operational maintenance of County-owned dams, including discussion of routine debris removal. She noted WDNR recently issued Milwaukee County a letter in regards to the Kletzsch Park dam. She said the dam needs inspection and estimated $200,000 to $400,000 in repairs are needed. She said she would provide the SEWRPC staff with a copy of the letter. She also

noted an estimate of $1.5 million to repair the Estabrook Park dam and another $1-2 million for sediment removal at the dam.

[Secretary's Note: Discussion of operational maintenance of County-owned dams was added to a new section of the chapter entitled "Other Notable Land and Water Resource Conservation Activities in Milwaukee County". This section is attached herein as Exhibit A.]

Mr. Fowler recommended that lagoon weirs be discussed along with dams. He suggested discussion of the lagoon management plan may cover this issue. Mr. Keith indicated that pond and lagoon management plan focused on water quality and recreational use issues and did not cover weirs or impoundment structures. Mr. Fowler suggested further addressing pond and lagoon issues along with stormwater ponding issues associated with these ponds and lagoons.

[Secretary's Note: After further discussion with the County staff, it was decided that the two major dams owned by the County (Estabrook and Kletzsch) would be addressed in the plan, but the small lagoon and pond weirs and outlet structures would not.]

In regards to the section discussing activities related to compliance with agriculture runoff performance standards, Mr. Hebard indicated that the survey examined whether the "T" value was exceeded. He noted that the reference to "T" value is incorrect as presented.

[Secretary's Note: The first sentence of the first full paragraph on page 6 was revised to read as follows:

"In 2007, the County completed a soil loss survey to determine **whether soil erosion levels exceeded** the maximum **tolerable** average annual rate of soil erosion **("T" value)** for each soil type that will permit a high level of crop productivity to be sustained economically and indefinitely."

In regards to the discussion of implementation activities related to protecting, restoring, and enhancing natural resources, Mr. Fowler noted that the extent of what is to be protected, restored, and enhanced needs to be documented. He explained before we can protect resources we must know what is left to protect. He suggested that the regional natural areas and critical species habitat and management plan be cited in this regard, and that the inventories in Chapter II be referenced in this Chapter. Mr. Russart noted the Milwaukee County Parks consist of 15,000 acres, roughly 9,100 acres of which are managed as natural areas. He added that Milwaukee County owns about 1,000 acres of agricultural land which are leased out. In addition, about 300 acres are enrolled in the Conservation Reserve Program (CRP).

[Secretary's Note: Inventories of natural resources, natural areas, and critical species habitat sites will be provided in Chapter II, "Resource Assessment."]

Mr. Dietl suggested the Committee might consider subheadings for other goals for clarity. Mr. Boxhorn responded this will be considered.

[Secretary's Note: After reviewing the subsections in question, Commission staff concluded that subheadings were not necessary for these sections.]

Concerning activities related to the goal of enhancing Lake Michigan bluff protection initiatives, Mr. Detzer suggested discussion of July 2009 FEMA public assistance funds, some of which were allocated for projects along the Lake Michigan shoreline.

[Secretary's Note: The Commission staff requested further information on these activities from County staff. This information had not been provided by the time of the drafting of these summary notes. The information will be added to the report when it is received. This addition will be documented in future summary notes.]

Ms. Gayan noted that the stipulation between the State and MMSD regarding sanitary sewer systems for Milwaukee County should be included. Mr. Detzer informed the Committee that this stipulation became effective after the review for the 2006 plan. He suggested discussion regarding the stipulation could be included under Goal 1. He said he would provide the Commission staff with information on this.

[Secretary's Note: Discussion of the County's activities in compliance with the stipulation regarding sanitary sewer systems was added to a new section of the chapter entitled "Other Notable Land and Water Resource Conservation Activities in Milwaukee County." This section is attached herein as Exhibit A.]

REVIEW OF PRELIMINARY DRAFT APPENDIX B, "OBJECTIVES, ACTIONS, AND PROGRESS TRACKING MEASURES FROM THE 2007-2011 UPDATE OF MILWAUKEE COUNTY LAND AND WATER RESOURCE MANAGEMENT PLAN", OF SEWRPC COMMUNITY ASSISTANCE PLANNING REPORT NO. 312 (CAPR NO. 312), *A LAND AND WATER RESOURCE MANAGEMENT PLAN FOR MILWAUKEE COUNTY: 2012-2016.*

Before reviewing the goals addressed in Appendix B, Mr. Hahn suggested the Committee also consider long-term goals in addition to goals laid out for the five-year time frame of the plan. He explained that sometimes a five-year planning cycle can be restrictive. Mr. Boxhorn added these long-term goals would be general goals intended to indicate the County's long-term vision. Mr. Detzer stated that he would like to see an example of what this approach would look like before committing to this.

Mr. Hahn asked the Committee whether the navigability of the County ponds and lagoons had been determined. He explained that whether a pond is considered navigable in a legal sense has a bearing on the allowable management options that could be permitted by the State. Mr. Detzer answered that navigability had not been determined. Mr. Russart said that the Milwaukee County park and open space plan, which is being prepared, addresses lagoons.

[Secretary's Note: Information from the update of the Milwaukee County park and open space plan regarding lagoons will be addressed in the work plan to be documented in Chapter IV.]

Mr. Boxhorn noted that Goal 4, regarding creation of a land information web portal to distribute geographic information, had for the most part been achieved. He proposed this effort be given less emphasis in the current plan update. The Committee agreed emphasis should be aimed at maintenance and upkeep of the system.

Noting that the County and its partners had put considerable effort into invasive species management, Mr. Boxhorn suggested that this issue could be raised to the level of an objective or a goal. Mr. Detzer agreed that invasive species management should be given greater emphasis. Mr. Russart stated that he believed this effort could be raised to the level of a goal and offered to gather more information on programs related to this effort. He indicated that he would forward his findings to Commission staff.

[Secretary's Note: Mr. Russart has provided this information to Commission staff. This information will be incorporated into the development of goals, objectives, and actions that will be documented in Chapter IV of the plan report.]

Mr. Hahn asked the Committee if there were any other goals that should be added or modified. Mr. Fowler said he felt flood management should be added as a goal. Mr. Hahn responded that the County doesn't truly have a direct role in flood management, but he agreed with Mr. Fowler that they have a role in maintaining open space which contributes to flood management. Mr. Detzer responded that open space preservation could be discussed further as a flood management tool under Goal 2. Mr. Martinka noted Milwaukee County is partnering with the River Revitalization Foundation, the Rotary Club of Milwaukee, and the Urban Ecology Center on an arboretum project along the Milwaukee River. He suggested this be discussed under Goal 2.

[Secretary's Note: These suggestions will be incorporated under a revised Goal 2 in Chapter IV of the plan report.]

Mr. Fowler suggested an objective be added to Goal 3 to maintain riparian land along rivers and streams in the County for recreational use and access. The Committee agreed this objective should be considered.

[Secretary's Note: The addition of a goal regarding maintaining riparian land for recreational use and access will be considered under Goal 3 in Chapter IV of the plan report.]

Regarding the discussion of educational signs under the Pond and Lagoon Management Plan objective in Goal 1, Mr. Russart noted the need for signs to be multi-lingual. He suggested signs include English, Spanish, and Hmong translations. He informed the Committee that translators are available through the UW-Extension.

Mr. Boxhorn suggested a section at the end of Chapter I could be inserted for other significant land management activities that the County is involved in.

[Secretary's Note: Such a section is attached hereto as Exhibit A.]

TIME AND DATE OF NEXT MEETING

After discussion, it was agreed that the next Advisory Committee meeting would be scheduled for Wednesday, November 3, 2010, at 2:00 p.m. at the Milwaukee County City Campus Building. **[NOTE THAT, FOLLOWING THE MEETING THE DATE FOR THE NEXT MEETING WAS CHANGED TO NOVEMBER 10, SAME TIME, SAME LOCATION.]** Mr. Hahn encouraged the Committee to submit any questions or comments via the SEWRPC website.

[Secretary's Note: The following materials for the next meeting can be found on the SEWRPC website:

Notice of Second Meeting and Agenda

Summary Notes of the October 7, 2010 Meeting of the Milwaukee County Land and Water Resource Management Plan Advisory Committee

Chapter II "Resource Assessment," of SEWRPC Community Assistance Planning Report No. 312 (CAPR No. 312), *A Land and Water Resource Management Plan for Milwaukee County: 2012-2016*

In addition to being posted on the SEWRPC website, the agenda for the second Committee meeting and the Summary Notes from the first meeting will be sent to Committee members by electronic mail.]

ADJOURNMENT

There being no further business, the meeting was adjourned by unanimous consent at 3:20 p.m.

COMMENTS ON CHAPTER I SUBMITTED BY MEMBERS OF THE ADVISORY COMMITTEE SUBSEQUENT TO THE MEETING

Following the meeting, Mr. Russart submitted general additions and corrections to Table I-1. These changes have been incorporated into the table and the revised table is attached as Exhibit B.

Respectfully Submitted,

Michael G. Hahn
Secretary

Attachments

#153902 V1 - CAPR-312 SUMMARY NOTES 10/07/10 MEETING
300-1087
MGH/ JEB/AWO/pk
12/14/2010

Exhibit A

[The following section was added to the end of Chapter I.]

OTHER NOTABLE LAND AND WATER RESOURCE CONSERVATION ACTIVITIES IN MILWAUKEE COUNTY

During the period from 2007 to 2010, several other projects and activities related to the conservation of land and water resources were conducted in Milwaukee County. While these projects and activities were not included in the work plan described in the 2006 update to the County's land and water resource management plan, they are notable because they included some involvement by the County or were conducted, in whole or in part, on County lands. This section describes these projects and activities.

Remediation of Legacy Toxic Sediments in Watercourses

During the period 2007 to 2010, efforts were made to remediate legacy toxic sediments in watercourses within Milwaukee County.

Little Menomonee River Moss-American Site Remediation

The Moss-American site comprises 88 acres, including a former creosote facility and six miles of the Little Menomonee River, which is adjacent to the former facility. The former Moss-American property is located at the intersection of Brown Deer and Granville Roads on Milwaukee's northwest side. About 65 acres are undeveloped Milwaukee County park land. About 23 acres are owned by the Union Pacific Railroad and are currently being used for industrial purposes.

Between 1921 and 1976, Moss-American operated a wood-preserving facility that treated railroad ties with a creosote and fuel-oil mixture. Environmental studies by the U.S. Environmental Protection Agency (USEPA) concluded that previous site activities contaminated soil and groundwater as well as sediment in the Little Menomonee River. Contaminants of concern include polychlorinated aromatic hydrocarbons and organic compounds such as benzene, toluene, ethyl benzene, and xylene.

Remediation activities at this site began in 1995 with channel remediation beginning in 2002. As part of the remediation of this site, five sections of the channel of the Little Menomonee River were rerouted, the contaminated sediment was removed and treated, the old channel was filled, and the new channel and areas disturbed by the clean up were revegetated. This remediation was conducted on an approximately five-mile-long reach of the River. In some sections of the River, the remediation involved removal of sediment, rather than rerouting the channel, because of the presence of bridges crossing the River. These remediation efforts represent implementation of recommendations first made in the Commission's comprehensive plan for the Menomonee

River watershed.[1] The remediation of the River was completed in December 2009. An active groundwater treatment system continues to operate on the site.

USEPA will continue to monitor this site through 2026. At that time a determination will be made regarding whether the site can be removed from the Federal Superfund list.

Lincoln Creek and Milwaukee River Sediment Projects

Studies of sediment deposits and sediment transport within the Milwaukee River system showed significant deposits of polychlorinated biphenyls (PCBs) within Estabrook Impoundment along the Milwaukee River and Lincoln Creek.[2] Most of this impoundment lies within or adjacent to Milwaukee County park lands. Based upon the studies, the WDNR has identified three priority areas for addressing the sediments within the impoundment. These include the Blatz Pavilion Lagoon within Lincoln Park, a Phase I project area that includes Lincoln Creek downstream from N. Green Bay Road and the west oxbow of the Milwaukee River, and a Phase II project area that includes the east oxbow of the Milwaukee River and the mainstem of the Milwaukee River from THE Estabrook Park dam to a point immediately upstream from Lincoln Park.

As the first part of the remediation efforts, nearly 4,000 cubic yards of sediment containing about 300 pounds of PCBs were removed from the Blatz Pavilion Lagoon in Lincoln Park. This project was completed in 2008. Sediment sampling conducted in March 2009 in the vicinity of the Pavilion showed very low to undetectable levels of PCBs. The Blatz Pavilion Lagoon project was the first stage in the WDNR efforts to restore the Milwaukee River in Lincoln Park. This site was selected by the WDNR, Milwaukee County, and local residents for the first stage in remediation efforts because the lagoon is the location of the Blatz Pavilion Community Center which brought park visitors into close proximity to contaminated sediments.

As previously indicated, the Phase I project area includes the downstream portion of Lincoln Creek and the west oxbow of the Milwaukee River. Remediation efforts in this project area will include removal of contaminated sediment, restoration of areas disturbed by sediment removal, and, if funding permits, additional habitat restoration. It is estimated that this project area contains over 100,000 cubic yards of sediment containing over

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[1]*SEWRPC Planning Report No. 26,* A Comprehensive Plan for the Menomonee River Watershed, *Volume Two,* Alternative Plans and Recommended Plan, *October 1976.*

[2]*Baird and Associates,* Final Report, Milwaukee PCB Mass Balance Project, *September 1997; Jeffrey S. Steuer, Sharon A. Fitzgerald, and David W. Hall,* Distribution and Transport of Polychlorinated Biphenyls and Associated Particulates in the Milwaukee River System, Wisconsin, 1993-1995, *U.S. Geological Survey Water-Resources Investigations Report No. 99-4100, 1999; and Wisconsin Department of Natural Resources,* Estabrook Impoundment Sediment Remediation Pre-Design Study Project Completion Report to USEPA, *PUBL-WI 826, August 2005.*

11,000 pounds of PCBs. It is anticipated that project design and necessary permitting activities for his project will be completed by the end of 2010, and that sediment removal and site and habitat restoration activities will begin in spring 2011 and be completed in spring 2012.

As previously indicated, the Phase II project area includes the east oxbow of the Milwaukee River and the mainstem of the Milwaukee River from the Estabrook Park dam to a point immediately upstream from Lincoln Park. The east oxbow is not known to contain significant deposits of PCB-contaminated sediment. Studies have shown that the one-mile section of the River downstream from the oxbow contains discrete deposits of sediment containing PCBs. In addition, the fixed-crest spillway at the Estabrook Park dam contains several feet of sediment comingled with woody debris. Limited sampling within the spillway indicates the presence of PCBs within the comingled debris and sediment. The USEPA is characterizing the sediments within the Phase II project area. As part of this characterization, sediment samples were collected in early 2010. As of October 2010, the results of this sampling were not available.

Maintenance and Repair of Dams

Estabrook Dam

On July 28, 2009, the WDNR issued an order that Milwaukee County repair or abandon Estabrook dam. This order established:

- A deadline for completing a drawdown of the Estabrook impoundment;
- A requirement for the completion, certification, and submission for approval of plans and specifications for repairs to the dam that had been previously identified in a revised work schedule dated October 16, 2007;
- A requirement that repairs be completed in accordance with approved plans and specifications;
- A requirement that a professional engineer certify the completion of repairs and that these repairs conform to the approved engineering plans; and
- A deadline of October 1, 2010 for performing detailed stability analyses for the entire structure under all loading conditions.

The order also specified that the impoundment shall not be refilled until all the repairs identified in the October 16, 2007 revised work schedule are completed. In addition, it indicated that authorization to refill the impoundment could not be granted until the stability analyses previously referred to are reviewed and approved by the WDNR.

The revised work schedule cited in the order specified required repairs. These included removal of trees and shrubs from all abutments; removal of debris from the fixed crest spillway and ice breakers; concrete repairs to piers, the operating bridge deck and walls, and the surfaces of the fixed spillway and abutments; establishment of survey benchmarks; and repairs to expansion joints, ice breakers, gates, and abutment banks of the control spillway.

The order set a deadline of January 28, 2011 for the County to inform the WDNR of its intent to either repair the dam or apply for abandonment of the dam and subsequently remove it. The order also set deadlines of July 29, 2011 for the County to submit plans and specifications for the repair of the dam to the WDNR for review and approval and July 27, 2012 for the County to select a competent contractor to repair the structure in accordance with the approved plans and specifications. The order set a deadline of 10 days after the completion of repairs for the County to submit an inspection, operation, and maintenance plan and an emergency action plan to the WDNR for review and approval.

Pursuant to the order, Milwaukee County retained a consultant to perform a detailed stability analysis of the dam under all loading conditions. Preliminary results from the structural assessment concluded that:[3]

- One concrete ice breaker and a portion of a second ice breaker require replacement. The other ice breakers require repairs;
- The gated spillway structure is currently stable under normal pool loading, but requires upstream tie-down anchoring to have a suitable factor of safety at full pool conditions with ice loading;
- The fixed overflow spillway with stoplogs is stable during full pool loading with and without ice loading;
- There is no bedrock scour or undercutting of the dam; and
- Clearing of vegetation along the shore and island and installation of riprap in limited areas along the shore will be required for erosion protection.

