Chicago Metropolitan Agency for Planning

CMAP




Water Quality Activities Report

July 2008 - December 2009

Highlights for 2008-2009

- Analyzed existing wastewater infrastructure capacity and developed a method to project the cost to the region of collecting and treating wastewater under various growth and technology scenarios for CMAP's comprehensive plan, called GO TO 2040.
- Completed a Section 319-funded watershed based plan for the Jackson Creek watershed in east-central Will County.
- Reviewed Illinois Water Quality Management Plan amendment requests which include Facility Planning Area boundary changes, wastewater land treatment areas, construction of new treatment plants and treatment plant expansions.
- Continued to provide outreach to local government officials, staff, and the public in implementing projects designed to reduce nonpoint source (NPS) pollution to the region's rivers, streams, lakes and wetlands.
- Developed draft recommendations as part of the Water Supply Plan for Illinois EPA as the responsible party for administering Clean and Drinking Water State Revolving Funds.
- Coordinated the Illinois Volunteer Lake Monitoring Program for Lakes in northeastern Illinois involving more than 120 volunteers.

For more information on topics discussed in this report, please call CMAP (312.454.0400). The individuals who worked on these projects are:

Hala Ahmed, *AICP, Associate Planner*: water supply planning, watershed planning, model water conservation ordinance.

David Clark, *Senior GIS Analyst:* population projection reviews, Facility Planning Area (FPA) map design and production.

Jesse Elam, AICP, *Senior Planner:* watershed planning, water supply, geographic information systems, open space planning, biodiversity protection.

Megan Elberts, E.I., *Water Resources Engineer*: water-supply planning, nonpoint source pollution control project, Facility Planning Area program.

Holly Hudson, *Senior Aquatic Biologist:* lake and watershed monitoring and management, volunteer lake monitoring, nonpoint source pollution control project management.

Timothy Loftus, Ph.D., *Principal, Water Resources*: watershed planning, water-supply planning, environment and natural resources.

Margaret Schneemann, *Water Resource Economist***:** water supply planning.

Amy Talbot, LEED® AP, *Associate Planner*: regional water supply planning, model water conservation ordinance, sustainable local food policy, conservation design, ecosystem restoration, Lake Michigan Academy.

Dawn Thompson, *Associate Planner:* Facility Planning Area program, geographic information systems, FPA map design and production, nonpoint source pollution control project management, Project Review Program.

This report was prepared in January 2010 using federal Water Pollution Control Act Section 604(b) funds from the Illinois Environmental Protection Agency. The findings and recommendations contained herein are not necessarily those of the funding agency.

Cover photos (from left): Dixie Briggs Fromm Project site in Kane County, gabion baskets at the Village of Wheeling, a muskrat at the Village of Streamwood's Project site pre-implementation (photos by H. Hudson and Megan Elberts, CMAP); arrowhead at Countryside Lake in Lake County (photos by H. Hudson).

Water-Based Planning

The Illinois Water Quality Management Plan (WQMP) identifies the state's goals and objectives pertaining to water quality protection. The Areawide Water Quality Management Plan (AWQMP) does something similar for the northeastern Illinois region and the AWQMP is part of the WQMP.

Northeastern Illinois as elsewhere has embraced watershed planning as the primary means of addressing nonpoint source pollution (Figure 1). Successful watershed plans engage local stakeholders, identify practical solutions to a variety of water resource issues, and ultimately solve water quality problems when funding is found to implement plan recommendations. In order to be eligible for Clean Water Act Section 319 funding to help support development of watershed plans, these plans must include certain information as required by the United States Environmental Protection Agency (U.S. EPA). Such U.S. EPA-compliant watershed plans address nine required components to ensure that implementation projects are targeted, well thought out, and effective in restoring waters that are impaired by nonpoint source pollution.

As an outcome of the planning processes that produced the three Kishwaukee River Basin plans discussed below, CMAP will encourage participants in new plan-development processes to address additional criteria in order to become more comprehensive in their treatment of water resources. The new criteria include: 1) developing a vision of watershed land use to enable estimation of both current and future pollutant loads, 2) setting target pollutant-load reductions for impaired waters (rather than just quantifying expected load reductions associated with implementation of plan recommendations (i.e. BMPs) as federally required, 3) comparison of municipal ordinances and/or subdivision codes with water quality driven standards as identified in the U.S. EPA Water Quality Scorecard or developed by the Center for Watershed Protection, and 4) more explicit consideration of groundwater protection (e.g. adoption of a water-use conservation ordinance that emulates a model ordinance; development of a wellhead protection program, etc.).

