MEMORANDUM REPORT NO. 199

SOUTHEASTERN WISCONSIN FOX RIVER COMMISSION IMPLEMENTATION PLAN: 2011-2020

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Chapter I

INTRODUCTION AND BACKGROUND

INTRODUCTION

The Southeastern Wisconsin Fox River Commission (SEWFRC) was established in 1997 by the State of Wisconsin pursuant to 1997 *Wisconsin Act* 27, which created Subchapter VI of Chapter 33 of the *Wisconsin Statutes*. The SEWFRC was created in response to citizen and community concerns over water resources problems in the Illinois-Fox River system. At that time, severe restrictions on navigation, water uses, water quality, and flooding and drainage were reported along the Fox River mainstem and its impoundments. These problems had been an increasing concern of the communities and residents within the Middle and Upper Fox River watershed since the late-1960s, or for more than 25 years prior to the establishment of the SEWFRC. The initial SEWFRC implementation plan was published in 1998.[1] The plan described herein updates that plan and makes recommendations for SEWFRC activities over the next decade.

Since its formation, the SEWFRC has undertaken and completed a number of significant projects within its jurisdiction, along the reach of the Fox River between the City of Waukesha, in Waukesha County, and the Village of Waterford, in Racine County (see Map 1). These projects have addressed a number of serious concerns related to erosion, water quality, and navigability of the River. Funding for these efforts has been largely through direct appropriation by the Wisconsin Legislature in support of the projects proposed for implementation in the initial SEWFRC Implementation Plan.[2] Additional funding was provided in support of these projects by the project applicants.

THE SOUTHEASTERN WISCONSIN FOX RIVER COMMISSION

1997 *Wisconsin Act* 27, which established the SEWFRC, set forth both its composition and its mandate. Pursuant to Section 33.55 of the *Wisconsin Statutes*, the membership of the Board of Commissioners of the SEWFRC is defined as follows:

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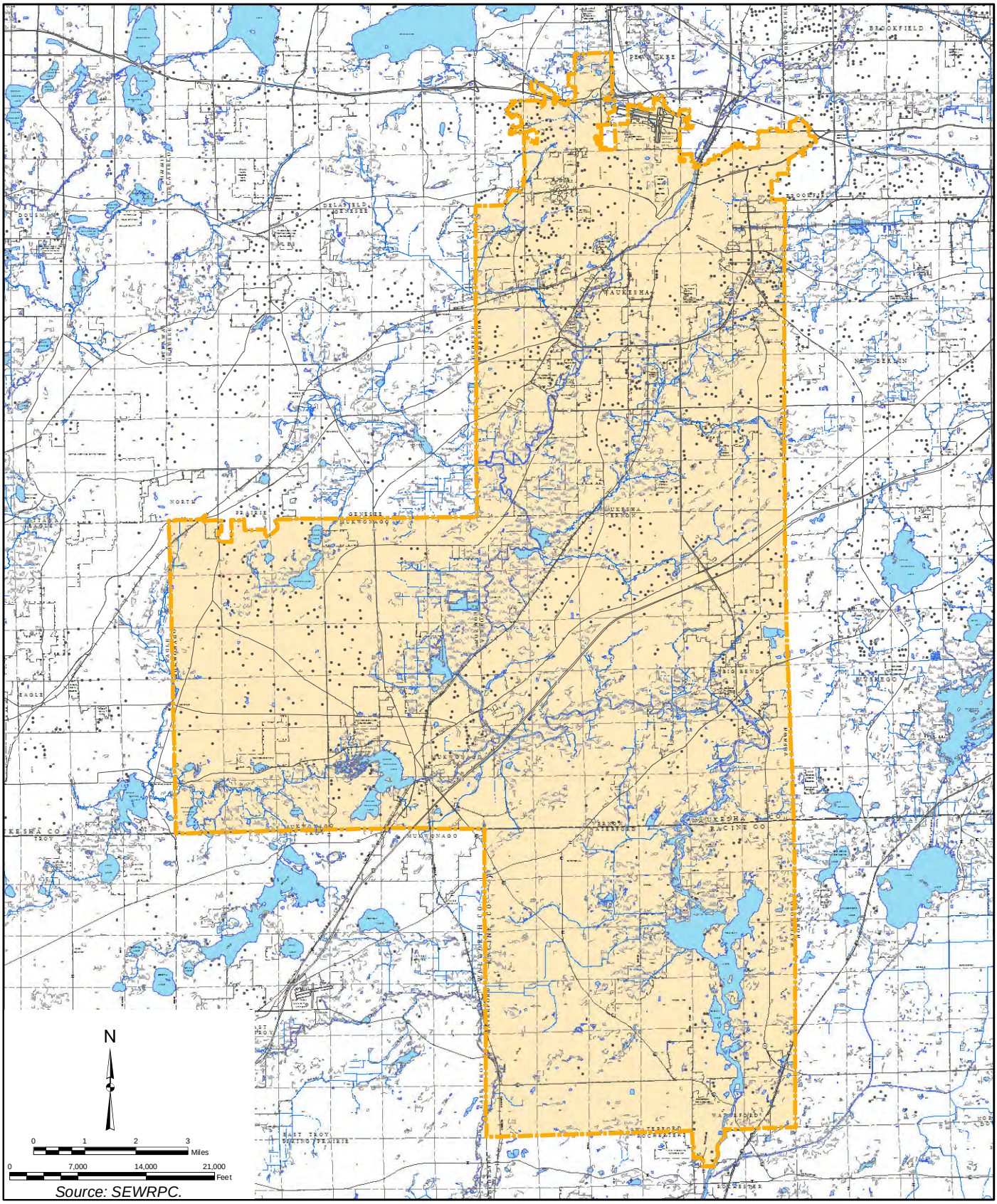
[1]*Southeastern Wisconsin Fox River Commission,* Southeastern Wisconsin Fox River Commission Implementation Plan, *March 1998.*

[2]*Southeastern Wisconsin Fox River Commission,* op. cit.*; see also SEWRPC Memorandum Report No. 102,* Water Level Control Plan for the Waterford-Vernon Area of the Middle Fox River Watershed, Racine and Waukesha Counties, Wisconsin, *March 1995.*

Map 1

SOUTHEASTERN WISCONSIN FOX RIVER COMMISSION PLANNING AREA



Source: SEWRPC.

- Village presidents of Big Bend, Mukwonago, and Waterford, or their designees
- Town chairpersons of Waterford, Vernon, Waukesha, and Mukwonago or their designees
- Mayor of the City of Waukesha or designee
- Two residents each from the Towns of Waterford and Vernon (appointed by Town Boards)
- One resident from the Village of Big Bend (appointed by Village Board)
- Racine and Waukesha County Executives or their designees
- One representative from the Southeastern Wisconsin Regional Planning Commission (SEWRPC) (nonvoting, *ex officio* member)
- One representative from the Wisconsin Department of Natural Resources (WDNR) (nonvoting, *ex officio* member)

The terms of the elected officials serving as SEWFRC Commissioners run concurrently with their terms of office, while the terms of residents were set at two years. For purposes of recordkeeping, the terms of the *ex officio* members also have been set at two years.

The powers and duties of the SEWFRC Board of Commissioners also were set forth in the enabling legislation. These duties, set forth in Sections 33.56 and 33.57 of the *Wisconsin Statutes*, include:

- Initiation and coordination of surveys and research projects to gather data relating to the surface waters and groundwaters of the Illinois Fox River basin that are located in the river municipalities;[3]
- Maintaining a liaison with Federal, State, and local agencies and other organizations involved in protecting, rehabilitating, and managing the water resources of the Fox River within the river municipalities;
- Development of a public informational and educational program on issues related to the surface waters and groundwaters of the Illinois Fox River basin that are located in a river municipality; and
- Utilization of the services of the Wisconsin Conservation Corps and volunteers to the greatest extent practicable for appropriate projects.

The SEWFRC Board of Commissioners Commission was to develop and implement plans and projects to:

- Improve water quality and the scenic, economic, and environmental value of the surface waters and groundwaters of the Illinois Fox River basin that are located in a river municipality;
- Protect or enhance the recreational use of the navigable waters of the Illinois Fox River basin;
- Coordinate and integrate county programs or projects within the Illinois Fox River basin affecting surface and groundwaters of the counties; and
- Develop and propose programs or projects to make improvements to the navigable waters of the Illinois Fox River basin located in a river municipality.

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[3]*The "river municipalities" are: the City of Waukesha; the Villages of Big Bend, Mukwonago, and Waterford; and the Towns of Mukwonago, Vernon, Waterford, and Waukesha.*

To accomplish these tasks, SEWFRC was empowered to:

- Create advisory committees as it considers necessary; and
- Promulgate rules necessary to implement the duties and powers granted to the Board of Commissioners.

Among the operating procedures adopted by the SEWFRC was the requirement that projects undertaken by the Commission be developed on a cost-share basis. During the initial period of the Commission's operations, this policy required at least a 10 percent contribution by the project applicant, although the cost-share ratio could be modified by vote of the Board based upon the specific circumstances of the applicant.

Funds to support the implementation of the Commission's activities were envisioned by the Legislature as being provided by the two member counties that make up the Commission. Section 33.60 of the *Wisconsin Statutes* sets forth the requirements associated with the creation and approval of the Commission's budget. It should be noted, however, that the SEWFRC has been supported in large part through direct Legislative appropriations since its inception, with some additional support from grantees and related grant programs administered by the State of Wisconsin.

THE ILLINOIS FOX RIVER BASIN

The Illinois Fox River watershed has been the subject of numerous plans and interventions since the publication of the initial comprehensive plan for the Fox River watershed prepared by the Regional Planning Commission during 1969 and 1970,[4] and subsequently refined.[5] Selected management measures, carried out in response to the strategies set forth in the SEWRPC comprehensive watershed plan, also have been implemented, including a shoreline erosion control project for a portion of the Waterford Impoundment carried out by the Town of Waterford and the affected residents; enactment and enforcement of construction site erosion control ordinances, streambank erosion control projects, and other nonpoint source control projects implemented under the auspices of the WDNR Upper Fox River nonpoint sources pollution abatement plan.

Based upon review of these previous planning programs, the water resource problems on the Fox River of most concern were identified as impairments to navigation in the river system and the impoundments due to limited depth, accumulated sediment, and obstructions caused by fallen trees and other debris. Consequently, the initial SEWFRC implementation plan focused on the implementation of actions to positively impact recreational uses and environmental conditions in the river system. Significant additional basin-scale planning activities were not envisioned. Rather, any additional planning effort was to be focused on developing local level, site-specific engineering designs needed to implement specific water resources management measures.

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[4]*See SEWRPC Planning Report No. 12,* A Comprehensive Plan for the Fox River Watershed, *Volume One,* Inventory Findings and Forecasts, *April 1969; and Volume Two,* Alternative Plans and Recommended Plan, *February 1970.*

[5]*SEWRPC Community Assistance Planning Report No. 5,* Drainage and Water Level Control Plan for the Waterford-Rochester-Wind Lake Area of the Lower Fox River Watershed, *May 1975; and SEWRPC Memorandum Report No. 102,* Water Level Control Plan for the Waterford-Vernon Area of the Middle Fox River Watershed, Racine and Waukesha Counties, Wisconsin, *March 1995. See also Wisconsin Department of Natural Resources Publication No. WR-366-94,* A Nonpoint Source Pollution Control Plan for the Upper Fox River Priority Watershed Project, *June 1994.*

In this regard, it was recognized that the water resources problems in the Fox River developed over many decades, and that specific problems could not be resolved in months or even years. Thus, the Commission's implementation strategy was focused on long-term improvement, predicated upon abatement of sedimentation from nonpoint sources and long-term education and broad public support. However, there was a parallel need to improve the water resources in the short-term. To this end, the SEWFRC's implementation strategy also supported activities having a direct positive impact, such as regulation of boating activities, streambank stabilization, removal of fallen trees and other obstructions, and navigational channel dredging. These activities were implemented to enable people to enjoy the water resources, even though these activities will not, in and of themselves, solve the long-term water resources problems. In addition, the initial implementation strategy adopted an ecosystem-based approach, pursuing sound resource management and protection to promote the critical environmental and pollution prevention functions of the watershed, including groundwater recharge and discharge, water quality improvement, erosion control, floodwater storage, wildlife habitat, and scenic beauty. The primary technical and regulatory aspects of this approach were intended to complement other regional and county programs to manage and protect natural resources.[6] The following actions are elaborated within Section 33.59 of the *Wisconsin Statutes*:

- Conducting an engineering study to determine areas for selective dredging, including selective shallow areas of the impounded area of the Waterford Impoundment;
- Clearing channel of fallen trees and similar debris;
- Developing a water use plan;
- Formulating an operating plan for the Waterford Dam, with a winter drawdown level and possible automation of the Waterford Dam using upstream sensors;
- Protecting the streambank from erosion;
- Maintaining, protecting, and improving shorelines, banks, and beds of navigable waters;
- Providing adequate public access to shoreline recreational areas and facilities; and,
- Implementing water safety, navigation, and boating regulations.

PURPOSE OF THE CURRENT PLAN

While the SEWFRC has made considerable progress toward alleviating some of the concerns expressed by the riparian communities and citizens, further work—both capital projects, as well as nonstructural activities, such as informational programming and awareness-raising—remain ongoing or to be completed. Consequently, this report is designed to review progress to date since the inception of the SEWFRC in 1998, identify additional works and activities that remain to be completed, and establish a framework for future implementation of Commission activities. This plan responds directly to the requirements of Section 33.59 of the *Wisconsin Statutes*.

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[6]*See, for example, SEWRPC Planning Report No. 42,* A Regional Natural Areas and Critical Species Habitat Protection and Management Plan for Southeastern Wisconsin, *September 1997; SEWRPC Community Assistance Planning Report No. 259, 2nd Edition,* A Land and Water Resource Management Plan for Racine County: 2008-2012, *October 2007; Waukesha County Department of Parks and Land Use,* Waukesha County Land and Water Resource Management Plan 2006-2010, *January 2006.*

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Chapter II

ACCOMPLISHMENTS AND STATUS REPORT

INTRODUCTION

Since its formation, the Southeastern Wisconsin Fox River Commission (SEWFRC) has undertaken and completed a number of significant projects along the reach of the Fox River between the City of Waukesha, in Waukesha County, and the Village of Waterford, in Racine County. In so doing, the SEWFRC has addressed a number of serious concerns related to erosion, water quality, and navigability of the River, in fulfillment of its mandate to improve water quality, protect or enhance the recreational use of the navigable waters of the Illinois Fox River basin, coordinate and integrate county programs or projects within the Illinois Fox River basin, and develop and propose programs or projects to make improvements to the navigable waters of the Illinois Fox River basin. The projects that have been undertaken by the Commission since its inception generally fall into eight broad classes of action; namely,

- Identification of areas for selective dredging;
- Clearing channels of debris;
- Development of a water use plan;
- Formulation of and support for an operating plan for the Waterford dam;
- Protection of the streambank from erosion;
- Maintenance of shorelines and navigable waters;
- Provision of adequate public access; and,
- Implementation of water safety regulations.

While much more work remains to be done, the Commission has initiated planning and conducted works that address the majority of these action areas.

AREAS FOR SELECTIVE DREDGING AND CHANNEL CLEARANCE

The initial implementation plan identified a number of areas where River flows and navigation were impeded or likely to be impeded by lack of depth, growths of aquatic and wetland vegetation, or similar obstructions. Although these issues remain a concern among the riparian communities and visitors to the region, little progress has been achieved in this area as of 2010. However, the Waterford Waterway Management District (WWMD)

remains actively engaged in discussions with the Wisconsin Department of Natural Resources (WDNR) with respect to the implementation of a dredging project or projects within the waterway that would enhance both navigation and flood conveyance and storage within the Waterford impoundment. The SEWFRC is an active partner with the WWMD in these discussions.

DEVELOPMENT OF WATER USE AND DAM OPERATING PLANS

Dam Operations

As a consequence of recommendations set forth in the initial implementation plan, the SEWFRC supported the development of various planning instruments relating to water use and operations of the Waterford dam, the downstream-most control structure in the middle reaches of the Fox River. As of 2010, there has been limited progress with respect to the automation of the control gates at Waterford, and Racine County, owner and operator of the dam, has expressed a reluctance to proceed with the implementation of this recommended action. In part, this reluctance is due to the absence of an upstream gauging station in sufficiently close proximity to the Waterford waterway to provide an accurate measure of inflowing water volumes to the impoundment. There is a concern that automated operation may result in the discharge of water from the impoundment, lowering water levels, during periods when there would not be elevated flows in the River. Consequently, the County has stated an intention to continue to operate the outlet structure based upon water levels observed at the dam, and to continue to do so manually based upon daily inspection.

The Village of Big Bend, WDNR, and SEWRPC have reiterated their desire for the placement of staff gauges at appropriate locations within the Village to provide the basis for the determination of flows at that point in the Middle Fox River. While such an action was recommended in the initial implementation plan, it remains to be implemented.

In a related activity, the SEWFRC has supported efforts by the WDNR and the Friends of the Vernon Marsh to restore flowages within the Marsh that have been created to promote waterfowl migrations and habitats in this State Wildlife Area.

Water Use Management

In contrast to the issue of dam operations, the issue of water use management has formed a focal point for actions by the SEWFRC, as indicated in Tables 1 and 2 (the other principle focal area of the SEWFRC efforts has been in the area of streambank and shoreline stabilization). Actions associated with water use have focused on two areas of activity; namely, well abandonment and stormwater management. In the early days of the SEWFRC, the Commission assisted a number of property owners in abandoning wells within its jurisdiction. Few details of these projects are available.

In recent years, the SEWFRC partnership with the WWMD and local municipalities has focused on the management of stormwater runoff to the Fox River system. Stormwater runoff is a major means of transport of contaminants from the land surface to river systems. Recognition of this relationship has led to the promulgation of Chapter NR 151, “Runoff Management,” of the *Wisconsin Administrative Code* and its associated stormwater management requirements, as well as the promulgation of the stormwater discharge permitting requirements set forth in Chapter NR 216 of the *Wisconsin Administrative Code*. In terms of the latter Chapter, Waukesha County, the City of Waukesha, the Villages of Big Bend and Mukwonago, and the Towns of Vernon and Waukesha, each of which is located at least partially within the SEWFRC jurisdictional area, as well as numerous other upstream communities, are among those required to obtain municipal separate storm sewer system stormwater discharge permits from the State of Wisconsin. The permits call for a public outreach and education component, opportunities for public involvement and participation, elimination of illicit discharges to the stormwater conveyance system, construction site pollution controls, post-construction pollution controls, and a pollution prevention strategy. In support of these actions on the part of riparian municipalities within the SEWFRC jurisdiction, the SEWFRC has invested in a number of stormwater runoff pollution abatement projects since 2002. These projects have served to reduce external contaminant loads to the system.

Table 1

STATUS OF THE INITIAL IMPLEMENTATION PLAN FOR THE SOUTHEASTERN WISCONSIN FOX RIVER COMMISSION: 1998-2010

Plan Element	Subelement	Management Measures	Implementation Status: 2010
Selective Dredging	- -	Remove 6,400 cubic yards of sediment from the channel between IH 43 and the Waterford impoundment (seven short reaches of 200 feet or less in length): dredging (and channel clearing) was estimated in SEWRPC MR No. 102 to reduce the 100-year recurrence interval flood elevation by up to 0.3 foot within the Town of Vernon	Pending
		Dredge along some of the shoreline and in shallow bays within the Waterford impoundment and Tichigan Lake, and in the Fox River immediately upstream from the impoundment; remove 56,000 cubic yards of material extending about 50 to 75 feet from the shore	Pending
Channel Clearance	- -	Remove trees and other debris from the channel within the Towns of Vernon and Waterford between IH 43 and the Waterford impoundment: Channel clearance (and dredging) was estimated in SEWRPC MR No. 102 to reduce the 100-year recurrence interval flood elevation by up to 0.3 foot within the Town of Vernon	Annual debris removal undertaken in and around the Waterford impoundment by the Fox River Citizens Against Underwater Sediment and Erosion (CAUSE)
Water Use	Nonpoint source pollution abatement	Prepare detailed local-level nonpoint source pollution control plans to identify the practices to be applied to specific lands	Ongoing: Waterford Waterway Management District (WWMD) assisted the Town of Waterford in the development of a stormwater management ordinance; WWMD installed various stormwater management practices around the Waterford impoundment
	Flood management	Lower the water level of the Waterford impoundment by up to 0.8 foot, providing about 1,500 acre-feet of additional storage volume in the event of a 100-year recurrence interval flood or about 2 percent of the total runoff volume associated with a 100-year recurrence interval flood	No action taken
Waterford Dam Operations	Winter drawdown	Implement winter (December 1-April 30) operating level of 772.6 feet NGVD 29, 1.1 feet lower than the normal operating level of 773.7 feet NGVD 29 (May 1-November 30)[a]	No action taken
	Outlet structure control automation	Install an automated river monitoring and control system for operating the gates at the dam, including a water level monitor located at CTH L in the Village of Big Bend	Problems with the automated system led to continuation of manual dam operations: manual operations can maintain the water surface elevation at approximately 773.7 feet NGVD 29[a]
		Establish two upstream monitoring sites with action levels to inform dam operations: recommended initial action levels would be 775.0 feet NGVD 29 at CTH L, and 775.5 feet NGVD 29 at Center Drive	Proposed for future action
Streambank Erosion Protection	- -	Protect 12,700 feet of streambank from erosion through the installation of riprap or other suitable methods between IH 43 and the Waterford impoundment	Shoreline erosion control practices installed at various locations within the Fox River basin
Maintenance of Shorelines, Beds, and Banks of Navigable Waters	- -	Purchase 702 acres—332 acres in the Town of Vernon and 370 acres in the Town of Waterford—and incorporate the lands into the Fox River Parkway recreational corridor; an additional three acres would remain in private ownership within the Edgewood Golf Course	Ongoing
Boating Access	- -	Develop a water use plan for the Fox River upstream of the Waterford impoundment, including establishing a navigation channel along the River, speed limits, motor size limitations, and slow-no-wake areas, as well as placing signage and buoys	Boating access provided by Waukesha County at Fox River Park; Boating access site at Village Park upgraded by the Village of Big Bend

Table 1 (continued)

Plan Element	Subelement	Management Measures	Implementation Status: 2010
Water Safety and Regulations	- -	Develop a water use plan for the Fox River upstream of the Waterford impoundment, including establishing a navigation channel along the River, speed limits, motor size limitations, and slow-no-wake areas, as well as placing signage and buoys	Some signage and buoys in place
Informational and Educational Program	- -	- -	SEWFRC website established; Watershed tour conducted for governmental decision makers; "Options for Open Space" manual prepared by the Fox River Partnership reproduced and disseminated

A bench mark (a chiseled square on the concrete walkway at the west (right, looking downstream) side of the dam) was established by SEWRPC in March of 1977, and designated as bench mark FX-143. The elevation of that bench mark, determined at that time using high order differential leveling that was connected to a different, higher order bench mark, is 778.258 feet above National Geodetic Vertical Datum, 1929 adjustment (NGVD 29). The WDNR independently determined the elevation of the same bench mark, which they designate as "296-I," to be 778.20 feet above NGVD 29, which is 0.06 foot lower than the SEWRPC bench mark elevation. The level of accuracy of the WDNR survey and the specifications and procedures applied for that survey are unknown. In 1994, during the field surveys of Fox River cross sections undertaken for preparation of the plan documented in SEWRPC Memorandum Report No. 102, Water Level Control Plan for the Waterford-Vernon Area of the Middle Fox River Watershed, Racine and Waukesha Counties, *March 1995, it was found that the original SEWRPC bench mark FX-143 had been removed when a chain link security fence was installed on the dam. Thus, in 1994, the bench mark was reset, and its elevation was established as 778.154 feet above NGVD 29.*

The difference in the SEWRPC reset bench mark elevation established in 1994 and the WDNR bench mark elevation for the original bench is small (0.05 foot), and NGVD 29 water surface elevations expressed to the nearest 0.1 foot will be the same based on either bench mark elevation. However, the October 15, 1982 dam operating order (see Appendix E) expresses a minimum reservoir water surface elevation to the nearest 0.01 foot based on the WDNR elevation for the original bench mark. To avoid confusion with that governing regulatory document, the NGVD 29 elevations of components of the Waterford dam and of the reservoir impounded by that dam are expressed in this report to the nearest 0.1 foot.