The consultant presented preliminary recommendations for the rehabilitation of the dam. These recommendations included some sediment removal, restoration of the gated spillway piers below the low level water line, spot concrete restoration on the overflow spillway section, replacement of two concrete ice breakers, repairs to the

[3]*AECOM, "Estabrook Dam Structural and Environmental Evaluation," September 21, 2010.*

remaining ice breakers, and installation of riprap on the shoreline at the gated spillway section. It was estimated that this rehabilitation would extend the life of the dam for approximately 20 years.

Kletzsch Park Dam

The WDNR inspected Kletzsch Park dam on July 30, 2008. Subsequent to this inspection, the Department issued a dam safety report which established a schedule for the County to complete required planning, studies, and repairs to the dam.

The dam safety report set deadlines for the County to submit two plans to the WDNR for review and approval. It required that an emergency action plan for the area downstream of the dam be submitted by April 15, 2010, and it required that an inspection, operation, and maintenance plan be submitted by January 15, 2011.

The dam safety report noted that scour and undermining of this dam have never been investigated and requested that a field investigation for scour and undermining be conducted. The report set a deadline of September 30, 2011 for the results of this investigation to be submitted to the DNR.

The report indicated that the dam required two repairs. It indicated that trees and moderately dense shrubs were present on the left (looking downstream) bank of the River adjacent to the left abutment of the dam, and it called for those trees and shrubs to be removed and for grass to be established on the bank. In addition, the inspection found deterioration and loss of masonry at the left abutment. It indicated that this deterioration must be evaluated and repaired. The report indicated that the plans and specifications for both of these repairs are to be submitted to the WDNR for review and approval prior to conducting the repairs. The report set a deadline of September 30, 2011 for completing the needed repairs.

Finally, the report noted that the existing benchmark located on the dam is intact. It indicated that a benchmark off the dam was required and requested that the County provide documentation from a registered land surveyor regarding the location and elevation of this additional benchmark by January 15, 2012.

Wildlife Hazard Management at General Mitchell International Airport

In 2009, General Mitchell International Airport (GMIA) developed a plan to identify and abate wildlife-related hazards to aircraft using the airport.[4] This plan was developed in cooperation with the U.S. Department of Agriculture's Wildlife Services. The plan identifies the wildlife species considered to pose the greatest threat to airport activities and specifies procedures for the management of these species and for habitat that provides cover

[4]*General Mitchell International Airport,* Wildlife Hazard Management Plan, *October 2009.*

for, or that acts to attract, these species. The plan addresses a variety of species including large mammals, such as deer and coyote; flocking birds, such as pigeons, house sparrows, starlings, and seagulls; large birds, such as waterfowl; and raptorial birds, such as hawks and falcons. Elements of the plan include:

- Monitoring of the populations and activities of the species of concern, both on airport grounds and in the vicinity of the airport;
- Management of wildlife populations on airport grounds. Management measures may include relocation of animals, deterrence measures designed to discourage animals from frequenting airport grounds, and depredation of animals in accordance with the conditions of permits and licenses issued by the Federal and State Governments;
- Management of wildlife habitat on airport grounds to reduce cover for wildlife species of concern;
- Coordination with neighboring landowners on activities to reduce attractiveness of lands in the vicinity of the airport to wildlife species of concern;
- Updating and maintaining wildlife-resistant perimeter fencing around the airport; and
- Maintenance of necessary permits and licenses for wildlife management activities.

Implementation of most of the activities recommended in the plan is conducted on an ongoing or as needed basis.

Sanitary Sewer Capacity, Management, Operations, and Maintenance (CMOM) Efforts

As part of a May 2002 stipulation agreement regarding sanitary sewer overflows between the MMSD and the State of Wisconsin, the District agreed to implement a capacity, management, operations, and maintenance (CMOM) program. CMOM principles were proposed by the USEPA in 2001 as a part of a draft Sanitary Sewer Overflow (SSO) Rule.[5] Generically, CMOM, principles are directed at reducing SSOs through stating the goals and objectives of an organization regarding overflows and the strategies and tactics that will be employed to achieve the goals. The MMSD saw the value of applying these principles to its other areas of responsibility also. Therefore, the MMSD developed and documented a broad CMOM Program to address its wastewater conveyance and storage system, its wastewater treatment plants, and the watercourse systems under its jurisdiction.

As part of its rules, the MMSD requires each of its satellite municipalities, including Milwaukee County, to develop a local CMOM program. The program objectives are to:

[5]*The draft rule was subsequently withdrawn and has not been promulgated.*

- Better manage, operate, and maintain collection systems;
- Investigate capacity constrained sections of the collection systems; and
- Proactively prevent SSOs.

As the owner of a satellite system to the MMSD, Milwaukee County is conducting ongoing implementation of its CMOM program. Implementation includes efforts to reduce infiltration and inflow to sanitary sewers that the County owns. As of October 18, 2010, the County has completed full inspection of 936 manholes, representing 98 percent of its manholes. As a result of these inspections, repairs and external improvements have been made to the majority of the manholes. These repairs and improvements include removal and replacement of manhole lids, removal and resetting of manhole frames, removal of masonry chimneys, installation of precast concrete chimneys, installation of chimney seals, and abandonment of some manholes. The County has also conducted cleaning and testing of its sanitary sewer mains, force mains, and laterals. As of October 18, 2010, the County has cleaned and flushed 151,513 linear feet of mains, force mains, and laterals, representing about 76 percent of the pipes in its system. In addition, the County has completed smoke testing of 41,670 linear feet, dye testing of 866 linear feet, and televised inspection of 101,852 linear feet of sanitary sewer pipes.

#153978 V1 - CAPR-312 SUMMARY NOTES 10/07/10 MEETING EXHIBIT A
300-1087
MGH/JEB/pk
10/15/10, 10/28/10

Exhibit B

Table I-1

NOTABLE PARTNERS WITH MILWAUKEE COUNTY IN LAND AND WATER RESOURCE CONSERVATION ACTIVITIES: 2007-2009

AmeriCorps (National Civilian Community Corps)	Milwaukee Area Technical College Service Learning Program
Badgerland Striders	Milwaukee Biome Project
Bicycle Federation of Wisconsin	Milwaukee Conservation Leadership Corps
Boy Scouts	Milwaukee German Immersion School
Center Street Park Watch	Milwaukee Metro Mountain Bikers
City of Milwaukee	Milwaukee Metropolitan Sewerage District
Cooper Park Watch	Nash Park Watch
Eagle Scouts	Natural Resources Foundation of Wisconsin
Friends of Boerner Botanical Gardens	Neighbors United for Washington Park
Friends of Bradford Beach	North Point Lighthouse Friends
Friends of Cathedral Square Park	The Park People
Friends of Dineen Park	Partners in Parks
Friends of Estabrook Park	Pheasants Forever—Southeast Wisconsin Chapter
Friends of Grant Park	Preserve Our Parks
Friends of Greenfield Park	REI
Friends of Hales Corners Park	Residents for Off-Leash Milwaukee Parks
Friends of Johnsons Park	River Revitalization Foundation
Friends of Kletzsch Park	Riverside Urban Ecology Center
Friends of Kohl Park	St. Bernadette Catholic School
Friends of Mill Pond	Saveland Park Watch
Friends of the Domes	Sheridan Park Friends
Friends of Wehr Nature Center	South Shore Park Watch
Girl Scouts	Southeastern Wisconsin Beach Task Force
Great Lakes Nonpoint Abatement Coalition	Southeastern Wisconsin Invasive Species Consortium
Groundwork Milwaukee	Southeastern Wisconsin Regional Planning Commission
Hawley Environmental School	Southeastern Wisconsin Watershed Trust
Holler Park Neighborhood Association	Story Hill Neighborhood Association
Humboldt Park Watch	Student Conservation Association (SCA)
Hyatt Regency Hotel	University of Wisconsin-Milwaukee Conservation and Environmental Science Program
Jacobus Park Neighborhood Association	University of Wisconsin-Milwaukee Department of Geography
Johnson Controls	University of Wisconsin-Milwaukee Service Learning Program
Juneau Park Friends	Urban Ecology Center
Keep Greater Milwaukee Beautiful, Inc.	U.S. Forest Service
Kops Park Watch	U.S. Natural Resources Conservation Service
Lake Park Friends	Wisconsin Coastal Management Program
Lyons Park Watch	Wisconsin Department of Agriculture, Trade and Consumer Protection
McCarty Park Watch	Wisconsin Department of Natural Resources
Milwaukee Area Land Conservancy	Wedgewood Park Watch

Source: Milwaukee County and SEWRPC.

Milwaukee County Department of Transportation and Public Works
Southeastern Wisconsin Regional Planning Commission

Notice of Second Meeting and Agenda

MILWAUKEE COUNTY LAND AND WATER RESOURCE MANAGEMENT PLAN ADVISORY COMMITTEE

DATE: November 10, 2010

TIME: 2:00 to 4:00 p.m.

PLACE: Milwaukee County City Campus
2711 W. Wells Street
Milwaukee, Wisconsin

AGENDA:

1. Introductions

2. Review and approval of Summary Notes of the October 7, 2010 Meeting of the Milwaukee County Land and Water Resource Management Plan Advisory Committee

3. Review and approval of preliminary draft Chapter II "Resource Assessment," of SEWRPC Community Assistance Planning Report No. 312, *A Land and Water Resource Management Plan for Milwaukee County: 2012-2016*

4. Next meeting

5. Adjourn

Michael G. Hahn
Secretary

#154241 V1 - MILW CTY L&WRMP ADV COMM 2ND MTG AGENDA 11/10/10
300-1087
MGH/pk
11/03/10

SUMMARY NOTES OF THE NOVEMBER 10, 2010 MEETING OF THE MILWAUKEE COUNTY LAND AND WATER RESOURCE MANAGEMENT PLAN ADVISORY COMMITTEE

INTRODUCTION

The second meeting of the Milwaukee County Land and Water Resource Management Plan Advisory Committee was convened at the Milwaukee County City Campus Building at 2:00 p.m. on November 10, 2010. The meeting was called to order by Mr. Timothy Detzer, Environmental Engineer, Milwaukee County Department of Transportation and Public Works. Attendance was taken by circulating a sign-in sheet.

In attendance at the meeting were the following individuals:

Timothy Detzer, Chairman	Environmental Engineer, Milwaukee County Department of Transportation and Public Works
Michael G. Hahn, Secretary	Chief Environmental Engineer, Southeastern Wisconsin Regional Planning Commission
Joseph E. Boxhorn	Senior Planner, Southeastern Wisconsin Regional Planning Commission
Joel Dietl	Planning Manager, City of Franklin
Sharon L. Gayan	Basin Supervisor, Wisconsin Department of Natural Resources
Stevan M. Keith	Sustainability Engineer, Milwaukee County Department of Transportation and Public Works
Jeffrey Martinka	Executive Director, Southeastern Wisconsin Watersheds Trust, Inc.
Aaron W. Owens	Research Analyst, Southeastern Wisconsin Regional Planning Commission
Brian Russart	Natural Areas Coordinator, Milwaukee County Parks Department

Mr. Detzer thanked Committee members for their attendance and turned the meeting over to Mr. Hahn. Mr. Hahn thanked everyone for their patience and understanding with regards to the electronic distribution of the meeting materials in lieu of receiving hard copies prior to the meeting. He explained the Commission staff is using that approach to distribution to meet the aggressive timeline for submittal of the report to the Wisconsin Department of Agriculture Trade and Consumer Protection, while affording the Committee sufficient time to review materials prior to meeting.

REVIEW OF SUMMARY NOTES OF THE OCTOBER 7, 2010 ADVISORY COMMITTEE MEETING

Mr. Boxhorn reviewed the Summary Notes from the October 7, 2010 meeting of the Advisory Committee.

[Secretary's Note: Several typographical errors were pointed out by the Committee and were corrected.]

Mr. Boxhorn asked whether there were any additional comments, corrections, or additions to the Summary Notes. None were offered. The Committee approved the October 7, 2010 Summary Notes by consensus. Mr. Boxhorn indicated that the updated and revised version of Chapter I, "Introduction" will be posted on the SEWRPC website.

REVIEW OF PRELIMINARY DRAFT CHAPTER II, "RESOURCE ASSESSMENT", OF SEWRPC COMMUNITY ASSISTANCE PLANNING REPORT NO. 312 (CAPR NO. 312), *A LAND AND WATER RESOURCE MANAGEMENT PLAN FOR MILWAUKEE COUNTY: 2012-2016.*

At Mr. Detzer's request, Mr. Boxhorn reviewed the preliminary draft of Chapter II, "Resource Assessment."

[Secretary's Note: After distribution of Chapter II to the Committee, several typographical errors were found and corrected. These corrections were not included in electronically distributed drafts but will be included in the final Chapter.]

Mr. Boxhorn indicated that inventory dates and figures are based on the most recent data available. He noted that the inventory dates for particular items range from 2000 to 2010.

While reviewing the section regarding soils and agriculture, Mr. Boxhorn noted that due to the highly urbanized and developed nature of the County, there are large areas of land that have no soil survey data available. These areas are indicated as such on the maps.

With reference to the section on farm production and revenue, Mr. Dietl asked if the horticulture revenues include revenues procured through the public sector. He noted that the City of Milwaukee operates a tree nursery in the City of Franklin, which is shown on Map II-5. Mr. Dietl suggested these revenues be included if they are determined to be substantial. Mr. Boxhorn explained the revenue data was derived from the U.S. Department of Agriculture (USDA) National Agriculture Statistics Service *2007 Census of Agriculture*. He indicated that he thought the census included private sector revenues only. Mr. Boxhorn said he would look further into this matter and if available he would include public sector revenue data.

[Secretary's Note: The 2007 Census of Agriculture lists two farms in Milwaukee County as being operated by "cooperatives, estates, trusts or institutions." Based upon the definitions in the census, it could not be determined whether the City's nursery was included among these.]

Concerning the discussion of the Lake Michigan bluff and ravine areas, Mr. Keith asked if it would be appropriate to insert references to a study conducted for the County regarding bluff stability at Warnimont Park. Mr. Keith added that there may be other studies that were conducted for the County which are not necessarily available publicly, but may be relevant to other areas of the plan as well. Mr. Hahn suggested these studies should be noted in the plan and requested that information on any related plans be provided. Mr. Russart added that he and his staff have knowledge of other areas within the County park system with unstable bluffs. He indicated he would provide a brief annotated list of those sites.

[Secretary's Note: The County staff is assembling the information on bluff stability at Warnimont Park. This information will be reviewed and summarized in Chapter II once it is provided. With respect to staff knowledge of bluff conditions, the following paragraph was added after fourth paragraph on page 7:

"Staff from the County Department of Parks, Recreation and Culture has also indicated that in 2010 they observed major areas of erosion on bluffs in several County Parks along Lake Michigan. These parks include Bender, Grant, Juneau, Lake, and Warnimont Parks. The County staff noted that the erosion they observed at Lake Park appears to be associated with the major rainfall events that occurred during July 2010. These field observations were made in the course of management activities, rather than as part of a systematic study of bluff conditions."]

Mr. Russart asked if data from the Milwaukee Riverkeeper volunteer water monitoring program was used in the water quality conditions section of the plan. Mr. Boxhorn explained that very little data from the program was available at the time these analyses were done. He acknowledged the value of such programs in gathering data over an extended period of time and indicated that future plan updates should include these data. Ms. Gayan indicated she would check with the WDNR fisheries biologists to see if there is any additional data to expand on Table II-10 relating to aquatic invasive species.

[Secretary's Note: The WDNR staff is assembling the information on aquatic invasive species in waterbodies in Milwaukee County. This information will be reviewed and summarized in Chapter II once it is provided]

Mr. Dietl asked whether we need to look at the causes of streambed and streambank erosion and if trends in these conditions, and in riparian buffer conditions, can be assessed. Mr. Detzer responded that the county stream assessment indicated reason for erosion at specific locations when the cause was known. Mr. Hahn added that there currently is no continuing data set regarding these conditions, though any future data collection may allow for assessment of trends. He continued that he does not foresee large changes in riparian buffers in much of the County due to well-established land use patterns.

In relation to Map II-16 showing the impaired waters within the County, Mr. Martinka noted that the Jackson Park Pond appears to be designated as impaired while ponds in Wilson Park and Veterans Park which appear to be in poor condition are not designated as impaired. Mr. Detzer explained that only the Jackson Park pond is on list of impaired waters designated under Section 303(d) of the Clean Water Act. Ms. Gayan further explained that the Jackson Park pond was on the 2008 list due to PCB contamination. Ms. Gayan mentioned the Jackson Park pond will not be listed on the proposed 2010 303(d) list.