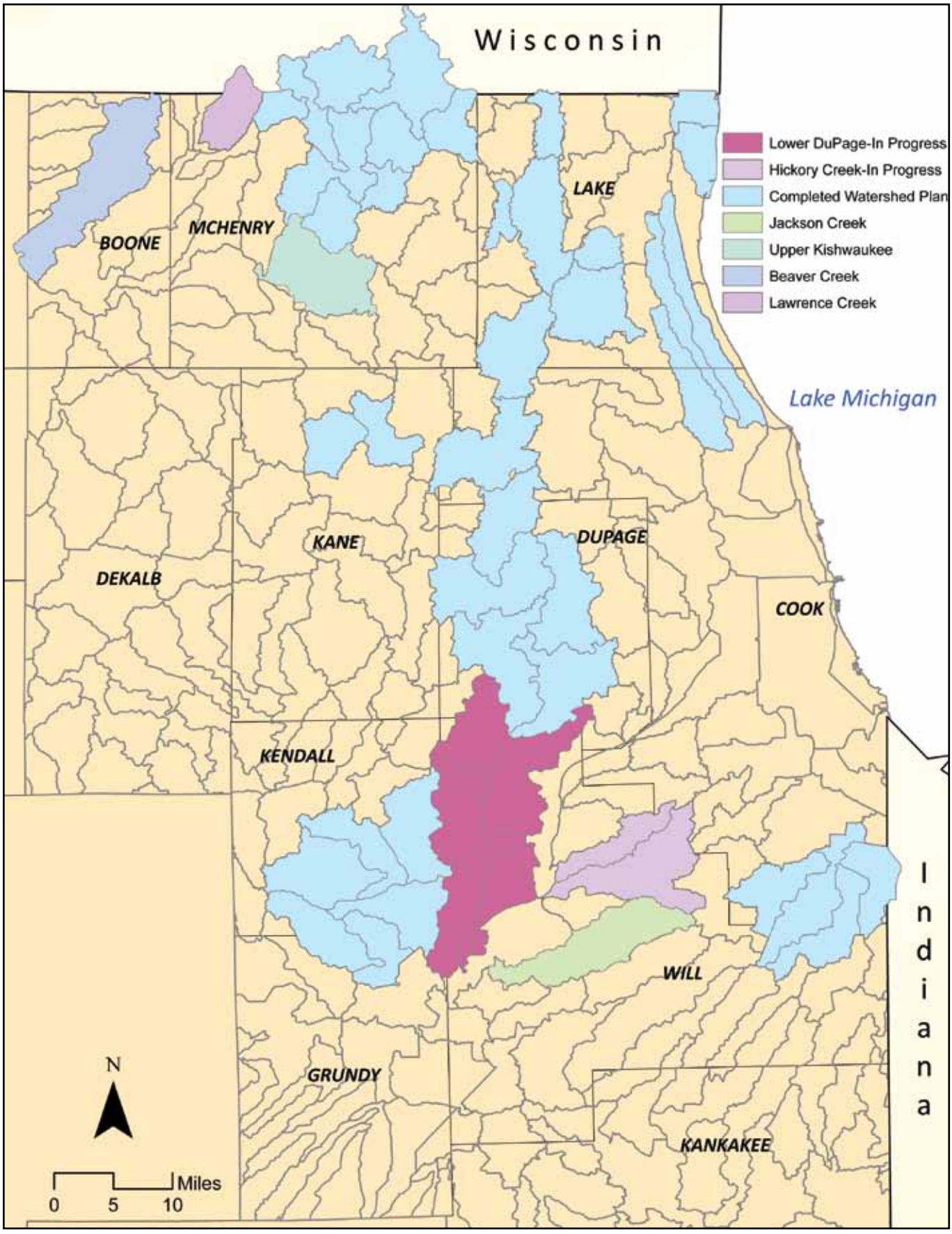
Kishwaukee River Basin

CMAP and collaborating members of the Kishwaukee River Ecosystem Partnership developed watershed plans for Beaver Creek (Boone County), the Upper Kishwaukee River (McHenry County), and Lawrence Creek (McHenry County), all subwatersheds of the Kishwaukee River Basin (Figure 1). These three watershed-based plans addressed new criteria, described above, and recommended by the Basin Management Advisory Group. These plans achieved widespread endorsement by the municipal and county governments involved. As a result, the three watershed plans were the first to be added to the WQMP. Inclusion of these plans will require NPDES permit or loan applications to be reviewed for consistency with these plans in addition to other elements of the WQMP.
It is now the intent of the IEPA Watershed Management Section to continue to incorporate watershed plans that combine point-and nonpoint-source planning and that have been adopted by affected parties into the WQMP going forward.

Jackson Creek

A Section 319-funded watershed-based plan was completed for the Jackson Creek Watershed in east-central Will County in April 2009. The 42 miles of stream in the hydrologic unit code (HUC) 0712000409 drain 52.6 square miles of land, most of which is in row crops, into the Des Plaines River. CMAP acted as watershed coordinator, while the Will County Stormwater Management and Planning Committee was the project sponsor. The plan complied with the nine minimum elements prescribed by U.S. EPA.

Figure 1: U.S. EPA-compliant watershed plans completed or in progress by CMAP in FY 2009



**Note: Wisconsin watershed boundaries are not included as part of this map.*

Wastewater Quality Planning and Management Activity

Under contract with Illinois EPA to implement the Northeastern Illinois Water Quality Management Plan, CMAP reviewed requested amendments to wastewater Facility Planning Areas (FPA). A summary of this fiscal year's review actions involving FPA boundary changes and new or expanded treatment facilities is represented in Table 1 and Table 2. A total of 18 requests were reviewed during this 1-year period. CMAP's Wastewater Committee recommended support for approximately 6315.70 acres of land transfer from a non-FPA to FPA or from one FPA to another FPA, one land treatment system, eight plant expansions, and considered one new wastewater treatment plant.

Table 1: Level I Water Quality Amendments

WQ Review Number	Applicant	Type of Request	Acreage Requested	CMAP Recommendation	Acreage CMAP Supported	IEPA Decision	Acreage IEPA Approved
08-WQ-015	City of Marengo	FPA Boundary Change-1,996 acres	1,996.00	Support	N/A	Approved	N/A
08-WQ-037	City of Sandwich	FPA Boundary Change-563 acres	563.00	Pending	N/A	Pending	N/A
08-WQ-048	Village of Pingree Grove	FPA Boundary Change-175 acres	175.00	Support	175.00	Pending	N/A
08-WQ-072	Village of Beecher	FPA Boundary Change - 160 acres	160.00	Support	160.00	Approved	160
08-WQ-081	City of Woodstock	FPA Boundary Change - 3874 acres	3,874.00	Support	N/A	Pending	N/A
08-WQ-081	City of Woodstock	WWTP Plant Expansion from 1.75 to 3.5 mgd	N/A	Support	N/A	Deferred	N/A
TOTAL			**6768.00**		**6205.00**		**2156**

Table 2: Level II Water Quality Amendments

WQ Review Number	Applicant	Type of Request	Acreage Requested	CMAP Recommendation	Acreage CMAP Supported	IEPA Decision	Acreage IEPA Approved
08-WQ-001	Village of Itasca	Relocate existing WWTP & increase capacity - 2.6 mgd to 3.2 mgd	N/A	Support	N/A	Deferred	N/A
08-WQ-002	Forest Preserve Dist. of Cook County	New Wastewater Land Treatment System	N/A	Support	N/A	Deferred	N/A
08-WQ-053	Newark Sanitary District	WWTP Expansion-0.110 to 0.250mgd	N/A	Support	N/A	Deferred	N/A
08-WQ-083	Fox Metro Water Reclamation Dist.	FPA Boundary Change-22 acres	22.00	Support	22.00	Pending	N/A
08-WQ-097	Village of Hoffman Estates	FPA Boundary Change-35.7 acres	35.70	Support	35.70	Approved	35.70
08-WQ-103	Lindenhurst Sanitary District	WWTP Expansion-2.0mgd to 2.25mgd	N/A	Support	N/A	Deferred	N/A
08-WQ-109	Mill Creek Reclamation Facility	Plant Expansion-1.0mgd to 2.1 mgd	N/A	Support	N/A	Deferred	N/A
08-WQ-110	York-Bristol Sanitary District	Plant Expansion-from 3.62 mgd to 7.8 mgd.	N/A	Support	N/A	Deferred	N/A
09-WQ-002	Illinois American Water Company	Plant Expansion from 0.70 mgd to 1.27 mgd	N/A	Support	N/A	Deferred	N/A
09-WQ-005	Grand Prairie Sanitary District	New Wastewater Treatment Plant	N/A	No Action Taken	N/A	Pending	N/A
09-WQ-041	Thorn Creek Basin Sanitary District	FPA Boundary Change-30 acres	30.00	Support	30.00	Pending	N/A
09-WQ-108	Aqua Illinois	WWTP Expansion from 2.17 mgd to 2.43 mgd	N/A	Support	N/A	Deferred	N/A
09-WQ-112	Mill Creek Water Reclamation District	FPA Amendment Change-23 acres	23.00	Support	23.00	Pending	N/A
TOTAL			**110.7**		**110.7**		**N/A**