The reservoir levels are related to a staff gauge, graduated in 0.02-foot increments, and affixed to the dam. Thus, day-to-day operation of the dam to maintain the target normal reservoir level of 1.60 feet on the staff gauge does not require direct relation of the reservoir level to NGVD 29. If, in the future, it is important to relate the elevation of dam components and/or the reservoir water surface to an off-dam feature whose elevation is expressed in NGVD 29, it is recommended that the 1994 SEWRPC elevation for bench mark FX-143 be used. It is also recommended that, if possible, WDNR consider revising the dam operating order establishing the minimum water level so that the level to the nearest 0.01 foot is based on the reset elevation of bench mark FX-143 (WDNR bench mark 296-I).

Source: SEWRPC.

Figure 1 illustrates an example of the type of stormwater management project undertaken by the SEWFRC during its first decade.

STREAMBANK AND SHORELINE EROSION CONTROL

Since its inception, the SEWFRC has made extensive progress in the control of shoreline and shoreland erosion, both within the riverine reaches of its jurisdiction as well as in the Waterford impoundment. The issue of streambank and shoreline stabilization has formed the other major work effort undertaken by the SEWFRC (in addition to the stormwater management activities described above). These efforts, which were identified as priority areas for intervention in the initial implementation plan,[1] have been encouraged by the Commission's partnerships with the WWMD, Racine and Waukesha Counties, and citizen-based organizations such as the Fox River Citizens Against Underwater Sediment and Erosion (Fox River CAUSE). Figure 1 illustrates an example of the type of shoreline stabilization project undertaken by the SEWFRC during its first decade.

[1]*See the analyses set forth in SEWRPC Memorandum Report No. 102,* Water Level Control Plan for the Waterford-Vernon Area of the Middle Fox River Watershed, Racine and Waukesha Counties, Wisconsin, *March 1995, as reflected in the SEWRPC Planning Program Report,* Southeastern Wisconsin Fox River Commission Water Resources Implementation Plan, March 1998, *March 1998.*

Table 2

PROJECTS COMPLETED BY THE SOUTHEASTERN WISCONSIN FOX RIVER COMMISSION: 1998-2010

Plan Element	County	Project/Management Measures (partner)	SEWFRC Cost	Total Cost	Implementation Status (2010)
Selective Dredging	- -	- -	- -	- -	- -
Channel Clearance	Racine	Grand Drive Channel Enhancement Feasibility Study (SEWFRC)	$ 25,907	$ 25,907	Completed 2009
Water Use	Racine	Beach Drive Stormwater Abatement (Town of Waterford)	$ 10,000	- -	Completed 2002
	Racine	Golden Bay Stormwater Abatement (Town of Waterford, Racine County, Golden Bay Subdivision Association)	50,000	- -	Completed 2004
	Racine	Grand Drive/Buena Park Stormwater Abatement (WWMD)	101,100	- -	Completed 2005
	Racine	STH 164 Stormwater Abatement (WWMD)	45,000	$ 97,000	Completed 2007
	Racine	Idlewood Drive Stormwater Abatement (WWMD)	47,634	- -	Completed 2010
	Racine	Island View Bay Drainage Improvement (WWMD)	70,500	85,538	Completed 2009
	Waukesha	Adams Well Abandonment (TRM)[a]	840	- -	Completed 2001
	Waukesha	Dodd Well Abandonment (TRM)[a]	662	- -	Completed 2001
	Waukesha	Fingland Well Abandonment (TRM)[a]	655	- -	Completed 2003
	Waukesha	Krogstad Well Abandonment TRM)	- -	30,000	
	Waukesha	Melzl Well Abandonment (TRM)[a]	- -	1,700	Completed 2003
	Waukesha	Ranke Well Abandonment (TRM)[a]	949	1,356	Completed 2002
	Waukesha	Schuett Well Abandonment (TRM)[a]	630	1,000	Completed 2001
	Waukesha	Great Blue Heron Girl Scouts (TRM)[a]	1,306	- -	Completed 2001
	Waukesha	DeBack High Residue Management (TRM)[a]	4,102	- -	Completed 2002
	Waukesha	Phantom Woods Road Stormwater and Erosion Control (Town of Mukwonago)	40,626	- -	Completed 2010
Waterford Dam Operations	- -	- -	- -	- -	- -
Streambank Erosion Protection	Racine	Langmesser Park Streambank Stabilization (Town of Waterford)	$ 68,000	- -	Completed 2002
	Racine	Waterford Dam and Village Hall Park Streambank Stabilization (Village of Waterford)	100,000	111,111	Completed 2008
	Waukesha	Vernon Wildlife Area Streambank Stabilization (Friends of Vernon Marsh)	5,800	$ 6,575	Completed 2010
	Waukesha	Big Bend Lions Park Streambank Stabilization (Village of Big Bend)[b]	6,370	22,294	Completed 2000
	Waukesha	Big Bend Lions Park Streambank Stabilization: Phase 1 (Big Bend Lions Club)[a]	4,920	31,140	Completed 2002
	Waukesha	Big Bend Lions Park Streambank Stabilization: Phase 2 (Big Bend Lions Club)	11,055	- -	Completed 2003
	Waukesha	Bruss Streambank Restoration (TRM)[a]	3,851	14,505	Completed 2002

Table 2 (continued)

Plan Element	County	Project/Management Measures (partner)	SEWFRC Cost	Total Cost	Implementation Status (2010)
Streambank Erosion Protection (continued)	Waukesha	Fox River Inn Property Acquisition (Waukesha County)	$177,000	$310,000	Completed 2001
	Waukesha	Fox River Inn Demolition (Waukesha County)	4,757	4,756	Completed 2002
	Waukesha	Fox River Inn Erosion Protection and Streambank Stabilization (Waukesha County, $960; 1998 Federal Disaster Recovery Fund, $29,250)[c]	270	30,480	Completed 2002
	Waukesha	Indianhead Park Streambank Stabilization (Village of Mukwonago)	87,000	- -	Completed 2008
	Waukesha	Kossik Streambank Stabilization (Waukesha Co. Land Conservancy)	5,487	5,487	Pending, Completed 2011
	Waukesha	Maney Streambank Stabilization (Town of Vernon)[d]	11,440	39,000	Completed 2001
	Waukesha	Maney Grassed Waterway (Waukesha County)[a]	1,740	7,830	Completed 2003
	Waukesha	Tschanz Grassed Waterway (Waukesha County)[a]	- -	2,388	Completed 2003
Maintenance of Shorelines, Beds, and Banks of Navigable Waters	Racine	Channel Drive (WWMD)	- -	- -	Completed 2004
	Racine	Fox Isle Shoreline Erosion Control (Village of Waterford)	$ 50,000	- -	Completed 2002
	Racine	Foxwood Isle (Foxwood Isle Association)	48,000	$ 52,800	Completed 2002
	Racine	River Grove (Town of Waterford)	5,442	- -	Completed 2002
	Racine	Schmidt and Caton Island Erosion Control	4,633	5,148	Completed 2010
	Waukesha	Mukwonago Park Shoreline Stabilization (Village of Mukwonago)	19,561	87,277	Completed 2009
	Waukesha	Hintz Wetland Restoration (Waukesha County) [a]	11,425	57,125	Completed 2003
Boating Access	Waukesha	Big Bend Boat/Canoe Launch (Village of Big Bend)	$ 54,742	- -	Completed 2010
Water Safety and Regulations	- -	- -	- -	- -	- -
Informational and Educational Program	Fox River	Fox River Partnership Open Space Manuals (Fox River Partnership)	$ 3,102	$ 3,102	300 copies produced in 2008

[a] *Targeted Runoff Management (TRM) Grant awarded to the SEWFRC by the Wisconsin Department of Natural Resources and administered by Waukesha County.*

[b] *Land and Water Resource Management Grant awarded to the SEWFRC by the Wisconsin Department of Agriculture, Trade and Consumer Protection and administered by Waukesha County.*

[c] *1998 Federal Disaster Recovery Grant awarded to Waukesha County by the Federal Department for Housing and Urban Development.*

[d] *Urban Nonpoint Source and Stormwater Management Grant in the amount of $26,152 awarded by the Wisconsin Department of Agriculture, Trade and Consumer Protection.*

Source: SEWRPC.

PUBLIC ACCESS AND WATER SAFETY

In recent years, the SEWFRC has played an active role in enhancing and encouraging recreational boating activities within the middle reaches of the Fox River. These efforts have been focused initially on the provision of recreational boating access to those reaches. While these efforts have formed a relatively minor part of the SEWFRC work program to date, the ongoing demands for water-based recreational activities in the Fox River watershed are such that support for implementation of access opportunities is likely to increase during the 2011 to 2020 period of currency of this plan update. Figure 2 illustrates an example of the type of public recreational boating access project undertaken by the SEWFRC during its first decade.

ANCILLARY ACTIVITIES

In addition to the mandated duties undertaken by the SEWFRC, the Commission has engaged in an active outreach and community awareness effort. Much of this effort has been undertaken through cooperative efforts sponsored by local units of government and nongovernmental partners. The primary example of such cooperative efforts has been the investment by the SEWFRC in reproduction of the "Options for Open Space" manual created by the Southeast Wisconsin Fox River Partnership.[2]

[2]*Southeast Wisconsin Fox River Partnership,* Options for Open Space, *2004:* http://basineducation.uwex.edu/southeastfox/projects/openspace.htm.

Figure 1

TYPICAL STORMWATER ABATEMENT AND SHORELINE STABLIZATION PROJECTS IMPLEMENTED BY THE SOUTHEASTERN WISCONSIN FOX RIVER COMMISSION: 1997-2010

Source: SEWRPC.

Figure 2

TYPICAL RECREATIONAL BOATING ACCESS PROJECT IMPLEMENTED BY THE SOUTHEASTERN WISCONSIN FOX RIVER COMMISSION: 1997-2010

Source: SEWRPC.

Chapter III

EMERGING ISSUES OF CONCERN

INTRODUCTION

In response to the 2007 request of the Southeastern Wisconsin Fox River Commission (SEWFRC) for assistance from the Southeastern Wisconsin Regional Planning Commission (SEWRPC) in updating and refining the 1998 implementation plan, the SEWRPC staff requested that the SEWFRC Commissioners identify issues of concern facing the communities within the middle reaches of the Fox River. The issues to be considered under this plan update as identified by the Commissioners, in cooperation with local units of government and collaborating agencies, are described below.

ISSUES OF CONCERN

As noted in Chapter II, the initial implementation plan contained the following plan elements based upon the Statutory requirements set forth in Subchapter VI of Chapter 33 of the *Wisconsin Statutes*:

1. Background, including planning area, overall objectives, and overview of statutory requirements.

2. Implementation plan elements, including selected dredging, channel and shoreline maintenance and debris clearing, dam operations at the Waterford dam, streambank erosion protection, shoreline recreation, water safety, navigation and boating regulations, water use, and other plan implementation activities.

3. Anticipated impacts of the implementation plan.

4. Recommended implementation strategies.

Chapter II set forth an overview of the accomplishments of the SEWFRC during its initial decade of operations, and a report on the status of implementation of each of the plan elements listed above.

In addition, however, a number of emerging issues were identified by the SEWFRC Commissioners during the decade since the initial plan was promulgated. The following additional items are considered in this implementation plan update:

1. Exploration of expanding the Commission's overall service area from that currently defined in paragraph (7) of Section 33.53 of the *Wisconsin Statutes*;

2. Evaluation of the membership of the Commission from that currently defined in Section 33.55(1) of the *Wisconsin Statutes*, and formulation of recommendations for modification, if appropriate;

3. Development of procedures for prioritizing and selecting projects to be implemented and for tracking project progress and budgets;

4. Development of alternative funding mechanisms for continued project support and administrative functioning (i.e., webpage), pursuant to the budget process as set forth in Section 33.60 of the *Wisconsin Statutes*, and consideration of ways to change the SEWFRC budget cycle to better match the budget cycles of Racine and Waukesha Counties;

5. Evaluation of the long-term impacts on the Fox River Watershed of the Great Lakes Compact, the regional water quality management plan, and associated State laws and programs related to stormwater management;

6. Identification of potential partnerships to leverage available resources;

7. Identification of future projects along with potential funding sources, including identification of the role of the SEWFRC in any such projects; and,

8. Consideration of the role of the SEWFRC in implementing measures to address urban and rural nonpoint source pollutants, including, but not limited to sediment, through wetland restoration, shoreline buffers, detention basins, stream rehabilitation, and related practices.

Because the original implementation plan elements are required to be addressed under the State legislation creating the SEWFRC (set forth in Subchapter VI of Chapter 33 of the *Wisconsin Statutes*), it may be necessary to obtain changes in the legislation if modifications to the Statutory elements are proposed. It also may be necessary to obtain changes in the legislation if it is proposed to add elements that are not currently included within the Legislative mandate of the SEWFRC. The need for any such modifications are addressed in this implementation plan update, which can serve as a briefing document that would be useful in pursuing changes in legislation.

CONSISTENCY WITH OTHER PLANS

Regional and Subregional Water Quality Management Plans

The Regional Planning Commission is the State-designated areawide water quality management planning agency pursuant to the provisions of the 1972 Federal Clean Water Act. The SEWRPC approach of regional planning is conceived as a hierarchy of plans, initiated by authorities established under the Federal Clean Water Act and devolved upon the SEWRPC as the regional planning organization charged with the local implementation of the Clean Water Act within the Southeastern Wisconsin-Metropolitan Milwaukee Region pursuant to the State Water Pollution Control Act (Chapter 283 of the *Wisconsin Statutes*). The regional water quality management plan provides the framework for the ongoing regional water quality management planning program,[1] including

[1]*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; Volume Three,* Recommended Plan, *June 1979; and as refined in SEWRPC Memorandum Report No. 93,* A Regional Water Quality Management Plan for Southeastern Wisconsin: An Update and Status Report, *March 1995.*

preparation of comprehensive lake management plans such as those for Eagle Spring Lake,[2] Pewaukee Lake,[3] the Phantom Lakes,[4] and Waterford impoundment,[5] all of which have been published or updated since the initial SEWFRC implementation plan was prepared. Also, recommendations set forth in the SEWRPC protection plans for the Pebble Creek and Mukwonago River watersheds,[6] each of which are partially within the portion of the Fox River watershed under the jurisdiction of the SEWFRC, are pertinent to this implementation plan.

Regional Water Supply Plan

In December 2010, SEWRPC adopted a regional water supply plan for the Southeastern Wisconsin Region.[7] This plan has a design year of 2035 and includes several major elements addressing: 1) sources of water supply, 2) water conservation, 3) groundwater recharge area protection, 4) stormwater management practices, 5) high-capacity well siting practices, and 6) enhanced rainfall infiltration. Relative to sources of water supply, the plan identifies areas that are recommended to be served by public water utilities, and, for each area identified, makes a recommendation as to the source of water to be used by the attendant water utility. Depending upon the specific utility, recommended water sources may include the deep aquifer, the shallow aquifer, some combination of deep and shallow aquifers, or Lake Michigan.

The regional water supply plan also recommends implementation of comprehensive water conservation programs, including both supply side efficiency measures and demand side conservation measures. The scope and content of these conservation programs are to be determined on a utility-specific basis to reflect the type and sustainability of the source of supply and probable future water supply infrastructure requirements.

The regional water supply plan further recommends the protection and preservation of groundwater recharge areas classified as having a high or very high recharge potential. Such protection may be largely achieved through the implementation of the adopted design year 2035 regional land use plan,[8] and supporting county comprehensive

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[2]*SEWRPC Community Assistance Planning Report No. 226,* A Lake Management Plan for Eagle Spring Lake, Waukesha County, Wisconsin, *October 1997; and SEWRPC Community Assistance Planning Report No. 226, 2nd Edition,* A Lake Management Plan for Eagle Spring Lake, Waukesha County, Wisconsin, *December 2010.*

[3]*SEWRPC Community Assistance Planning Report No. 58, 2nd Edition,* A Lake Management Plan for Pewaukee Lake, Waukesha County, Wisconsin, *May 2003.*

[4]*SEWRPC Community Assistance Planning Report No. 230,* A Lake Management Plan For The Phantom Lakes, Waukesha County, Wisconsin, *Volume One,* Inventory Findings, *January 2006; and Volume Two,* Alternatives and Recommended Plan, *January 2006.*

[5]*SEWRPC Community Assistance Planning Report No. 283,* A Lake Management Plan for the Waterford Impoundment, Racine County, Wisconsin, *Volume One,* Inventory Findings, *October 2007; and Volume Two,* Alternative and Recommended Plans, *October 2007.*

[6]*SEWRPC Community Assistance Planning Report No. 309,* Mukwonago River Watershed Protection Plan, *June 2010; SEWRPC Community Assistance Planning Report No. 284, Part One,* Pebble Creek Watershed Protection Plan, Waukesha County, Wisconsin, *June 2008.*

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

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

plans,[9] since these plans recommend preservation of the environmental corridors, isolated natural resource areas, and prime and other agricultural areas of the Region that facilitate recharge. Depending on the zoning and development practices utilized, additional highly rated and very highly rated recharge areas also may be substantially protected through inclusion into suburban-density and low-density residential areas that optimize open space. In these areas, it is recommended that careful site design and the application of stormwater management practices designed to maintain the natural hydrology and maintain recharge be applied. It is also recommended that the recharge areas be considered for protection and preservation as open space by agencies and organizations involved in land conservancy activities.

The regional water supply plan additionally recommends implementation of state-of-the-art stormwater management practices, including application of treatment and infiltration systems, which, to the extent practicable, will maintain the natural recharge in areas committed to urban land use development. This recommendation is intended to apply to residential and some nonresidential developments served by both municipal and private water supply systems in order to contribute to a sustainable groundwater supply. Such practices are considered important, even in areas, served by individual wells and onsite sewage disposal systems, where the majority of the water used is returned to the aquifer system as such areas do experience some losses due to water use.

The regional water supply plan recommends that the siting of all new high-capacity wells include analyses of potential impacts, and subsequent monitoring of the actual impacts, of such wells on the shallow aquifer, existing wells, and nearby surface waters. The siting studies should be designed to develop the necessary understanding of the hydrogeological system associated with each candidate site and to assess the likelihood of impacts of proposed wells upon nearby existing wells and surface waterbodies. The studies should include identification of significant potential negative impacts, needed mitigative actions, or site location revisions. Water levels in the vicinity of new high-capacity wells proposed to be placed into the shallow aquifer should be monitored before the wells are constructed to establish a baseline during the test well phase of well development, including levels expected to be maintained in private wells, as well as after the wells are placed into operation to develop performance and impact data.

The regional water supply plan recommends enhanced rainfall infiltration in areas where evaluations conducted in conjunction with the siting of high-capacity wells in the shallow aquifer indicate probable reductions in baseflow in nearby streams and reductions in water levels in lakes and wetlands due to installation and operations of these wells. Two means of providing for the enhanced recharge are recommended: 1) through the installation of constructed rainfall infiltration systems in areas where adverse impacts are anticipated in surface water features considered to be highly dependent on groundwater contributions, and 2) through applications of farming practices that reduce or eliminate tillage of fields. Locating these systems will require site-specific analyses to ensure that enhanced recharge systems are located in areas contributing water to the waterbodies expected to be impacted, and in areas well suited for shallow groundwater recharge. The specific measures used must be selected and designed on a case-by-case, site-specific basis, but generally include such measures as rain gardens, large bioretention basins, infiltration ponds, infiltration ditches, and subsurface storage and infiltration galleries. In contrast, no-till or low-till farming practices have the potential to be applied not only on an areawide basis, but also in areas potentially affected by high-capacity well withdrawals. These no-till and low-till farming practices also have other benefits, such as reduced erosion, which are often the primary purpose for the application of the practice. When applying low- or no-till practices, it will be important to consider additional factors including the potential impact of nutrient management and agricultural chemical management practices on groundwater quality.

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[9]*SEWRPC Community Assistance Planning Report No. 301,* A Multi-Jurisdictional Comprehensive Plan for Racine County: 2035, *November 2009; SEWRPC Community Assistance Planning Report No. 209,* A Development Plan for Waukesha County, Wisconsin, *August 1996, as amended; see also Waukesha County Department of Parks and Land Use, Waukesha County University of Wisconsin-Extension, and Waukesha County Municipalities,* A Comprehensive Development Plan for Waukesha County, Waukesha County, Wisconsin, *February 2009.*

Potential Impacts of a Lake Michigan Diversion on Water Quantity in the Fox River

The recommended diversion of Lake Michigan water to provide a source of water supply for the City of Waukesha, set forth in the regional water supply plan, is subject to the provisions and processes set forth in the Great Lakes-St. Lawrence River Basin Water Resources Compact. This agreement is a legally binding interstate compact among the Great Lakes States that was ratified by concurring legislation of the member states and consented to by the U.S. Congress. With certain limited exceptions, the Compact prohibits all new or increased diversions of water from the Great Lakes basin into another watershed. The three exceptions from the diversion prohibition are for: 1) intra-basin transfers of water from the watershed of one of the Great Lakes into the watershed of another Great Lake, 2) communities that straddle the subcontinental divide between the Great Lakes basin and the adjacent basin (straddling communities), and 3) communities located outside the Great Lakes basin that lie wholly within a county that straddles the subcontinental divide (community within a straddling county).

Under the Compact, the City of Waukesha is considered to be a community within a straddling county. Consequently, the plan recommends that the City of Waukesha Water Utility convert to Lake Michigan as the source of water, with the provision for return flow to Lake Michigan. Return flow could be provided by returning treated wastewater by pipeline either directly to Lake Michigan or to streams tributary to Lake Michigan. With regard to this recommendation, the regional water supply plan recognizes that more detailed engineering, legal, and environmental information will be required to support any application for Lake Michigan water and to meet the requirements of the Great Lakes-St. Lawrence River Basin Water Resources Compact and of 2007 *Wisconsin Act* 227. Such information should be assembled together with the necessary preliminary engineering and planning documents required for plan implementation. In addition, the environmental analysis process, set forth in Chapter NR 150 of the *Wisconsin Administrative Code*, is likely to be deemed applicable by the Wisconsin Department of Natural Resources (WDNR). This process is designed to ensure proper environmental analysis of specific project consequences, and may require preparation of a full environmental impact statement.

The City of Waukesha currently utilizes groundwater as a source of water supply and subsequently discharges it as treated wastewater to the Fox River in the Mississippi River basin. As described above, the regional water supply plan recommends that Waukesha be provided with Lake Michigan water as a source of supply, necessitating the provision of return flows to Lake Michigan. Discharges by the Waukesha wastewater treatment plant currently constitute a major source of water to the Fox River. Reductions in those discharges associated with a return flow of water to the Great Lakes basin, as envisioned in the regional water supply plan and as required by the Great Lakes-St. Lawrence River Basin Water Resources Compact, could potentially produce adverse environmental impacts in the form of reduced flows in the Fox River. The impacts of wastewater treatment plant discharges on the flows in the Fox River are described in the regional water supply plan.[10]

In the regional water supply plan, flow data for the Waukesha wastewater treatment plant were compared to stream discharge data provided by the streamflow gauge located on the Fox River at Waukesha (USGS gauge number 05543830).[11] The flow data were disaggregated into months and the locations of the 10th percentile, 25th percentile, 50th percentile, 75th percentile, and 90th percentile ranks were determined for each month.[12] These

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[10]*SEWRPC Planning Report No. 52*, op. cit.