Mr. Boxhorn asked Ms. Gayan whether the 2010 list of impaired waters for Section 303(d) of the Clean Water Act has been approved by the U.S. Environmental Protection Agency (USEPA). Ms. Gayan replied that, to her knowledge, the list has not yet been approved. Ms. Gayan noted that a revised list of impaired waters is prepared by the WDNR and is provided to USEPA every two years. She suggested this information be added to the discussion of impaired waters.

[Secretary's Note: The following sentence will be added to the second full paragraph on page 16:

(In this Secretary's Note and in subsequent Notes, unless indicated otherwise, revised and added text is indicated in bold letters for clarification only. The report text will not be bold.)

"Section 303(d) of the Clean Water Act requires that the states periodically submit a list of impaired waters to the USEPA for approval. **The WDNR revises the list of impaired waters every two years.** While Wisconsin most recently submitted this list in 2010, the most recent **USEPA-**approved list **is** the one submitted in 2008. Map II-16 graphically depicts, and Table II-9 lists, stream reaches in Milwaukee County that are classified as being impaired waters on the most recently approved list."]

Mr. Boxhorn explained that the trophic statuses of 16 lakes, ponds, and lagoons listed in Table II-16 were reported as part of the County's pond and lagoon management plan. He further explained that the trophic status of Upper Kelly Lake was assessed as part of a lake protection plan conducted by SEWRPC for the Kelly Lakes Association. Mr. Dietl asked how the lake management planning process is initiated. He noted Kopmeier Lake has one riparian landowner, a non-profit organization. He asked if a municipality could apply for lake management plan grant funding on behalf of such an organization. Ms. Gayan indicated lake management funding could be applied for by municipalities. She stated that Heidi Bunk of the WDNR staff would be of further assistance regarding these matters. Mr. Hahn noted that the Commission staff can assist in lake management planning and added that there are also private consultants who specialize in this area.

With regard to Map II-11, Mr. Dietl asked if floodplain boundaries shown are approximate or detailed floodplains. Mr. Hahn believed the map showed detailed floodplains only. He suggested this should be explained in the text and noted on the map. He further suggested the ongoing floodplain updating program being conducted

by the Milwaukee County Automated Mapping and Land Information System (MCAMLIS), the Milwaukee Metropolitan Sewerage District (MMSD) and SEWRPC be mentioned.

[Secretary's Note: The following text was added to the end of the first paragraph on page 19:

"It is important to note that Map II-11 shows only detailed floodplain delineations. The Commission staff continues to prepare updated, digital floodplain and floodway maps for all of Milwaukee County and portions of Ozaukee, Washington, and Waukesha Counties that are adjacent to Milwaukee County. The project is being performed for the Milwaukee County Automated Land Information System (MCAMLIS) Steering Committee and the MMSD."

The following note was added to Map II-11:

"Note: Floodplains shown represent only detailed delineations. Approximate delineations are not shown."]

In reference to discussion in the fifth full paragraph on page 18 regarding invasive species in wetlands, Mr. Russart pointed out common buckthorn should be changed to glossy buckthorn and noted that phragmites and narrowleaf cattail should be added to the list.

[Secretary's Note: The last sentence in the fifth full paragraph on page 18 was revised to read as follows:

"DPRC conducts control efforts for over 30 species of invasive terrestrial plants, including wetland species such as **glossy** buckthorn, purple loosestrife, reed canary grass, **phragmites, and narrowleaf cattail**."]

With respect to the sections on natural areas and critical species habitat sites, Mr. Boxhorn pointed out the absence of inventory data and mapping in the current draft. He explained that the update to the natural areas and critical species habitat site plan is going before the Regional Planning Commission for approval on December 1, 2010. He informed the Committee that updated data will be added to the text and natural areas and critical species habitat sites will be shown on Map II-19.

OTHER BUSINESS

There being no additional discussion on Chapter II, Mr. Boxhorn informed the Committee that revisions will be made to the Chapter and the revised Chapter will be available on the SEWRPC website. He added that questions or comments on this preliminary draft chapter or any other related items can be provided to the SEWRPC staff via the comments page on the SEWRPC website. Mr. Detzer suggested that he would post an announcement on the University of Wisconsin-Extension list serve to notify the public of the opportunity to weigh in on the plan through the SEWRPC website. The Committee was in agreement.

ADJOURNMENT

There being no further business, the meeting was adjourned by unanimous consent at 3:15 p.m.

Respectfully Submitted,

Michael G. Hahn
Secretary

#154440 –CAPR-312 SUMMARY NOTES 11/10/2010 MEETING
300-1087
JEB/AWO
11/17/10, 11/19/10

Milwaukee County Department of Transportation and Public Works
Southeastern Wisconsin Regional Planning Commission

Notice of Third Meeting and Agenda

MILWAUKEE COUNTY LAND AND WATER RESOURCE MANAGEMENT PLAN ADVISORY COMMITTEE

DATE: November 30, 2010

TIME: 2:00 to 4:00 p.m.

PLACE: Milwaukee County City Campus
2711 W. Wells Street
Milwaukee, Wisconsin

AGENDA:

1. Introductions

2. Review and approval of Summary Notes of the November 10, 2010 Meeting of the Milwaukee County Land and Water Resource Management Plan Advisory Committee

3. Review and approval of preliminary draft Chapter III, "Related Plans, Regulations, and Programs," of SEWRPC Community Assistance Planning Report No. 312 (CAPR No. 312), *A Land and Water Resource Management Plan for Milwaukee County: 2012-2016*

4. Review and approval of preliminary draft Chapter IV, "Goals, Objectives, and Work Plan" of CAPR No. 312

5. Review and approval of preliminary draft Chapter V, "Progress Monitoring and Evaluation," of CAPR No. 312

6. Next steps

7. Adjourn

Michael G. Hahn
Secretary

#154562 V1 - MILW CTY L&WRMP ADV COMM 3RD MTG AGENDA 11/30/10
MGH/
11/17/10

SUMMARY NOTES OF THE NOVEMBER 30, 2010 MEETING OF THE MILWAUKEE COUNTY LAND AND WATER RESOURCE MANAGEMENT PLAN ADVISORY COMMITTEE

INTRODUCTION

The third meeting of the Milwaukee County Land and Water Resource Management Plan Advisory Committee was convened at the Milwaukee County City Campus Building at 2:00 p.m. on November 30, 2010. The meeting was called to order by Mr. Stevan M. Keith, Sustainability Engineer, Milwaukee County Department of Transportation and Public Works. Attendance was taken by circulating a sign-in sheet.

In attendance at the meeting were the following individuals:

Michael G. Hahn, Secretary	Chief Environmental Engineer, Southeastern Wisconsin Regional Planning Commission
Joseph E. Boxhorn	Senior Planner, Southeastern Wisconsin Regional Planning Commission
Julie Esch	Policy Analyst, Milwaukee County
Sharon L. Gayan	Basin Supervisor, Wisconsin Department of Natural Resources
Stevan M. Keith	Sustainability Engineer, Milwaukee County Department of Transportation and Public Works
Jeffrey Martinka	Executive Director, Southeastern Wisconsin Watersheds Trust, Inc.
Aaron W. Owens	Research Analyst, Southeastern Wisconsin Regional Planning Commission
Brian Russart	Natural Areas Coordinator, Milwaukee County Parks Department

Mr. Keith informed Committee members that Timothy Detzer, Committee Chair and Environmental Engineer in the Milwaukee County Department of Transportation and Public Works, was unable to be present at the meeting. Mr. Keith acted as Chair in Mr. Detzer's absence.

REVIEW OF SUMMARY NOTES OF THE NOVEMBER 10, 2010 ADVISORY COMMITTEE MEETING

Mr. Hahn reviewed the Summary Notes from the November 10, 2010 meeting of the Advisory Committee. In regards to the section concerning bluff stability studies, Mr. Boxhorn indicated that he had received a shoreline and bluff stability study on Warnimont Park from Mr. Keith. He noted that discussion of this study will be added to Chapter II.

[Secretary's Note: The first full sentence in the first partial paragraph on page 7 of Chapter II was revised to read:

(In this Secretary's Note and in subsequent Notes, unless indicated otherwise, revised and added text is indicated in bold letters for clarification only. The report text will not be bold.)

"In addition, bluff stability conditions were surveyed in **Warnimont Park in 2001**[12] and Lake Park in 2002.[13]**"**

The footnote on the Warnimont Park Study will be:

"[12]***STS Consultants, LTD.,* **Shoreline Erosion Study for Warnimont Park in the City of Cudahy, Wisconsin,** ***December 2002.***"

The following paragraph was added after the fourth full paragraph on page 7 of Chapter II:

"In 2001, bluff stability and erosion conditions were assessed along approximately 2,000 linear feet of bluff in Warnimont Park.[15] This study found visible evidence of erosion along the toe of the bluffs; evidence of recent bluff failures, including translational slides and rotational slumps; and visible water seeps at mid-bluff levels, some exhibiting relatively rapid discharge of water during field investigation."

The footnote from this additional paragraph will be:

"[15] *STS Consultants*, op. cit."]

Mr. Boxhorn also noted that Ms. Gayan had provided him with additional data to expand on discussion of aquatic invasive species in Chapter II.

[Secretary's Note: Round goby was added to the Milwaukee River line in Table II-10. The following text was also added to the end of the second full paragraph on page 13 of Chapter II:

"Round goby, a fish species native to the Caspian Sea and Black Sea regions of Eurasia, has been detected in the portion of the Milwaukee River downstream of Estabrook Dam. This species feeds heavily on the eggs and fry of other fish species and may also displace native forage fish species. In addition, all streams tributary to Lake Michigan are considered viral hemorrhagic septicemia waters, although the presence of this fish disease has not been verified in streams in Milwaukee County."]

Mr. Boxhorn reminded the Committee that inventories of natural areas and critical species habitat sites will be added to Chapter II following approval of the amendment to the regional natural areas plan by the Regional Planning Commission at their December 1, 2010 meeting.

[Secretary's Note: The inventories of natural areas and critical species sites have been added to Chapter II in the spaces reserved for Table II-17 and Map II-19 Also, the text in the natural areas and critical species habitat sites section on page 21 of Chapter II has been revised. The revised section, including Table II-17 and Map II-19, are attached herein as Exhibit A.]

Mr. Hahn asked whether there were any additional comments on the Summary Notes. None were offered. The Committee approved the November 10, 2010 Summary Notes by consensus.

REVIEW OF PRELIMINARY DRAFT CHAPTER III, "RELATED PLANS, REGULATIONS, AND PROGRAMS," OF SEWRPC COMMUNITY ASSISTANCE PLANNING REPORT NO. 312 (CAPR NO. 312), *A LAND AND WATER RESOURCE MANAGEMENT PLAN FOR MILWAUKEE COUNTY: 2012-2016.*

At Mr. Hahn's request, Mr. Boxhorn reviewed the preliminary draft of Chapter III, "Related Plans, Regulations, and Programs."

Mr. Boxhorn informed the Committee that Joel Dietl was unable to attend the meeting. He added that Mr. Dietl had provided several comments and suggestions on the Chapters being reviewed in two electronic mail messages sent to Mr. Boxhorn. Mr. Boxhorn stated that he would present Mr. Dietl's comments during his review of the relevant sections of the chapters.

[Secretary's Note: Copies of the correspondence sent by Mr. Dietl are attached hereto as Exhibit B.]

In reference to discussion on regional plans on pages 1 through 5, Mr. Boxhorn noted that Mr. Dietl asked whether specific examples of environmental corridors, urban development, prime agriculture, and other agricultural land and rural-density development in Milwaukee County should be cited in the report. Mr. Boxhorn indicated that these items were inventoried in Chapter II of the plan. Mr. Boxhorn noted that Mr. Dietl also asked whether examples of regional plans could be provided. He gave the example of the recommendation in the Regional Park and Open Space Plan for the addition of parks and parkways along some of the County's rivers and streams to further protect these resources. Mr. Boxhorn indicated specific examples relevant to Milwaukee County will be reviewed and added to the chapter.

[Secretary's Note: The following sentences were added to the end of the first full paragraph on page 3:

"The regional natural areas plan makes recommendations for the acquisition and protective ownership of several natural areas and critical species habitat sites in Milwaukee County. These recommendations are summarized on Map II-19 in Chapter II of this report."

The following sentence was added to the end of the second full paragraph on page 3:

"In Milwaukee County, the adopted park and open space plan recommends the acquisition of additional parkway along the mainstem of the Root River and Ryan Creek in the City of Franklin and along the mainstem of Oak Creek in the City of Oak Creek."]

Ms. Esch asked when the revision to the Milwaukee County Park and Open Space Plan would be completed. Mr. Boxhorn explained that SEWRPC staff is waiting for comments from County staff in order to proceed with the plan.

Mr. Boxhorn noted that via electronic mail correspondence Mr. Dietl had asked whether the discussion of local ordinances on pages 12 through 14 should include discussion of municipalities with regulations that are more stringent than the State-mandated minimums. Mr. Boxhorn indicated that this section is not intended to inventory specifics of local ordinances. After some discussion, it was the consensus of the Committee not to expand on the discussion of County and local ordinances.

In reference to the discussion of State regulations for the control of nonpoint source pollution, Ms. Gayan noted that revisions to Chapter NR 151 of the *Wisconsin Administrative Code* would take effect on December 1, 2010. Mr. Boxhorn indicated that the plan chapter would be updated to reflect this.

[Secretary's Note: The third sentence in the fourth full paragraph on page 14 will be revised to read as follows:

"NR 151 was also revised in 2010, with revisions taking effect December 1, 2010."]

At Mr. Boxhorn's request, Mr. Owens reviewed the section of the chapter regarding conservation programs. He noted that some of the programs discussed may be more relevant to Milwaukee County than others. He pointed out that the section is designed to demonstrate what programs are available and is not meant to inventory which programs are being used in the County and by whom. Mr. Boxhorn mentioned a suggestion made by Mr. Dietl to add examples or numbers of individuals in Milwaukee County participating in the programs to the chapter. Mr. Boxhorn indicated he would like to receive guidance from Mr. Detzer regarding this issue.

[Secretary's Note: After discussion with Mr. Detzer, the Commission staff attempted to obtain data on the numbers of farms in Milwaukee County enrolled in several conservation programs and found that such data were not available.]

After finishing the review of the section regarding conservation programs, Mr. Owens asked whether the Committee was aware of any additional programs that should be discussed. Ms. Gayan suggested that discussion of the Great Lakes Restoration Initiative be added. Mr. Hahn noted that this had been discussed subsequent to distribution of the chapter and indicated discussion of this program will be added to the section.

[Secretary's Note: The following paragraph was added after the second paragraph on page 20:

"***Great Lakes Restoration Initiative***

The Great Lakes Restoration Initiative (GLRI) is a multiagency effort led by the U.S. Environmental Protection Agency (USEPA). The initiative targets the most significant environmental problems affecting the Great Lakes, including contaminated sediment, aquatic invasive species, nearshore health and nonpoint source pollution, habitat and wildlife protection and restoration, and education. Funds are allocated strategically to implement both Federal programs and projects initiated by states, tribes, municipalities, universities, and other organizations. Grant funds are awarded competitively to projects which focus on achieving results in the identified target areas. During 2010, a total of $475 million in Federal funds was appropriated for the GLRI. The level of funding beyond 2010 is uncertain as of the date of this plan report."]

Mr. Martinka suggested adding the Wisconsin Coastal Management Program to the discussion of conservation programs. The Committee agreed that this should be included and Mr. Owens indicated that discussion of this program will be added to the chapter.

[Secretary's Note: The following paragraph was added after the third full paragraph on page 22:

"***Wisconsin Coastal Management Program***

The Wisconsin Coastal Management Program (WCMP) is administered by the Department of Administration, Bureau of Intergovernmental Relations. The WCMP is a voluntary State-Federal partnership that works through a council appointed by the Governor to provide policy coordination among state agencies and to award Federal funds to local governments and other entities for the implementation of initiatives related to the management of coastal zones in the state. The program has identified wetlands protection, habitat restoration, public access, land acquisition, nonpoint source pollution control, land use and community planning, natural hazards, and Great Lakes education projects as current priorities. The program also provides assistance to local governments in the management and protection of shorelands, wetlands, and floodplains through zoning and permitting."]

Mr. Boxhorn stated that Mr. Dietl asked whether it would be worthwhile to discuss trends in the conservation regulations and programs. He suggested discussion of which programs are being utilized more often or less often as well as discussion on which programs Milwaukee County is doing particularly well or poorly. After discussion with the Committee it was determined this matter needed further clarification from Mr. Dietl. Mr. Boxhorn indicated he would further discuss this issue with Mr. Dietl.

[Secretary's Note: It was found that there are not sufficient data available to characterize trends in the conservation regulations and programs, and that privacy laws preclude some of the data being available.]

Mr. Boxhorn asked the Committee if there was any further discussion regarding Chapter III. There was none.