American Recovery and Reinvestment Act of 2009

The American Recovery and Reinvestment Act of 2009 provided additional funding for Illinois EPA's State Revolving Fund (SRF) Loan Program as well as its Drinking Water State Revolving Fund Program. The SRF Loan Program funds many of the requests for wastewater treatment plant improvements and expansions considered by the Wastewater Committee. CMAP reviewed a total of 98 requests for SRF Loans during this 1-year period.

Under the existing SRF loan program, an applicant pays 3 or 4% interest on a wastewater improvement loan. Loans funded through the American Recovery and Reinvestment Act of 2009 however are funded with a zero percent interest rate. Approximately 20% of the SFR funds will be used for green infrastructure projects, water and energy efficiency improvements, and environmentally innovative activities.

Facility Planning Area Map Updates

Under a contract with Illinois EPA, CMAP prepares Facility Planning Area base maps and point source tabular accounts for amendments to the Illinois Water Quality Management Plan.

During the program year of 2009, CMAP completed revisions to the Facility Planning Area (FPA) maps that incorporated all of the recent FPA boundary amendments. In addition to FPA boundaries, these new maps also include the location of municipal NPDES permit discharges as well as tabular descriptions of each municipal discharge. These new maps will provide more information to municipal units of government, planners, engineers, and the general public. New maps are available for download at http://www.data.cmap.illinois.gov/fpa/main.aspx .

Wastewater Committee

As required by Senate Bill 1201, terms of the Chairmanship of the Wastewater Committee rotated between the Illinois Association of Wastewater Agencies and the Metropolitan Water Reclamation District of Greater Chicago.

The new CMAP Wastewater Committee consists of the following members:

- Commissioner Debra Shore, Chairwoman, Metropolitan Water Reclamation District of Greater Chicago
- Mr. Wally Van Buren, Illinois Association of Wastewater Agencies
- Mr. Frank Beal, CMAP Board
- Hon. Roger Claar, CMAP Board
- Hon. Richard Reinbold, CMAP Board

Wastewater Infrastructure Capacity and Costs

CMAP is developing a comprehensive plan, called GO TO 2040, to guide growth and infrastructure investment for the region. The plan, due to be completed in 2010, will make recommendations for policies and investments needed for northeastern Illinois to reach its potential. For the plan to be viable, it is critical that the benefits and costs of these recommendations be understood. To do so, CMAP analyzed existing wastewater infrastructure capacity and developed a method to project the cost to the region of collecting and treating wastewater under various growth and technology scenarios. An early version of the method was reviewed at a meeting on May 6, 2009 and is available at http://www.goto2040.org/panel.aspx. Although it is not complete, further analysis has suggested that the costs of providing and maintaining local roads, wastewater service, public water supply, and stormwater infrastructure generally decrease as development becomes more compact.

Nonpoint Source Pollution Control Projects – Section 319, Clean Water Act

The Illinois EPA receives federal funds through Section 319(h) of the Clean Water Act to help implement Illinois' Nonpoint Source (NPS) Management Program (Program). The purpose of the Program is to work cooperatively with local units of government and other organizations toward the goal of protecting the quality of Illinois' waters by controlling NPS pollution. The Program supports several types of activities including implementation of cost-effective corrective and preventive best management practices (BMPs) on a watershed scale; implementation of demonstrative new and innovate BMPs on a non-watershed scale; NPS pollution control information, education and outreach programs; NPS pollution control research and monitoring projects; and development of watershed-based plans.

For more than eleven years, CMAP and its predecessor the Northeastern Illinois Planning Commission have assisted numerous local municipalities, agencies, and organizations in implementing projects designed to reduce NPS pollution to the region's rivers, streams, lakes and wetlands. This assistance has typically included grant application development as well as project coordination, administration, and technical review of design plans, BMP installations, and education and outreach products. During the past year, CMAP has provided assistance to eight project participants (Figure 2).

Fox and Des Plaines River Watershed Projects

Figure 2: CMAP Assisted 319 Projects Active in FY 2009

U.S. EPA's Section 319 FY06 Funding Cycle Projects Assisted by CMAP

Four projects were funded under U.S. EPA's FY06 Section 319 grant cycle. As part of this cycle, CMAP is providing financial, administrative, and technical assistance to Kane County, the Geneva Park District, the Village of Wheeling, and the City of Aurora along with other project participants during design and implementation of the various BMPs for nonpoint source pollution control. Completion dates for the four projects were extended until July 2010. The total budget for the projects is $3,350,254 of which $2,000,000 is federal and $1,350,254 local sponsor funded. Project highlights are provided below.

Kane County continues to work with Dundee Township to implement the **Dixie Briggs Fromm Steam Corridor Restoration** project, located within the 151-acre Dixie Briggs Fromm (DBF) Open Space and Nature Preserve in Dundee Township in northeastern Kane County. The project stabilized 2,929 feet of eroding streambanks. Over the past year, stream stabilization practices were monitored and maintained, additional native plantings were conducted, educational signage developed, an Operations and Maintenance Plan and a final report completed, and a webpage developed on the County's webpage highlighting the project. The webpage may be found at http://www.co.kane.il.us/kcstorm/dixie-Briggs/index.asp.

The Geneva Park District is conducting the final phase of a half mile long restoration/ stabilization project on **White's Creek**. This project stabilized the stream channel and banks and restored natural stream functions along approximately 1,350 linear feet of the creek through the District's Esping Park. During the past year, a final Operations and Maintenance Plan was completed, educational signage installed along a walking path near the creek and stream stabilization practices were monitored and maintained.