[11]*This stream gauge is operated under the long-standing SEWRPC-U.S. Geological Survey (USGS) cooperative stream gauging program. It was chosen because of its location in the watershed and because it has a long period of record.*

[12]*A percentile rank is the percentage of values which are lower than a given value. For example, the 10th percentile represents the upper boundary of the lowest 10 percent of the data. The interpretation of this statistic is that on 10 percent or the dates in this month during the period of record, average daily discharge at this gauge was less than or equal to this value. Similarly, the 90th percentile represents the upper boundary of the lowest 90 percent of the data and is interpreted in a similar manner.*

monthly flow percentiles were compared to the average monthly flow from the Waukesha wastewater treatment plant in order to estimate the percentage of the streamflow immediately downstream of the plant's outfall which was comprised of treated effluent. Mean daily streamflows at the Waukesha stream gauge over its period of record was about 68 million gallons per day (mgd).

At the Waukesha wastewater treatment plant outfall, treated effluent from the wastewater treatment plant represents a seasonally significant portion of the discharge during the summer and fall when the flow in the River is less than the monthly median daily average:

- At the 50th percentile, discharge of treated effluent from the Waukesha plant is estimated to represent about one-quarter of the flow immediately below the outfall during the months of July through September. This indicates that, during these months, treated effluent represents more than one-quarter of the flow immediately below the plant outfall about half the time.

- At the 25th percentile, discharges of treated effluent from the plant represent about one-third of the streamflow immediately below the plant outfall during the months of June through October. This indicates that, during these months, treated effluent represents more than one-third of the streamflow immediately below the plant outfall about 25 percent of the time.

- At the 10th percentile, discharges of treated effluent from the wastewater treatment plant represents between 40 percent and 50 percent of the streamflow immediately below the plant outfall during June through December, and about 50 percent of stream flow during September. This indicates that, during these months, treated effluent represents more than 40 percent of the streamflow immediately below the plant outfall about 10 percent of the time.

This analysis indicates that treated effluent from the Waukesha wastewater treatment plant constitutes a major component of baseflow to the Fox River immediately downstream of the treatment plant outfall. Therefore, actions that would eliminate discharges from this wastewater treatment plant may be expected to result in significant seasonal reductions in flow in the Fox River immediately downstream of the treatment plant. It may be expected that these periods of reduced flow would occur about 10 percent of the time. In addition, reductions in flow in the Fox River might also occur if discharges from this wastewater treatment plant were reduced substantially rather than eliminated, although the magnitude of the reductions in flow in the River and the frequency with which impacts would be likely to occur would depend upon the magnitude of the reductions in discharges from the wastewater treatment plant.[13]

Similar analyses were conducted in the regional water supply plan based upon stream discharge data at the streamflow gauge located at New Munster in Kenosha County (USGS gauge number 05545750) and discharges of effluent from the 10 public and four private wastewater treatment plants located upstream from this gauge. These analyses indicate that the impacts on water quantity at the New Munster gauge resulting from return flows

[13]*It is important to note the limitations of this analysis. First, with respect to water quantity, the analysis assumes that effluent additions to streamflow are conservative and additive in the Fox River. This is not the case, principally because of flow interactions between the Fox River and the groundwater system, especially in the case of the large stone quarries operating in the area that pump potentially significant volumes of groundwater from the quarries into the stream system. Also, the analysis does not examine the response of the shallow groundwater system to a conversion by the City of Waukesha to Lake Michigan as a source of water supply. Therefore, the estimates of the impacts on the Fox River of a conversion of the City of Waukesha Water Utility to a Lake Michigan water supply may be considered to be a worst case, rather than a most likely case, scenario. Consequently, the regional water supply plan recognizes that more detailed studies would be necessary to address the potential impacts on water quantity in the Fox River of conversion of the Waukesha Water Utility to a Lake Michigan water supply.*

associated with the Waukesha Water Utility converting to a Lake Michigan source of water supply would most likely be considerably smaller than those estimated at the Waukesha gauge.

The provision of Lake Michigan water as a source of supply to the City of Waukesha would be unlikely to require complete elimination of discharges to the Fox River from the City wastewater treatment plant. Comparison of the average daily pumpage by the Waukesha Water Utility to the average daily discharges reported by the Waukesha wastewater treatment plant in the Compliance Maintenance Annual Reports (CMAR), required pursuant to Chapter NR 208 of the *Wisconsin Administrative Code*, for the years 2003 through 2007 indicates that the water utility pumpage accounted for about 85 percent of the water treated and discharged by the wastewater treatment plant. The remaining 15 percent was derived from clearwater infiltration and inflows into the sanitary sewerage system. Such infiltration and inflows originate as groundwater west of the subcontinental divide. Assuming that this proportion is typical of the sewerage system, it indicates that, on average, about 15 percent of the treated effluent would be available for discharge to the Fox River, while the remaining 85 percent would need to be returned to the Lake Michigan watershed. Thus, the impacts of the return flows, required under the Great Lake-St. Lawrence Water Resources Compact, on water quantity in the Fox River could be reduced through active management of the return flow to the Lake Michigan watershed and periodic discharges to the Fox River. Under such management, during periods of low flow, a portion of the effluent treated by the Waukesha wastewater treatment plant could be discharged to the Fox River in order to enhance the flows in the River, while, during periods of typical flows, most or all of the treated effluent, however, would be returned to Lake Michigan. During periods of high flow, more water would be discharged to the Fox River providing a flood control benefit to the Lake Michigan drainage system. As long as the amount of water returned to the Lake Michigan on an annual basis was equal to the amount withdrawn less the allowance for consumptive use, the return flow requirement should be satisfied.

Additional Considerations Related to a Potential City of Waukesha Diversion of Water from Lake Michigan

Water Quality Considerations

If the source of water supply to the City of Waukesha was to be shifted from groundwater to Lake Michigan water, there should be a reduction in the hardness of the water provided by the Waukesha Water Utility. The regional water supply plan notes that this would minimize or even eliminate the need for water softening by the Utility's customers, resulting in reductions in the concentrations of chloride in the wastewater conveyed to the Waukesha wastewater treatment plant as well as in the chloride loads discharged by the plant. [14] In the case of the Fox River, this would potentially be of benefit in reducing chloride.

Groundwater Considerations

The City of Waukesha currently draws its water supply primarily from the deep aquifer. In this regard, it has been estimated that the City is removing five times more water from the deep aquifer than was naturally replenished in 1900.[15] The use of the deep aquifer by communities within the Region and adjacent areas has resulted in a significant drawdown of that aquifer. At present, there is no immediate water shortage in the area because groundwater is flowing into this aquifer from surrounding areas of the deep aquifer and as leakage from the shallow aquifer. Nevertheless, increased pumpage from the deep aquifer throughout the Region under projected water use demand conditions would contribute to 1) additional draw down of the deep aquifer and associated water supply quality problems and 2) increased pumping costs. Consequently, the regional water supply plan recommends measures that would stop or reverse water level declines in the deep aquifer. Pursuant to the implementation of the recommended plan, water levels in the deep sandstone aquifer would be expected to rise. This increase in water levels should ensure the sustainability of that aquifer through the 2035 planning horizon.

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[14] *SEWRPC Planning Report No. 52,* op. cit.

[15] *SEWRPC Technical Report No. 46,* Groundwater Budget Indices and their Use in Assessing Water Supply Plans for Southeastern Wisconsin, *February 2010.*

Under the recommended regional water supply plan, it is recommended that certain water utilities that currently obtain their water supply from the deep aquifer, or a combination of the deep and shallow aquifers, increase their reliance on the shallow aquifer in the future. It is also recommended that certain utilities that currently rely on a groundwater supply switch to a Lake Michigan supply. Because unconfined shallow aquifers are hydraulically connected to surface waterbodies, water levels in the shallow aquifers are buffered by the surface water system. Consequently, increased reliance on the shallow aquifer may result in reductions in groundwater-derived baseflows in some locations. In other locations, baseflows would be expected to increase because of less reliance on the shallow aquifer when certain utilities switch to Lake Michigan as a source of supply. Prior to finalizing the recommended water supply plan components for the Region, two subalternatives were developed. The only difference between those subalternatives is that Subalternative Plan 1 calls for the City of Waukesha to continue to utilize groundwater as a source of supply, with the supply being obtained approximately equally from both the shallow and deep aquifers, while Subalternative Plan 2, which was adopted as the recommended plan, calls for the City of Waukesha to obtain a Lake Michigan source of supply. The effects on baseflows to streams were evaluated under each subalternative by applying the regional groundwater simulation model.[16] That evaluation shows that under each subalternative some streams in the Fox River watershed could be expected to see some reduction in baseflow, while others would be expected to experience an increase, or augmentation, in baseflow. The evaluation also indicates that the reductions would be less significant and the augmentations somewhat more significant under Subalternative 2 with the City of Waukesha switching to a Lake Michigan source of supply. Measures are recommended to be implemented under the regional water supply plan to moderate the effects of increased reliance on the shallow aquifer as a source of supply and to evaluate, and to mitigate where warranted, the effects on surface water resources of new high capacity wells that may be developed in the shallow aquifer in the future. The recommended plan (Subalternative 2) calling for connection of the City of Waukesha to a Lake Michigan supply was found to meet the plan objectives more fully than Subalternative 1, primarily because the recommended plan offers advantages relating to the long-term sustainability of the deep aquifer, reductions in chloride discharges to surface waters, and improvements in groundwater-derived baseflow inputs to the surface water system.[17]

Biological Status Considerations

There could be habitat and biological status issues associated with a proposed diversion of Great Lakes water to the City of Waukesha. Both SEWRPC and WDNR staff have noted that the Fox River downstream of the City of Waukesha wastewater treatment plant contains a high quality fishery, including a number of endangered, threatened, and special concern species. These fish communities have been documented in SEWRPC river protection plans in both the Pebble Creek and Mukwonago River tributaries to the Fox River,[18] with the former plan noting the value of the Fox River as a refuge for these fishes during times of stress within the Creek. This high quality abundance and diversity of fishes could be negatively affected by reduced flows in the Fox River. The active flow management approach as described under the regional water supply plan could offset the potential negative effects during low-flow periods on the Fox River, which are especially critical to the abundance and diversity of fishes. In addition, the reduction in groundwater abstractions associated with the proposed use of Lake Michigan water as a source of water supply for the City of Waukesha Water utility could enhance the discharge of groundwater into the Fox River, to the benefit of the fishery, especially those species favoring colder water conditions.

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[16]*See SEWRPC Planning Report No. 52, Map 111, page 616; Map 112, page 617; Map 118, page 650; and Map 119, page 651.*

[17]*SEWRPC Planning Report No. 52,* op. cit.

[18]*See SEWRPC Community Assistance Planning Report No. 284,* Pebble Creek Watershed Protection Plan, Waukesha County, Wisconsin, *Part One, June 2008; SEWRPC Community Assistance Planning Report No. 309,* Mukwonago River Watershed Protection Plan, *June 2010.*

RELATIONSHIPS WITH OTHER GOVERNMENTAL UNITS

The SEWFRC, as a special-purpose unit of government created pursuant to the provisions of Subchapter VI of Chapter 33 of the *Wisconsin Statutes*, has defined relationships with the general-purpose units of government that nominate the individuals who form the SEWFRC Board of Commissioners. In addition, there are a number of special-purpose units of government within, or in the vicinity of, the SEWFRC jurisdictional area. Typically, these units of government lack a formal relationship with the SEWFRC, although, in the case of the Illinois Fox Waterway Agency as described below, the SEWFRC has entered into an intergovernmental agreement pursuant to the authorities granted in Section 66.0301 of the *Wisconsin Statutes*. The Waterford Waterway Management District (WWMD), a Subchapter IV governmental organization created under Chapter 33 of the *Wisconsin Statutes*, although lacking a formal intergovernmental agreement with the SEWFRC, remains an active partner with the SEWFRC within the Waterford impoundment.

Special-Purpose Units of Government

Waterford Waterway Management District

The Waterford impoundment is a 1,132-acre waterbody located within U.S. Public Land Survey Sections 10 through 15, 23, 26, and 35, Township 4 North, Range 19 East, Town and Village of Waterford, Racine County, as shown on Map 2. The tributary area draining to the impoundment is about 358 square miles. While this tributary basin has historically encompassed large tracts of agricultural land, increasing portions are in urban land uses and the trend toward urban development continues.

The impoundment is both fed and drained by the Fox River. The Fox River enters the impoundment at its northern extreme, and continues in a southerly direction after passing over the fixed crest of the Waterford dam in the Village of Waterford. The western portion of the dam was reconstructed in 1977. There are two fixed-crest spillways, flanking the radial gates installed in 1977 pursuant to recommendations set forth in the adopted Fox River watershed plan.[19] In addition to the Fox River, a number of small streams and springs drain to the impoundment.

Seeking to improve the usability of the Waterford impoundment, restore and protect its natural assets, and develop its recreational use potential in a manner consistent with the water use objectives applied to the impoundment and its attendant stream system, the Waterford community formed the WWMD in 2003.[20] As one of its first actions, the WWMD requested that SEWRPC work cooperatively with the District and WDNR to prepare a lake management plan for the impoundment. The resultant comprehensive lake management plan represents part of the ongoing commitment of the WWMD, as well as of the Village and Town of Waterford, to sound environmental planning and ecosystem restoration and protection with respect to the impoundment and Fox River watershed.[21]

The goals of the WWMD with respect to the impoundment, as adopted at the meeting of the Board of Commissioners on November 20, 2004, include the following:

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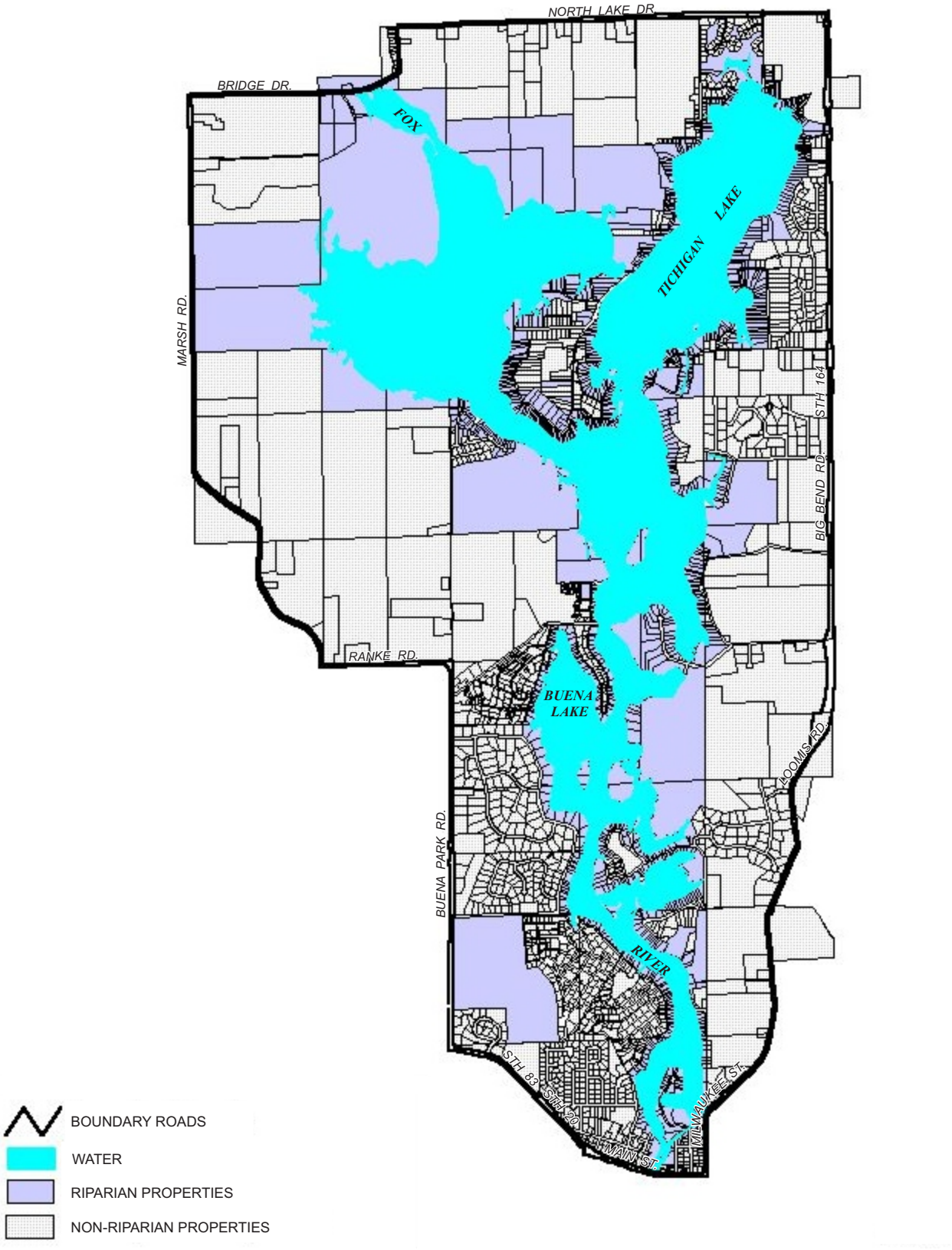
[19]*SEWRPC Planning Report No. 12,* A Comprehensive Plan for the Fox River Watershed, *Volume One,* Inventory Findings and Forecasts, *April 1969, and Volume Two,* Alternative Plans and Recommended Plan, *February 1970.*

[20]*The Waterford Waterway Management District is a public inland lake protection and rehabilitation district formed under Subchapter IV of Chapter 33 of the* Wisconsin Statutes.

[21]*See SEWRPC Community Assistance Planning Report No. 283,* op. cit.

Map 2

BOUNDARY OF THE WATERFORD WATERWAY MANAGEMENT DISTRICT



Source: Racine County Real Estate Description Department.

- Monitoring and proactively contributing to the preparation of the Lake Management Plan being developed by SEWRPC and aggressively implementing its recommendations.

- Building and maintaining close partnerships with the WDNR, the Town and Village of Waterford, Racine County, and the Fox River Citizens Against Underwater Sedimentation and Erosion (Fox River CAUSE), among others, to garner their commitment and support for initiatives to improve and protect the waterway.

- Developing productive relationships with the U.S. Army Corps of Engineers, the Southeast Wisconsin Fox River Basin Partnership, the Racine County Lakes Association, and other agencies, boards, and commissions to promote the betterment of the waterway.

- Establishing and implementing projects, programs, and measures which complement the Lake Management Plan and improving the surrounding tributary area environment, thereby reducing or eliminating new or existing negative influences on the quality of the water within the Fox River and Tichigan Lake.

- Informing and educating the electors and property owners of the District, waterway users, and the general community on issues, plans, and programs affecting the tributary area environment to gain their active support for, and participation in, District initiatives.

- Establishing and maintaining a fiscally responsible budget that represents the needs and desires of District electors and property owners, and that supports all programs that lead to environmental improvement and ecosystem renewal.

- Maintaining appropriate and meaningful boundaries for the District such that all property owners located within will benefit from inclusion in the District and thereby promote improvement of the waterway.

- Encouraging open discussion and public participation at all District Board of Commissioners and Committee meetings.

Since the publication of the comprehensive lake management plan for the Waterford waterway, the WWMD has cooperated closely with the SEWFRC in the implementation of projects and programs within the two Commissions' joint jurisdiction, below the bridge at North Bridge Drive in the Town of Waterford. These actions represent several of many actions undertaken by the District to manage the Waterford impoundment and its natural resources, as noted in Tables 1 and 2 in Chapter II of this document.

Town of Waterford Sanitary District No. 1

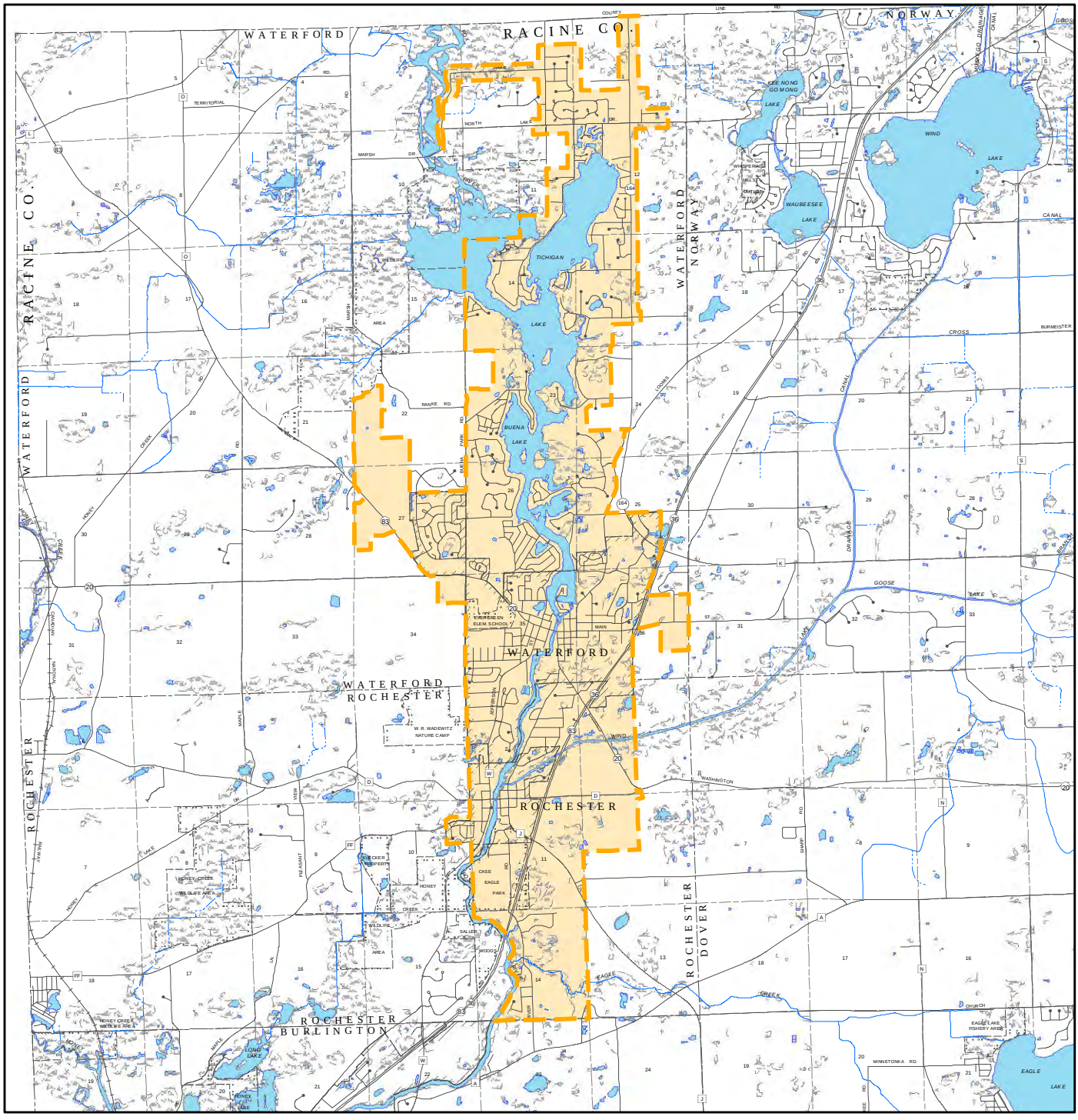
The Town of Waterford Sanitary District No. 1 was formed pursuant to authorities granted to the Town of Waterford under Subchapter IX of Chapter 60 of the *Wisconsin Statutes*. The District provides wastewater conveyance to approximately 40 percent of the Town's population, centered around Tichigan Lake and areas riparian to the Waterford impoundment, as shown on Map 3.[22] Wastewater treatment is provided by the Western Racine County Sewerage District facilities located in the Village of Rochester.[23] The provision of public sanitary

[22]*SEWRPC Community Assistance Planning Report No. 141, 2nd Edition,* Sanitary Sewer Service Area for the Waterford/Rochester Area, Racine County, Wisconsin, *April 1996.*

[23]*SEWRPC Community Assistance Planning Report No. 217,* A Land Use Plan for the Town of Waterford: 2010, Racine County, Wisconsin, *May 1995, as amended.*

Map 3

BOUNDARY OF THE TOWN OF WATERFORD SANITARY DISTRICT NO. 1



SANITARY DISTRICT BOUNDARY

Source: SEWRPC.