REVIEW OF PRELIMINARY DRAFT CHAPTER IV, "GOALS, OBJECTIVES, AND WORK PLAN," OF SEWRPC COMMUNITY ASSISTANCE PLANNING REPORT NO. 312 (CAPR NO. 312), ***A LAND AND WATER RESOURCE MANAGEMENT PLAN FOR MILWAUKEE COUNTY: 2012-2016.***

Mr. Boxhorn reviewed the preliminary draft Chapter IV, "Goals, Objectives, and Work Plan."

Mr. Boxhorn noted that a section on education programs was included in the chapter and indicated that discussion of educational programs is a plan requirement listed in the guidance from the Wisconsin Department of Agriculture, Trade, and Consumer Protection (DATCP). Ms. Esch suggested that the County focus more on partnering with municipalities, MMSD, and WDNR on public education activities. Mr. Keith noted that the County currently does have partnerships with those entities. Mr. Boxhorn pointed out that collaborative education efforts are discussed further in the workplan in Table IV-1. Ms. Esch recommended that these partnerships also be addressed more prominently in the text of the Chapter. Mr. Boxhorn indicated that discussion regarding partnerships in public education will be added to the chapter text.

[Secretary's Note: The following paragraph was added after the third full paragraph on page 3:

"Much of the County's public educational programming is conducted in collaboration or cooperation with the County's partners in managing land and water resources. These partners include the local governments within the County; State agencies, such as DATCP, WDNR, and the University of Wisconsin-Extension; the Milwaukee Metropolitan Sewerage District; and private organizations, such as the Southeastern Wisconsin Watersheds Trust, Inc. (Sweet Water), the Southeastern Wisconsin Invasive Species Consortium (SEWISC), and local friends groups to the Milwaukee County Parks."

The following section was added after the second full paragraph on page 6:

"**PARTNERSHIP EFFORTS**

Milwaukee County has conducted many of its land and water resource conservation activities in cooperation and collaboration with a variety of partners. Notable partners in these efforts during the years 2007 through 2009 are listed in Table I-1 in Chapter I of this report. As indicated in the work plan set forth in Table IV-4, the County will continue to utilize, maintain, and expand these partnerships, as appropriate.

As discussed in Chapter III of this report, the Milwaukee Metropolitan Sewerage District, in collaboration with the Southeastern Wisconsin Watersheds Trust, Inc. (Sweet Water), has developed watershed restoration plans for the Kinnickinnic and Menomonee River watersheds. Sweet Water has recently developed implementation plans and developed lists of priority projects for implementing these watershed restoration plans. In the Kinnickinnic River watershed, Sweet Water is developing potential projects related to stormwater management, riparian buffer installation, and channel enhancement. In the Menomonee River watershed, Sweet Water is

developing potential projects related to agricultural runoff, stormwater management, riparian buffer installation, nutrient load reduction, streambank stabilization, and educational outreach related to the management of pet waste. These projects may present opportunities for the County to engage in collaborative efforts in order to meet the goals and objectives of the Milwaukee County land and water resource management plan."]

Mr. Boxhorn stated that a discussion of performance standard implementation strategies was added to the chapter. He noted that this discussion was modeled after the implementation strategies given in the land and water resource management plans of neighboring counties. In his correspondence, Mr. Dietl expressed concern that this section has a regulatory orientation, particularly in comparison to the other elements of the plan. He suggested there should be more discussion of the source of these requirements. He also indicated that it would be desirable for significant public education efforts to precede implementation of this strategy. Mr. Boxhorn noted that while Mr. Detzer had also voiced concerns that the section was fairly prescriptive, he indicated that he recognized that the County needs to outline an approach to identify and address noncompliant farms. Mr. Boxhorn explained that the section was added because DATCP might not accept the plan without a strategy for identifying and bringing into compliance farms that are out of compliance with agricultural performance standards. He further noted that the WDNR may object to the absence of discussion of performance standards implementation strategy in the plan.

Mr. Hahn asked Ms. Gayan whether the section on performance standards implementation strategy was consistent with what the WDNR expects. Ms. Gayan indicated that she felt the section was sufficient.

Mr. Boxhorn noted that Mr. Dietl had suggested in his correspondence making the third-order headings on pages 4 and 5 subheadings to priority farms strategy.

[Secretary's Note: Following the meeting, Commission staff discussed this with Mr. Dietl. After explaining that the subheadings under the heading "Implementation Strategy (Agricultural)" were intended to set forth a series of steps, it was agreed that the subheading "Priority Farms Strategy: Identify and Evaluate Farms for Compliance with Standards and Prohibitions" was confusing. The first subheading on page 4 was revised to read:

"***Identify and Evaluate Farms for Compliance with Standards and Prohibitions***"]

Mr. Boxhorn distributed Table IV-1, a revised version of the workplan. The revised table included priority designations for each planned action, as suggested by Mr. Detzer. Mr. Boxhorn told the Committee that Mr. Russart had also provided priority designations. Mr. Boxhorn reviewed Table IV-1 and pointed out instances where Mr. Detzer and Mr. Russart had differing priority rankings. Mr. Russart indicated that he would defer to the judgment of Mr. Detzer on planned actions related to his Department.

[Secretary's Note: A revised version of Table IV-1 that incorporates revisions based upon the following discussion by the Committee is attached herein as Exhibit C.]

In regards to implementation recommendations relating to soil erosion on page 2 of Table IV-4, Mr. Boxhorn asked Mr. Russart if the item should be changed to represent the updated Milwaukee County Agricultural Land Lease policy. Mr. Russart indicated that it should be updated to reflect the new policy rather than the study.

Mr. Boxhorn noted that Mr. Dietl suggested adding an objective under the second goal along the lines of providing support to other agencies and partners. Mr. Dietl pointed out that the WDNR and USGS monitoring programs may often experience budget cuts and may welcome the support even if it does not include any financial elements. Mr. Russart objected to the vagueness of the language "provide assistance." Mr. Hahn suggested replacing "provide assistance" with "collaborate with." Mr. Russart agreed that wording would be better. Mr.

Keith pointed out that the third planned action under the first workplan objective of Goal 2 is very similar to what Mr. Dietl is proposing. The Committee came to consensus that this subject is already adequately encompassed in the workplan.

Mr. Martinka indicated that the Southeastern Wisconsin Watersheds Trust, Inc. (SWWT) is finalizing a report on public awareness of the value of water resources. He also noted that the process for development of a Root River watershed restoration plan has begun. He suggested these projects could be added as planned action in the work plan. Mr. Boxhorn agreed that these should be added and requested that Mr. Martinka provide more details.

[Secretary's Note: An action item was added to Table IV-1 under the first objective of the Goal 1 to cooperate with efforts to develop a watershed restoration plan for the Root River watershed.]

In regards to Table IV-1, Mr. Martinka suggested including additional agencies for a number of the planned actions.

[Secretary's Note: Those additions were made.]

Concerning the planned action of beach grading and grooming, Mr. Martinka asked if the MMSD was partnering with Milwaukee County DPRC. Mr. Russart was unaware of any partnerships related to beach grooming projects, but indicated he would check with DPRC staff to verify.

[Secretary's Note: Mr. Russart confirmed via electronic mail that the MMSD was not involved with any County-led beach grooming efforts.]

Concerning the footnote to Table IV-1, Mr. Martinka requested that "Sweet Water" be added to the definition of the SWWT acronym. He noted that many people only know the organization as Sweet Water and may not make the relation to Southeastern Wisconsin Watersheds Trust, Inc. Mr. Boxhorn said the addition would be made.

Mr. Boxhorn asked the Committee if there were further questions, additions, or comments regarding Chapter IV. There were none. He reminded the Committee that they could submit additional comments through the comments page on the SEWRPC website.

REVIEW OF PRELIMINARY DRAFT CHAPTER V, "PROGRESS MONITORING AND EVALUATION," OF SEWRPC COMMUNITY ASSISTANCE PLANNING REPORT NO. 312 (CAPR NO. 312), ***A LAND AND WATER RESOURCE MANAGEMENT PLAN FOR MILWAUKEE COUNTY: 2012-2016.***

Mr. Boxhorn reviewed the preliminary draft of Chapter V, "Progress Monitoring and Evaluation."

With regard to water quality monitoring partners, Mr. Martinka noted that the Milwaukee Basin Partnership was listed as a cooperating partner and that he believed the group no longer existed. Ms. Gayan confirmed this. Mr. Boxhorn indicated that the group would be removed from the paragraph.

[Secretary's Note: The sixth sentence in the last partial paragraph on page 1 continuing onto page 2 was changed to read as follows:

"The County also plans to continue to work on collecting water quality data in cooperation with conservancy and environmental organizations, State and Federal Agencies, school districts, utility companies, local governments, the Milwaukee Metropolitan Sewerage District (MMSD), and adjacent County and local governments and other groups such as the Southeastern Wisconsin Watersheds Trust,

Inc., Milwaukee Riverkeeper, Root-Pike Watershed Initiative Network, and SEWRPC."]

There were no additional comments or suggestions from the Committee related to Chapter V.

OTHER BUSINESS

Mr. Boxhorn noted that the updated report draft of the plan along with the summary notes from this meeting will be posted on the SEWRPC website. He added that questions or comments on the draft plan or any related items can be provided to the SEWRPC staff via the comments page on the SEWRPC website or by electronic mail. Mr. Boxhorn indicated that a draft of the plan will be sent to DATCP in early to mid December 2010. Ms. Gayan noted that the WDNR needs to certify that NR 151 components of the plan are consistent with the applicable statutes. She indicated she will send the plan to John Pfender for WDNR approval. She further noted that a statement from WDNR indicating that they have reviewed the plan will be sent to DATCP. Mr. Keith noted that the public hearing on the plan will be held during a future County Parks, Energy & Environment Committee meeting.

ADJOURNMENT

There being no further business, the meeting was adjourned by unanimous consent at 3:15 p.m.

Respectfully Submitted,

Michael G. Hahn
Secretary

Attachments

#154792 V1 - CAPR-312 SUMMARY NOTES 11/30/10 MEETING
300-1087
MGH/JEB/AWO./pk
12/14/10

Exhibit A

Natural Areas and Critical Species Habitat Sites

A comprehensive inventory of "natural areas" and "critical species habitat sites" in the Southeastern Wisconsin Region was completed by the Regional Planning Commission in 1994.[37] The inventory identified the most significant remaining natural areas—essentially, remnants of the pre-European settlement landscape—as well as other areas vital to the maintenance of endangered, threatened, and rare plant and animal species in the Region. A recent amendment to this plan has added natural areas and critical species sites that have been identified since the publication of the initial plan.[38]

Natural Areas

Natural areas are tracts of land or water so little modified by human activity, or sufficiently recovered from the effects of such activity, that they contain intact native plant and animal communities believed to be representative of the landscape before European settlement. Natural areas are classified into one of three categories: natural areas of statewide or greater significance (NA-1), natural areas of countywide or regional significance (NA-2), and natural areas of local significance (NA-3). Classification of an area into one of these three categories is based upon consideration of the diversity of plant and animal species and community types present; the structure and integrity of the native plant or animal community; the extent of disturbance from human activity; the commonness of the plant or animal community; the uniqueness of the natural features; the size of the site; and the educational value.

As illustrated on Map II-19, and indicated in Table II-17, a total of 55 known natural areas were identified in Milwaukee County as part of the updated inventory. In combination, these sites encompassed about 2,891 acres (4.5 square miles) or 1.9 percent of the total area of the County.

Critical Species Habitat Sites and Aquatic Sites

Critical species habitat sites consist of areas, exclusive of identified natural areas, which are important for their ability to support State-designated endangered, threatened, or rare plant or animal species. Such areas constitute "critical" habitat considered to be important to the survival of a species or group of species of special concern. As shown on Map II-19 and described in Table II-17 a total of 55 critical species habitat sites were identified in Milwaukee County as part of the updated inventory. Together, these critical species habitat sites encompassed about 796 acres (1.2 square miles), or 0.5 percent of the County.

The regional natural areas plan also identified several critical aquatic habitat areas in the County. These areas were identified because they either support rare fish, herptile, or mussel species or bisect terrestrial natural areas. These areas include the portion of the mainstem of the Menomonee River upstream from the confluence with Underwood Creek; the portion of the mainstem of the Milwaukee River upstream from Walnut Street; the mainstem of the Root River downstream from Ryan Road; and Fish Creek, the Root River Canal, Tess Corners Creek, and Whitnall Park Creek.

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[37]*SEWRPC Planning Report No. 42,* A Regional Natural Areas and Critical Species Habitat Protection and Management Plan for Southeastern Wisconsin, *September 1997.*

[38]*SEWRPC,* Amendment to the Natural Areas and Critical Species Habitat Plan for the Southeastern Wisconsin Region, *December 2010.*

Table II-17

KNOWN NATURAL AREAS AND CRITICAL SPECIES HABITAT SITES IN MILWAUKEE COUNTY: 2009

Number on Map II-19	Area Name	Classification Code	Location	Ownership	Size (acres)	Description and Comments
1	Adams Prairie	NA-2	T5N, R21E Section 32 City of Franklin	Private	37	Species-rich, high-quality wet-mesic prairie and sedge meadow complex
2	Root River Canal Woods	NA-2	T5N, R21E Section 34 City of Franklin T4N, R21E Section 3 Town of Raymond	Milwaukee County and private	152 (plus 163 in Racine County)	A mixture of good-quality dry-mesic and lowland hardwood forest along the Root River Canal. One of the largest intact forested tracts in this part of the Region. Extends south into Racine County
3	Root River Wet-Mesic Woods—West	NA-2	T5N, R21E Sections 35, 36 City of Franklin	Milwaukee County and private	273	Mixture of medium-aged lowland and upland hardwoods that is recovering well from past disturbance. The ground flora is particularly rich and diverse, including good populations of several rare species. This is an important part of the Root River environmental corridor
4	Rawson Park Woods	NA-2	T5N, R22E Section 2 City of South Milwaukee	Milwaukee County and City of Milwaukee	23	Despite heavy human use, especially from the adjacent high school, this site contains probably the best remaining example of beech-maple forest in Milwaukee County. The north half is in best condition. The rich ground flora contains a good population of blue-stemmed goldenrod (*Solidago caesia*), a State-designated endangered species
5	Cudahy Woods	NA-2 (SNA)	T5N, R22E Section 4 City of Oak Creek	Milwaukee County	47	An upland hardwood forest containing two major forest types separated by a small stream. To the north is a dry-mesic forest of oak, cherry, and hickory; southward is an old-growth mesic forest of sugar maple, beech, and red oak. One of the best forests of its kind in the vicinity; there is a history of past scientific research
6	Falk Park Woods	NA-2	T5N, R22E Section 7 City of Oak Creek	Milwaukee County and private	78	This is a diverse, relatively large north-south stand of woods. Consists mostly of good-quality dry-mesic uplands, with mesic stands of beech and sugar maple at the north end, and low areas of ephemeral ponds, wet-mesic hardwoods, and streams interspersed throughout. Past disturbances appear minimal
7	Root River Wet-Mesic Woods—East	NA-2	T5N, R22E Section 32 City of Oak Creek T4N, R22E Section 5 Village of Caledonia	Milwaukee County and Racine County	50 (plus two in Racine County)	Wet-mesic and mesic woods bordering a gravel-bottom stream that is tributary to the Root River. Contains a rich, diverse flora, including several rare species
8	Greenfield Park Woods	NA-2	T6N, R21E Section 6 City of West Allis	Milwaukee County	52	A good stand of southern dry-mesic hardwoods dominated by red and white oaks, sugar maple, and basswood. Includes ephemeral ponds and a lowland hardwood swamp

Table II-17 (continued)