The City of Aurora is undertaking work in several interrelated efforts to implement its **Green Infrastructure Implementation Project** within the City's riverfront tax increment financing districts, brownfield sites, and planned sewer decombination areas in order to provide more effective treatment of urban runoff before it enters the Fox River. The project includes the following components:

- construction of a stormwater wetland complex within the River's Edge Park to treat numerous pollutants typical of urban runoff;
- development of a naturalized stormwater management corridor plan (NSMCP) to extend naturalized stormwater conveyance and treatment elements throughout the Study Area and to serve as a tool for parcel prioritization for BMP implementation;
- construction of a pilot bio-filtration BMP feature within a Study Area neighborhood in one of the parcels identified in the NSMCP;
- incorporation of BMPs into pending sewer decombination projects, consistent with the NSMCP;
- development and distribution of a stormwater management toolkit to educate local government agencies, developers, contractors, and land owners about nonpoint source pollution, water quality protection, and stormwater BMP design; and
- development and implementation of several public education and outreach strategies in support of all project components.

During the past year, the naturalized storm water corridor plan and education work strategy were finalized, and a stormwater management toolkit was developed. Design plans and specifications were also prepared for the River's Edge Park BMPs, and the Lincoln Avenue (Figure 3) and Spring St. (Figure 4) decombination project, bio-filtration facility, and decombination BMPs. CMAP submitted a request to Illinois EPA for a one-year project extension to accommodate construction, public education and outreach and storm water management toolkit distribution activities.

Figure 3: Bio-filtration Facility Lincoln Avenue

The City is designing the bio-filtration system to receive and treat urban runoff that would have previously gone through the stormwater sewers directly into the Fox River. The facility will specifically treat urban runoff from a commuter parking lot (photos by H. Hudson and M. Elberts, CMAP).

The Village of Wheeling implemented the **Buffalo Creek Streambank Stabilization Project**. A tributary to the Des Plaines River, Buffalo Creek drains approximately 26.82 square miles in south central Lake County and north central Cook County, Illinois. The most severely impacted reaches were located in the northern third of the program area and were the target of this Phase 1 stabilization project. Approximately 6,260 linear feet of stream channel were addressed, utilizing both structural and bio-technical techniques to stabilize and enhance the riparian corridor, reduce loss of real estate, and improve water quality and aquatic habitat in Buffalo Creek.

During the past year slope stabilization construction was completed, planting plugs were installed along the project reach, erosion control and sedimentation control measures were constructed and on-going photo documentation continued (Figure 5).

Figure 4: Decombination BMPs-Spring Street

Decombination BMPs shall be designed to receive and treat urban runoff before it enters the Fox River. The project utilizes the right of way between the sidewalk and Spring Street (photos by H. Hudson and M. Elberts, CMAP).

Figure 5: Buffalo Creek Streambank Stabilization Project Site

The Village's project includes the structural and biotechnical stabilization of 6,260 feet of severely eroded streambank. The design included the use of gabion baskets to stabilize eroded streambanks (photo by H. Hudson and M. Elberts, CMAP).

U.S. EPA's Section 319 FY08 Funding Cycle Projects Assisted by CMAP

Four projects were funded under U.S. EPA's FY08 Section 319 grant cycle. As part of this cycle, CMAP is providing financial, administrative, and technical assistance to the Village of Streamwood, Dundee Township, the Village of West Dundee, and the St. Charles Park District, along with other project participants during design and implementation of the various best management practices (BMPs) for nonpoint source pollution control. The total budget for the projects is $2,302,677 of which $1,247,622 is federal and $1,055,055 local sponsor funded. Project highlights are provided below.

The **Village of Streamwood South Branch Popular Creek Implementation Project** is undertaking work stabilizing approximately 2,160 feet of eroding streambank along a 1,080 foot segment of the South Branch of Poplar Creek located between the Streamwood Oaks Golf Course and Whispering Drive in Streamwood, Cook County, Illinois (Figure 6). During the past year, final design plans were completed and all permit applications were submitted to respective agencies.

Dundee Township is working to implement the **Jelkes Creek Reclamation Project**. Implementation includes conducting reclamation and restoration of a 160-acre site on Jelkes Creek, a tributary of the Fox River, located southwest of the Village of Sleepy Hollow in northern Kane County, Illinois (Figure 7). The work consists of the following activities:

- reconfiguration of the site by re-grading to reduce slopes and facilitate construction of the BMPs described in the points below, respreading of the topsoil berms, and installation of native plant materials in the respread topsoil zones;
- construction of eight biofiltration swales totaling 3,250 linear feet to treat and infiltrate runoff from the site;
- conversion of two existing basins into wetland filtration basins and one existing into a detention retrofit basin with shoreline stabilization and native plantings to improve pollutant removal before discharging stormwater;
- construction of five stormwater detention basins to improve water quality, remove suspended and soluble nonpoint source pollutants, enhance habitat and aesthetics, and improve water retention and other beneficial hydrologic functions; and development of an educational brochure and a series of educational signs to be installed at the project site.

During the past year, final design plans were completed and all permit applications were submitted to respective agencies, construction commenced, soil and sediment control measures were installed, plus signage was installed. The Township also held an official Ground Breaking ceremony. Conceptual information about the project can be found at http://www.dundeetownship.org/index.php?m=31&PHPSESSID=fcae8a217af533c4dae95fda17c9b277.

Figure 6: Village of Streamwood South Branch Popular Creek Implementation Project Site

This project was identified in the Poplar Creek Watershed Action Plan as a high priority project. This is the first phase of a planned multiyear project to stabilize the banks along the South Branch of Poplar Creek (photo by H. Hudson, CMAP).

Figure 7: Jelkes Creek Reclamation Project Restoration Site

Water quality impacts on Jelkes Creek include siltation/sedimentation, nutrient enrichment, and habitat degradation (photos by H. Hudson and M. Elberts, CMAP).

The Village of West Dundee is constructing two bioretention facilities near the Fox River in northeastern Kane County, Illinois (Figure 8). One facility shall be approximately 1,000 square feet in size and located at the end of Oregon Street. The other facility was originally proposed to be located at the end of Fay Avenue but was later changed to South End Park. Educational signage also will be developed and installed at each project site. During the past year, an alternate location, South End Park, was selected in place of the Fay Avenue site. The new site will allow greater access and visibility by the Public and for maintenance purposes. Trench excavation testing was also completed to determine soil characteristics.