N

0 3,500 7,000 10,500 Feet

sewer service within the Town of Waterford was initiated with the creation of the Town of Waterford Sanitary District No. 1 during 1972, although it was not until the summer of 1986 that the sanitary sewer service area plan was completed. Provision of public sewer service reduces the pollutant loadings from the onsite sewage disposal systems to both surface water and groundwater.

The revised year 2010 Waterford/Rochester sanitary sewer service area, tributary to the Western Racine County Sewerage District sewage treatment facility, encompasses about 10.3 square miles. About 3.2 square miles of primary environmental corridors and about 0.2 square mile of isolated natural resource areas were located within this service area. This revised year 2010 sanitary sewer service area tributary to the Western Racine County Sewerage District wastewater treatment facility would accommodate a design year 2010 resident population of about 11,600 persons, with a seasonal population of about 600 persons. The incremental population and housing unit levels envisioned in the Waterford/Rochester sewer service area would be accommodated at a density of about 1.8 dwelling units per net residential acre, or within the recommended net density range for the Waterford/Rochester area of the Region as identified in the regional land use plan.[24]

Racine County Farm Drainage District No. 1

Racine County Farm Drainage District No. 1 appears to have been established in 1921, pursuant to authorities granted to the Racine County circuit court under Chapter 88 of the *Wisconsin Statutes*, with the agricultural drain tile system being installed shortly thereafter.[25] While the files available from the Racine County Clerk of Courts indicate that the original clay drain tiles have been repaired and replaced over the ensuing years, no records could be found indicating the size, type, and total length of replacement tile in any given year, or the precise locations, elevations, or grades of the replacements. The lands tributary to the subsurface agricultural drainage system maintained by the Farm Drainage District total about 1.3 square miles. As of 1993, approximately 18 percent of the tributary area was located within the Town of Norway, 63 percent within the Town of Waterford, and 19 percent within the Village of Waterford, as shown on Map 4. As of 1990, about 80 percent of the land in the study area was in rural land uses including cropland, pasture and other agricultural lands, unused lands, wetlands, and woodlands. The balance was in urban land uses including residential, commercial, and transportation-related land uses.

The stormwater drainage system which serves urban development in the Waterford area has been interconnected over time with the agricultural drain tile system, resulting in overloading of the drain tile system and the lift station operated by the Racine County Farm Drainage District No. 1. The major interconnection occurred in 1977 when the Foxmead subdivision was developed in Village of Waterford. The subdivision was constructed along the portion of drain tile between STH 36 and the abandoned electric interurban railway right-of-way located to the northwest. This resulted in the abandonment of a portion of the tile drainage system, which was replaced by two detention basins constructed in the subdivision. These basins drained through storm sewers which connected with the drain tiles conveying flows from the remainder of the agricultural drainage system. This combined flow is then conveyed via the main drain tile to the Racine County Farm Drainage District No. 1 lift station where it is ultimately pumped into the Fox River through a series of open and enclosed channels. A further interconnection between the urban stormwater drainage system and the agricultural drainage system occurred in the Town of Waterford at the west end of South Gale Circle where a surface inlet admits runoff from a portion of a small development along South Gale Circle to drain tile line. The lift station at the outlet of the drain tile system was installed around 1963 in an effort to improve drainage from the low-lying lands along the tile line, which was impeded by relatively high levels of the Fox River at the tile outlet and by ground subsidence resulting from settlement along the drain tile lines following the initiation of drainage in the 1920s.

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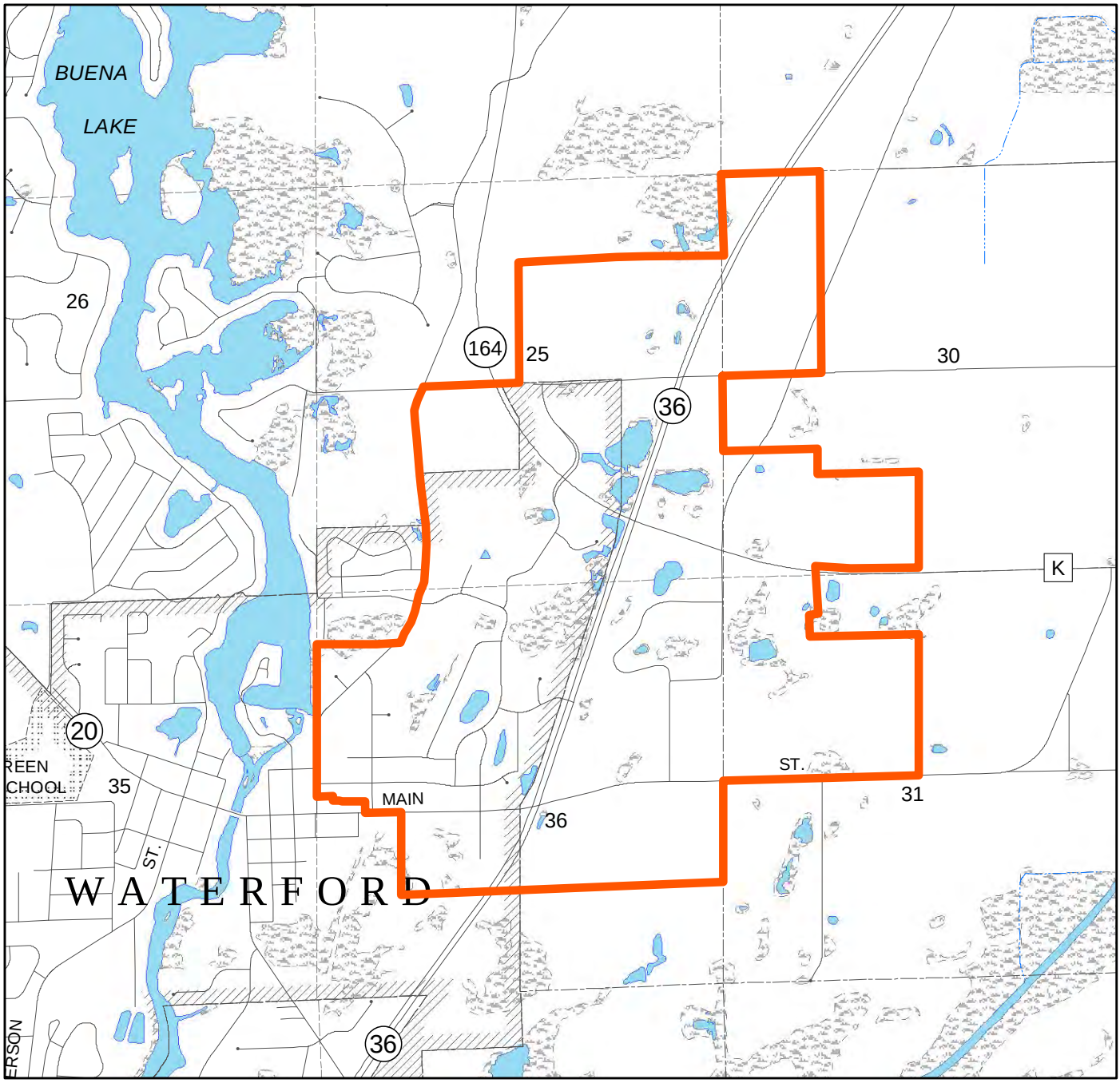
[24]*SEWRPC Planning Report No. 48,* op. cit.

[25]*SEWRPC Memorandum Report No. 79,* An Agricultural Drainage and Urban Stormwater Management Plan for Racine County Farm Drainage District No. 1, Village of Waterford and Towns of Norway and Waterford, Racine County, Wisconsin*, September 1993.*

Map 4

BOUNDARY OF THE WATERFORD DRAINAGE DISTRICT



Source: Racine County and SEWRPC.

As of 2010, the Racine County Farm Drainage District No. 1 and the Village of Waterford were considering the conversion of the District to a stormwater utility district.[26]

Illinois Fox Waterway Agency

During 2002, the SEWFRC entered into an intergovernmental agreement with the Illinois Fox Waterway Agency. This agreement recognized the Illinois-Fox River—with Lake Tichigan and the Chain O' Lakes, from its headwaters in Waukesha County, Wisconsin, through Lake and McHenry Counties in Illinois—as an important recreational and ecological asset for the quality of life of both Illinois and Wisconsin citizens. The agreement also recognized the actions of the State Legislatures—both in the State of Illinois in creating the Fox Waterway Agency to specifically address the Fox River system in Illinois, and in the State of Wisconsin in creating the Southeastern Wisconsin Fox River Commission to address the Fox River system in Wisconsin—to promote clean and navigable waters, and address a myriad of common water quality and recreation issues, across state lines. Because the two agencies lack a common boundary, consideration of creating such a coterminous jurisdictional boundary was identified as an issue of concern to be considered in the current implementation plan for the SEWFRC.

With respect to the proposed request for access to water from Lake Michigan by the City of Waukesha, as discussed above,[27] the requirement for return flows to be directed back into the Great Lakes has been noted by the Fox Waterway Agency as a concern voiced by the recreational boating community and riparian communities to the Chain O'Lakes in Illinois. This concern relates to reductions in water depth and potential navigational concerns associated with periods of low flow in the Fox River.

Implications of a Possible Future Expansion of the SEWFRC Jurisdiction

The SEWFRC Board of Commissioners, in a 2010 discussion of boundary options, summarized in Chapter IV, considered a southward expansion of the SEWFRC jurisdiction along the mainstem of the Fox River from its current southern boundary in the Village of Waterford to the state line, so as to create a contiguous boundary with the Illinois Fox Waterway Agency. The SEWFRC Board of Commissioners, through this consideration, expressed the viewpoint that such an expansion would better facilitate joint actions for managing the River, its flows, and its contaminant loads within both States. Inclusion of those downstream municipalities, riparian to the mainstem of the Fox River, between the Village of Waterford in Racine County, and the Wisconsin-Illinois state line would add the City of Burlington, the Village of Rochester, and the Town of Burlington, all in Racine County, and the Village of Silver Lake, the Town of Wheatland, and the Town of Salem, all in Kenosha County.

Similarly, should consideration be given to including the upstream riparian municipalities so as to encompass the entirety of the mainstem of the Fox River within the State of Wisconsin, there would be a potential to add several further municipalities within Waukesha County, including the Cities of Brookfield and Pewaukee, the Villages of Lannon and Menomonee Falls, and Town of Brookfield.

Inclusion of these municipalities would also increase the numbers of special-purpose governmental units that would be encompassed within a potential future SEWFRC jurisdiction. In the downstream direction, south of the Village of Waterford, an expanded SEWFRC would include portions of the Norway and Dover Drainage District, the Eagle Creek Drainage District, and the Hoosier Creek Drainage District in Racine County, all of which are farm drainage districts created pursuant to Chapter 88 of the *Wisconsin Statutes*. No additional farm drainage districts would be encompassed within a proposed future SEWFRC in an upstream direction, along the mainstem of the Fox River.

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[26]*Documented in SEWRPC Community Assistance Planning Report No. 259,* A Land and Water Resource Management Plan for Racine County: 2000-2004, *September 2000.*

[27]*See SEWRPC Planning Report No. 52,* op. cit.

In the downstream direction, south of the Village of Waterford, an expanded SEWFRC would include portions of the Western Racine County Sewerage District and the Town of Salem Sewer Utility District No. 2. The Pewaukee Lake Sanitary District, a Chapter 60, *Wisconsin Statutes*, town sanitary district with public inland lake protection and rehabilitation district powers serving the Town of Delafield and the City of Pewaukee through contractual agreements, also would be partially included within an expanded SEWFRC jurisdiction extending upstream of the current northern boundary.

Concluding Remarks

A range of governmental organizations currently exist within and adjacent to the boundary of the SEWFRC as established under Chapter 33 of the *Wisconsin Statutes*, and a number of additional organizations also may come into similar geographic relationships with the SEWFRC in the future. To the extent practicable, entering into formal or informal relationships with these entities would provide the SEWFRC with a broad governmental platform from which to manage the Fox River, its water quality and navigation. Formal relationships with these governmental entities can be accomplished through intergovernmental agreements authorized pursuant to the provisions of Chapter 66 of the *Wisconsin Statutes*, while informal relationships can be built through the dissemination of the SEWFRC meeting notices and minutes. The formal agreement with the Illinois Fox Waterway Agency and informal relationship with the WWMD provide examples of these types of arrangements which have proven mutually beneficial in the ability of the SEWFRC achieving its mission. These types of relationships are at the discretion of the SEWFRC Board of Commissioners and the governing bodies of the potential partner agencies. In the case of a possible future change in the SEWFRC jurisdiction, Legislative action would be required to amend Chapter 33 of the *Wisconsin Statutes*. In the interim, therefore, an awareness of the SEWFRC's neighboring governmental bodies can provide a platform for joint action and activities in the management of the Middle Fox River, while the SEWFRC website provides a vehicle for outreach to the community at large and other nongovernmental organizations with interests in the Fox River and its environs.

Chapter IV

IMPLEMENTATION PLAN

INTRODUCTION

Subchapter VI of Chapter 33 of the *Wisconsin Statutes* requires that the Southeastern Wisconsin Fox River Commission (SEWFRC) develop an implementation plan to facilitate the conduct of its operations within the middle reaches of the Fox River to address issues of concern to Racine and Waukesha Counties and riparian municipalities, including the City of Waukesha; the Villages of Big Bend, Mukwonago, and Waterford; and the Towns of Mukwonago, Vernon, Waterford, and Waukesha. In the implementation plan, the Commission is required to address the following plan elements in fulfillment of its Statutory requirements: selective dredging, channel and shoreline maintenance and debris clearing, dam operations at the Waterford Dam, streambank erosion protection, shoreline recreation, water safety, navigation and boating regulations, water use, and other plan implementation activities. The initial 1998 implementation plan, consequently, identified a number of specific areas where interventions were recommended, based upon inventory data set forth in the regional water quality management plan and site-specific investigations conducted in support of the SEWFRC by the Southeastern Wisconsin Regional Planning Commission (SEWRPC).[1]

Based upon the accomplishments of the SEWFRC that have been summarized in Chapter II of this plan, and on the emerging issues identified in Chapter III, this chapter sets forth a framework implementation plan to guide SEWFRC activities over the next decade.

ACTIONS TO ADDRESS STATUTORY ISSUES

Areas for Selective Dredging and Channel Clearing

Watershed

Overview

Table 3 documents the efforts of the Fox River municipalities and Counties in adopting construction site erosion control ordinances and stormwater management requirements as mechanisms to reduce the flow of contaminants,

[1]*See 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; Volume Three,* Recommended Plan, *June 1979; as refined in SEWRPC Memorandum Report No. 93,* A Regional Water Quality Management Plan for Southeastern Wisconsin: An Update and Status Report, *March 1995; see also SEWRPC Memorandum Report No. 102,* Water Level Control Plan for the Waterford-Vernon Area of the Middle Fox River Watershed, Racine and Waukesha Counties, Wisconsin, *March 1995.*

Table 3

ENVIRONMENTAL AND NATURAL RESOURCE-RELATED LAND USE REGULATIONS OF THE SOUTHEASTERN WISCONSIN FOX RIVER COMMISSION MEMBER MUNICIPALITIES: 2010

Community	Type of Ordinance				
	General Zoning	Floodland Zoning	Shoreland or Shoreland Wetland Zoning	Subdivision Control	Construction Site Erosion Control and Stormwater Management
Waukesha County.....	Adopted	Adopted	Adopted and WDNR approved	Floodland and shoreland only	Adopted
City of Waukesha.....	Adopted	Adopted	Adopted	Adopted	Adopted
Village of Big Bend	Adopted	Adopted	Adopted and WDNR approved	Adopted	Included in other ordinances
Village of Mukwonago.....	Adopted	Adopted	Adopted	Adopted	Adopted
Town of Mukwonago.....	Adopted	County ordinance	County ordinance	Adopted	Included in other ordinances
Town of Vernon	County ordinance	County ordinance	County ordinance	Adopted	Included in other ordinances
Town of Waukesha	Adopted	County ordinance	County ordinance	Adopted	Included in other ordinances
Racine County.....	Adopted	Adopted	Adopted	Adopted	Adopted
Village of Waterford	Adopted	Adopted	Adopted	Adopted	Adopted
Town of Waterford	County ordinance	County ordinance	County ordinance	Adopted	Adopted

NOTE: WDNR = Wisconsin Department of Natural Resources.

Source: SEWRPC.

including sediment, into the Fox River and its attendant waterbodies. Enforcement of these ordinances forms a necessary prerequisite to the management of accumulated materials within the River. This is especially true for accreting waterbodies such as the Waterford Impoundment wherein the deposition of sediments has reduced navigability in portions of the impoundment and contributed to loss of storage and associated flood risks. While these measures are applicable to the urban areas within the watershed, similar soil erosion control measures are recommended for application in rural areas. In particular, low- or no-till agricultural practices and the provision and protection of riparian buffer strips form effective agricultural soil erosion control practices which should be widely implemented. In this regard, the regional water quality management plan, the nonpoint source pollution control plan, and the County agricultural erosion control plans promote reduction in soil losses due to agriculture and other human activities within the basin.[2]

[2]*See SEWRPC Planning Report No. 30,* op. cit., *Volume Three,* Recommended Plan, *June 1979; as refined in SEWRPC Memorandum Report No. 93,* op. cit.*; Wisconsin Department of Natural Resources Publication No. WR-366-94,* Nonpoint Source Control Plan for the Upper Fox River Priority Watershed Project, *June 1994; Wisconsin Department of Natural Resources Publication No. PUBL-WT-701-02,* The State of the Southeast Fox River Basin, *February 2002; SEWRPC Community Assistance Planning Report No. 159,* Waukesha County Agricultural Soil Erosion Control Plan, *June 1988; SEWRPC Community Assistance Planning Report No. 160,* Racine County Agricultural Soil Erosion Control Plan, *July 1988; SEWRPC Community Assistance Planning Report No. 259, 2nd Edition,* A Land and Water Resource Management Plan for Racine County: 2008-2012, *October 2007; Waukesha County Department of Parks and Land Use,* Waukesha County Land and Water Resource Management Plan 2006-2010, *January 2006.*

Stormwater Management

The 1987 amendments to the *Federal Clean Water Act* established a Federal program for permitting stormwater discharges. The State of Wisconsin obtained certification from the U.S. Environmental Protection Agency which enabled the State to administer a stormwater discharge permitting program as an extension of the existing Wisconsin Pollution Discharge Elimination System (WPDES) program. Section 283.33 of the *Wisconsin Statutes* provides authority for the issuance of stormwater discharge permits by the State. The administrative rules for the State stormwater discharge permit program are set forth in Chapter NR 216, "Storm Water Discharge Permits," of the *Wisconsin Administrative Code*, which took effect on November 1, 1994, and were most recently updated effective December 2009. Within the jurisdictional area of the SEWFRC, Racine and Waukesha Counties, the City of Waukesha, the Villages of Big Bend and Mukwonago, and the Towns of Vernon and Waukesha are required to have a stormwater discharge permit under Chapter NR 216.[3]

URBAN AND URBANIZING AREAS

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.

Regardless of whether a municipality is required to have a stormwater discharge permit under Chapter NR 216, Chapter NR 151 requires that all construction sites that have one acre or more of land disturbance must discharge no more than five tons of sediment per acre per year.[4] 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.

Further, 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 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 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

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[3]*Upstream of the SEWFRC jurisdictional area, the Cities of Brookfield and Pewaukee, the Villages of Lannon and Menomonee Falls, and the Town of Brookfield are subject to stormwater discharge permitting requirements, while downstream of the SEWFRC jurisdictional area Kenosha County, the Village of Silver Lake, and the Towns of Salem and Wheatland, all of which are located on the mainstem of the Illinois-Fox River, are subject to stormwater discharge permitting requirements.*

[4]*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, the existing standard of an 80 percent reduction in the amount of sediment that runs off the site will still be in effect.*

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.

Rural Areas

In addition, the State Legislature required the Wisconsin Department of Natural Resources (WDNR) and the Wisconsin Department of Agriculture, Trade and Consumer Protection (WDATCP) to develop performance standards for controlling nonpoint source pollution from agricultural and nonagricultural land and from transportation facilities.[5] Chapter NR 216 identifies several categories of municipalities, industries, and construction sites that must obtain permits. The permit requirements are based on the performance standards set forth in Chapter NR 151 of the *Wisconsin Administrative Code*, which became effective on October 1, 2002. These latter standards were revised in December 2010. In general, for land that does not meet the Chapter 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.

Under Chapter NR 216 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. 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. Chapter 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.

Recommendations

It is recommended that the construction site erosion control ordinances and stormwater management requirements continue to be stringently enforced by the Counties and/or Fox River municipalities, including requirements for the maintenance of such facilities, in order to minimize the conveyance of contaminants from the land surface to the waterways. It is further recommended that these ordinances be reviewed periodically by the Counties and Fox River municipalities, as appropriate, for consistency with the state-of-the-art and the requirements refined accordingly. The SEWFRC can assist the Fox River municipalities in this endeavor by providing advice and soliciting support for the funding of both urban and rural nonpoint source pollution abatement practices, including support for the provision of State resources through the runoff management grant programs promulgated under Chapters NR 153, NR 154, and NR 155 of the *Wisconsin Administrative Code*, among other programs.

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[5]*The State performance standards are set forth in the Chapter NR 151, "Runoff Management," of the* Wisconsin Administrative Code. *Additional* Wisconsin Administrative 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, "Runoff Management Grant Program," Chapter NR 154, "Best Management Practices, Technical Standards and Cost-Share Conditions," and Chapter NR 155 "Urban Nonpoint Source Water Pollution Abatement and Stormwater Management Grant Program." Those chapters of the* Wisconsin Administrative Code *became effective during 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 Wisconsin Department of Agriculture, Trade, and Consumer Protection revised Chapter ATCP 50, "Soil and Water Resource Management," to incorporate the changes required under 1997* Wisconsin Act *27.*

River System

Overview

The initial implementation plan noted that boating activity on the Fox River was severely restricted due to sedimentation and accumulation of fallen trees and debris which had become increasingly more severe over time. These obstructions were documented by the SEWRPC staff, and formed the basis for recommendations set forth in the initial implementation plan.[6]

Since that time, different reaches of the Fox River have experienced relatively large floods, such as those associated with regional rainfall events in 1999, 2000, 2004, 2007, 2008, 2009, and 2010.[7] These events have exacerbated the obstructions and navigational impairments reported during the initial planning program. At least two major debris jams were observed during a 2010 reconnaissance conducted by SEWRPC staff, as shown in Figure 3. These debris jams were of such magnitude that even a small watercraft, such as a canoe, could not travel downriver without being portaged around the obstacles. Numerous other tree falls were observed during this reconnaissance; however, the placement of these tree falls was such that they did not constitute a navigational obstruction as shown in Figure 4. In general, the WDNR has noted that such tree falls constitute significant and beneficial habitat for fishes and other aquatic life.[8]

In addition to the tree falls, erosion and deposition of sediment remain an issue of concern in the Fox River downstream of the City of Waukesha. While sediment deposits, such as those described in the 1995 SEWRPC water level control plan, were not readily apparent during the 2010 reconnaissance due to high water conditions, it is expected that similar conditions may exist in selected reaches of the upstream reaches of the River. Examples of streambank and roadside (CTH ES) erosion are shown in Figure 5.