Number on Map II-19	Area Name	Classification Code	Location	Ownership	Size (acres)	Description and Comments
9	St. Francis Seminary Woods	NA-2	T6N, R22E Sections 14, 15 City of St. Francis	St. Francis Seminary	52	This southern mesic forest features mature basswood, sugar maple, beech, red oak, and paper birch. The site is divided by a gravel road, a small tributary to Lake Michigan, and numerous trails. The relatively diverse ground flora includes the State-designated endangered blue-stemmed goldenrod (*Solidago caesia*)
10	Warnimont Park Fens	NA-2 (SNA)	T6N, R22E Section 36 City of Cudahy	Milwaukee County	2	Clay bluffs with spring seepages along Lake Michigan support calcareous fens which contain an unusual flora. Regionally uncommon plants include buffaloberry (*Shepherdia canadensis*), variegated scouring-rush (*Equisetum variegatum*), Ohio goldenrod (*Solidago ohioensis*), small fringed gentian (*Gentianopsis procera*), and false asphodel (*Tofieldia glutinosa*), a State-designated threatened species
11	Grobschmidt Park Wetlands and Upland Woods	NA-3	T5N, R21E Sections 1, 2 City of Franklin	Milwaukee County and private	83	A combination of moderate-quality deep and shallow marsh, sedge meadow, shrub-carr, and disturbed dry-mesic woods. Site contains a restored prairie
12	Bike Trail Marsh	NA-3	T5N, R21E Section 3 City of Franklin	Milwaukee County	3	Good-quality shallow marsh
13	Root River Low and Upland Woods	NA-3	T5N, R21E Section 3 City of Franklin	Milwaukee County	76	Primarily wet-mesic and floodplain woods along Root River, with upland dry-mesic forest at north end
14	Root River Parkway Woods	NA-3	T5N, R21E Section 4 Village of Greendale	Milwaukee County	64	Dry-mesic forest on undulating topography, dominated by relatively large red oaks. Ground layer is sparse. The woods contains hiking and ski trails
15	Whitnall Park Woods—South	NA-3	T5N, R21E Sections 5, 8 City of Franklin T6N, R21E Section 32 Village of Hales Corners	Milwaukee County and private	145	Site consists of several more-or-less connected stands of dry-mesic upland woods. The area of highest quality is surrounded by golf links. Here, mature red oaks and sugar maples provide a canopy over a representative ground flora that includes two State-designated species: American gromwell (*Lithospermum latifolium*) and black haw (*Viburnum prunifolium*)
16	Monastery Lake Wetlands	NA-3	T5N, R21E Section 8 City of Franklin	Private	48	A diverse wetland plant community complex consisting of deep and shallow marsh, sedge meadow, fresh (wet) meadow, shrub-carr, and the last tree-size tamaracks in Milwaukee County
17	Root River Bike Trail Woods	NA-3	T5N, R21E Section 15 City of Franklin	Milwaukee County	108	Relatively diverse combination of wet-mesic and dry-mesic woods bordering Root River
18	Mission Hills Wetlands	NA-3	T5N, R21E Sections 16, 17 City of Franklin	Private	38	Complex of sedge meadow, shallow marsh, and wet prairie

Table II-17 (continued)

Number on Map II-19	Area Name	Classification Code	Location	Ownership	Size (acres)	Description and Comments
19	Franklin (Puetz Road) Woods	NA-3	T5N, R21E Sections 23, 24 City of Franklin	City of Franklin	34	Situated along the headwaters of Oak Creek, this site consists of mature dry-mesic hardwoods, lowland hardwoods, and stands of younger growth. The rich and diverse flora includes black haw (*Viburnum prunifolium*), a State-designated special concern species
20	Fitzsimmons Road Woods	NA-3	T5N, R21E Section 25 City of Franklin	Milwaukee County and Milwaukee Area Land Conservancy	39	The south and east portions of this dry-mesic woods are mostly second-growth; the west portion is less disturbed, with larger, mature trees. In the northwest are several ephemeral ponds where the State-designated endangered hoplike sedge (*Carex lupuliformis*) is found
21	Root River Parkway Prairie	NA-3	T5N, R21E Section 27 City of Franklin	Milwaukee County	51	Wet-mesic prairie located within the Root River Parkway wetland complex. Characteristic species include big bluestem, saw-toothed sunflower, Virginia mountain mint, prairie cordgrass, leadplant, azure aster, bottle gentian, prairie dock, and slender ladies'-tresses orchid. It is the largest prairie remaining in Milwaukee County
22	60th Street Woods	NA-3	T5N, R21E Section 27 City of Franklin	Milwaukee County	11	Small, but species-rich upland woods
23	Ryan Creek Woods	NA-3	T5N, R21E Section 28 City of Franklin	Private	102	One of the larger woodlots remaining in Milwaukee County, this is a dry-mesic woods of varying quality that is recovering from past disturbance. An east-west stream crosses the south end
24	Franklin Oak Woods and Oak Savanna	NA-3 (SNA)	T5N, R21E Section 29 City of Franklin	Milwaukee County	79	The entire site is former oak savanna, but only the north portion retains this appearance. Here are large, scattered, open-grown bur oaks, but the understory consists mainly of weeds, with a few prairie species persisting. The south portion has degraded further into a dense shrubland. Recent restoration efforts, including cutting and burning, are attempting to restore this site to more of a pre-settlement condition
25	Elm Road Woods	NA-3	T5N, R21E Section 36 City of Franklin	Private	20	A small, mostly second-growth woodlot of southern mesic forest and lowland hardwoods. American beech is present at the western edge of its range. Contains two populations of two State-designated special concern species: American gromwell (*Lithospermum latifolium*) and black haw (*Viburnum prunifolium*)

Table II-17 (continued)

Number on Map II-19	Area Name	Classification Code	Location	Ownership	Size (acres)	Description and Comments
26	Grant Park Woods—Old Growth	NA-3	T5N, R22E Section 1 City of South Milwaukee	Milwaukee County	42	Dissected by ravines, this site has long been used as a park. Despite the heavy human influence, this beech-maple woods, which is a remnant of the original Lake Michigan forest, retains some of its pre-settlement character. The rich ground flora includes the State-designated endangered blue-stemmed goldenrod (*Solidago caesia*)
27	Grant Park Woods—South	NA-3	T5N, R22E Section 1, 12 City of South Milwaukee	Milwaukee County	45	A remnant of the once more-widespread beech-maple mesic woods along Lake Michigan, this is a narrow wooded strip of moderate quality in Grant Park. Bordered on the west by golf course
28	Oak Creek Parkway Woods	NA-3	T5N, R22E Sections 11, 12 City of Oak Creek	Milwaukee County	24	Dry-mesic woods along Oak Creek
29	Esch-Honadel Woods	NA-3	T5N, R22E Section 18 City of Oak Creek	Private	64	A patchy mix of low woods, second-growth upland forest, and relatively undisturbed beech woods. Integrity of the woods is threatened by encroaching residential development
30	Wedge Woods	NA-3	T5N, R22E Section 23 City of Oak Creek	Private	17	A small, disturbed woods consisting of lowland hardwoods at the low, wet west end, and dry-mesic woods at the drier east end. Contains one of the largest populations of the State-designated endangered blue-stemmed goldenrod (*Solidago caesia*) in the State. Threatened by residential development
31	Oak Creek Low Woods	NA-3	T5N, R22E Section 26, 27 City of Oak Creek	Milwaukee County and private	68	Moderate-quality wet-mesic woods, with small areas of mesic woods
32	Ryan Road Woods	NA-3	T5N, R22E Section 29 City of Oak Creek	Milwaukee County and private	42	Dry-mesic woods containing critical species
33	Root River Riverine Forest	NA-3	T5N, R22E Sections 31, 32, 33, 34 City of Oak Creek T4N, R22E Sections 3, 4, 5, 6 Village of Caledonia	Milwaukee County, Racine County, Wisconsin Department of Transportation, and private	147 (plus 184 in Racine County)	A significant portion of the Root River corridor. Extends south into Racine County
34	West Branch Root River Woods	NA-3	T6N, R21E Section 7 City of West Allis	Private	12	Small remnant of native forest in highly developed area
35	Mitchell's Woods	NA-3	T6N, R21E Section 11 City of Milwaukee	Milwaukee County	37	Mixed-quality woods bordering Kinnickinnic River
36	Glenwood School Woods	NA-3	T6N, R21E Section 14 City of Milwaukee	Glenwood School	7	Relatively good-quality dry-mesic woods on school grounds
37	Whitnall Park Woods—North	NA-3	T6N, R21E Section 32 Village of Hales Corners	Milwaukee County	82	Stands of dry-mesic and lowland hardwoods within Whitnall Park. Contains forked aster (*Aster furcatus*), a State-designated threatened species
38	Grootemaat Woods	NA-3	T6N, R21E Section 35 City of Greenfield	City of Greenfield	20	Dry-mesic woods with ephemeral ponds

Table II-17 (continued)

Number on Map II-19	Area Name	Classification Code	Location	Ownership	Size (acres)	Description and Comments
39	Warnimont Park Woods	NA-3	T6N, R22E Section 36 City of Cudahy	Milwaukee County	47	Mix of mesic and dry-mesic woods located on bluffs along Lake Michigan, traversed by ravines which provide cooler and moister micro-habitats
40	Menomonee River Swamp—South	NA-3	T7N, R21E Section 6 City of Wauwatosa	Milwaukee County, City of Milwaukee, and Wisconsin Department of Transportation	99	A portion of the Menomonee River bordered by lowland hardwood forest and dry-mesic upland woods. Contains American gromwell (*Lithospermum latifolium*) and heart-leaved skullcap (*Scutellaria ovata*), both State-designated special concern species
41	Currie Park Low Woods	NA-3	T7N, R21E Section 8 City of Wauwatosa	Milwaukee County	27	A portion of the Menomonee River bordered by disturbed lowland hardwoods and upland dry-mesic woods. The ground flora is rich, including such rare species as the State-designated threatened forked aster (*Aster furcatus*)
42	Blue Mound Country Club Woods	NA-3	T7N, R21E Section 17 City of Wauwatosa	Milwaukee County and private	17	A small patch of southern dry-mesic woods containing critical species habitat
43	Wil-O-Way Woods	NA-3	T7N, R21E Section 20 City of Wauwatosa	Milwaukee County	41	Moderate-quality southern dry-mesic hardwoods containing a representative ground flora
44	Jacobus Park Woods	NA-3	T7N, R21E Section 27 City of Wauwatosa	Milwaukee County	11	A small remnant of the original southern dry-mesic forest on bluffs overlooking the Menomonee River. Contains several populations of the State-designated threatened forked aster (*Aster furcatus*), as well as other regionally rare species
45	Downer Woods	NA-3	T7N, R22E Section 10 City of Milwaukee	University of Wisconsin—Milwaukee	11	A disturbed southern dry-mesic hardwood forest where scattered large oaks and smaller ashes and basswoods dominate the tree stratum. There is a thick shrub layer of natives and exotics. One of the few undeveloped woods within this part of the County
46	Granville Low Woods	NA-3	T8N, R21E Section 6 City of Milwaukee	Milwaukee Metropolitan Sewerage District	50	Good quality wet-mesic woods supporting critical species habitat
47	Bradley Woods	NA-3	T8N, R21E Section 9 City of Milwaukee	City of Milwaukee and private	34	An old-growth southern mesic forested island, dominated by sugar maple, beech, and basswood. One of the few remnants of the original forest remaining in northern Milwaukee County. The western portion, owned by the County, is least disturbed
48	Convent Woods	NA-3	T8N, R21E Section 10 City of Milwaukee	Private	9	Small though floristically diverse mesic forest remnant
49	Brown Deer Park Woods	NA-3	T8N, R21E Section 13 Village of Brown Deer	Milwaukee County	43	Small islands of remnant southern mesic hardwoods within a golf-course matrix, dominated by beech and sugar maple

Table II-17 (continued)

Number on Map II-19	Area Name	Classification Code	Location	Ownership	Size (acres)	Description and Comments
50	Harbinger Woods	NA-3	T8N, R21E Sections 18 City of Milwaukee T8N, R20E Section 13 Village of Menomonee Falls	Milwaukee County and private	34 (plus 12 in Waukesha County)	Mesic upland woods and lowland hardwoods bordering the Menomonee River that extend into Waukesha County. The spring flora of the mesic woods is rich and diverse, including American gromwell (*Lithospermum latifolium*), a State-designated special concern species. Also present are several chinkapin oaks (*Quercus muehlenbergii*), a State-designated special concern tree species.
51	Menomonee River Swamp—North	NA-3	T8N, R21E Sections 19, 30 City of Milwaukee T8N, R20E Section 24 Village of Menomonee Falls	Milwaukee County and private	75 (plus four in Waukesha County)	Discontinuous patches of disturbed floodplain forest bordering the Menomonee River
52	Haskell Noyes Park Woods	NA-3	T8N, R21E Section 21 City of Milwaukee	Milwaukee County	20	Disturbed southern mesic hardwood forested island with a substantial amount of beech. Best old-growth remnant is near center of woods. Pond and wetlands are present at south end
53	McGovern Park Woods	NA-3	T8N, R21E Section 35 City of Milwaukee	Milwaukee County	14	Remnant woodland within urban park
54	Schlitz Audubon Center/Doctors Park Woods and Beach	NA-3	T8N, R22E Sections 9, 10 Village of Bayside	Schlitz Audubon Center and Milwaukee County	72	Mesic and dry-mesic woods on bluffs and in steep ravines along Lake Michigan. Site includes lake sand beach
55	Kletzsch Park Woods	NA-3	T8N, R22E Section 19 City of Glendale	Milwaukee County	13	A remnant of southern mesic to dry-mesic forest on the west bank of the Milwaukee River. The diversity of habitats (upland woods, ravine, floodplain, and slope) has resulted in a diverse ground flora, including the State-designated threatened forked aster (*Aster furcatus*)
56	Russell Avenue Woods	CSH	T5N, R21E Section 2 City of Franklin	Private	9	Woodland that supports a population of red trillium (*Trillium recurvatum*), a State-designated special concern species
57	Loomis Road Woods	CSH	T5N, R21E Section 9 City of Franklin	Private	13	Small woodland in residential area contains two State-designated special concern species: red trillium (*Trillium recurvatum*) and American gromwell (*Lithospermum latifolium*)
58	Countryside Woods	CSH	T5N, R21E Section 12 City of Franklin	City of Franklin and Metropolitan Milwaukee Sewerage District	26	A wooded mix of lowlands and uplands contains populations of two State-designated special concern species: red trillium (*Trillium recurvatum*) and black haw (*Viburnum prunifolium*)
59	35th Street Woods	CSH	T5N, R21E Section 12 City of Franklin	Private	14	Upland and lowland wooded site, containing black haw (*Viburnum prunifolium*), a State-designated special concern species
60	Shooting Star Prairie and Shrubland (Carity Prairie)	CSH	T5N, R21E Section 20 City of Franklin	Milwaukee Area Land Conservancy and private	18	Upland prairie remnant, dominated by shooting star, and associated shrub thicket

Table II-17 (continued)

Number on Map II-19	Area Name	Classification Code	Location	Ownership	Size (acres)	Description and Comments
61	Oakwood Park Oak Woods	CSH	T5N, R21E Section 25, 26 City of Franklin	Milwaukee County and private	8	Upland woodlot, formerly of NA-3 status, now downgraded because of extensive development of industrial park
62	Elm Road Woods—North	CSH	T5N, R21E Section 36 City of Franklin	Private	32	Disturbed dry-mesic woods
63	Oak Creek Parkway Bike Trail Woods	CSH	T5N, R22E Section 2 City of South Milwaukee	Milwaukee County	2	Small wooded patch containing the State-designated endangered blue-stemmed goldenrod (*Solidago caesia*)
64	Industrial Park Mesic Woods	CSH	T5N, R22E Section 8 City of Oak Creek	Private	5	Mesic forest remnant within industrial park supporting goldenseal (*Hydrastis canadensis*), a State-designated special concern species
65	Camelot Park Woods	CSH	T5N, R22E Section 10 City of Oak Creek	Milwaukee County	15	A small population of the State-designated endangered blue-stemmed goldenrod (*Solidago caesia*) is located within this upland woodlot
66	Oak Creek Bluffs and Beach—North	CSH	T5N, R22E Section 12 City of South Milwaukee	Milwaukee County	4	Seepage areas on eroding clay banks along Lake Michigan support two State-designated special concern species: Ohio goldenrod (*Solidago ohioensis*) and false asphodel (*Tofieldia glutinosa*)
67	Blakewood School Woods	CSH	T5N, R22E Section 15 City of South Milwaukee	Blakewood School	1	Small mesic woodlot on school grounds
68	Meyers Woods	CSH	T5N, R22E Section 19 City of Oak Creek	Private	10	Woodland that has recently lost acreage due to residential development, yet still supports black haw (*Viburnum prunifolium*), a State-designated special concern species
69	Puetz Road Woods	CSH	T5N, R22E Section 19 City of Oak Creek	Private	22	A wooded mix of lowlands and uplands contains populations of two State-designated special concern species: red trillium (*Trillium recurvatum*) and black haw (*Viburnum prunifolium*)
70	Wood Creek Woods	CSH	T5N, R22E Section 20 City of Oak Creek	Private	27	Upland and lowland woodlot, formerly of NA-3 status, now downgraded because of extensive residential development
71	Howell Avenue Woods	CSH	T5N, R22E Section 21 City of Oak Creek	Private	21	Mixed-quality woodlot, threatened by development
72	Fittshur Wetland	CSH	T5N, R22E Section 23 City of Oak Creek	Private	6	A population of the State-designated endangered blue-stemmed goldenrod (*Solidago caesia*) is located in the wooded upland border
73	Schmidt/Johnson Woods	CSH	T5N, R22E Section 23 City of Oak Creek	Private	6	Small woodland containing black haw (*Viburnum prunifolium*), a State-designated special concern species
74	Bender Park Stream and Meadow	CSH	T5N, R22E Section 25 City of Oak Creek	Milwaukee County	2	Open lowlands adjacent to a small stream support waxy meadow rue (*Thalictrum revolutum*), a State-designated special concern species

Table II-17 (continued)