The **St. Charles Park District** is implementing streambank and streambed stabilization of a 1,700 foot segment of Norris Woods Creek, a tributary of the Fox River, located in the Norris Woods Nature Preserve (Figure 9). The **Norris Woods** project will include reconfiguration of accumulated sediment in an on-line pond to facilitate installation of wetland plant species to slow and filter streamflow; reconfiguration of a basin located in the lower third of the project site into a vegetated swale to collect and filter runoff before discharging to the creek; and development and installation of two interpretive signs to be installed at the project site.

Over the past year, design plans were completed and all permit applications were submitted to respective agencies, rock gathering began and mid-level canopy clearing consisting of non-native invasives began.

Figure 8: Village of West Dundee's Bioretention Facilities

The South End Park site will allow greater access and visibility by the Public (photos by H. Hudson, CMAP).

Figure 9:
St. Charles Park District's Norris Woods Project site

One of the most severely eroded sections.

Lake Monitoring and Management

Volunteer Lake Monitoring Program

Illinois' Volunteer Lake Monitoring Program (VLMP) completed its 28th season in October 2008 and began its 29th season in May 2009. Initiated by Illinois EPA in 1981, this popular program brings together citizens, state agency staff, and regional planning commissions to monitor and investigate the quality of Illinois' lakes. CMAP serves as program coordinator for the seven-county northeastern Illinois region. Staff provides volunteer training, technical assistance, educational materials, training material updates, data and equipment management, volunteer recognition recommendations, and assistance in annual report preparation.

Volunteer monitors measure water transparency (clarity) in a lake of their choosing using a simple device called a Secchi disk (an 8-inch diameter plate painted black and white in opposite quadrants, attached to a calibrated rope or tape measure) (Figure 10). The disk is lowered into the water and the depth at which it is no longer visible is recorded. Volunteers also record water color, aquatic plant growth, and several other factors relating to lake, weather, and watershed conditions each time they monitor. Monitoring typically is done twice a month from May through October at three in-lake locations. The Secchi measurements are used to document changes in water transparency during the monitoring season as well as from year to year (Secchi transparency is affected by the color of the water and the amount of suspended sediment and algae in the lake). Another useful bit of information the Secchi measurement indicates is that about twice as deep as you can see the Secchi disk in the water is the sunlit, or "euphotic," zone of the lake. This means that within this zone there is generally enough sunlight for aquatic plants and algae to live and grow.

In addition to Secchi disk monitoring, a subset of the volunteers (on a rotating basis) also collect water chemistry samples on a monthly basis that are analyzed at an Illinois EPA or Illinois EPA-certified laboratory. The water chemistry data provides important information on suspended material in the lake (e.g., sediment, algae) as well as levels of nutrients (phosphorus, nitrogen) that can promote nuisance aquatic plant and algae growth. Some volunteers also collect samples for chlorophyll analysis and record dissolved oxygen and temperature data. The chlorophyll data is particularly useful in determining the amount of microscopic, "planktonic" algae in the lake. Dissolved oxygen and temperature data are useful for determining if the lake stratifies during the summer (separates into layers of warm, upper water and cool, bottom water) and if there is adequate oxygen in the water to support aquatic life.

Primary goals of the VLMP are to familiarize volunteers with lake processes and to help them learn about lake ecology and the cause-and-effect relationships that exist between their lake, its watershed, weather, and human activity. Through the VLMP's hands-on educational structure, the data and information gathered can more effectively assist in local lake and watershed management decision-making. Lake scientists, planners, and consultants also use the data for a wide variety of purposes. Furthermore, the Illinois EPA uses VLMP data in its biennial assessment of the state's waters as required by the federal Clean Water Act.

Figure 10: Volunteers for the Illinois' Volunteer Lake Monitoring Program

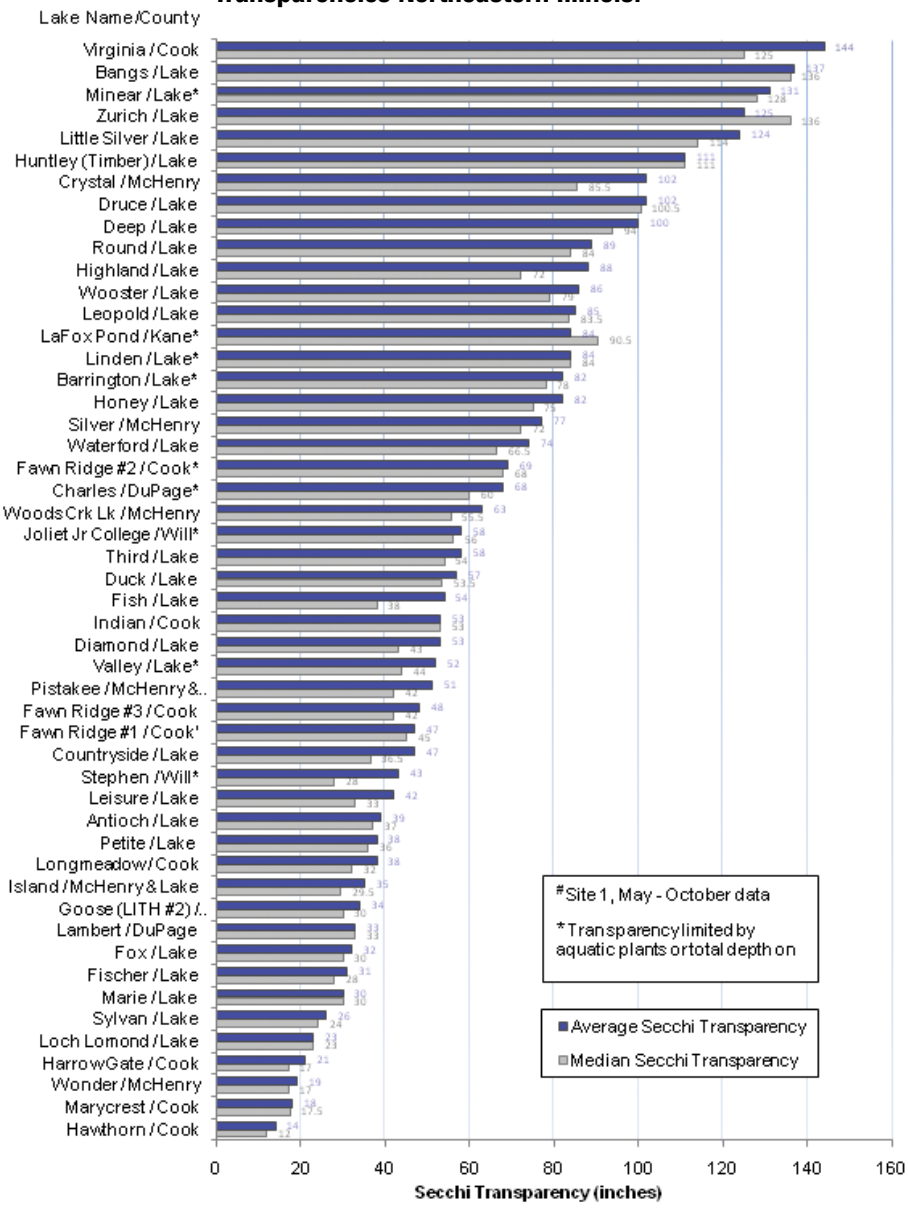
Volunteer Tim Shelton uses a Secchi disk to measure water transparency at Marycrest Lake, Cook Co. (photo by H. Hudson, CMAP).