Recommendations

It is recommended that navigability along the River be maintained by the WDNR, Counties, Fox River municipalities, and riparian landowners, as appropriate, through the removal of selected accumulations of sediment, debris, and log jams. This recommendation is intended to provide for the removal of selected sediment deposits that are the most severe impediments to navigation. Once the navigability of the channel is established, it is recommended that a routine schedule of maintenance be carried out.

It should be noted that the removal of material from the bed of a navigable waterway such as the Fox River will require a permit from the WDNR under Chapter 30 of the *Wisconsin Statutes* and potentially from the U.S. Army Corps of Engineers and County in which the work is to be undertaken. The permit application will require identification of a dredge spoil site and provision of sufficient detail so that an assessment can be made of the potential environmental impacts of the project. Selected dredging projects in excess of 3,000 cubic yards of material require the preparation of an environmental analysis pursuant to Chapter NR 150 of the *Wisconsin Administrative Code*. Sediment depth data for the existing and proposed channel would have to be developed at

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[6]*See SEWRPC Memorandum Report No. 102,* op. cit.

[7]*See U.S. Geological Survey Scientific Investigations Report 2008–5235, "Flood of June 2008 in Southern Wisconsin," 2008, and peak instantaneous streamflow records for the USGS Fox River gauges at Waukesha (No. 05543830),* http://nwis.waterdata.usgs.gov/wi/nwis/peak?site_no=05543830&agency_cd=USGS&format=html, *and near New Munster (No. 05545750),* http://nwis.waterdata.usgs.gov/wi/nwis/peak?site_no=05545750&agency_cd=USGS&format=html.

[8]*See, for example, Wisconsin Department of Natural Resources Publication No. PUB FR-388 2007,* Management Recommendations for Forestry Practices along Wisconsin's Coastal Trout Streams, *June 2007; Wisconsin Department of Natural Resources Publication No. FR093 REV03,* Wisconsin's Forestry Best Management Practices for Water Quality: A Field Manual for Loggers, Landowners and Land Managers, *2003.*

Figure 3

MAJOR DEBRIS JAMS ON THE FOX RIVER: 2010

Source: SEWRPC.

Figure 4

TREE FALLS FORMING AQUATIC HABITAT AREAS ALONG THE FOX RIVER: 2010

Source: SEWRPC.

Figure 5

EROSION OBSERVED ALONG THE FOX RIVER: 2010

Source: SEWRPC.

the sites where sediment removal is proposed, and appropriate habitat protection and restoration responses detailed, including erosion control measures and return flow management practices. The WDNR may require that additional testing of sediments be made as part of the review process.

To the extent practicable, remedial measures to stabilize eroding banks should be accomplished through biological rather than "harder" structural engineering approaches. Where the River flow is such that biological alternatives are not practicable, use of riprap could be considered, as shown in Figure 6. Figure 7 shows examples of remedial measures implemented by the SEWFRC during the period of the initial implementation plan.

Guidance regarding the removal of fallen trees and debris is available from both the U.S. Department of Agriculture and the American Fisheries Society.[9]

Impoundment Area

Overview

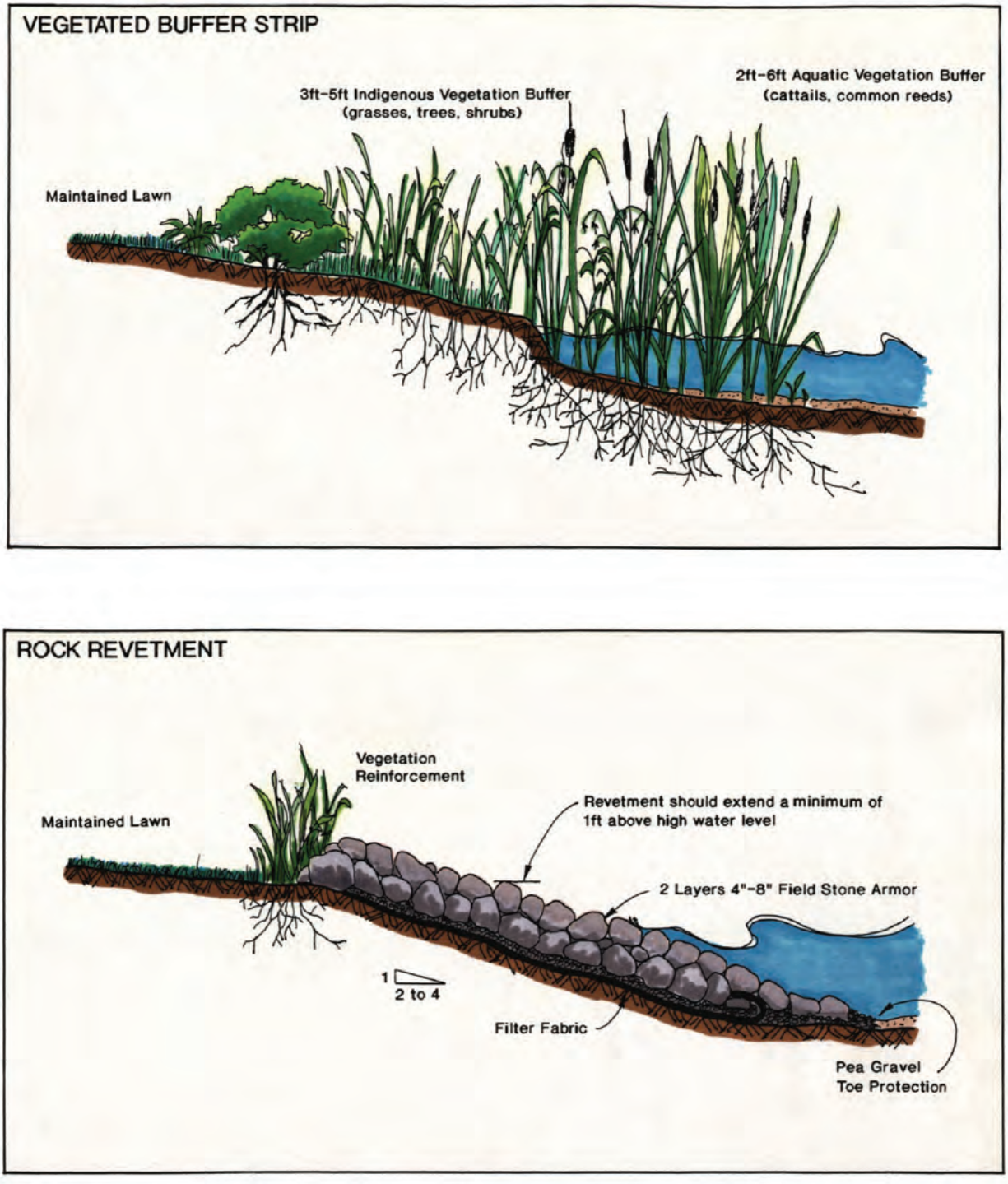
Water depth problems due, in part, to sedimentation currently severely limit shoreline access and boating activities within the Waterford Impoundment.[10] In addition to the shoreline areas, there is a significant observed problem with navigation in the upper reaches of the impoundment as a result of the siltation which has occurred. The problems associated with lack of depth for navigation are aggravated during low water periods, while the transport and deposition of sediment in the debouchment of the Fox River has been aggravated by the recent

[9]*See U.S. Department of Agriculture Report R8-TP-16,* Stream Habitat Improvement Handbook, *June 1992; and American Fisheries Society Report,* Stream Obstruction Removal Guidelines, *1983.*

[10]*See SEWRPC Community Assistance Planning Report No. 283,* A Lake Management Plan for the Waterford Impoundment, Racine County, Wisconsin, *Volume One,* Inventory Findings, *October 2007; Volume Two,* Alternative and Recommended Plans, *October 2007.*

Figure 6

RECOMMENDED ALTERNATIVES FOR SHORELINE EROSION CONTROL



NOTE: Design specifications shown herein are for typical structures. The detailed design of shoreline protection structures must be based upon analysis of local conditions.

Source: SEWRPC.

Figure 7

EXAMPLES OF SHORELINE STABILIZATION AND HABITAT RESTORATION PROJECTS COMPLETED BY THE SOUTHEASTERN WISCONSIN FOX RIVER COMMISSION: 1998-2010

Source: SEWRPC.

floods.[11] The point of deposition is such that the major depositional area lies between the WDNR public recreational boating access site and the main body of the Waterford Impoundment. This problem is graphically illustrated in Figure 8. These photographs were taken from a shallow draft vessel (pontoon boat) typical of the watercraft employed on the Waterford Impoundment.

It should also be noted that the deposition of sediments in this area is likely to have caused the disruption in breeding success of trout, which historically were reported to have frequented the coldwater streams entering the upper reaches of the Waterford Impoundment from the WDNR Tichigan Wildlife Area.

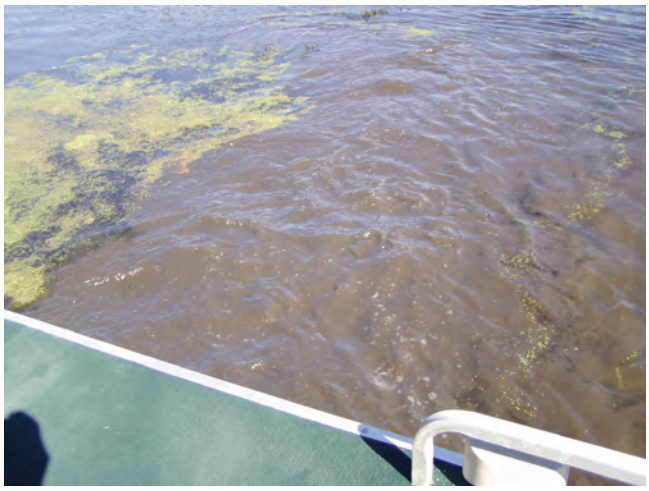
Recommendations

It is recommended that dredging be undertaken along selected shoreline areas and in shallow bays within the Waterford Impoundment and Tichigan Lake, and in the Fox River immediately upstream from the impoundment. Sponsors of such projects are likely to include individual riparian landowners, special purpose governmental units, general purpose units of government, and consortia comprised of all three of these stakeholders as well as nongovernmental entities such as the Fox River Citizens Against Underwater Sedimentation and Erosion (Fox River CAUSE), for example. Dredging within the impoundment and Tichigan Lake would be mainly along areas of existing development, such as those shown on Maps 5 and 6 and illustrated in Figure 9. This dredging recommendation is intended to minimize existing navigational problems in these shallow areas as well as to allow for more flexibility in the operational limits applicable to the water levels in the Impoundment. As was noted previously, this proposed dredging will require that a permit be obtained under Chapter 30 of the *Wisconsin Statutes*. Sufficient detail regarding the dredging will be needed in the permit application so that an assessment can be made of the potential environmental effects of the project. Cross-sections of the existing and proposed channel conditions and information on the extent of the Impoundment dredging will be required, and the WDNR will require that additional testing of sediments be made as part of the review process.

[11]*U.S. Geological Survey Scientific Investigations Report 2008—5235, "Flood of June 2008 in Southern Wisconsin," 2008.*

Figure 8

DEPOSITIONAL AREAS IN THE WATERFORD IMPOUNDMENT: 2010



Source: SEWRPC.

Development of Water Use and Dam Operating Plans

Overview

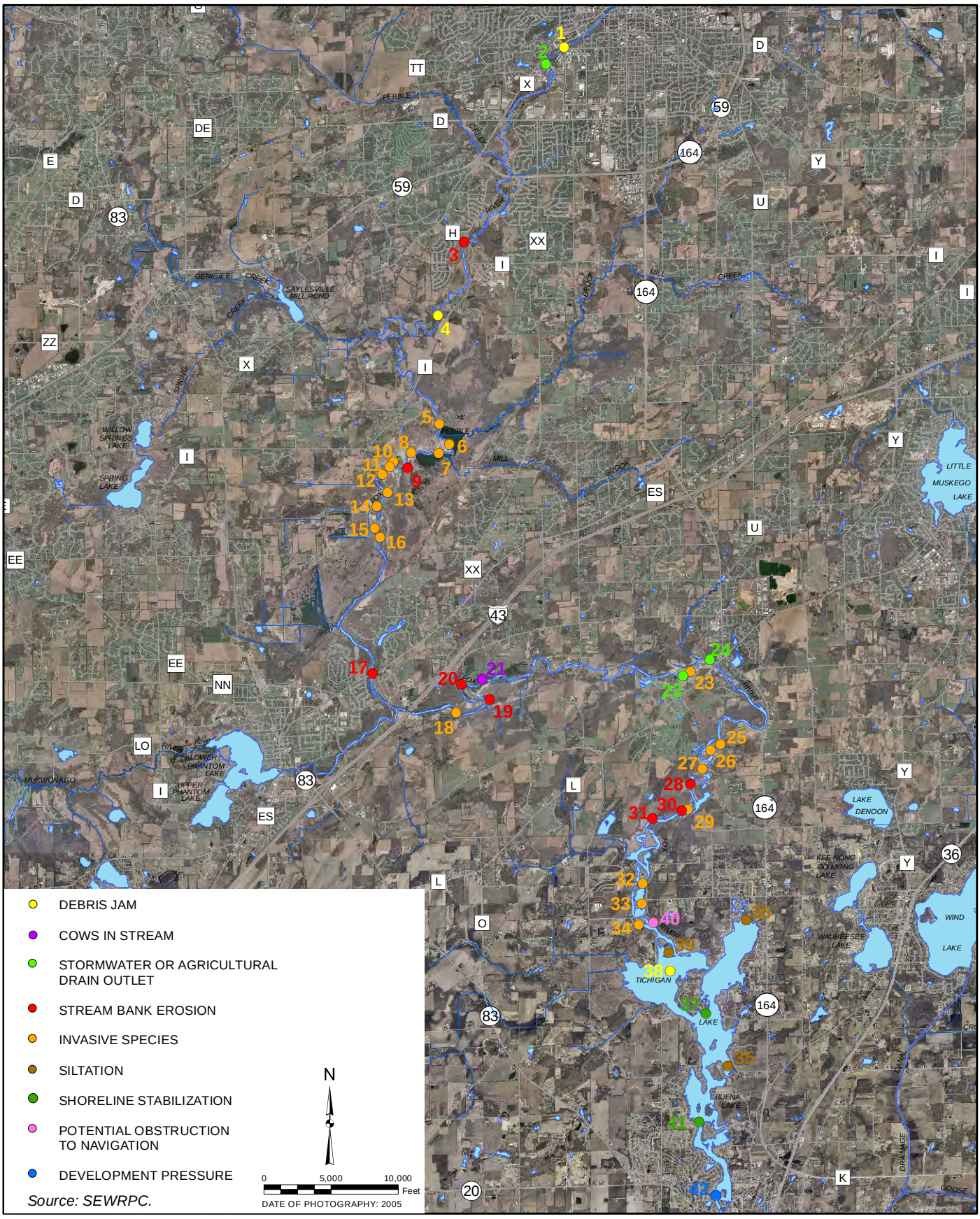
Currently, the water level in the Waterford Impoundment is maintained at about elevation 773.4 feet above the National Geodetic Vertical Datum of 1929 (NGVD 29) year-round. The operation is manually controlled. Typically, observations and adjustments of the spillway gates at the Waterford Dam are made daily or, in some cases, twice daily. As previously noted, flooding and drainage problems along the Fox River upstream of the Waterford Impoundment are a significant concern. These problems most often occur in the spring, but also may occur during other times of the year. Options evaluated in the 1995 SEWRPC water level control plan included a drawdown during winter and early spring intended to minimally reduce upstream spring flooding and reduce ice damage in the Impoundment during the winter; however, the comprehensive lake management plan for the Waterford Impoundment later discounted this recommendation on the basis that spring inflows carry the largest percentage of the contaminant load into the Impoundment, and that impounding water of this quality would have more significant negative environmental consequences than those related to any ice damage that might be alleviated. Filling the impoundment at the end of an over-winter drawdown with nutrient-rich spring runoff could result in more intense growths of aquatic plants and algae in early summer.

The need to accommodate large volume inflows within the Waterford Impoundment remain a concern, especially among residents living in the vicinity of Bridge Road in the Town of Waterford whom WDNR staff have identified as being within the delineated floodway. The WDNR, SEWFRC, WWMD, and Racine County staff have considered this situation, and the WWMD and SEWFRC have proposed dredging a portion of the impoundment, as noted above, as a possible means of reducing the severity of flooding in this area. To this end, a floodplain analysis would be required to determine the potential benefit to be achieved from this action. This proposal is linked to the dredging project(s) noted above, and remains under consideration at the time of writing.

Upstream of the Waterford Impoundment, and forming part of the uppermost reach of the Fox River within the SEWFRC jurisdiction, is the Barstow Impoundment, also known as Saratoga Lake, both of which are shown in Figure 10. This Lake is a narrow, shallow impoundment on the Fox River within the City of Waukesha, initially having been created to run a millrace to power a flour and feed mill which subsequently was removed. The City of Waukesha's Frame Park occupies a significant part of the frontage, although urban residential and industrial lands also border the waterbody. This dam has a fixed crest spillway so manipulation of impoundment levels is not possible.

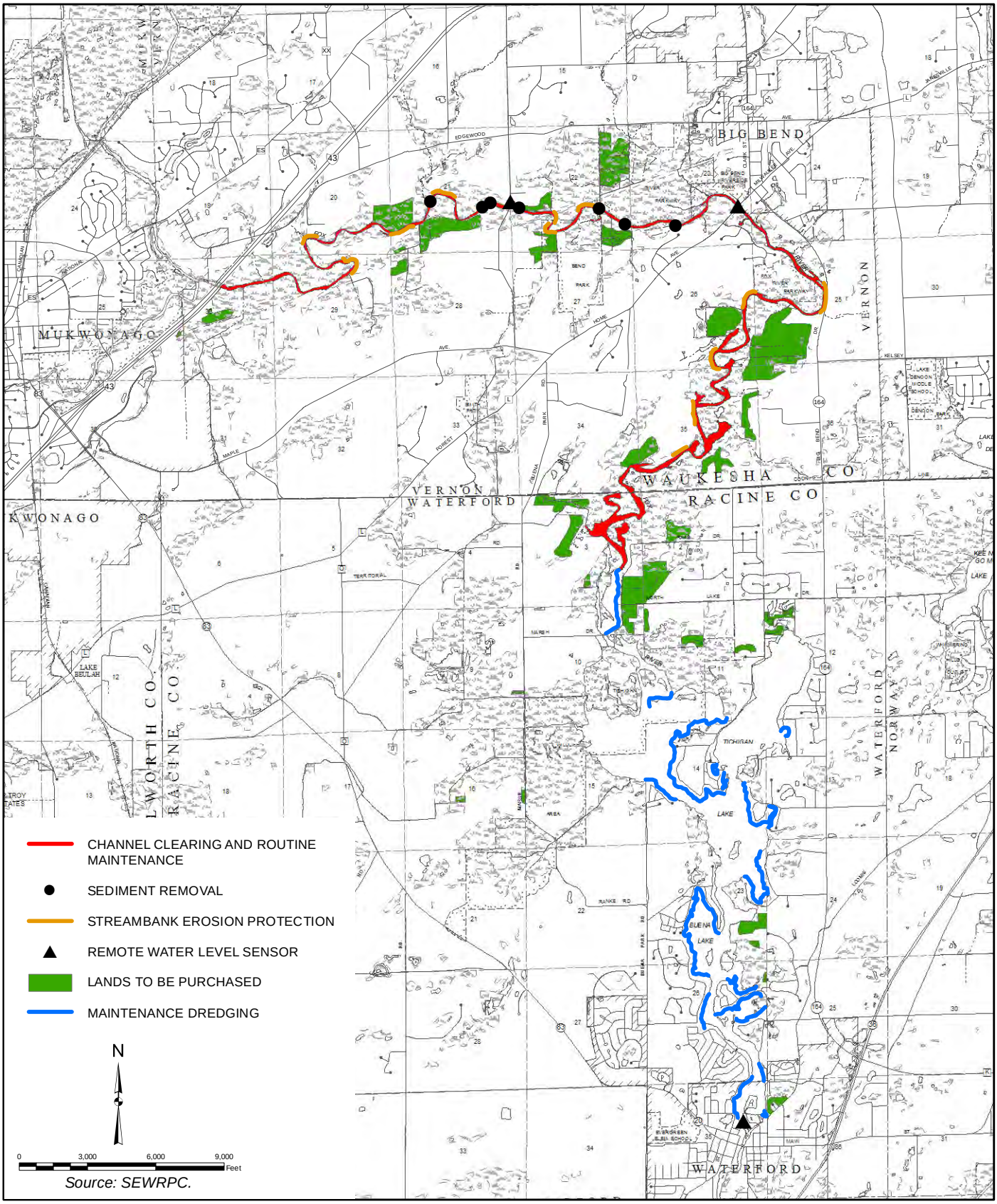
Map 5

AREAS OF CONCERN IDENTIFIED WITHIN THE SOUTHEASTERN WISCONSIN FOX RIVER COMMISSION JURISDICTION: 2010



Map 6

RECOMMENDED WATER LEVEL CONTROL PLAN FOR THE VERNON AND WATERFORD AREA OF THE MIDDLE FOX RIVER



Source: SEWRPC.

Figure 9

EROSION, WOOD DEBRIS JAMS, AND INVASIVE SPECIES ON THE FOX RIVER BETWEEN BARSTOW DAM AND THE WATERFORD IMPOUNDMENT: 2010
(see numbered locations on Map 5)

1 - WOOD DEBRIS JAM AT RAILROAD BRIDGE

2 - WASTEWATER TREATMENT PLANT OUTLET

3 - EROSION DOWNSTREAM OF CTH H

4 - WOOD DEBRIS JAM

5 through 8 - PHRAGMITES

9 - EROSION ALONG VERNON MARSH ACCESS ROAD

10 through 16 and 18 - PHRAGMITES

17 - EROSION AT CTH ES

19 - EROSION

20 - EROSION

21 - COWS IN RIVER

22 - DRAIN TILE OUTLET DEPOSITION

Figure 9 (continued)

28 - EROSION

30 - EROSION

31 - EROSION

35 - SILTATION

36 - SILTATION

37 - SHORELINE STABILIZATION

38 - DEBRIS JAM

39 - SILTATION

40 - POTENTIAL OBSTRUCTION TO NAVIGATION

41 - SHORELINE STABILIZATION

42 - DEVELOPMENT PRESSURE

NOTE: No photos available for Number 24, drainage from parking lot at CTH L; Numbers 25 through 27 and Number 29 are phragmites stands; and Numbers 32 through 34 are stands of purple loosestrife.

Source: SEWRPC.

Figure 10

IMPOUNDMENTS ON THE FOX RIVER: BARSTOW IMPOUNDMENT IN THE CITY OF WAUKESHA (LEFT) AND WATERFORD IMPOUNDMENT IN THE VILLAGE OF WATERFORD (RIGHT)

Source: SEWRPC.