Number on Map II-19	Area Name	Classification Code	Location	Ownership	Size (acres)	Description and Comments
75	Bender Park Woods—North	CSH	T5N, R22E Section 25 City of Oak Creek	Milwaukee County	11	Small woodlot along Lake Michigan, at north end of Bender Park
76	Bender Park Woods—South	CSH	T5N, R22E Section 25 City of Oak Creek	Milwaukee County	5	Small woodlot in Bender Park with a relatively rich ground flora, including the State-designated endangered blue-stemmed goldenrod (*Solidago caesia*)
77	Ryan Road Upland Woods—East	CSH	T5N, R22E Section 29 City of Oak Creek	Milwaukee County	4	Disturbed dry-mesic woodlot
78	Truck Stop Woods	CSH	T5N, R22E Section 30 City of Oak Creek	Private	11	Disturbed mix of upland and lowland woods and shrubland
79	PPG Woods	CSH	T5N, R22E Section 32 City of Oak Creek	Private	19	Disturbed dry-mesic woodlot
80	Bender Clay Banks and Ravine—South	CSH	T5N, R22E Section 36 City of Oak Creek	Milwaukee County	2	Seepage areas on the clay banks along Lake Michigan support slender bog arrow-grass, (*Triglochin palustre*), a State-designated special concern species
81	Clay Ravine Woods	CSH	T5N, R22E Section 36 City of Oak Creek	WE Energies	12	Wooded ravine cut through the Lake Michigan clay bluffs contains a population of the State-designated endangered blue-stemmed goldenrod (*Solidago caesia*)
82	Oak Creek Bluffs and Beach—South	CSH	T5N, R22E Section 36 T5N, R23E Section 31 City of Oak Creek	Milwaukee County	24	A stretch of Lake Michigan that supports sea rocket (*Cakile edentula*), a State-designated special concern species found on open, sandy beaches
83	Oak Creek Power Plant Woods	CSH	T5N, R22E Section 36 City of Oak Creek	WE Energies	16	Upland mesic woodlot on the grounds of the Oak Creek power plant supports a population of the State-designated endangered blue-stemmed goldenrod (*Solidago caesia*)
84	Honey Creek Parkway Woods	CSH	T6N, R21E Section 9 City of West Allis	Milwaukee County	5	Woodland within an urban park that supports a population of red trillium (*Trillium recurvatum*), a State-designated special concern species
85	Lyons Park Woods	CSH	T6N, R21E Section 14 City of Milwaukee	Milwaukee County	6	Woodland within an urban park that supports a population of red trillium (*Trillium recurvatum*), a State-designated special concern species
86	Holt Park Woods	CSH	T6N, R21E Section 17 City of Greenfield	Milwaukee County	8	Woodland within an urban park that supports a population of red trillium (*Trillium recurvatum*), a State-designated special concern species
87	Cold Spring Road Thicket	CSH	T6N, R21E Section 19 City of Greenfield	Private	2	Upland shrubland contains small population of American gromwell (*Lithospermum latifolium*), a State-designated special concern species
88	Grange Avenue Woods	CSH	T6N, R21E Section 33 Village of Greendale	Milwaukee County	14	Disturbed dry-mesic woods with hoptree (*Ptelea trifoliata*), a State-designated special concern species, found along border

Table II-17 (continued)

Number on Map II-19	Area Name	Classification Code	Location	Ownership	Size (acres)	Description and Comments
89	Westway Woods	CSH	T6N, R21E Section 34 Village of Greendale	Village of Greendale	9	Suburban woodland that supports a population of red trillium (*Trillium recurvatum*), a State-designated special concern species
90	Scout Lake Park Woods	CSH	T6N, R21E Section 35 Village of Greendale	Milwaukee County	43	Upland woods surrounding Scout Lake contain a small population of American gromwell (*Lithospermum latifolium*), a State-designated special concern species
91	Trestle Ravine Woods	CSH	T6N, R22E Section 14 City of St. Francis	WE Energies	3	A small woodland containing the State-designated endangered blue-stemmed goldenrod (*Solidago caesia*)
92	Greene Park Woods	CSH	T6N, R22E Section 23 City of Cudahy	Milwaukee County	7	A small woodland within a park containing the State-designated endangered blue-stemmed goldenrod (*Solidago caesia*)
93	Cudahy Park Woods	CSH	T6N, R22E Section 34 City of Cudahy	Milwaukee County	4	Small woodland within urban park
94	Underwood Parkway Woods	CSH	T7N, R21E Section 20 City of Wauwatosa	Milwaukee County	16	Woodland above Underwood Creek, adjacent to parkway
95	County Grounds Woods	CSH	T7N, R21E Section 21 City of Wauwatosa	Milwaukee County	10	Remnant dry-mesic woods containing forked aster (*Aster furcatus*), a State-designated threatened species
96	Harwood Avenue Woods	CSH	T7N, R21E Section 21 City of Wauwatosa	Milwaukee County	46	Woodlands bordering Menomonee River
97	Hart Park/Psychiatric Hospital Woods	CSH	T7N, R21E Section 22 City of Wauwatosa	Milwaukee County	41	Woodland along Menomonee River supports populations of one threatened plant species and five special concern plant species
98	Hawthorn Glen	CSH	T7N, R21E Section 23 City of Milwaukee	Milwaukee County	16	Woodland supports two State-designated special concern species: American gromwell (*Lithospermum latifolium*) and hoptree (*Ptelea trifoliata*)
99	Doyne Park Woodland	CSH	T7N, R21E Section 26 City of Milwaukee	Milwaukee County	4	Woodland bordering Menomonee River contains small population of hoptree (*Ptelea trifoliata*), a State-designated special concern species
100	Menomonee River PCA No. 10	CSH	T7N, R21E Section 27 City of Wauwatosa	Milwaukee County	3	Small wooded area along the Menomonee River contains hoptree (*Ptelea trifoliata*), a State-designated special concern species
101	Stadium Bluff Woods	CSH	T7N, R21E Section 35 City of Milwaukee	Zablocki Veterans Affairs Medical Center	6	Wooded bluff located between Veterans Center and Miller Park parking area supports a population of forked aster (*Aster furcatus*), a State-designated threatened species. This site is also identified as GA-1, a geological site significant in the history of science

Table II-17 (continued)

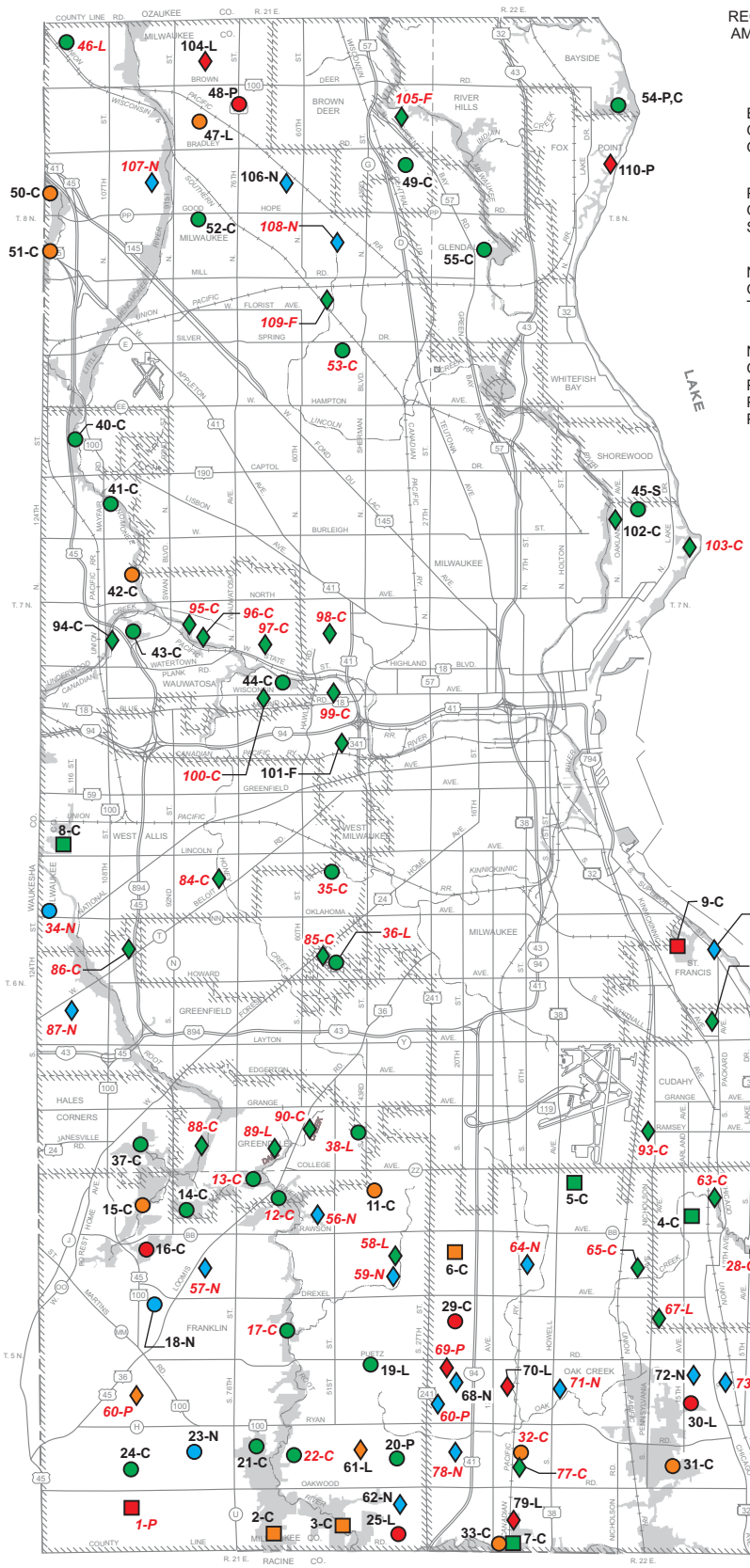
Number on Map II-19	Area Name	Classification Code	Location	Ownership	Size (acres)	Description and Comments
102	Cambridge Avenue Woods	CSH	T7N, R22E Section 9 City of Milwaukee	Milwaukee County	17	Relatively diverse stretch of primarily upland dry-mesic woods on east side of Milwaukee River that contains several populations of forked aster (*Aster furcatus*), a State-designated threatened species
103	Lake Park Woods	CSH	T7N, R22E Sections 14, 15 City of Milwaukee	Milwaukee County	46	Dry-mesic forest remnants along the wooded ravines of Lake Park
104	Research Center Woods	CSH	T8N, R21E Section 4 City of Milwaukee	Private	22	Remnant dry-mesic forest containing a small population of the State-designated endangered blue-stemmed goldenrod (*Solidago caesia*)
105	Silver Maple Island	CSH	T8N, R21E Section 12 Village of Brown Deer	Bureau of Land Management	1	Wooded island in Milwaukee River contains a population of sweet Indian plantain (*Hasteola suaveolens*), a State-designated special concern species
106	Brynwood Country Club Woods	CSH	T8N, R21E Section 15 City of Milwaukee	Private	5	Small wooded patch within golf course
107	West Granville Mesic Woods	CSH	T8N, R21E Section 17 City of Milwaukee	Private	8	Remnant dry-mesic woods within residential area
108	Greentree Road Woods	CSH	T8N, R21E Section 23 City of Milwaukee	Private	5	Upland woodland contains a population of American gromwell (*Lithospermum latifolium*), a State-designated special concern species
109	Army Reserve Woods	CSH	T8N, R21E Section 26 City of Milwaukee	U.S. Army	11	Small woodland containing a population of the State-designated endangered blue-stemmed goldenrod (*Solidago caesia*)
110	Fox Point Bluffs and Ravines	CSH	T8N, R22E Sections 9, 16, 21, 28 Village of Fox Point	Private	93	Wooded bluffs and ravines along Lake Michigan that, though disturbed, support a relatively diverse native flora

NOTE: Shaded areas indicate sites added in the 2010 amendment to the regional natural areas and critical species habitat protection and management plan.

Source: SEWRPC.

Map II-19

NATURAL AREAS AND CRITICAL SPECIES HABITAT SITES IN MILWAUKEE COUNTY: 2009



CURRENT STATUS AND PLAN RECOMMENDATION UNDER THE 2010 AMENDMENT TO SEWRPC NATURAL AREAS AND CRITICAL SPECIES HABITAT MANAGEMENT PLAN	NA-1 SITE	NA-2 SITE	NA-3 SITE	CRITICAL SPECIES HABITAT
ENTIRELY UNDER PROTECTIVE OWNERSHIP/PROTECTIVE OWNERSHIP TO BE RETAINED	(NONE)	■	●	♦
PARTIALLY UNDER PROTECTIVE OWNERSHIP/REMAINDER OF SITE TO BE ACQUIRED	(NONE)	■	●	♦
NOT UNDER PROTECTIVE OWNERSHIP/ENTIRE SITE TO BE ACQUIRED	(NONE)	■	●	♦
NOT UNDER PROTECTIVE OWNERSHIP/TO BE PRESERVED TO EXTENT PRACTICABLE WITHOUT PROTECTIVE OWNERSHIP	(NONE)	(NONE)	●	♦

RECOMMENDED OWNERSHIP KEY:

F-FEDERAL GOVERNMENT
S-STATE GOVERNMENT
C- COUNTY GOVERNMENT
L-LOCAL GOVERNMENT
P-PRIVATE CONSERVANCY ORGANIZATION
N-NO PROTECTIVE OWNERSHIP RECOMMENDED

27-SITE REFERENCE NUMBER (SEE TABLE II-17)

28-NEWLY IDENTIFIED SITE REFERENCE NUMBER (SEE TABLE II-17)

PRIMARY ENVIRONMENTAL CORRIDORS

NOTE: Newly identified sites are those identified in the 2010 amendment to the regional natural areas and critical species habitat protection and management plan.

Source: SEWRPC.

Exhibit B

Boxhorn, Joseph E.

From: Joel Dietl [JDietl@franklinwi.gov]
Sent: Monday, November 29, 2010 10:09 AM
To: Boxhorn, Joseph E.
Subject: Milwaukee County Land and Water Resource Management Plan, Chapter 3 comments

Hi Joseph,

As I may not be able to attend Tuesday's meeting, my comments on Chapter 3 are set forth below. Other Chapter comments will be forthcoming.

- Could Milwaukee County examples of environmental corridors, urban development, prime agricultural lands, and other agricultural and rural density (see page 2) be provided?
- Could Milwaukee County examples of the Regional Plans (see page 3) be provided? The Regional Park and Open Space Plan recommends, for instance, additional parks, parkways, etc. along some of the County's rivers and streams that could serve to further protect these resources.
- Include mention or provide examples of those communities with natural resource protection standards greater than the state mandated minimums, such as greater floodplain protections, shoreland zoning of all wetlands (not just those 5 acres or larger), greater stream and/or wetland setbacks, protection of secondary environmental corridors and isolated natural resource areas, etc. (see page 13). Franklin for instance has some of these additional zoning regulations.
- Could real-life examples and/or the number of individuals participating within such programs as CRP, EQIP, WRP, etc. be provided (see page 18)?
- In general, would it be worthwhile to discuss any trends with these plans and regulations? Are they being utilized more often or less often, are there certain plans or regulations that are more appropriate for an urban county like Milwaukee, is Milwaukee County doing particularly well – or particularly poorly – in comparison with adjacent counties?

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Boxhorn, Joseph E.

From: Joel Dietl [JDietl@franklinwi.gov]
Sent: Monday, November 29, 2010 11:47 AM
To: Boxhorn, Joseph E.
Subject: Milwaukee County Land and Water Resource Management Plan, Chapters 4 and 5

Hi Joseph,

Here are my comments on Chapters 4 and 5.

- Is the Priority Farms Strategy (beginning on page 4) something new to the Milwaukee County Land and Water Resource Management Plan? Is it currently being enforced in Milwaukee County? This seems to be an extremely regulatory/mandatory oriented program, particularly in comparison with all of the other goals, work plans, and programs contained within the Milwaukee County Land and Water Resource Management Plan. If this is new to Milwaukee County, this should be preceded by a significant public education and awareness effort first. Even if this is not new, this section of Chapter 4 should explain where this requirement comes from (NR 151?).
- Should "Document and Report Compliance Status", "Offer Technical Assistance…", etc. be sub-headings under the Priority Farms Strategy?
- Should a new work plan be added under Goal 2, along the lines of 'Provide support to other agencies and partners'? This could place a higher emphasis on working with and assisting other groups such as the Milwaukee Riverkeepers. Also, DNR's and USGS's monitoring programs may often experience budget cuts etc., and may welcome the support, even if it does not include any financial elements.