Volunteer Carol Bettis (Duck Lake, Lake Co.) filters lake water for chlorophyll analysis (photo by H. Hudson, CMAP).

Of the 137 lakes VLMP-monitored statewide at least once during 2008, 63 were in northeastern Illinois involving 124 volunteers. The accompanying chart (Figure 11) presents the average and median Secchi disk transparency values for the 50 northeastern Illinois lakes that were monitored during at least four of the six months of the May – October monitoring season. For 2008, nine of these lakes had an average transparency of at least 96 inches (8 feet). Virginia Lake in Cook County topped the list with a 144-inch average (12 feet), followed by several lakes in Lake County (Bangs, Minear, Zurich, Little Silver, Huntley, Druce, and Deep) and one in McHenry County (Crystal Lake). Numerous other lakes around the region recorded average Secchi readings between about 48 and 96 inches (4 to 8 feet, with 4 feet considered a minimum guideline for swimming safety). On the lower end of the spectrum, several lakes displayed low average transparency values of less than 24-36 inches (2 to 3 feet), generally due to high levels of suspended sediment and/or algae.

In spring 2009, CMAP staff completed development of an instructional DVD and created the design layouts for the DVD's self-mailer and label. Further, staff prepared the final draft of the 3rd edition of the VLMP Training Manual, including a greatly expanded section on aquatic invasive species with the input of Illinois-Indiana Sea Grant AIS aquatic invasive species specialists. The Training Manual will be finalized and distributed along with the DVD to VLMP participants beginning with the 2010 season. CMAP staff also participated in beta testing of a web-based VLMP data entry and retrieval system that is being developed by Illinois EPA, and which should go on-line in 2010. Contact Northeastern Illinois VLMP Coordinator Holly Hudson at CMAP for more information about the VLMP.

Figure 11: 2008 VLMP Average and Median Secchi Disk Transparencies Northeastern Illinois.



Lake Rehabilitation And Protection

For more than 25 years, CMAP and its predecessor the Northeastern Illinois Planning Commission have assisted numerous local municipalities and agencies in studying, protecting, and rehabilitating their lakes. This assistance typically involves developing grant applications, monitoring lake conditions and diagnosing problems, formulating rehabilitation and protection plans, and assisting in the implementation of rehabilitation and protection strategies.

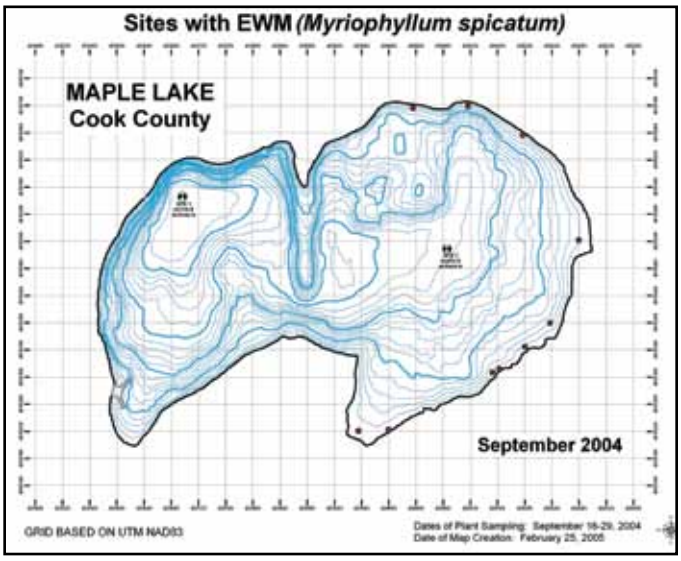
Maple Lake Rehabilitation and Protection Project

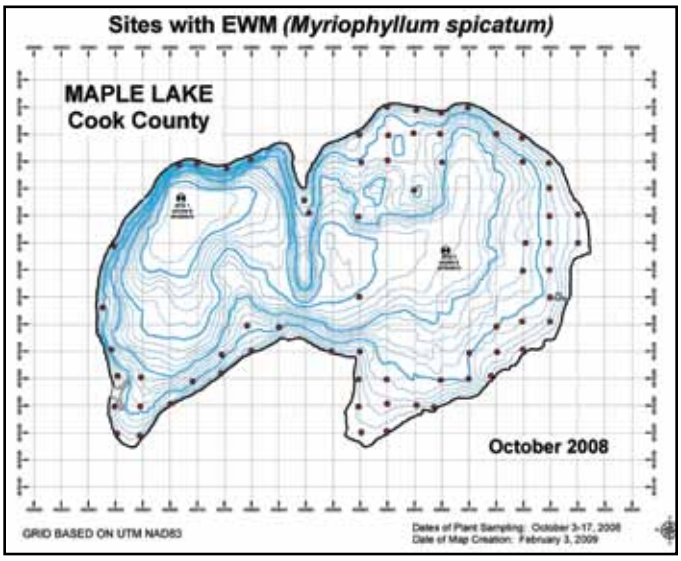
Implementation of an Illinois Clean Lakes Program Phase 2 rehabilitation and protection program at the Forest Preserve District of Cook County's Maple Lake continued. Supported by a Clean Lakes Program grant from the Illinois EPA, the District is accomplishing several projects aimed at protecting the lake's water quality and improving aquatic habitat and recreational opportunities. CMAP is serving as technical project advisor to the District for the Phase 2 program.