It is important that the hydrological and hydraulic connectivity between the various impoundments on the Fox River and adjacent to the Fox River be recognized and taken into consideration in the overall management of flows in the Middle Fox River. Of particular note is the recommendation set forth in the Mukwonago River Watershed protection plan,[12] that consideration be given to operating the three Mukwonago River impoundments—forming Eagle Spring Lake, Lake Beulah, and Lower Phantom Lake—as a cascade of impoundments to avoid placing the downstream-most Lower Phantom Lake dam at risk during large floods, such as those experienced during the early summers of 2008 through 2010.[13]

Of similar concern regarding the functioning of the watershed impoundments as part of an overall hydrologic and hydraulic system is the dam safety requirement of the WDNR that the spillway of the Pewaukee Lake dam have sufficient capacity to pass the 1,000-year recurrence interval flood discharge into the Fox River just upstream of the Barstow Impoundment. This increased spillway discharge capacity is to be achieved within the current operating range for Pewaukee Lake, and is intended to avoid an uncontrolled release of water from Pewaukee Lake in the event of a dam failure. However, given the observed risks to the downtown portions of the City of Waukesha from flooding associated with smaller floods than a 1,000-year recurrence interval event, as experienced during 2008 through 2010, the introduction of greater volumes of water from the Pewaukee River watershed and Pewaukee Lake constitutes a risk to downstream infrastructure within the Fox River watershed.

Recommendations

Conceptually, the water level in the Waterford Impoundment could be managed by Racine County in such a way as to provide up to 1.1 feet (2,240 acre-feet) of storage by releasing impounded water and dropping the lake surface elevation to the State-permitted minimum elevation of 772.6 feet above NGVD 29. This would not provide

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[12]*SEWRPC Community Assistance Planning Report No. 309,* Mukwonago River Watershed Protection Plan, *June 2010.*

[13]*U.S. Geological Survey Scientific Investigations Report 2008—5235,* op. cit.

significant additional floodwater storage, and in the absence of the dredging project being proposed by the WWMD would reduce riparian landowner access to the waterway. Under current conditions, it takes about two to three days of "normal" flow to increase the level of the impoundment from 772.6 feet above NGVD 29 to the current operating level of 773.7 feet above NGVD 29. During drought conditions, this time could be as much as one week, while, during wet weather periods, this time could be considerably shorter. Currently, surface elevation changes are made on the basis of operator judgment and consideration of weather conditions. Placement of staff gauges upstream of the impoundment, in the Village of Big Bend, could provide a more quantitative basis for making operating decisions, and is therefore recommended. Under this plan element, the drawdown should be no lower than the currently permitted minimum operating level of 772.6 feet above NGVD 29 unless selective dredging is undertaken prior to the implementation of this plan element. The timing and duration of any drawdown should be undertaken with due consideration of the Lake fishery, and impacts on spawning, over-wintering, and other biological activities.

It is recommended that the manual water level control operations be continued by Racine County staff, but that dam operators be kept apprised of upstream conditions by observers in the Village of Big Bend and Town of Vernon and that the upstream conditions be factored into the control strategy. The Village of Big Bend and the Town of Vernon municipal engineering staff would be responsible for notifying the Waterford dam operator when water levels along the upper reaches approach pre-determined elevations on staff gauges that would be installed at selected locations, such as in the impoundment and along the upstream sides of the bridge abutments of the CTH L bridge in the Village of Big Bend and the Center Drive bridge in the Town of Vernon. When a pre-determined elevation is reached, the observer would notify the dam operator.

It is further recommended that consideration be given by the SEWFRC and/or WDNR to the conduct of hydrologic and hydraulic analyses of flows in the entirety of the Fox River, given the land use and water resources management changes that have occurred or are currently occurring in the watershed. These analyses could be conducted as part of an update of the 1969 SEWRPC comprehensive plan for the Fox River watershed as recommended in Chapter V of this report. As noted above, a hydrologic and hydraulic analysis should consider the connectivity of the Fox River and Mukwonago River impoundments within the overall watershed management program.

Streambank and Shoreline Erosion Control

Overview

Erosion and sediment deposition in the Fox River and its impoundments is a major water resources problem. A detailed description of the sedimentation problems in the reach of the Fox River from the Waterford dam to IH 43 was presented in the 1995 water level control plan. That report estimated a need for installation of erosion control measures on about 13,000 linear feet of streambank in the reaches considered. While the activities of the SEWFRC during the initial period of plan implementation have addressed some of the worst areas of erosion, areas remain which are contributing sediments to the waterway. These areas are shown on Map 5.

Recommendations

It is recommended that eroded streambanks along the Fox River system be protected through installation of suitable stabilization measures by riparian landowners, potentially in partnership with the SEWFRC. Such measures could include regrading, establishment of vegetation, or placement of riprap, depending upon the severity of the situation and the River flow dynamics. The use of vegetated measures, including bioengineering, is preferred where such measures will resolve the identified problems.

It should be noted that activities calling for the placement of material on the bed or banks of a navigable waterway such as the Fox River will require that a permit be obtained from the WDNR under Chapter 30 of the *Wisconsin Statutes*. The permit applications to be submitted by the landowners will require that sufficient detail be provided so that an assessment can be made of the potential environmental effects of the project, such as loss of aquatic habitat, wetland losses, or increases in flooding. Permits may also be required under local zoning and U.S. Army Corps of Engineers regulations.

The stormwater management requirements of the State stormwater discharge permit program, set forth in Chapter NR 216, "Storm Water Discharge Permits," of the *Wisconsin Administrative Code*, can be expected to contribute to the reduction of sediment erosion (and stormwater-borne contaminant loading) from lands tributary to the Fox River, while the protection of shoreland wetlands and riparian buffers can be expected to slow the velocity of water, allowing the settling of suspended soil particles, infiltration of runoff and soluble pollutants, adsorption of pollutants on soil and plant surfaces, and uptake of soluble pollutants by plants. The 2010 revisions to Chapter NR 151 created Section NR 151.03 which requires that no tillage operations be conducted within five feet of the top of the channel of surface waters. This section also indicates that tillage setbacks greater than five feet but no more than 20 feet may be required to meet this standard. It also requires that crop producers shall maintain the area within the tillage setback in adequate sod or self-sustaining vegetative cover that provides a minimum of 70 percent coverage. It is important to note that nonagricultural performance standards set forth in Section NR 151.12 (post-construction performance standard for new development and redevelopment) also 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[14] and Chapter NR 103-designated wetlands of special natural resource interest, while setbacks of not less than 10 feet from less susceptible wetlands and drainage channels may be allowed. Under the 2010 revisions of Chapter NR 151, these performance standards are set forth in Section NR 151.125.

Public Access and Water Safety

Public Access

Overview

Public access to the River and its impoundments is guaranteed in Article IX of the *Wisconsin Constitution* which provides that "…the navigable waters leading into the Mississippi and St. Lawrence, and the carrying places between the same, shall be common highways and forever free, as well to the inhabitants of the state as to the citizens of the United States…." The right of access to the waterways of the State is quantified in Chapter NR 1 of the *Wisconsin Administrative Code*, which establishes minimum and maximum access standards for the waters of the State. In the case of the Waterford Impoundment, these standards require a minimum of 29 car-trailer parking places, based upon the surface area of the waterway. Currently a total of 125 car and 34 car-trailer parking places are provided at the existing public access sites in the Village of Waterford and at the WDNR public recreational boating access site at Bridge Drive in the Town of Waterford. This level of access is considered adequate pursuant to the WDNR standards.

In addition, there is an access site to the Fox River in the Village of Big Bend, which was recently improved as a result of investments made by the SEWFRC, as noted in Table 1 in Chapter II of this report. Further, public pier access, walking trails, and recreational facilities, including small boat rentals, are available in Frame Park, on the Barstow impoundment, in the City of Waukesha.[15] Additional passive recreational access is under development downstream of the Barstow impoundment in the City of Waukesha.

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[14]*The portion of the Mukwonago River in the Town and Village of Mukwonago to its confluence with "Upper Phantom Lake"* [sic] *within the jurisdiction of the SEWFRC has been designated an Exceptional Resource Water of the State pursuant to Section NR 102.11 of the* Wisconsin Administrative Code*. See also the recommendations set forth in SEWRPC Community Assistance Planning Report No. 309, cited above.*

[15]*See also SEWRPC Memorandum Report No. 145,* Lake and Stream Resources Classification Project for Waukesha County, Wisconsin: 2000*, December 2005.*

Recommendations

It is recommended that the SEWFRC support Racine and Waukesha Counties in the implementation of the county park and open space plans, which include the development of a Fox River recreational corridor,[16] and related recommendations set forth in the comprehensive development plans and land and water resource management plans.[17]

Over time, it is recommended that those lands identified as incurring damages on a regular basis, as shown on Map 6, be acquired as they become available on the open market.[18] The lands purchased under this plan would become part of the Fox River recreational corridor. As an alternative to outright purchase of land, consideration could also be given to obtaining conservation easements from the property owners concerned. Land acquisition and conservation easements can be acquired through various programs, including the State of Wisconsin Stewardship Program and Lake Protection Grant Program, while stream buffers can be obtained through the U.S. Department of Agriculture (USDA) Conservation Reserve Enhancement Program and/or the State of Wisconsin River Management Planning and Protection Grant Program. Such easements can complement the land acquisition recommendations.

Public and Recreational Safety

Overview

Allied with public recreational boating access and land acquisition is the issue of user conflicts and recreational use safety. In addition, motorized watercraft operating in the relatively close confines of the Fox River or in nearshore areas can aggravate shoreland and streambank erosion problems. Coupled with the reduced visibility created by the numerous meanders in the channel, high-speed boating activities within the Fox River channel can create a hazard for more passive users of the Fox River, such as canoeists and fishermen. To address these concerns, the Fox River municipalities have adopted a range of ordinances that are summarized in Table 3. In addition, the Town and Village of Waterford operate a patrol on the Waterford impoundment during both open water and ice-covered conditions. All boaters and anglers using the Fox River and its impoundments are subject to State boating and fishing regulations.[19]

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[16]*See, inter alia, SEWRPC Community Assistance Planning Report No. 134, 2nd Edition,* A Park and Open Space Plan for Racine County, *July 2001; SEWRPC Community Assistance Planning Report No. 137,* A Park and Open Space Plan for Waukesha County, *December 1989; SEWRPC Community Assistance Planning Report No. 71,* A Park and Open Space Plan for the Town of Waterford, Racine County, Wisconsin, *January 1990; SEWRPC Community Assistance Planning Report No. 122,* A Park and Open Space Plan for the Town of Vernon, Waukesha County, Wisconsin, *March 1985.*

[17]*See SEWRPC Community Assistance Planning Report No. 209,* A Development Plan for Waukesha County, Wisconsin, *August 1996, as amended; see also Waukesha County Department of Parks and Land Use, Waukesha County University of Wisconsin-Extension, and Waukesha County Municipalities,* A Comprehensive Development Plan for Waukesha County, Waukesha County, Wisconsin, *February 2009; SEWRPC Community Assistance Planning Report No. 301,* A Multi-Jurisdictional Comprehensive Plan for Racine County: 2035, *November 2009; SEWRPC Community Assistance Planning Report No. 259, 2nd Edition,* op. cit.*; Waukesha County Department of Parks and Land Use,* Waukesha County Land and Water Resource Management Plan 2006-2010, *January 2006.*

[18]*Appropriate entities to be considered in the acquisition and management of critical lands are identified in SEWRPC Planning Report No. 42,* A Regional Natural Areas and Critical Species Habitat Protection and Management Plan for Southeastern Wisconsin, *September 1997, as amended.*

[19]*Wisconsin Department of Natural Resources Publication No. PUB-FH-301 2010,* Guide to Wisconsin Hook and Line Fishing Regulations 2010-2011, *2010; Wisconsin Department of Natural Resources Publication No. PUBL-LE 301 2010,* 2010 Wisconsin Boating Regulations and Handbook, *2010; and, Wisconsin Department of Natural Resources Publication No. PUBL-LE-201 2009/2010,* Wisconsin Snowmobile Laws, *2009.*

Figure 11

NONNATIVE SPECIES—*PHRAGMITES AUSTRALIS* AND *MYRIOPHYLLUM SPICATUM*—OBSERVED IN AND AROUND THE FOX RIVER: 2010

Source: SEWRPC.

Recommendations

It is recommended that the SEWFRC support the efforts of the Fox River municipalities and the WWMD in establishing a navigational channel along the Fox River. This would include management and removal of debris jams and other impediments to navigation such as those illustrated in Figures 3 and 9, management of sediment depositional areas such as those illustrated in Figure 8 to ensure adequate depth for navigation, and management of aquatic plant communities to control especially nonnative aquatic plant growths such as those illustrated in Figure 11.

Consideration also should be given by the SEWFRC to encouraging the periodic review and modification, as necessary, of boating and other regulations relating to water use and use of the water resources in an ice-bound state; establishment of slow-no-wake areas; determination of locations for signage and buoys; and, dissemination of information on laws, policies, and good stewardship. Periodic review of local ordinances by the Fox River municipalities is recommended to ensure currency with State law and best practices.

ANCILLARY ACTIVITIES

It is proposed that the SEWFRC periodically review information on the presence and spread of nonnative species within their jurisdiction. Such species are identified in Chapter NR 40 of the *Wisconsin Administrative Code*, and include both terrestrial and aquatic species of concern. During the 2010 reconnaissance, incipient stands of the potentially invasive wetland plant, *Phragmites australis*, were observed at several locations within the River system. A typical stand of phragmites is shown in Figure 11. In addition, isolated stands of purple loosestrife, *Lythrum salicaria*, were observed in the vicinity of the WDNR public recreational boating access site near Bridge Drive. Invasive aquatic plants known to exist in the system include both Eurasian water milfoil, *Myriophyllum spicatum*, and curly-leaf pondweed, *Potamogeton crispus*. These latter species are specifically identified as target species for aquatic plant management measures in the lake management plan for the Waterford Impoundment.[20]

[20]*SEWRPC Community Assistance Planning Report No. 283,* op. cit.

That plan also noted the occurrence and control of another loosestrife varietal, yellow loosestrife, *Lysimachia vulgaris*, which is reported to be even more aggressive in colonizing shoreland wetland areas than the purple varietal.

ACTIONS TO ADDRESS EMERGING ISSUES OF CONCERN

During 2008-2009, the SEWFRC Board of Commissioners initiated a series of discussions on issues of concern to the Commissioners, the Fox River municipalities, and Racine and Waukesha Counties that were not covered by the list of concerns set forth in Subchapter VI of Chapter 33 of the *Wisconsin Statutes*. Four groups of issues were identified; namely, the modification of the SEWFRC boundary and composition of the Board of Commissioners; project identification, prioritization, and funding; regional issues of concern related to the Great Lakes Basin Compact and other recent legislation; and, development of partnerships. Each of these emerging concerns is discussed below.

Modification of the Commission Boundary and Composition of the Board of Commissioners

Overview

The Commission's overall jurisdictional area is currently defined in Section 33.54 of the *Wisconsin Statutes*, which defines the boundary of the SEWFRC as extending from "the northern boundary of the City of Waukesha downstream to the point immediately below the Waterford Dam." Clearly, then, there are lands riparian to the Fox River that extend both above and below this current boundary. Anecdotal evidence suggests that a larger number of municipalities were considered for inclusion within the SEWFRC, but some of those considered declined to participate. Inclusion of a greater number of communities makes sense from a hydrological perspective, since there are both lands and communities upstream of the City of Waukesha that drain into the Barstow impoundment and which contribute to the flow of the Fox River at that point, and communities below the Waterford Impoundment into which the Fox River flows. This downstream segment receives the outflow from the Waterford Impoundment, which, due to its size serves to moderate flows in the downstream reaches of the Fox River. Thus, it may not be unreasonable for these communities to be excluded from the SEWFRC. On the other hand, the communities upstream of the Barstow impoundment contribute significant amounts of both water and contaminants to the Fox River, which are transferred downstream; the Barstow impoundment being a river-run lake with a very short water retention time.[21]

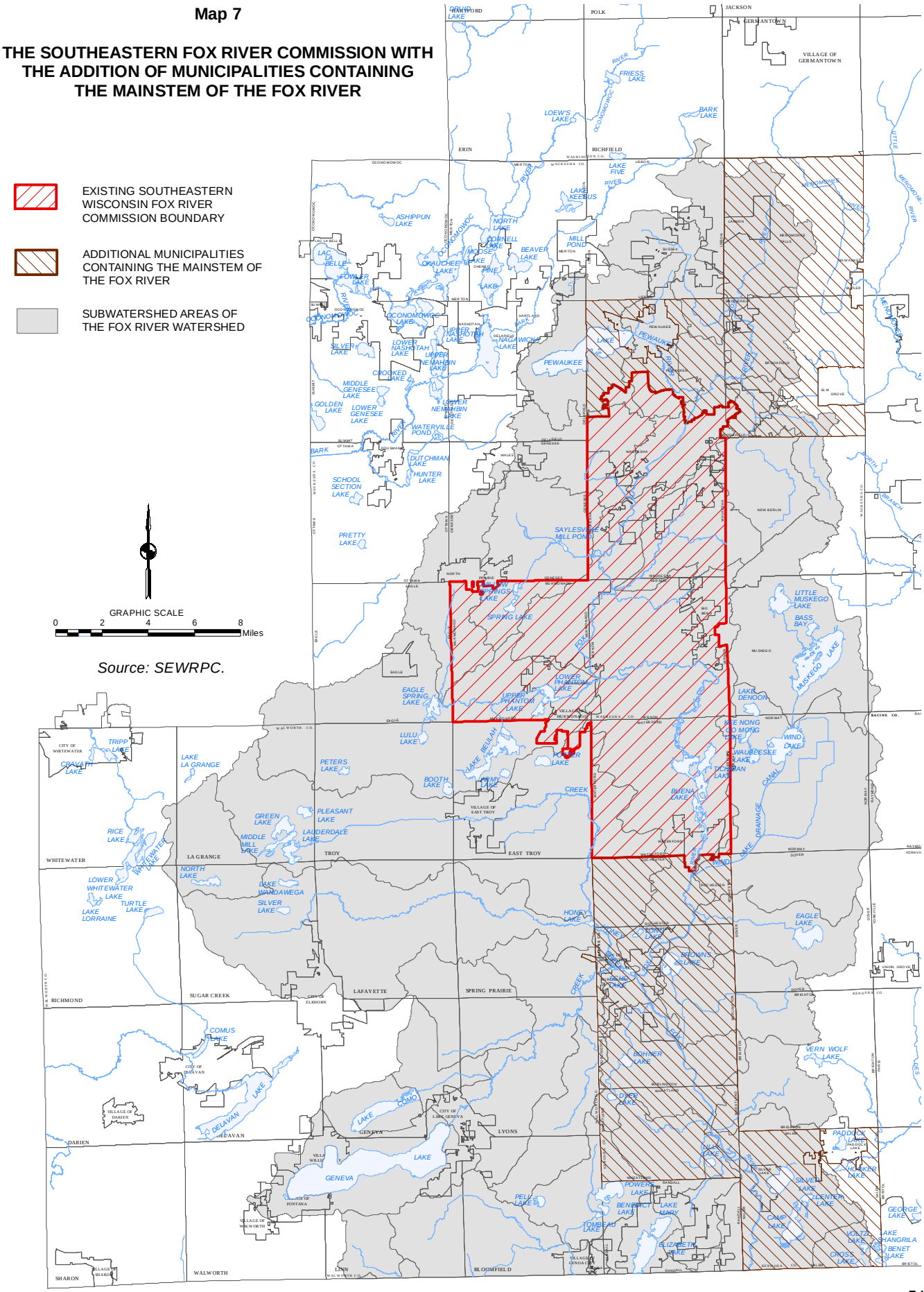
The SEWFRC Board of Commissioners, during a 2010 discussion of boundary options, were unanimous in asking that extension of the SEWFRC boundary southward be considered under this implementation plan. A critical element in this request was the intention of the Commissioners that an effort be explored to achieve contiguous boundaries with the Illinois Fox Waterway Agency, to better facilitate joint actions for managing the River, its flows, and its contaminant loads. Consequently, consideration is given to the inclusion of those downstream municipalities, riparian to the mainstem of the Fox River, between the Waterford Impoundment in the Village of Waterford in Racine County, and the Wisconsin-Illinois state line in the Town of Salem in Kenosha County, as shown on Map 7. Such an expansion of the SEWFRC jurisdiction would include the City of Burlington, the Village of Rochester, and the Town of Burlington, all in Racine County, and the Village of Silver Lake, the Town of Wheatland, and the Town of Salem, all in Kenosha County.

Should consideration be given to including the upstream riparian municipalities, also shown on Map 7, there would be a potential to add several further municipalities within Waukesha County, including the Cities of Brookfield and Pewaukee, the Villages of Lannon and Menomonee Falls, and Town of Brookfield. This latter configuration would include the entirety of the mainstem of the Fox River within the State of Wisconsin, ensuring that all of the potential river municipalities have a platform on which to discuss issues of common concern with respect to the River and its shared water resources. While the eventual desirability of including all River

[21] *See SEWRPC Memorandum Report No. 145,* op. cit.

Map 7

THE SOUTHEASTERN FOX RIVER COMMISSION WITH THE ADDITION OF MUNICIPALITIES CONTAINING THE MAINSTEM OF THE FOX RIVER



municipalities within the SEWFRC was acknowledged, the SEWFRC Board of Commissioners, during the 2010 discussion of boundary options, placed a priority on a southward extension of the SEWFRC jurisdiction so as to establish a contiguous boundary with the Illinois Fox Waterway Agency.

Inherent in any alteration of the boundary of the SEWFRC would be the modification of the Board of Commissioners. Currently, the SEWFRC Board of Commissioners is comprised of the following persons, pursuant to Section 33.55 of the *Wisconsin Statutes*: the Racine County Executive; the Waukesha County Executive; the mayor of the City of Waukesha; the presidents of the Villages of Big Bend, Mukwonago, and Waterford; the chairpersons of the Mukwonago, Vernon, Waterford, and Waukesha town boards, or their designees; two residents of the Town of Waterford appointed by the town board; two residents of the Town of Vernon appointed by the town board; one resident of the Village of Big Bend appointed by the village board; one nonvoting representative from SEWRPC appointed by the Chairperson of the Regional Planning Commission; and, one nonvoting representative from the WDNR appointed by the Secretary of Natural Resources. Collectively, these individuals form a 17 person Board of Commissioners.

The addition of the downstream municipalities would potentially add, at a minimum: the Kenosha County Executive, the mayor of the City of Burlington; the presidents of the Villages of Rochester and Silver Lake; and the chairperson of the Burlington, Salem, and Wheatland town boards, or their designees, in addition to any other citizen members as may be determined, increasing the size of the SEWFRC Board of Commissioners to a minimum of 24 persons.

Likewise, the addition of the upstream municipalities would potentially add the mayors of the Cities of Brookfield and Pewaukee, the presidents of the Villages of Lannon and Menomonee Falls, and the chairperson of the Brookfield town board, or their designees, increasing the size of the SEWFRC Board of Commissioners to 29 persons.

In either case, the size of the Board of Commissioners of an expanded SEWFRC could potentially be reduced by the elimination of the residents appointed by the Village of Big Bend board and the Towns of Vernon and Waterford town boards. It should be noted, however, that these individuals have often served the SEWFRC as elected officers of the Board, and have played a vital part in the operations conducted by the SEWFRC. That said, the apparent rationale for the inclusion of the residents on the SEWFRC Board of Commissioners would seem to be related to the frequency of occurrence of the concerns about which the SEWFRC was formed; namely, the improvement of the water quality and the scenic, economic and environmental values, the protection and enhancement of the recreational use of the navigable waters of the River, and the coordination and integration of county programs and projects for the waters of the counties. On this basis, the inclusion of additional residents from downstream municipalities, especially from the Town of Salem, may warrant consideration. However, inclusion of two residents from this municipality would potentially increase the size of the SEWFRC Board of Commissioners to between 27 and 31 individuals, should two residents be appointed by the Salem Town Board in a similar manner as the residents are appointed from the Towns of Vernon and Waterford.