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Exhibit C

Table IV-1

MILWAUKEE COUNTY WORKPLAN: 2012-2016

Workplan Objective	Planned Actions	Status of Planned Actions	Agencies[a]	Priority[b]
Goal 1: Improve Water Quality through the Reduction of Sediment and Nutrient Delivery to Surface Waters in Milwaukee County				
Encourage Public Awareness of Water Quality Problems and Stormwater Issues. Ensure that County Staff is Adequately Trained to Develop Strategies and Implement Technologies to Solve Water Quality Problems	Work with local agencies and organizations to hold educational workshops and conferences designed to train consultants, inspectors, municipalities, developers, and County personnel about technologies and regulatory codes related to stormwater and water quality issues	Ongoing	ES, DPRC, UWEX, DATCP, WDNR, MMSD, SWWT	M
	Respond to walk in, telephone, and e-mail inquiries	Ongoing	ES, DPRC	H
	As requested, give presentations to university classes, public groups, and others on stormwater and water quality issues	Ongoing	ES, DPRC	M
	Cooperate with efforts to develop a watershed restoration plan for the Root River Watershed	Ongoing	EX, DPRC, SWWT, UWEX, SEWRPC	M
Implement NR 216 Stormwater Requirements	Comply with conditions of WPDES NR 216 permit	Ongoing	ES, DPRC, County departments, local governments	H
	Conduct dry weather screening at major outfalls	Ongoing	ES	H
	Maintain stormwater pollution prevention plans (SWPPP) for applicable County facilities	Ongoing	ES, County departments	H
	Inspect for illicit connections in conjunction with SWPPP maintenance activities and other projects	Ongoing	ES, municipalities	H
	Disconnect illicit connections as they are discovered	Ongoing	ES, County departments	H
	Inspect and maintain County owned, operated, and permitted structural stormwater facilities	Ongoing	ES	H
	Update and maintain County storm sewer map	Ongoing	ES	H
	Assess compliance with 40 percent reduction in total suspended solids required for 2013	Ongoing	ES	H
	Work with partners to provide pet litter management supplies and signage in high traffic areas within the park system	Ongoing	ES, DPRC, Friends groups, SWWT	H

Table IV-1 (continued)

Workplan Objective	Planned Actions	Status of Planned Actions	Agencies[a]	Priority[b]
Goal 1: Improve Water Quality through the Reduction of Sediment and Nutrient Delivery to Surface Waters in Milwaukee County (continued)				
Work with Partners to Identify and Implement Measures to Prevent Future Beach Closings Resulting from Bacterial Contamination	Assist researchers working to identify sources of bacterial contamination by providing access to pertinent information on research findings	Ongoing	DTPW, MMSD, UWM GLWI	H
	Continue beach grading and grooming	Ongoing	DPRC	H
	Continue gull and goose abatement activities at selected locations with nuisance populations	Ongoing	DPRC	H
	Complete projects recommended by Lake Michigan storm sewer evaluation conducted as required by the County's WPDES NR 216 permit	Ongoing	ES	H
	Comply with conditions of WPDES NR 216 permit	Ongoing	ES, County departments	H
Conduct and Promote Streambank Stabilization Projects and Projects Employing Best Management Practices (BMPs) to Reduce Erosion	Work with stakeholders to seek funding for streambank stabilization projects	Ongoing	ES, DPRC, MMSD, SWWT	M
	Work with lessees of County lands and State agencies to install filter strips, riparian buffers, and other appropriate BMPs on agricultural parcels	Ongoing	DPRC, ES, DATCP, WDNR, FSA, NRCS	H
	Install riparian buffers as a part of stormwater and streambank related projects	Ongoing	DTPW, DPRC, MMSD, WDNR, SWWT	H
	Complete high priority projects listed in the County Streambank Assessment Report	Ongoing	DTPW, DPRC, SWWT	M
	Work with stakeholders and project partners to increase public awareness of the causes of streambank erosion and the efforts to correct these problems through press releases, web pages, and /or educational displays	Ongoing	DTPW, DPRC, UWEX, DATCP, WDNR, SWWT	M
	Implement recommendations relating to soil erosion and water quality outlined in the updated Milwaukee County Agricultural Lease Policy	Ongoing	DPRC, ES, DATCP, NRCS, FSA	L

Table IV-1 (continued)

Workplan Objective	Planned Actions	Status of Planned Actions	Agencies[a]	Priority[b]
Goal 1: Improve Water Quality through the Reduction of Sediment and Nutrient Delivery to Surface Waters in Milwaukee County (continued)				
Implement the Recommendations Outlined in the County Pond and Lagoon Management Plan	Continue monitoring of County park ponds and lagoons	Ongoing	DPRC, ES	H
	Continue aquatic macrophyte management activities	Ongoing	DPRC	H
	Conduct additional improvement projects recommended in the Pond and Lagoon Management Plan	Ongoing	DPRC, ES	H
	Post multilingual educational signs at the sites of pond and lagoon projects to inform Park visitors about problems at the lagoons and methods for improving water quality	Ongoing	DPRC, ES, UWEX	M
	Initiate consideration of a long-term program to address sediment deposition in County ponds and lagoons	Ongoing	DPRC, ES	H
Comply with the NR 151 Agricultural Performance Standards	Annually monitor agricultural fields to ensure compliance with NR 151 standards and prohibitions	Ongoing	ES	H
	Develop and maintain a database for tracking the status of agricultural fields and operations	Ongoing	ES	H
	Conduct a soil loss survey during the plan period to determine whether the rate of soil loss is under “T,” the tolerable rate of soil loss	Ongoing	ES, TSP	H
	Identify priority farms and operations and notify noncompliant operators	Ongoing	ES, DATCP, NRCS, WDNR	H
	Provide cost-share and technical assistance to priority farm landowners to implement BMPs. Information may be provided through newsletters, brochures, mailings, and one-on-one meetings	Ongoing	ES, DATCP, NRCS, WDNR	H
Minimize Introductions of Chloride into Surface Waters of the County	Use road deicing best practices in order to reduce introductions of chloride into the environment	Ongoing	DTPW, DPRC, County departments, Local governments	H

Table IV-1 (continued)

Workplan Objective	Planned Actions	Status of Planned Actions	Agencies[a]	Priority[b]
Goal 2: Protect, Maintain, and Restore Land and Water Resources in Milwaukee County				
Continue to Manage the Milwaukee County-Owned Natural Areas Using the Latest Advancements in Restoration Ecology	Establish new, and maintain existing, partnerships with local colleges and universities, and community groups	Ongoing	DRPC, Local colleges, Friends groups	H
	Encourage volunteer efforts by holding volunteer workdays in Milwaukee County natural areas	Ongoing	DPRC, Local colleges, Friends groups	H
	Working with partner organizations and volunteers, continue to inventory and monitor the Milwaukee County natural resource base	Ongoing	DPRC, ES, Local colleges, Friends groups	M
	Develop natural resource management policies to guide future management	Ongoing	DPRC, ES	H
	Develop site-specific management plans for DPRC natural areas	Ongoing	DPRC	H
	Analyze the existing publicly-generated hiking trails to determine the most ecologically sustainable trails and stabilize those trails	Ongoing	DPRC	H
	Identify areas in which to minimize mowing adjacent to waterbodies, giving consideration to the control of invasive plants and restoration of native plant communities called for under Goal 5 and accommodating active recreational use of some park lands	Ongoing	DPRC, ES	H
Increase Public Awareness of the Value of Land and Water Resources in Milwaukee County	Develop and update as necessary natural resource management reference material that can be used by partner organizations and private individuals to manage natural resources under their control	Ongoing	DPRC, ES, UWEX, SEWISC, SWWT	M
	Conduct and assist in conducting workshops, lectures, community presentations, and professional publications on Milwaukee County's natural resource management efforts and the value of natural resource management projects to the community	Ongoing	DPRC, ES	M
	Expand partnerships with local universities and colleges to provide training opportunities for natural resource management students	Ongoing	DPRC, ES	H

Table IV-1 (continued)

Workplan Objective	Planned Actions	Status of Planned Actions	Agencies[a]	Priority[b]
Goal 2: Protect, Maintain, and Restore Land and Water Resources in Milwaukee County (continued)				
Increase Public Awareness of the Value of Land and Water Resources in Milwaukee County (continued)	Develop volunteer resources and provide training for volunteers	Ongoing	DPRC, ES, UWEX, SWWT	M
	Post and distribute multilingual informational materials on land and water resource conservation issues and approaches	Ongoing	DPRC, ES, UWEX, SWWT	M
	Respond to walk in, telephone, and e-mail inquiries	Ongoing	ES, DPRC, UWEX, WDNR	H
	Report on activities through written reports, short talks, lectures, press releases, and other activities	Ongoing	ES, DPRC	M
Maintain and Acquire High-Quality Natural Areas in Accordance with the Milwaukee County Parks and Open Space Plan	Maintain partnerships with local conservation groups and municipalities for identification and maintenance of high-quality natural areas that should be protected	Ongoing	DPRC, ES	H
	Work with stakeholders and landowners to acquire natural areas from willing sellers	Ongoing	DPRC, ES, WDNR, SWWT	M
	Seek grant opportunities to for acquiring natural area parcels from willing sellers	Ongoing	DPRC, ES, WDNR	M
Maintain Land in River Corridors for Recreational Use and Access	Maintain and enhance facilities to provide and improve access to river corridors and rivers at appropriate locations	Ongoing	DPRC, DTPW, WDNR	M
	Pursue partnerships on projects to improve access to river corridors and rivers	Ongoing	DPRC, DTPW, WDNR,	M
	Seek grant opportunities for providing and improving access to river corridors and rivers	Ongoing	DPRC, WDNR	M
Goal 3: Enhance Lake Michigan Bluff Protection Initiatives				
Continue to Improve and Maintain Lake Michigan Shoreline Protection Measures and Abate Shoreline Erosion Problems in Milwaukee County Parks	Conduct or partner on bluff stabilization and shoreline protection projects	Ongoing	DPRC, DTPW	H
Maintain Lakefront Land for Recreational Use and Access	Seek partnerships on projects to improve lake access	Ongoing	DPRC, DTPW, WDNR	M
	Enhance facilities to provide and improve access	Ongoing	DPRC, DTPW, WDNR	M

Table IV-1 (continued)

Workplan Objective	Planned Actions	Status of Planned Actions	Agencies[a]	Priority[b]
Goal 4: Maintain the Existing Information Network and Land Information Web Portal				
Ensure that Mapping and the GIS Infrastructure Are Updated on a Regular Basis	Maintain partnerships with local and State governments to share data	Ongoing	MCLIO, SEWRPC, WDNR, Local governments	H
	Update GIS data and layers as new or updated data become available	Ongoing	MCLIO, ES	H
Promote Effective Use of the GIS by County Staff, Natural Resource Professionals, Developers, and Citizens	Conduct GIS training sessions for County staff	Ongoing	MCLIO	M
	Present training related to the County's GIS, available layers, and land information web portal at local workshops and conferences	Ongoing	MCLIO	M
Goal 5: Limit the Introduction and Reduce the Spread of Invasive Species in Milwaukee County				
Provide Information to County Staff and Residents About How to Control Invasive Species	Conduct invasive species training for Milwaukee County employees involved in land and water resource management	Ongoing	DPRC, WDNR, SEWISC	H
	Update DPRC's invasive species management guide as new techniques and knowledge become available	Ongoing	DPRC	M
	Conduct invasive species removal workdays in County parks and natural areas for community volunteers and university students	Ongoing	DPRC, Friends groups, colleges and universities	H
	Post and distribute materials related to invasive species identification and management and respond to direct inquiries and telephone and e-mail inquiries	Ongoing	DPRC, UWEX, WDNR, SEWISC	H
	Work with partners to develop reference and educational materials related to invasive species identification and management	Ongoing	DPRC, UWEX, WDNR, SEWISC	M
Develop a Comprehensive and Coordinated Approach to the Management of Invasive Species in Milwaukee County	Inventory Milwaukee County-managed property for species listed as prohibited or restricted under NR 40	Ongoing	DPRC	H
	Establish a task force from applicable County departments to develop an "umbrella" invasive species management policy to guide County invasive species management activities	Ongoing	DPRC, County departments	H
	Prioritize Milwaukee County-managed properties for the development of site-specific invasive species management plans	Ongoing	DPRC	H

Table IV-1 (continued)

Workplan Objective	Planned Actions	Status of Planned Actions	Agencies[a]	Priority[b]
Goal 5: Limit the Introduction and Reduce the Spread of Invasive Species in Milwaukee County (continued)				
Develop a Comprehensive and Coordinated Approach to the Management of Invasive Species in Milwaukee County (continued)	Develop site-specific invasive species management plans for Milwaukee County-managed properties	Ongoing	DPRC	H
	Update DPRC's invasive species management guide as new techniques and knowledge become available	Ongoing	DPRC	M
Manage Infestations of Invasive Species in Milwaukee County-Managed Properties	Conduct invasive species training for Milwaukee County employees involved in land and water resource management	Ongoing	DPRC, UWEX, WDNR, SEWISC	H
	Restore native plant communities in infested sites	Ongoing	DPRC	H
	Conduct invasive species control efforts in accordance with the DPRC quick reference guide	Ongoing	DPRC, Friends groups	H
	Continue gypsy moth suppression activities in partnership with the WDNR	Ongoing	DPRC, WDNR	H
	Monitor for emerald ash borer and manage ash trees on County lands in accordance with the DPRC Emerald Ash Borer Preparedness Plan	Ongoing	DPRC, WDNR	H

[a]*Agency acronyms used in this table are defined as follows:*

- *DATCP = Wisconsin Department of Agriculture, Trade and Consumer Protection*
- *DPRC = Milwaukee County Department of Parks, Recreation and Culture*
- *DTPW = Milwaukee County Department of Transportation and Public Works*
- *ES = Milwaukee County Environmental Services*
- *FSA = U.S. Department of Agriculture Farm Services Agency*
- *MCLIO = Milwaukee County Land Information Office*
- *MMSD = Milwaukee Metropolitan Sewerage District*
- *NRCS = U.S. Department of Agriculture Natural Resources Conservation Service*
- *SEWISC = Southeast Wisconsin Invasive Species Consortium*
- *SEWRPC = Southeastern Wisconsin Regional Planning Commission*
- *SWWT = Southeastern Wisconsin Watersheds Trust, Inc. (Sweet Water)*
- *TSP = Technical Services Provider*
- *UWEX = University of Wisconsin-Extension*
- *UWM GLWI = University of Wisconsin Great Lakes WATER Institute*
- *WDNR = Wisconsin Department of Natural Resources*

[b]*Priority symbols are defined as follows:*

- *H = High priority for implementation*
- *L = Low priority for implementation*
- *M = Medium priority for implementation*

Source: Milwaukee County Environmental Services; Milwaukee County Department of Parks, Recreation and Culture; and SEWRPC.

Environment

Land and Water Resource Management Planning

Milwaukee County Land and Water Resource Management Plan

In 1997, the State Legislature, through Wisconsin Act 27, amended Chapter 92 of the Wisconsin Statutes, requiring that all counties develop a land and water resource management plan and that they update those plans every five years to remain eligible to receive conservation staff funding and cost-share grant monies. The locally-led planning process is intended to address each individual county's unique natural resources, identify particular problems associated with the resource base, and establish a plan to help protect and restore those resources. In addition, the county plans are intended to focus on State minimum nonpoint source pollution performance standards related to agriculture and urban development. The plan development process is intended to encourage innovative programming and leadership and to build local support. The plans identify natural resources and their current condition and limitations, and set forth a strategy that addresses natural resource issues and problems. They also provide a means to educate the public about these issues and problems and include the public in the steps necessary to protect the natural resource base.

SEWRPC is presently working with Milwaukee County on an update to its land and water resource management plan. The plan is being documented in SEWRPC Community Assistance Planning Report No. 312, *A Land and Water Resource Management Plan for Milwaukee County: 2012-2016*.

Report materials, meeting materials, and comment submittal opportunities relative to this work effort may be accessed on the links provided below:

Preliminary Draft Report:

Chapter I, "Introduction"

Chapter II, "Resource Assessment"

Chapter III, "Related Plans, Regulations, and Programs"

Chapter IV, "Goals, Objectives, and Work Plan"

Chapter V, "Progress Monitoring and Evaluation"

Appendix B, "Objectives, Actions, and Progress Tracking Measures from the 2007-2011 Update of Milwaukee County Land and Water Resource Management Plan"

Appendix C, "Conservation Practices"

Meeting Materials:

November 30, 2010 Agenda

November 10, 2010 Agenda

November 10, 2010 Minutes

October 7, 2010 Agenda

October 7, 2010 Minutes

Links

Community Assistance Planning Report No. 259, 2nd Edition
A Land and Water Resource Management Plan for Racine County: 2008-2012 (2nd Edition) (10/2007, 131pp)

Community Assistance Planning Report No. 255, 2nd Edition
A Land and Water Resource Management Plan for Kenosha County: 2008-2012 (2nd Edition) (10/2007, 127pp)

Comment Opportunity
Use the box below to submit any comments you may have about the Land and Water Resource Management Plan. A record of public comments will be assembled and provided to the Plan Task Force and to the Commission for deliberations in preparing the final plan.