During the past year, CMAP staff conducted a whole lake survey of the aquatic plant population and prepared plant distribution maps, monitored the condition of the shorelines stabilized under projects completed during 2006 and 2007, developed maps and calculated accumulated sediment volumes for planning a nearshore sediment removal project, and researched the latest technologies and techniques for invasive aquatic plant management. The District's Fisheries staff continued to monitor the lake's fish community and conduct nuisance aquatic plant control to facilitate recreational fishing (Figure 12).

Figure 12: Aquatic Plant Community Monitoring

A recent invader to Maple Lake, Eurasian water milfoil overflows the sampling rake during the fall 2008 aquatic plant community survey (photo by H. Hudson, CMAP).





Plots from the fall 2004 and fall 2008 aquatic plant community surveys reveal the spread of the invasive Eurasian water milfoil in Maple Lake.

Over the coming year CMAP will be working with the District to develop and implement comprehensive plans to control several invasive aquatic plant species including Eurasian water milfoil (*Myriophyllum spicatum*), curlyleaf pondweed (*Potamogeton crispus*), and flowering rush (*Butomus umbellatus*), as well as to diversify the native aquatic plant community. Plans for a nearshore accumulated sediment removal project also will be finalized, and investigations for other aquatic nuisance species including rusty crayfish (*Orconectes rusticus*) and round gobies (*Neogobius melanostromus*) will be conducted. A year of post-implementation water sampling is also expected to commence.

Related Natural Resource Activities; Chicago Wilderness Activities

Chicago Wilderness

The Chicago Wilderness Green Infrastructure Vision (GIV), an identification of important areas for protection and restoration within the greater Chicago metropolitan area, is the chief conservation basis of the GO TO 2040 Plan. CMAP staff has been working with Chicago Wilderness members to clarify the precepts of the GIV and ensure that it guides the policies and investments recommended in the GO TO 2040 Plan. Staff has been meeting regularly with Chicago Wilderness to provide updates on plan development and get feedback from the conservation community.

Lake Biodiversity Recovery and Protection Plan Development Pilot Project

The Illinois Department of Natural Resources (DNR) awarded C2000 funding to CMAP in 2006 to support a Lake Biodiversity Recovery and Protection Plan Development Pilot Project. This is a joint undertaking of CMAP and the Lake County Health Department–Lakes Management Unit (LCHD-LMU). This project will produce a database of biological, chemical, physical, and management data and information for more than 160 lakes in Lake County, Illinois — the pilot project area. Two, lake-specific biodiversity protection and recovery plans also will be developed, targeting one "exceptional" and either an "important," "restorable," or "refuge" lake within the County.

During this past year, work continued toward finalizing the lake classification criteria and the database queries in order to classify the lakes. The criteria used for lake categorization includes the following:

- lake origin (glacial or man-made);
- "species of interest" (fish, aquatic macrophytes, reptiles, and amphibians that are indicative of a high level of ecosystem health);
- number of native fish species;
- number of native aquatic macrophyte and macroalgae species;
- percentage of exotic macrophytes;
- percentage of exotic fish; and
- other variables that demonstrate the lake's ability to support reintroduced threatened/endangered species (i.e., water chemistry, invasive species).

The Lake County Forest Preserve District agreed to partner with CMAP and LCHD-LMU on plan development for two of their lakes. To be completed over the next year, the plans will outline actions for native aquatic species protection and possible reintroduction of extirpated species, as well as serve as models that may be utilized at other lakes in the Chicago Wilderness region. An advisory team consisting of fisheries, wildlife, and aquatic biologists from Illinois DNR, U.S. Fish & Wildlife Service, and U.S. Army Corps of Engineers also was convened to provide technical review and input during plan development, as well as offer guidance regarding potential funding sources, cooperative efforts, and technical assistance for future implementation of the lake recovery and protection plans.

Figure 13: Native Aquatic Plants

Water marigold (Megalodonta beckii) is one of several endangered or threatened (E&T) aquatic plant species in Illinois. Such plants tend to be found in glacial lakes with clear water and little to no competition from invasive aquatic plants. Interestingly, where E&T aquatic plants species tend to be found, E&T fish species tend to be present as well, indicating an important link (photo courtesy of Linda Curtis).

Spotlight on Green Communities

Spotlight on Green Communities is a CMAP web feature highlighting the initiatives the region's communities are undertaking to "go green" and reap the environmental benefits. The project stems from the results of a 2008 CMAP survey, which provided a wealth of information on which green practices communities are conducting and which they are interested in learning more about. The responses of over 200 communities and districts help direct our technical assistance program and serve as a repository of green practice case studies for the Spotlight feature and events such as panel sessions and webinars (see our web page at http://www.cmap.illinois.gov/assistance/greenpractices/.)

Spotlight on Village of Niles Community Rain Garden

The Village of Niles' community rain garden was featured as the first Spotlight feature in December 2009. CMAP staff worked with the Village to put together a step-by-step description of the project including goals, site selection, costs, installation, and results. Following is a brief summary.

Figure 14: Niles Community Rain Garden

Results and Benefits

The drainage area going to the rain garden is over 36,000 square feet, of which 20,000 comes from adjacent rooftops and pavement. After two phases, the site has a total of 2,754 square feet of rain garden and 1,866 square feet of prairie grass area, both holding over 2,000 native plantings that will retain the first inch of rainfall. The plant mix — sand, topsoil, and organic mulch — significantly increases absorption of the soils. The garden provides a habitat for butterflies, birds and other insects, and attracts dragonflies, which consume high rates of mosquitoes. Little maintenance will be required when the plants and grasses are fully established.

The Rain Garden

In spring 2008, the Village set out to transform a three-quarter acre lot with two vacant buildings into rain gardens, native prairie plants, and permeable pathways to filter rainwater runoff from impervious surfaces and to reduce runoff by allowing stormwater to seep naturally into the ground instead of flowing into storm drains and surface waters which can cause erosion, pollution, flooding, and diminished groundwater. They used native plants that don't require fertilizer and are more tolerant of local climate, soil, and water conditions. By June 2008 the Village had a1,400 square foot rain garden with over 560 native flowers and grasses. The following chart lists the plants they used.