From a purely organizational point of view, such a large number of individuals would be an unwieldy body. Based upon previous experiences of the SEWFRC, there are times when it is difficult to achieve attendance by the nine persons who currently constitute the quorum needed to conduct the business of the Commission, as required pursuant to Section 33.55(3) of the *Wisconsin Statutes*. The inclusion of only elected officials, or their designees, could be seen as placing an additional burden upon these individuals, especially if there were no other persons—residents—who could perform the duties of secretary required under section 33.55(6) of the *Wisconsin Statutes*, although a recording secretary could possibly be hired to perform the duties of maintaining meeting minutes, notices, and other correspondence. Acquisition of staff, however, would require a budget from which the SEWFRC could pay such an individual. This issue is related to the funding of the SEWFRC which is an emerging issue discussed below and in Appendix A.

Any of the actions set forth above would require the amendment of Subchapter VI of Chapter 33 of the *Wisconsin Statutes*. Any such amendment would require action by the State Legislature and Governor in amending the *Wisconsin Statutes* to accommodate a refined organizational structure for the SEWFRC.

Recommendations

It is recommended that the SEWFRC initiate conversations with the Legislature with a view toward a Legislative initiative that would allow the Commission to attach lands to its jurisdiction. Such an action would require amendment of Subchapter VI of Chapter 33 of the *Wisconsin Statutes*; however this would be a once-off amendment and not require further action by the Legislature as the SEWFRC boundaries change in future. It is suggested that the procedure set forth in Subchapter IV of Chapter 33 be utilized as a basis for an attachment and detachment process that could be applied to the SEWFRC. These processes are, in part, based upon the receipt of a petition by landowners seeking attachment or detachment from a public inland lake protection and rehabilitation district. In the case of the SEWFRC, it would be proposed that a petition to attach would be originated by a governmental unit (River municipality) within the Fox River watershed; such municipality should be contiguous to the current area of jurisdiction of the SEWFRC. While the SEWFRC Board of Commissioners has placed a priority on extending the jurisdiction southwards, or downstream, it is recommended that the municipalities within the entirety of the Fox River mainstem corridor in Wisconsin be considered for such attachment.

In support of the attachment of additional governmental entities to the SEWFRC, it is further recommended that, at a minimum, representation on the Board of Commissioners of the SEWFRC be offered to the municipal chief elected officer or their designee. This would potentially increase the numbers of Commissioners; however, it is recommended that a quorum be established based on one-half of the total number of Commissioners plus one individual. In the case of a downstream expansion of the SEWFRC to the Illinois border, this would potentially involve 17 elected officials, and the five appointed Commissioners and two *ex officio* Commissioners appointed by SEWRPC and the WDNR, respectively, as currently included by *Statute*.

Given the workloads incumbent upon the elected officials of the Counties and River municipalities within the SEWFRC, the appointment by the executive officers of the Counties and River municipalities of alternate Commissioners as provided in Section 33.55 of the *Wisconsin Statutes* is strongly recommended to ensure that the SEWFRC meets its quorum requirements.

Funding and Projects

Overview

Pursuant to Section 33.54 of the *Wisconsin Statutes*, the SEWFRC can request that funds be appropriated by Racine and Waukesha Counties and/or by the Fox River municipalities—the City of Waukesha, the Villages of Big Bend, Mukwonago, and Waterford; and the Towns of Mukwonago, Vernon, Waterford, and Waukesha—to enable the SEWFRC to perform its duties of improving water quality, protecting and enhancing recreational use, and coordinating and integrating county water-related programs and projects. The SEWFRC was also empowered to solicit and receive gifts, grants, and other financial aids. Grants and other aids, directly appropriated by the Legislature and administered by the WDNR, have historically provided the funds utilized by the SEWFRC in the conduct of its mandated activities.

Funding Process and Fiscal Cycle

Subchapter VI, Section 33.60 of the *Wisconsin Statutes* would seem to indicate that the Wisconsin Legislature envisioned a request for funding through the counties as the primary funding mechanism of the SEWFRC's activities. Section 33.60(3) specifically directs the Board of Commissioners of the SEWFRC, following a public budget hearing, to "submit the proposed budget to Racine County and to Waukesha County for incorporation into each county's budget to be subject to any review procedures that apply to a county budget…" The required public hearing affords any resident or taxpayer the opportunity to comment on the proposed budget, and for the SEWFRC Board of Commissioners to amend the budget if necessary (see Section 33.60(2) of the *Wisconsin Statutes*).

The SEWFRC budget must contain six items; namely, a list of anticipated revenue, a list of proposed appropriations, a list of actual revenue and expenditures for the current year to date, a list of proposed revenue and expenditure for the balance of the current year, and a list of fund balances. A budget summary—consisting of all expenditures, all revenues, all other funding sources, and all fund balances—for the previous year, current year, and proposed future year must be published as a Class 1 notice in both Racine County and Waukesha County at least 15 days prior to the budget hearing. Class 1 notice provisions set forth under Chapter 985 of the *Wisconsin Statutes* require one insertion in the official newspaper for each county (see Section 33.60(1) of the *Wisconsin Statutes*). The SEWFRC budget is based on a calendar year.

The SEWFRC Board of Commissioners must submit the proposed budget to Racine County and to Waukesha County for incorporation into each County's budget process, pursuant to Section 33.60(3) of the *Wisconsin Statutes*. The County budget process requires that budget requests be submitted by each component entity (department) of the County to the County Director of Administration no later than July 15th of each year. This is a statutory requirement set forth in Section 59.60(4) of the *Wisconsin Statutes*. Counties may establish a form for such submissions, which are then crafted into a unified budget by the County Director of Administration for consideration by the County Board (and County Executive). This draft budget must be submitted no later than August 15th of each year, in accordance with Section 59.60(5) of the *Wisconsin Statutes*. The County Board is then required to act on the proposed budget during the period through October 1st of each year, as required pursuant to Section 59.60(6) of the *Wisconsin Statutes*. The agreed draft of the County budget must then go to a noticed public hearing to be held before the first Monday of November, prior to adoption of the budget (see Section 59.60(7) of the *Wisconsin Statutes*).

Based upon this timeline, the SEWFRC must compile its fiscal year budget no later than the Commission's May meeting. This would provide adequate time for the budget to be: 1) placed before the communities with the required period of notice established in Section 33.60(1), and 2) submitted to the County directors of administration in advance of the July 15th deadline, thereby ensuring, to the extent possible, the availability of operating funds for the following calendar fiscal year.

Prior to the 2009-2010 State of Wisconsin fiscal year, the SEWFRC solicited grants-in-aid from the State of Wisconsin. These solicitations generated approximately $250,000 per biennium of financial support for the SEWFRC to commit to projects. The SEWFRC operating expenses during this period were paid for from the interest accrued on the grants-in-aid during their period of currency. However, continued funding of project support and administrative functioning (i.e., the SEWFRC webpage, *http://www.sewfrc.org/*) is likely to require a more stable source of funds outside of interest income, especially since the 2009-2010 State of Wisconsin fiscal year no State grants-in-aid have been forthcoming. Funding was restored in the 2011-2012 State of Wisconsin budget.

The need for a stable budget process is fundamental if the SEWFRC is going to prioritize, select, and fund projects to be implemented within the portion of the Fox River watershed within its jurisdiction. A stable funding source also has implications for the project and fund tracking process and budgeting process. As has been set forth above, the current SEWFRC budget process that has occurred between October and December annually would have to be better matched with the budget cycles of Racine and Waukesha Counties. These latter are set forth, as has been noted, in Chapter 59 of the *Wisconsin Statutes*.

Subchapter VI of Chapter 33 of the *Wisconsin Statutes* also provides that the SEWFRC, "a county or a river municipality may solicit gifts, grants and other aid for the commission to enable the commission to perform the functions in this subchapter." Consequently, it is anticipated that the SEWFRC will continue to seek direct State aids through the appropriation process as well as grants-in-aid through a variety of State grant programs, including the Chapter NR 7 Recreational Boating Facilities Grant Program administered by the Wisconsin Waterways Commission, the NR 190 through NR 198 lake and river grant programs administered by the WDNR, and similar State and Federal programs.

Project Cycle

The SEWFRC project submission process historically has been an amalgam of projects required to be undertaken in response to Statutory mandate, set forth in Section 33.59 of the *Wisconsin Statutes*, addressing the preparation of plans for the dredging of selected shallow areas of the impoundment area in Waterford, clearing channels of fallen trees and other debris, water use, Waterford dam operations and automation, streambank erosion protection, protection and improvement of shorelines, access to shoreline recreational areas, and water safety and navigation, *ad hoc* community requests, and, a formal process of project solicitation undertaken as part of the process of budget development. In recent years, the process has been refined and formalized (see *http://sewfrc.org/project-application.html*). Project proposals are being solicited in the areas of: feasibility studies, construction projects (including construction of erosion control practices), rain gardens, bio-retention swales, or shoreline restoration, rehabilitation projects, acquisition and placement of navigational aids, and channel dredging. The adopted policy also requires a minimum of a 10 percent matching contribution, either in cash or in-kind.

The process of presenting a proposal to the SEWFRC also has been formalized, with the following requirements being applied: identification of a project manager or contact person; a formal presentation to the SEWFRC; submission of a project narrative and proposed budget; documentation of a proposed timeline for completion of the project; a commitment to completing the project in a timely manner; and maintenance of receipts, documents, and appropriate permits required. Periodic status reports to the SEWFRC also may be requested. Public bidding requirements apply to units of government conducting projects in cooperation with the SEWFRC.

While the foregoing process provides a sound basis for initiating and conducting projects within the scope of the SEWFRC's mandate, it should be noted that the submission of project concept documents and funding requests should be undertaken in a timely manner so that the SEWFRC can compile its fiscal year budget no later than the Commission's May meeting.

Finally, it has been the experience of the SEWFRC that not all projects can be completed in accordance with their proposed project timetable. Hence, there has been some flexibility for the SEWFRC to allocate available funds to projects that can be completed within a specific budget period. While this flexibility has been reasonable under the biennial funding received by the SEWFRC, such flexibility may not be possible under a funding program that must conform to County requirements and an annual budget process.

Recommendations

The SEWFRC has played an effective and important role in managing the middle reaches of the Fox River within the State of Wisconsin. The nature and numbers of projects executed in cooperation with the SEWFRC, as noted in Chapters II and III of this plan, have initiated the process of meeting the SEWFRC mandate as set forth in Subchapter VI of Chapter 33 of the *Wisconsin Statutes*. As documented in Chapter III, these actions have not completely resolved all of the issues of concern facing the river municipalities that form the SEWFRC. Hence, continuation of the Commission's efforts is recommended.

It is also recommended that the Commission initiate conversations with the County Executives of Racine and Waukesha Counties with respect to the solicitation of funds to sustain the SEWFRC efforts, as set forth in Subchapter VI of Chapter 33 of the *Wisconsin Statutes*. In addition, the SEWFRC should continue to seek grants-in-aid and/or direct appropriations from the State of Wisconsin.

The solicitation of project concepts, as currently proposed by the SEWFRC, should be continued. With respect to the distribution of funds awarded to successful project applicants, it is recommended that the SEWFRC provide not more than one-half of the grant award to the applicants, upon request, in advance of project completion, with the balance of the SEWFRC share of the projects funds being provided upon completion of the project. It is recommended that the SEWFRC Board of Commissioners adopt this policy as part of the Commission's Standard Operating Procedures (see Appendix B).

Implications of the Emerging Issues

Overview

The SEWFRC mandate to improve water quality and scenic, economic, and environmental values; protect and enhance recreational use of the navigable waters of the Fox River; and coordinate and integrate county water resources programs and projects is sufficiently broad in scope to support the role of the SEWFRC in implementing measures to address urban and rural nonpoint source pollutants, including, but not limited to sediment, through wetland restoration, shoreline buffers, construction of detention basins and infiltration facilities, stream rehabilitation, and related practices. Indeed, many of the projects already executed by the SEWFRC fall broadly into these categories of action, as can be seen in Table 2 in Chapter II of this report. Under the mandate currently given to the SEWFRC pursuant to Subchapter VI of Chapter 33 of the *Wisconsin Statutes*, actions have been undertaken or proposed in the following priority areas: selective dredging (proposed), channel clearance (ongoing), water use management (ongoing), Waterford dam operations (implemented in part), streambank erosion protection (ongoing), maintenance of shorelines and navigable waters (implemented in part), boating access (ongoing), water safety and regulations (ongoing), and informational and educational programming (implemented in part). The proposed areas for future action discussed above are wholly consistent with these mandates and associated actions.

In addition, as discussed in Chapter III, the proposed diversion of water from Lake Michigan by the City of Waukesha has the potential to indirectly affect the availability of water within the Illinois-Fox River. The impact of such a diversion on both the Fox River and streams in the Lake Michigan basin that could potentially receive return flow from the City of Waukesha should be determined under the Environmental Impact Statement related to the City's diversion application that will be prepared by the WDNR.

The infiltration requirements, adopted by the State of Wisconsin pursuant to Chapter NR 151 of the *Wisconsin Administrative Code*, are intended, in part, to replenish groundwater supplies that would otherwise be diminished as a result of stormwater being discharged from a site as surface runoff as opposed to infiltration. Some concerns have been expressed regarding the potential impact of stormwater-borne pollutants, particularly chloride, on groundwater sources. Chloride in solution is a conservative element that is not readily removed by typical stormwater management practices. Thus, a number of communities have adopted salt reduction practices, such as using a sand/salt mix, alternatives to sodium chloride, and more efficient anti-icing and deicing agent application practices for winter road maintenance.

Recommendations

The emerging issues facing the Fox River basin are not dissimilar to the issues facing surface water resources elsewhere in Wisconsin. The Wisconsin Groundwater Coordinating Council, among others, has recognized a number of these issues.[22] While the vast majority of these issues may be beyond the ability of the SEWFRC, or indeed of any single agency, to address at a level that would effect meaningful change, the SEWFRC can support State and Federal initiatives toward integrated water resources management, including consideration of the conjunctive use of surface and ground waters.[23] Consequently, it is recommended that the SEWFRC Board of Commissioners maintain a "watching brief" with respect to emerging issues with Commissioners periodically reporting on development proposals, ordinance changes, and issues of concern within their jurisdictions. Such notices would permit the SEWFRC to take action as necessary to ensure the coordination of county water resources management efforts, ongoing improvement of water quality and environmental values, and the protection of the navigable waters of the Fox River.

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[22]*See Wisconsin Department of Natural Resources,* Wisconsin Groundwater Coordinating Council Fiscal Year 2010 Report to the Legislature, *August 2010:*
http://www.dnr.state.wi.us/org/water/dwg/gcc/rtl/2010/gccreport2010.pdf.

[23]*SEWRPC Planning Report No. 52,* A Regional Water Supply Plan for Southeastern Wisconsin, *December 2010—this regional water supply plan is an example of a planning program that considers the interaction between groundwater and surface waters and the conjunctive use of surface and ground waters.*

As an initial step in establishing and maintaining a level of awareness of emerging legislation, changing laws, and advancing science and technologies, it is recommended that the Commissioners advise the SEWFRC of prospective ordinance changes applicable to SEWFRC activities being considered by the Counties and River municipalities. Because of their ongoing relationships with Federal agencies with authorities in areas relevant to the SEWFRC, such as the U.S. Department of Agriculture, it is recommended that the County-appointed Commissioners periodically apprise the SEWFRC Board of Commissioners of Federal plans and programs applicable to the SEWFRC activities. Further, it is recommended that the *ex officio* Commissioners periodically apprise the SEWFRC Board of Commissioners of scientific and technical advances that could affect the projects being considered or executed by the SEWFRC and its partners. Additionally, it is recommended that the Commission Secretary enroll in the notification services provided by the Wisconsin Legislature. Enrollment in this service can be accomplished through the Wisconsin Legislative Notifications Website at *http://notify.legis.state.wi.us.*

Partnerships

Overview

The SEWFRC is, among other attributes, a coordinating body. Foremost among the partnerships created within the Commission's mandate is a partnership between Racine and Waukesha Counties and between the SEWFRC, Counties, and the Fox River municipalities. In addition, the State of Wisconsin, in creating the SEWFRC envisioned an active role for the citizens within the Fox River municipalities, especially those in the Village of Big Bend and Towns of Vernon and Waterford, who were nominated to serve as Commissioners on the SEWFRC Board of Commissioners. Since the formation of the SEWFRC, the Commission has maintained an active program of community involvement. This involvement has often taken the form of partnerships with civic organizations, such as the Fox River CAUSE, and other (special-purpose) governmental units, such as the WWMD. While none of these organizations is represented officially on the SEWFRC Board of Commissioners, it has not been unusual for members of these organizations to be serving Commissioners. Since both the SEWFRC and WWMD are Chapter 33 special-purpose governmental organizations, there is considerable coincidence of mission and mandate between the two entities. As noted in Chapter III of this document, the town sanitary districts, such as the Town of Waterford Sanitary District formed under Chapter 66 of the *Wisconsin Statutes*, and farm drainage districts, such as the Waterford Drainage District formed under Chapter 88 of the *Wisconsin Statutes*, that lie within the SEWFRC jurisdiction also are potential partners in the execution of projects and programs that would advance the purposes of the SEWFRC. To this end, the intergovernmental agreement between the SEWFRC and the Illinois Fox Waterway Agency can provide a model for cooperative agreements among and between these special-purpose units of government.

It is with consideration of this latter intergovernmental agreement with the Illinois Fox Waterway Agency that the SEWFRC Board of Commissioners identified the southward expansion of the SEWFRC as a priority action. Creation of contiguous special-purpose governmental units along a navigable waterway of the United States has the potential to enhance access by both governmental entities of grants-in-aid from Federal government sources, such as the U.S. Environmental Protection Agency and the U.S. Army Corps of Engineers.

Recommendations

Recognizing the coincidence of purpose between the SEWFRC and other governmental and nongovernmental organizations within the Middle Fox River basin, it is recommended that the SEWFRC continue to create, support, and cooperate in partnerships. It is noted that partnerships with the WWMD in recent years have proven especially beneficial in addressing riparian issues of concern to both governmental entities. As noted in Chapter III, extension of such partnerships to the town sanitary districts and farm drainage districts that lie within the SEWFRC jurisdiction through either formal or informal agreements would support the SEWFRC's mandate for water quality protection and maintenance of navigation within the Fox River.

It is further recommended that the SEWFRC consider seeking Legislative authority to invite the participation of those Fox River municipalities, especially those lying downstream of the current SEWFRC jurisdiction, to integrate their communities into the SEWFRC. While integration would require consideration of issues such as

representation on the Board of Commissioners of the SEWFRC, such issues are capable of resolution. Of possibly greater concern would be the devolution of authority to the SEWFRC of the power to attach or detach lands/communities. As noted, this would require Legislative action to achieve. In the interim, it is recommended that the SEWFRC seek to establish intergovernmental agreements with the downstream River municipalities, pursuant to authorities granted to governments under Chapter 66 of the *Wisconsin Statutes*.

With respect to nongovernmental entities with coincident interests, it is recommended that the SEWFRC continue to cooperate with organizations such as the Fox River CAUSE and the Fox River Partnership, especially in the areas of outreach, community informational programming, and school-based educational programming. Such cooperation can only lead to increased appreciation for the Fox River, its waters, and natural resources in southeastern Wisconsin.

SUMMARY

The SEWFRC has maintained an active presence in the Middle Fox River basin, executing a number of priority projects related to selective dredging and channel clearing, water use and dam operating plans, streambank and shoreline erosion control, and public access and water safety. Continuation of these efforts is indicated. In this chapter, the initial implementation plan for the SEWFRC is endorsed, and serves as a basis for the continuing actions of the SEWFRC in addressing shared issues of concern among the River municipalities of the basin.

Beyond the continuation of the SEWFRC's Statutory mandates, a number of emerging issues have been identified, in part associated with the application of the City of Waukesha for access to a Lake Michigan water supply. In addition, as discussed in Chapter III, the proposed diversion of water from Lake Michigan by the City of Waukesha has the potential to indirectly affect water quantity, water quality, and habitat within the Illinois-Fox River. The SEWFRC should remain apprised of developments related to the application of the City of Waukesha for access to Lake Michigan water and of WDNR review of that application, including development of an Environmental Impact Statement.

Further, the current plan proposes extension of the SEWFRC's jurisdiction, with the ultimate objective of making the boundaries of the SEWFRC and Illinois Fox Waterway Agency coterminous at the State line. By focusing on the mainstem of the Fox River, about seven governmental entities would be brought into the Commission's ambit. Such an addition to the SEWFRC jurisdiction would require Legislative action by the Wisconsin Legislature. In the interim, the SEWFRC may wish to consider entering into intergovernmental agreements with these municipalities and inviting their *ex officio* participation in the Commission's deliberations as is currently the case with the Chairperson of the WWMD.

The SEWFRC also has the potential to enhance its outreach efforts. In particular, partnerships with entities such as the Fox River CAUSE and Fox River Partnership offer great potential for achieving synergies of purpose.

In view of emerging issues of concern in the Fox River basin, the SEWFRC has a definite ongoing job to do and role to play in the management of the Middle Fox River. It is especially important that the SEWFRC not only continue its support of constructed projects, but also of engaging in community outreach, whether through the formal educational system or informally. Such actions are already within the Commission's mandate. However, for the Commission to successful and effectively fulfill the needs of the riverine communities, a more stable platform of funding is required. To this end, pursuit of the county-based budgeting mechanisms envisioned by the Legislature at the time of creation of the SEWFRC is a fundamental recommendation of this implementation plan.

Chapter V

IMPACTS OF THE IMPLEMENTATION PLAN

INTRODUCTION

The 1995 Southeastern Wisconsin Regional Planning Commission (SEWRPC) water level control plan presented an evaluation of the environmental impacts, including the regulatory floodplain considerations, likely to arise from the implementation of the plan.[1] No significant negative environment impacts were anticipated. Nevertheless, it was recognized that actual implementation of the various plan elements, in some cases, would require permitting (Federal, State, county, and/or municipal), as well as the conduct of additional, project-specific environmental analyses. As the current implementation plan, set forth in Chapter IV, incorporates by reference the actions proposed in the initial implementation plan insofar as they remain outstanding issues of concern—as in the case of proposed actions relating to the dredging of the Waterford impoundment and contiguous portions of the Fox River—the same permitting and detailed environmental assessment requirements apply to this plan.