Your Contact Information:

First Name:*	
Last Name:*	
Email Address:*	
Organization	
Mailing Address:	
City:*	
State:*	
Zip:	

* Denotes a required field

You may also submit a comment via the following:

Email:	jboxhorn@sewrpc.org
Fax:	262-547-1103
U.S. Mail:	Southeastern Wisconsin Regional Planning Commission P.O. Box 1607 Waukesha, WI 53187-1607

If you have any questions, please contact:	Michael Hahn SEWRPC Chief Environmental Engineer 262-547-6722, Ext 243

Press the "Submit" button when finished.

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Monday – Friday
8:00 a.m. – 4:30 p.m.

Phone: (262) 547-6721
Fax: (262) 547-1103
E-mail: sewrpc@sewrpc.org

Boxhorn, Joseph E.

From: Hahn, Michael G.
Sent: Thursday, December 09, 2010 4:16 PM
To: Boxhorn, Joseph E.
Subject: FW: [MRBasin] Milwaukee County Updating Land & Water Resource Management Plan
Attachments: ATT00001.txt

From: mrbasin-bounces@lists.uwex.edu [mailto:mrbasin-bounces@lists.uwex.edu] **On Behalf Of** Overholt, Gail
Sent: Thursday, December 09, 2010 3:07 PM
To: CES-Mrbasin
Subject: [MRBasin] Milwaukee County Updating Land & Water Resource Management Plan

Milwaukee County is presently working with Southeastern Wisconsin Regional Planning Commission (SEWRPC) to update its land and water resource management plan.

In 1997, the State Legislature, through Wisconsin Act 27, amended Chapter 92 of the Wisconsin Statutes, requiring that all counties develop a land and water resource management plan and that they update those plans every five years to remain eligible to receive conservation staff funding and cost-share grant monies. The locally-led planning process is intended to address each individual county's unique natural resources, identify particular problems associated with the resource base, and establish a plan to help protect and restore those resources. In addition, the county plans are intended to focus on State minimum nonpoint source pollution performance standards related to agriculture and urban development. The plan development process is intended to encourage innovative programming and leadership and to build local support. The plans identify natural resources and their current condition and limitations, and set forth a strategy that addresses natural resource issues and problems. They also provide a means to educate the public about these issues and problems and include the public in the steps necessary to protect the natural resource base.

Milwaukee County's original plan was developed in 2001 and was updated in 2006 in cooperation with the Department of Agriculture, Trade and Consumer Protection and the Wisconsin Department of Natural Resources. The current update will serve the 2012-2016 period.

You may view draft chapters and related documents of the plan as well as make comments on SEWRPC's website at: http://www.sewrpc.org/SEWRPC/Environment/LandandWaterResourceManagementPlanning.htm

A public meeting is planned for early 2011.

Boxhorn, Joseph E.

From: Hahn, Michael G.
Sent: Thursday, December 09, 2010 4:17 PM
To: Boxhorn, Joseph E.
Subject: FW: [SWWT-WATS] Milwaukee County Updating Land & Water Resource Management Plan
Attachments: ATT00001.txt

From: swwt-wats-bounces@lists.uwex.edu [mailto:swwt-wats-bounces@lists.uwex.edu] **On Behalf Of** Watershed Action Teams
Sent: Thursday, December 09, 2010 3:12 PM
To: swwt-wats@lists.uwex.edu
Subject: [SWWT-WATS] Milwaukee County Updating Land & Water Resource Management Plan

Milwaukee County is presently working with Southeastern Wisconsin Regional Planning Commission (SEWRPC) to update its land and water resource management plan.

In 1997, the State Legislature, through Wisconsin Act 27, amended Chapter 92 of the Wisconsin Statutes, requiring that all counties develop a land and water resource management plan and that they update those plans every five years to remain eligible to receive conservation staff funding and cost-share grant monies. The locally-led planning process is intended to address each individual county's unique natural resources, identify particular problems associated with the resource base, and establish a plan to help protect and restore those resources. In addition, the county plans are intended to focus on State minimum nonpoint source pollution performance standards related to agriculture and urban development. The plan development process is intended to encourage innovative programming and leadership and to build local support. The plans identify natural resources and their current condition and limitations, and set forth a strategy that addresses natural resource issues and problems. They also provide a means to educate the public about these issues and problems and include the public in the steps necessary to protect the natural resource base.

Milwaukee County's original plan was developed in 2001 and was updated in 2006 in cooperation with the Department of Agriculture, Trade and Consumer Protection and the Wisconsin Department of Natural Resources. The current update will serve the 2012-2016 period.

You may view draft chapters and related documents of the plan as well as make comments on SEWRPC's website at: http://www.sewrpc.org/SEWRPC/Environment/LandandWaterResourceManagementPlanning.htm

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Appendix B

OBJECTIVES, ACTIONS, AND PROGRESS TRACKING MEASURES FROM THE 2007-2011 UPDATE OF MILWAUKEE COUNTY LAND AND WATER RESOURCE MANAGEMENT PLAN

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Table B-1

OBJECTIVES, ACTIONS, AND PROGRESS TRACKING RELATED TO GOAL 1: IMPROVE WATER QUALITY THROUGH THE REDUCTION OF SEDIMENT AND NUTRIENT DELIVERY TO SURFACE WATERS WITHIN MILWAUKEE COUNTY

Objective	Action	Progress Tracking
Encourage public awareness of water quality problems and stormwater issues. Ensure that County staff is adequately trained to develop strategies to implement technologies to solve water quality problems	Continue to work with local agencies and organizations to hold educational workshops and conferences designed to train consultants, inspectors, municipalities, developers, and County personnel about the latest technologies and regulatory codes relating to stormwater and water quality issues	Assist in hosting at least one workshop per year regarding stormwater or water quality issues
Implement NR 216 stormwater requirements	Implement NR 216 stormwater requirements. As part of the Milwaukee County Stormwater Process, monitor chlorides entering surface waters within the County from roadways treated with deicing salts	Compliance with NR 216 permit once issued[a]
		Conduct chloride study (per DNR approval)
		Obtain NR 216 stormwater permit or work through local municipalities to achieve similar objectives
Work with the Southeastern Wisconsin Beach Task Force (SWBTF) to identify and implement measures to prevent future beach closings resulting from bacterial contamination	Assist researchers working to identify sources of bacterial pollution by providing access to pertinent information on research findings (i.e. findings from the storm sewer study). Continue current actions such as beach grading and grooming. Complete storm sewer evaluation at Bradford Beach. Implement recommendations of storm sewer evaluation as agreed upon by Milwaukee County and WDNR	Continue to work with SWBTF to solve issues relating to beach closings and bacterial contamination
		Compliance with WPDES NR 216 permit
		Completion of project recommended by storm sewer evaluation
Implement recommendations relating to soil erosion and water quality in the Milwaukee County Parks Agricultural Lands Resource & Lease Value Analysis	Reinstate the 75-foot buffer requirement along waterways on all leased lands. Work with lessees and State agencies to install buffers and filter strips. Enroll farmed wetlands in CRP (or similar programs)	Reinstate the 75-foot buffer requirement
		Install filter strips and/or buffers in five agricultural parcels
		Enroll parcels used for marsh hay in CRP
Continue to conduct and promote streambank stabilization projects, as well as projects employing Best Management Practices (such as vegetative buffers) to reduce erosion and improve water quality. Projects will be based on the Streambank Assessment Report	Encourage the use of buffers or other BMPs in all stormwater or streambank-related projects. Work with stakeholders to seek funding and complete high-priority projects listed in the Streambank Assessment Report. As projects are completed, work with stakeholders and project partners to increase public awareness about the causes leading to streambank erosion and the efforts made to correct the problems through press releases, web pages, and/or educational displays	Install 10 buffers as part of stormwater or streambank-related projects
		Complete three high-priority projects listed in the Streambank Assessment Report by 2011
		Issue three news releases associated with the projects

Table B-1 (continued)

Objective	Action	Progress Tracking
Implement the recommendations outlined in the Pond and Lagoon Management Plan	Conduct the three pilot studies recommended by the Pond and Lagoon Management Plan. Use the results of the studies to identify the techniques that are most successful and cost-effective, and in what situation they are most effective. Rank waterbodies within the Park System based on water quality and potential for improvement. Post educational signs at the pilot study areas to inform Park visitors about the problems at the Lagoons and the methods for improving water quality	Conduct the three pilot studies
		Post educational signs at each of the study sites
		Rank the waterbodies within the Park System
Comply with the NR 151 Agricultural Performance Standards	Continue to monitor agricultural fields and operations (including the Milwaukee County Zoo) for compliance with the NR 151 performance standards and prohibitions. Develop a database for tracking the status and monitoring of agricultural operations. Notify owners of noncompliant operations/fields. Promote the use of BMPs and conservation initiatives through cost share programs and technical assistance to address problems and bring operations/fields into compliance. Complete transect survey to identify noncompliant farms	Annually monitor agricultural fields to ensure compliance of the standards and prohibitions in Milwaukee County
		Develop a database for monitoring of fields/operations
		Conduct a soil loss survey to determine “T” once every planning period
		Identify Priority Farms/Operations and notify noncompliant operators
		Provide cost-share and technical assistance to Priority Farm landowners to implement BMPs. Information may be provided via newsletters, brochures, and other mailings as well as one-on-one meetings

[a]*The County NR 216 stormwater discharge permit was issued in December 2006.*

Source: Cedarburg Science and Milwaukee County.

Table B-2

OBJECTIVES, ACTIONS, AND PROGRESS TRACKING RELATED TO GOAL 2: PROTECT, RESTORE, AND ENHANCE WETLANDS, GRASSLANDS, WOODLANDS, ENVIRONMENTAL CORRIDORS, QUALITY FARMLAND, AND NATURAL AREAS, INCLUDING THOSE LOCATED WITHIN MILWAUKEE COUNTY-OWNED PARKS AND OPEN SPACES

Objective	Action	Progress Tracking
Continue to pursue opportunities to protect, enhance, and/or restore wetlands, grasslands, and woodlands and/or woody wildlife cover. Maintain woodlands, grasslands, and prairies within the County using recognized management techniques	Establish partnerships as applicable through Wetlands Reserve Program (WRP), watershed programs, Conservation Reserve Program, and DNR USFWS Wetland Restoration Initiative. Effectively utilize efforts by the Trails and Natural Areas Crew (TNAC) and volunteer groups to manage and maintain Park lands	Restart the native plant nursery
		Bring invasive species levels to low maintenance levels in five areas within the County Parks System
		Establish new and maintain existing public/private partnerships
Increase public awareness of the value of wetlands, grasslands, and woodlands by promoting educational programs in Milwaukee County Parks and by encouraging volunteer groups to assist with the management of native habitats	Encourage natural areas management by volunteer groups by organizing volunteer workdays at Milwaukee County Parks. Use these opportunities to educate volunteers and local citizens about the features and importance of natural habitats and their stressors through short presentations, educational materials and displays, and press releases	Encourage volunteer efforts by holding 10 volunteer workdays in Milwaukee County Natural Areas per year
		Issue a press release related to the workdays
		Educate volunteers about why their efforts are important through short talks, handouts, etc.
Identify and acquire high-quality natural areas in accordance with the Milwaukee County Parks and Open Space Plan	Work with local conservation groups (Milwaukee Area Land Conservancy, Green Seems) and municipalities to identify high-quality natural areas that should be protected. Work with stakeholders to develop a plan, follow up with landowners, and administer County policy to secure natural areas from willing sellers	Work with stakeholders to create a high-priority acquisition list in the Parks & Open Space Plan
		Work with stakeholders to acquire high-priority parcels

Source: Cedarburg Science and Milwaukee County.

Table B-3

OBJECTIVES, ACTIONS, AND PROGRESS TRACKING RELATED TO GOAL 3: ENHANCE LAKE MICHIGAN BLUFF PROTECTION INITIATIVES

Objective	Action	Progress Tracking
Continue to improve and maintain Lake Michigan shoreline protection measures in Milwaukee County Parks, and abate shoreline erosion problems	Toe protection; bluff slope regrading, surface water runoff control, berms, groundwater drainage, bulkhead and groin system development; maintenance	Conduct or partner on one bluff stabilization or shoreline protection project
Maintain lakefront land for recreational use and access	Enhance facilities to provide and improve access	Seek partnerships on projects that enhance lake access

Source: Cedarburg Science and Milwaukee County.

Table B-4

OBJECTIVES, ACTIONS, AND PROGRESS TRACKING RELATED TO GOAL 4: EFFECTIVELY USE AND MAINTAIN THE EXISTING INFORMATION MANAGEMENT NETWORK AND ESTABLISH A LAND INFORMATION WEB PORTAL TO DISTRIBUTE GEOGRAPHIC INFORMATION

Objective	Action	Progress Tracking
Ensure that mapping and the GIS infrastructure are updated on a regular basis	Enable a taskforce from various County Departments, assisted by GIS specialists, to create a priority list of data that needs updating and a timetable for updating infrastructure and data. Many of the existing data layers are similar to ones that local and State government use. The taskforce should also coordinate and share data with these entities to ensure that efforts are not duplicated	Create a priority list for updating GIS data
		Create a timetable for updating GIS data and infrastructure
Promote effective use of GIS by County staff, natural resource professionals, developers, and citizens	Continue to provide training for County staff, enabling them to effectively use the GIS. Participate in local workshops or conferences to educate the public about the GIS, once it is available on the Internet	Conduct GIS training sessions for County staff
		Present a talk relating to the County's GIS and available layers at two local workshops or conferences
Distribute GIS data within County Departments and make available to the general public	Create a Land Information Web portal that could make the data available via the Internet	Make GIS data available to the public via the Internet early in the planning period

Source: Cedarburg Science and Milwaukee County.

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Appendix C

CONSERVATION PRACTICES

This table lists the current technical standards and potential sources of cost-share funding for the conservation practices likely to be utilized in Milwaukee County to meet the agricultural nonpoint pollution performance standards.

Conservation Practice	Practice Code[a]	Potential Funding Source[b]	Standard
Access Road	560	SWRM, EQIP, WHIP	ATCP 50.65
Animal Trails and Walkways	575	SWRM, EQIP	ATCP 50.66
Barnyard Runoff Control Systems	Various	SWRM, EQIP	ATCP 50.64
Contour Farming	330	EQIP	ATCP 50.67
Critical Area Stabilization	342	SWRM, EQIP	ATCP 50.69
Diversion	362	SWRM, EQIP	ATCP 50.70
Field Windbreak	612	EQIP, WHIP	ATCP 50.71
Filter Strips	393	SWRM, EQIP, WHIP, CRP	ATCP 50.72
Grade Stabilization Structure	468	SWRM, EQIP	ATCP 50.73
Heavy Use Area Protection	561	SWRM, EQIP	ATCP 50.74
Livestock Fencing	382	SWRM, EQIP, WHIP	ATCP 50.75
Livestock Watering Facilities	614	SWRM, EQIP	ATCP 50.76
Manure Storage System	313	SWRM, EQIP, TRM	ATCP 50.62
Manure Storage System Closure	360	SWRM	ATCP 50.63
Milking Center Waste Control Systems	Various	SWRM, EQIP	ATCP 50.77
Nutrient Management	590	EQIP	ATCP 50.78
Pesticide Management	595	EQIP	ATCP 50.79
Prescribed Grazing	Various	EQIP	ATCP 50.80
Riparian Buffer	391	SWRM, EQIP, CRP	ATCP 50.83
Roof Runoff System	558	SWRM, EQIP	ATCP 50.85
Roofs	Various	SWRM	ATCP 50.84
Sediment Basin	350	SWRM, EQIP	ATCP 50.86
Sinkhole Treatment	725	SWRM	ATCP 50.87
Streambank and Shoreline Protection	580	SWRM, EQIP, WHIP, TRM	ATCP 50.88
Subsurface Drain	606	SWRM, EQIP	ATCP 50.90
Terrace System	600	SWRM	ATCP 50.91
Underground Outlet	620	EQIP	ATCP 50.92
Wastewater Treatment Strip	635	SWRM, EQIP, TRM	ATCP 50.94
Water and Sediment Control Basin	638	SWRM, EQIP, TRM	ATCP 50.95
Waterways Systems	412	SWRM, EQIP, CRP	ATCP 50.96
Well Decommissioning	351	SWRM, EQIP	ATCP 50.97
Wetland Development or Restoration	657	SWRM, EQIP, WRP, CRP, TRM	ATCP 50.98

Footnotes to Appendix C

[a]*Practice codes refer to NRCS field office technical guides available at* http://efotg.nrcs.usda.gov/

[b]*Potential funding sources:*

CRP	=	*Conservation Reserve Program*
EQIP	=	*Environmental Quality Incentives Program*
SWRM	=	*Soil and Water Management Program*
TRM	=	*Targeted Runoff Management Program*
WHIP	=	*Wildlife Habitat Incentives Program*
WRP	=	*Conservation Reserve Program*

Source: SEWRPC.