Table 3: Chart of Native Plants

QTY	Common Name	Scientific Name	Soil Condition	Height
50	**Sky Blue Aster**	Aster azureus	Dry-Mesic	2-3'
30	**Tall Coreopsis**	Coreopsis tripteris	Dry-Mesic	6-8'
75	**Purple Coneflower**	Echinicea purpurea "magnus"	Dry-Mesic	2-3'
15	**Wild Geranium**	Germanium maculatum	Dry-Mesic	1.5-2'
36	**Prairie Blazing Star**	Liatris pycnostachya	All	4-6'
15	**Wild Bergamot**	Monarda Fistulosa	All	3-4"
25	**Wild Quinine**	Parthenium integrifolium	Wet	3-4"
50	**Obedient Plant**	Physostegia Virginia "deep pink"	Wet-Mesic	3-4"
10	**Compass Plant**	Silphium lacinicatum	Dry-Mesic	6-8'
50	**Showy Goldenrod**	Solidago speciosa	Dry-Mesic	2-3"
15	**Golden Alexanders**	Zizia aurea	Wet-Mesic	1.5-2"
10	**Prairie Dock**	Silphium terebinthinaceum	All	1.5-2"
24	**Joe Pye Weed**	Eupatorium maculatum	Wet-All	4-6"
20	**Side Oats Grama**	Bouteloua curtipendula	Dry	2-3'
20	**Switch Grass**	Panicum virgatum	Dry-all	4-6"
25	**Little Bluestem Grass**	Schizachyrium scoparium	Dry-Mesic	2-3'
20	**Indian Grass**	Sorghastrum nutans	Dry-all	4-6'
22	**Purple Love Grass**	Eragrostis spectabilis	All	1-3'

Water Supply Planning

Third-year funding (fiscal year 2009) was a casualty of the ongoing state budget challenge. In response, several county governments, two investor-owned water utilities, the DuPage Water Commission, and the Plumbing Contractors Association of Chicago and Cook County donated a total of $122,000 to help fund critical components of the planning process. One-hundred thousand dollars was given to the Illinois State Water Survey to continue their regional groundwater modeling effort and the balance of $22,000 was used to fund a supplemental study on residential water use conducted by Southern Illinois University Carbondale. CMAP also contributed to the total cost of the latter study.

Planning continued to explore demand-management strategies as well as address opportunities for integration between land-use planning and water-supply planning. Regarding the latter, water revolving funds were discussed for their role in influencing regional development patterns (i.e. infill/reinvestment vs. greenfield development involving land-use change) and potential for incenting or rewarding communities with water-use conservation and source-water protection programs that are integrated with their comprehensive plans. Accordingly, draft recommendations were developed for Illinois EPA as the responsible party for administering Clean and Drinking Water State Revolving Funds.

The regional planning process was originally scheduled to end June 30, 2009. The interruption of state funding along with the breadth of issues addressed, necessitated a one-year extension with final plan approval scheduled for January 26, 2010. As fiscal year 2010 got underway, the Illinois Department of Natural Resources partially restored third-year funding to assist with process/plan completion.

Lake Michigan Academy

Lake Michigan Academy is a program supported by the U.S. EPA Great Lakes National Program Office that invites regional planning agencies to share their work and to receive training on watershed issues so that they are able to conduct outreach to their constituents. The overarching goals of the program are to improve the environmental quality of Lake Michigan and to strive towards achieving the goals outlined in the Lakewide Management Plan (LaMP). To commence each cycle of the program, a public conference is held to provide training and collaboration between regional planning agencies. After the conference, regional planning agencies conduct subwatershed implementation projects utilizing techniques learned in their recent training. CMAP hosted the conference in 2008 and is responsible for the administration of the program through the end of March 2010. In this cycle, six regional planning agencies were each awarded a $15,000 grant and provided $5,000 of in-kind match to conduct implementation projects. The table below outlines the projects (Table 3).

Table 4: Lake Michigan Academy Projects

Bay-Lake Regional Planning Commission (BLRPC) **Project Title**: Greenprint Project **Details**: In coordination with Door County, Door County Natural Areas Group and the Trust for Public Land, this project will create a GIS database and modeling "greenprint" tool that identifies, prioritizes, communicates and tracks critical lands for regional resource protection. Maps, statistics and documentation of model development will be produced during the grant period.	**South Central Michigan Planning Commission (SMPC)** **Project Title**: Zoning Amendments for Non-Point Source Pollution Reduction **Details**: This project aims to reduce non-point source pollution within the Lake Michigan watershed by increasing the capacity of municipalities to make use of available municipal zoning statute amendments and use watersheds as a basis for environmental decision-making across political boundaries. Review of development ordinances that impact sensitive water bodies and wetlands, development of amendatory language for zoning ordinances and preparation of development alternatives for proposed land conversions were produced during the grant period.
Northwestern Indiana Regional Planning Commission (NIRPC) **Project Title**: Green Infrastructure in Northwestern Indiana **Details**: This project provides information about the benefits of Green Infrastructure (GI), an introduction to GI technology, and tools to incorporate GI in Northwestern Indiana. Workshops, a GI Handbook brochure and a GI checklist were produced during the grant period.	**Southeastern Wisconsin Regional Planning Commission(SEWRPC)** **Project Title**: Riparian Buffer Guide Preparation and Educational Activities **Details**: This project develops a comprehensive, yet flexible guide that will facilitate the establishment of riparian buffers for the purpose of improving water quality and enhancing terrestrial and aquatic habitat in streams tributary to Lake Michigan. This guide will serve as an important tool in the implementation of the regional water quality management plan update as well as for local governments and private entities, such as land trusts.
Northwest Michigan Council of Government (NWMCOG) **Project Title**: New Designs for Growth Green Infrastructure Project **Details**: This project identifies areas of ecological importance within the 10-county region, looks at barriers to implementing GI practices at the state, county, township and village planning level and provides guidance for addressing development expansion in a way that helps the region prosper and protect its natural resources. Detailed maps and presentations were provided to each county as well as a "Green Infrastructure Planning Manual."	**West Michigan Shoreline Regional Development Commission (WMSRDC)** **Project Title**: Muskegon County Green Infrastructure Inventory and Analysis **Details**: This inventory project identifies green infrastructure needs and opportunities, including specific geographic areas that have the potential to provide valuable ecological services through conservation, restoration and retrofit Best Management Practices in Muskegon County. GIS maps and analysis, charrette-style stakeholder meetings, and a green infrastructure plan were produced during the grant period.

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