Chapter III of this plan has noted the planning context within which this implementation plan has been developed; namely, this plan forms an element of the planning process established pursuant to the Federal Clean Water Act and State Water Pollution Control Act (Chapter 283 of the *Wisconsin Statutes*). More specifically, formulation of this implementation plan is specifically required by Subchapter VI of Chapter 33 of the *Wisconsin Statutes*. Consequently, this implementation plan is part of the continuum of plans that give effect to the mandates of the Federal and State legislation. This plan is formulated, therefore, within the context of the regional water quality management plan,[2] its refinements,[3] the Fox River comprehensive watershed plan,[4] and the Wisconsin

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[1]*See SEWRPC Memorandum Report No. 102,* Water Level Control Plan for the Waterford-Vernon Area of the Middle Fox River Watershed, Racine and Waukesha Counties, Wisconsin, *March 1995, as reflected in the SEWRPC Planning Program Report,* Southeastern Wisconsin Fox River Commission Water Resources Implementation Plan, March 1998, *March 1998.*

[2]*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; Volume Three,* Recommended Plan, *June 1979.*

[3]*SEWRPC Memorandum Report No. 93,* A Regional Water Quality Management Plan for Southeastern Wisconsin: An Update and Status Report, *March 1995.*

[4]*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.*

Department of Natural Resources (WDNR) priority watershed plan for the Fox River watershed.[5] In addition, this plan was developed with recognition of the recommendations set forth in applicable local-level plans, including county land and water resource management plans,[6] and various lake- and stream-specific waterbody management plans.[7,8]

PLANNING CONSIDERATIONS

A comprehensive plan for the Fox River watershed was prepared and published by SEWRPC during 1969 and 1970, as one of the first major planning efforts of the then-newly created Regional Planning Commission.[9] Given the development which has occurred within the area tributary to the Fox River since publication of the comprehensive plan in 1969, as documented in subsequent editions of the regional land use plan and in the county comprehensive plans,[10] and given the more-recent completion by SEWRPC of several lake management and

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[5]*Wisconsin Department of Natural Resources Publication No. WR-366-94,* Nonpoint Source Control Plan for the Upper Fox River Priority Watershed Project, *June 1994; Wisconsin Department of Natural Resources Publication No. PUBL-WT-701-02,* The State of the Southeast Fox River Basin, *February 2002.*

[6]*SEWRPC Community Assistance Planning Report No. 259, 2nd Edition,* A Land and Water Resource Management Plan for Racine County: 2008-2012, *October 2007; Waukesha County Department of Parks and Land Use,* Waukesha County Land and Water Resource Management Plan 2006-2010, *January 2006.*

[7]*SEWRPC Community Assistance Planning Report No. 283,* A Lake Management Plan for the Waterford Impoundment, Racine County, Wisconsin, *Volume One,* Inventory Findings, *October 2007; Volume Two,* Alternative and Recommended Plans, *October 2007; Community Assistance Planning Report No. 230,* A Lake Management Plan for the Phantom Lakes, Waukesha County, Wisconsin, *Volume One,* Inventory Findings, *January 2006; Volume Two,* Alternatives and Recommended Plan, *January 2006; SEWRPC Community Assistance Planning Report No. 226,* A Lake Management Plan for Eagle Spring Lake, Waukesha County, Wisconsin, *October 1997; SEWRPC Community Assistance Planning Report No. 58, 2nd Edition,* A Lake Management Plan for Pewaukee Lake, Waukesha County, Wisconsin, *May 2003.*

[8]*SEWRPC Community Assistance Planning Report No. 284, Part One,* Pebble Creek Watershed Protection Plan, Waukesha County, Wisconsin, *June 2008; SEWRPC Community Assistance Planning Report No. 309,* Mukwonago River Watershed Protection Plan, *June 2010; SEWRPC Planning Program Report,* Southeastern Wisconsin Fox River Commission Water Resources Implementation Plan, March 1998, op. cit.*; see also SEWRPC Community Assistance Planning Report No. 5,* Drainage and Water Level Control Plan for the Waterford-Rochester-Wind Lake Area of the Lower Fox River Watershed, *May 1975; and, SEWRPC Memorandum Report No. 102,* op. cit.

[9]*See SEWRPC Planning Report No. 12,* A Comprehensive Plan for the Fox River Watershed, *Volume One,* Inventory Findings and Forecasts, *April 1969; and Volume Two,* Alternative Plans and Recommended Plan, *February 1970.*

[10]*SEWRPC Planning Report No. 48,* A Regional Land Use Plan for Southeastern Wisconsin: 2035, *June 2006; SEWRPC Community Assistance Planning Report No. 301,* A Multi-Jurisdictional Comprehensive Plan for Racine County: 2035, *November 2009; SEWRPC Community Assistance Planning Report No. 209,* A Development Plan for Waukesha County, Wisconsin, *August 1996; see also Waukesha County Department of Parks and Land Use, Waukesha County University of Wisconsin-Extension, and Waukesha County Municipalities,* A Comprehensive Development Plan for Waukesha County, Waukesha County, Wisconsin, *February 2009; SEWRPC Community Assistance Planning Report No. 259, 2nd Edition,* op. cit.*; and, Waukesha County Department of Parks and Land Use,* Waukesha County Land and Water Resource Management Plan 2006-2010, *January 2006.*

watershed restoration plans noted above, the regional groundwater model,[11] and the regional water supply plan,[12] it may be timely to consider updating the comprehensive plan for the Fox River watershed. The updating of the comprehensive plan for the watershed is especially critical in view of the extreme rainfall events observed during recent years,[13] and the associated risks to people, property, and infrastructure. Development of a refined Fox River watershed plan would be a major multi-county planning effort, and a significant commitment of resources on the part of entities sponsoring such an update. The Southeastern Wisconsin Fox River Commission (SEWFRC) could play a key role in developing support for such a study, and coordinating its preparation.

DESIGN AND IMPLEMENTATION CONSIDERATIONS

As indicated in Chapters II and IV of this plan, the SEWFRC has not only accomplished a number of major projects, primarily in the areas of stabilization of areas of erosion and stormwater management, but has a number of ongoing and emerging challenges to address. Given site-specific considerations, each of the new projects identified herein require detailed engineering design prior to implementation. This is especially true in the case of structural interventions, such as stormwater ponds, infiltration swales, streambank and lakeshore stabilization practices, and management of sediments within the Fox River channel and impoundments.

While the need for engineering design is reduced in the case of many nonstructural interventions, the need for detailed implementation plans remains an important consideration. In this latter case, technical and other assistance may be available from the WDNR, the University of Wisconsin-Extension (UWEX) and the Wisconsin Association of Lakes (WAL), collectively the Wisconsin Lakes Partnership. These organizations have resources such as model ordinances, and guidance for community involvement, that may be available without charge to the various entities within the Middle Fox River basin that are tasked with implementing this strategic plan. In addition, groups such as The Nature Conservancy (TNC), Fox River Citizens Against Underwater Sediment and Erosion (Fox River CAUSE), the Friends of the Mukwonago River, the Friends of the Vernon Marsh, and the Fox River Partnership are potential advocates for the implementation of planned actions. Many of these organizations have been active partners with the SEWFRC during the implementation of actions under the initial implementation plan.

Implementation of recommended structural interventions generally requires consideration of many variables, and hence may require assistance beyond that provided by the aforementioned partners. In some cases, this specialist role can be filled by staff from the relevant county or municipal government departments, such as the land and water conservation divisions of the Counties. These agencies also have access to other specialist assistance, such as that provided to farm operators by the U.S. Department of Agriculture (USDA) through the Natural Resources Conservation Service (NRCS) or Farm Services Agency (FSA). The NRCS staff may be able to assist farmers with the preparation of farm plans to reduce erosion, enhance the effectiveness of agrochemical amendments, and establish crop rotations, among other services.

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[11]*See SEWRPC Technical Report No. 37,* Groundwater Resources of Southeastern Wisconsin, *June 2002; SEWRPC Technical Report No. 46,* Groundwater Budget Indices and their Use in Assessing Water Supply Plans for Southeastern Wisconsin, *February 2010; SEWRPC Technical Report No. 47,* Groundwater Recharge in Southeastern Wisconsin Estimated by a GIS-Based Water-Balance Model, *July 2008; and, SEWRPC Technical Report No. 48,* Shallow Groundwater Quantity Sustainability Analysis Demonstration for the Southeastern Wisconsin Region, *November 2009; see also SEWRPC Memorandum Report No. 167,* Simulation of Shallow Groundwater Flow in the Vicinity of the Village of Eagle, *June 2006*

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

[13]*See U.S. Geological Survey Scientific Investigations Report 2008-5235, "Flood of June 2008 in Southern Wisconsin," 2008.*

Some structural measures will require the application of numerical models to determine optimal effectiveness of the proposed measures, and the use of these models to assist in locating the practices within the riparian area. Such assistance can be provided by many of the engineering consulting companies that offer services to municipal utilities or agricultural operations. Such services may also be of benefit in the likely event that State (or Federal and/or local) government permits are required for the installation of structural practices. At a minimum, such permits are required for land disturbing activities, as detailed below. As noted in Chapter I, the municipal governments comprising the SEWFRC include Racine and Waukesha Counties, the City of Waukesha, the Villages of Big Bend, Mukwonago, and Waterford, and the Towns of Mukwonago, Vernon, Waterford. To date, these municipalities have been active partners with the SEWFRC in streambank stabilization, stormwater management, and provision of public recreational boating access to the Fox River.

Other assistance may be available from special-purpose units of government located within the SEWFRC jurisdictional area, including the Waterford Waterway Management District (WWMD) and the Phantom Lakes Management District (PLMD), created in like manner to the SEWFRC pursuant to authorities granted under Chapter 33 of the *Wisconsin Statutes*, to provide water quality management services to the Waterford impoundment and Upper and Lower Phantom Lakes, respectively; the Town of Waterford Sanitary District, created pursuant to authorities granted under Chapter 66 of the *Wisconsin Statutes*, to provide wastewater management services to portions of the Town of Waterford; and Racine County Farm Drainage District No. 1, created pursuant to authorities granted under Chapter 88 of the *Wisconsin Statutes*, to create and maintain agricultural drainage systems in the Town of Waterford located east of the Waterford impoundment. These entities have specific authority to levy taxes and collect special charges for services provided within their areas of jurisdiction, although the agricultural drainage district also has extra-territorial powers associated with the collection of funds to maintain their drainage networks. To date, the WWMD has been an active partner with the SEWFRC in stormwater management and lakeshore stabilization within the Waterford waterway.

Maintaining ongoing partnerships with the governmental units and private organizations within the watershed is essential not only for the development of site-specific interventions but also in the formulation and delivery of the informational and educational programming offered by the SEWFRC.

PERMITTING CONSIDERATIONS

As noted above, many structural activities likely to be undertaken by the SEWFRC and its partners will require various permits, particularly for land disturbing activities. These permits include municipal permits, county permits, and State/Federal permits. The latter will almost always be required as the land disturbing activities affect the navigable waters of the State and the United States. In the majority of cases, the State permit requirements will satisfy the Federal permit requirements of the U.S. Army Corps of Engineers.

The principle permit required for land disturbing activities within the 600-feet shoreland zone surrounding navigable streams and the 1,000-feet shoreland zone around lakes will be the permits issued by the WDNR pursuant to authorities granted under Chapter 30 of the *Wisconsin Statutes*. In particular Subchapter III of Chapter 30 identified permitting requirements associated with: “structures and deposits,” “bridges and culverts,” “waterfowl habitat,” “wharves and piers,” placement of rafts and other recreational structures, “withdrawal of water,” enlargement of waterways and changes of watercourses, and shoreline protection. In addition, with respect to the maintenance of the various dams placed along streamcourses within the SEWFRC jurisdiction—the Barstow (Saratoga) impoundment, Waterford impoundment, and the Lower Phantom Lake dam—Chapter 31 of the *Wisconsin Statutes* also sets forth necessary permitting requirements, These requirements are further elucidated in relevant chapters of the *Wisconsin Administrative Code* governing natural resources.

In addition to the foregoing, Table 3 in Chapter IV of this report sets forth the various county and local ordinances that apply to the lands abutting the Middle Fox River within the SEWFRC jurisdiction. Of particular note are the local government requirements related to construction site erosion control and stormwater management that relate specifically to the protection of water quality of the Middle Fox River. Effective implementation and ongoing maintenance of stormwater management facilities, for example, is critical to the successful implementation of this

plan, especially as new urban density development occurs within the watershed. As noted in Chapter II, many of the communities draining to the Fox River are currently subject to the stormwater management requirements set forth in Chapters NR 151 and NR 216 of the *Wisconsin Administrative Code*.

OPERATIONAL CONSIDERATIONS

The SEWFRC, in the execution of its mandate, has adopted several operational procedures as a guide to the effective implementation of projects and operation of the Commission. The SEWFRC Board of Commissioners, pursuant to authorities granted under Section 33.57(4) of the *Wisconsin Statutes*, was empowered to promulgate rules necessary to implement the duties and powers granted to the Board of Commissioners. Among the operating procedures adopted by the SEWFRC were guidelines governing the terms of service of the appointed Commissioners and *ex officio* Commissioners, and guidelines governing the project cycle and proposal of projects to the Commission. Among the guidelines applicable to projects are the requirements that: 1) project proposals be submitted to the SEWFRC Board of Commissioners for consideration, 2) projects have a clearly identified sponsor including either a governmental sponsor and/or private sector sponsor, and 3) projects be developed on a cost share basis within a proposed project timeline. The operational guidelines, current through December 31, 2010, are summarized in Appendix B. The SEWFRC Board of Commissioners reserves the right to promulgate, modify, or repeal the operational guidelines as prudent and necessary for the conduct of the Commission's business.

While the initial SEWFRC implementation plan has provided strategic guidance to the SEWFRC in the execution of its mandate,[14] the Commission historically has taken a somewhat *ad hoc* approach to project selection and funding. While the criteria for submitting a project proposal to the Commission have been clearly articulated, little guidance has been available for prioritizing and selecting specific projects from among the project concepts submitted. In part, this has been due to the availability of funds with which to support the projects that have been proposed. More recently, project selection has been predicated upon the availability of finance. While both the quality of the proposed projects and the availability of funds with which to finance them remain valid criteria for the allocation of funding, a more rigorous process of project selection is desirable. To this end, the development of a project ranking score sheet similar to those developed for the WDNR lake and river grant programs is recommended.[15] The award of points within the scoring system should include the following:

- The degree to which the proposed project meets the objectives of the SEWFRC implementation plan;
- The degree to which the proposed project meets the need for actions recommended in a plan other than the SEWFRC implementation plan;
- The degree to which the proposed project assists in local decision-making or formulation of a strategy to protect the quality of the Fox River ecosystem;
- The degree to which the project will protect critical riverine ecosystems or special concern, threatened or endangered species and/or their habitat;

[14]*SEWRPC Planning Program Report*, Southeastern Wisconsin Fox River Commission Water Resources Implementation Plan, March 1998, op. cit.

[15]*See Wisconsin Department of Natural Resources Publication No. PUB-CF-007 2010,* Lake Management Planning Grant Program and Lake Protection and Classification Grant Program Guidelines and Application, *2010; see also Wisconsin Department of Natural Resources Publication No. PUB-CF-002 2009*, River Protection Grant Program: River Planning Grants and River Management Grants Guidelines and Application, *2009.*

- The degree to which the project will enhance knowledge and understanding of the Fox River ecosystem;

- The degree to which the project makes efficient use of all available funding sources, including the acquisition and use of nonSEWFRC funds in excess of the 10 percent minimum local share requirement;

- The level of support for the project from other affected management units or organizations;

- The degree to which the proposed activities have a good likelihood of successfully meeting the project objectives, including consideration of the ability of the applicant to complete the project within budget and on time;

- The completeness—including the receipt of any applicable permits—and degree of detail in the application, and inclusion of a proposed time frame within which the project will be implemented; and,

- Whether it is a first-time project, with such projects given preference.

Adoption a clearly articulated basis for project proposal ranking will contribute to the transparency of the SEWFRC operations and better inform potential project applicants of the requirements necessary to access SEWFRC funds.

With respect to the distribution of funds awarded to successful project applicants, it is recommended that the SEWFRC provide not more than one-half of the grant award to the applicants, upon request, in advance of project completion, with the balance of the SEWFRC share of the projects funds being provided upon completion of the project. Such a reimbursement program is consistent with other State grant programs, specifically the Chapter 50/51 Stewardship Program, among others.

CONCLUDING REMARKS

The continuation and maintenance of both structural and nonstructural interventions proposed and/or implemented by the SEWFRC is critical to the protection and rehabilitation of water quality in the Middle Fox River. However, it is unlikely that the necessary effort required for this purpose can be undertaken solely by the SEWFRC. To overcome this challenge, the continuation of partnerships and forging of new partnerships between the SEWFRC, governmental entities, and the private sector will be necessary to maintain and enhance water quality, recreational access and use, and public safety within the Middle Fox River.

Chapter VI

IMPLEMENTATION STRATEGY

INTRODUCTION

The southeastern Wisconsin Fox River watershed forms a critical hydrological and ecological corridor linking the communities of southeastern Wisconsin, ultimately linking these communities with their sister communities in Illinois and the Mississippi River basin. The Southeastern Wisconsin Fox River Commission (SEWFRC) focuses on the major issues of concern shared by the communities of the Middle Fox River, ranging from the City of Waukesha to the Village of Waterford, and contained between the headwaters of the Barstow impoundment and the tailwaters of the Waterford Impoundment. These issues include the full range of urban- and rural-area water resource concerns, including provision for navigation and mitigation of flooding; streambank and shoreline stabilization; public access and water safety; as well as emerging issues of concern relating to water supply, water quantity, and water quality, as detailed in Chapters III and IV of this plan.

In response to these issues of concern, Chapter IV set forth a number of recommended actions required to address the ongoing current, as well as emerging issues of concern. In Chapter V of this plan, it was recommended that the actions needed to address these concerns be undertaken as a cooperative effort involving the SEWFRC, the Wisconsin Department of Natural Resources (WDNR), local units of government and special-purpose units of government within the SEWFRC jurisdiction, as well as various private organizations. It is recommended that the SEWFRC provide the framework within which overall plan implementation and coordination can be accomplished, with selected local and special-purpose units of government being involved as appropriate and necessary in the implementation process associated with each element. As set forth in Chapter V, governmental agencies, special-purpose units of government, and nongovernmental organizations within the Fox River basin have a range of skills that can be brought to bear in assisting landowners and others in implementing, among other actions, shoreland stabilization, stormwater runoff control, and water quality management measures.

In this chapter, an implementation strategy is recommended to guide SEWFRC activities with respect to the actions and activities of the cooperating units of government and nongovernmental entities in addressing each of the recommended plan elements. It should be noted that funding of plan implementation activities is intended to be provided largely through a combination of local, State, and Federal sources.

SELECTIVE DREDGING AND CHANNEL CLEARANCE

River System

The initial 1998 implementation plan noted that boating activity on the Fox River was severely restricted due to sedimentation and accumulation of fallen trees and debris which had become increasingly more severe over time.[1] Since that time, the Southeastern Wisconsin Region has experienced several floods that have exacerbated the obstructions and navigational impairments reported during the initial planning program.[2] At least two major debris jams of such magnitude as to require even a small watercraft, such as a canoe, to be portaged around the obstacles, as well as numerous other tree falls, were observed during the 2010 reconnaissance. Erosion and deposition of sediment also remain an issue of concern in the Fox River downstream of the City of Waukesha. These areas are shown on Map 5 in Chapter IV of this report.

Removal of selected sediment deposits forming the most severe impediments to navigation should be carried out as a cooperative effort of State and local government. These actions are necessary to maintain the hydrological connectivity of the Fox River, and contribute to the reduction in risk of flooding during high-flow events. Because these actions benefit the entire community riparian to significant reaches of the Fox River, it is important that these actions be considered to be of wider benefit than could be accrued to riparian landowners and River municipalities. Consequently, and in light of the potential costs associated with dredging and disposal of dredge spoils, the major cost of these efforts is recommended to be borne by the State. It is, however, noted that any such activities will require that a permit be obtained from the WDNR under Chapter 30 of the *Wisconsin Statutes* and potentially from the U.S. Army Corps of Engineers. Guidance regarding the removal of fallen trees and debris is available from both the U.S. Department of Agriculture and the American Fisheries Society.[3]

In addition, to the extent practicable, remedial measures are recommended to stabilize eroding banks. Implementation of biological and/or structural (e.g., use of riprap) engineering responses as appropriate should be undertaken as a cooperative effort between local landowners, the river municipalities, and the WDNR. Again, it is noted that permits for such activities must be obtained from the WDNR under Chapter 30 of the *Wisconsin Statutes* and potentially from the U.S. Army Corps of Engineers.

Impoundment Area

Siltation and sediment deposition currently severely limit shoreline access and boating activities both within the Barstow impoundment, as well as the Waterford Impoundment.[4] This siltation has resulted in significant observed problems with navigation that are aggravated during low water periods, while the transport and deposition of

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[1]*See SEWRPC Memorandum Report No. 102,* Water Level Control Plan for the Waterford-Vernon Area of the Middle Fox River Watershed, Racine and Waukesha Counties, Wisconsin, *March 1995.*

[2]*See U.S. Geological Survey Scientific Investigations Report 2008-5235, "Flood of June 2008 in Southern Wisconsin," 2008.*

[3]*See U.S. Department of Agriculture Report R8-TP-16,* Stream Habitat Improvement Handbook, *June 1992; and American Fisheries Society Report,* Stream Obstruction Removal Guidelines, *1983.*

[4]*See SEWRPC Community Assistance Planning Report No. 283,* A Lake Management Plan for the Waterford Impoundment, Racine County, Wisconsin, *Volume One,* Inventory Findings, *October 2007; Volume Two,* Alternative and Recommended Plans, *October 2007.*

sediment in the debouchment of the Fox River have been aggravated by recent floods.[5] Within the Waterford Impoundment, the major depositional area lies between the WDNR public recreational boating access site and the point of confluence of the Impoundment and Tichigan Lake, in an area locally known as Conservancy Bay. This deposition also is likely to have caused the disruption in breeding success of trout, which historically were reported to have frequented the cold water Tichigan Creek entering the upper reaches of the Waterford Impoundment from the WDNR Tichigan Wildlife Area.[6] Consequently, it is recommended that dredging be undertaken along selected shoreline areas and in shallow bays within the Waterford Impoundment and Tichigan Lake, and in the Fox River immediately upstream from the Impoundment.[7]

As was noted previously, this proposed dredging will require that a permit be obtained under Chapter 30 of the *Wisconsin Statutes*. Because there is potential benefit to both riparian landowners as well as visitors to this area, it is recommended that dredging be undertaken as a cost-shared arrangement between the riparian owners, the WDNR, the Waterford Waterway Management District (WWMD), the Village of Waterford, and the Town of Waterford. Potential cost-share funding for such a project may be available pursuant to Chapter NR 7 of the *Wisconsin Administrative Code* through the Recreational Boating Facilities grant program. Potential Federal cost-share funding through the U.S. Army Corps of Engineers also is being explored by the WWMD Board of Commissioners. Such Federal participation may be warranted due to the fact that this section of the Fox River is part of an interstate waterway and tributary stream system to the Mississippi River basin.

DEVELOPMENT OF WATER USE AND DAM OPERATING PLANS

The water level in the Waterford Impoundment is currently controlled manually by Racine County staff and maintained at about elevation 773.4 feet above National Geodetic Vertical Datum of 1929 (NGVD 29) year-round. Options evaluated in the 1995 SEWRPC water level control plan included both the automation of the dam operations, as well as consideration of a drawdown during winter and early spring. The former recommendation was not found to be feasible, and automated operation of the dam gates at Waterford did not proceed. In addition, the comprehensive lake management plan for the Waterford Impoundment has discounted the previously recommended winter drawdown on the basis that spring inflows carry the largest percentage of the contaminant load into the impoundment. Impounding water of this quality in a reservoir of reduced volume would be likely to have more significant negative environmental consequences than those related to ice damage that would be alleviated.

The WWMD and SEWFRC have proposed dredging portions of the impoundment, as a means of perhaps better conveying and storing floodwaters to provide some reduction in flood flows and elevations. This proposal is linked to the dredging project(s) noted above. Thus, it is recommended that this dredging also be undertaken as a cost-shared arrangement between the riparian owners, the WDNR, the WWMD, the Village of Waterford, and the Town of Waterford, potentially supported in part with grants-in-aid from the State and Federal sources.

The 1998 implementation plan also set forth the recommendation that staff gauges be placed upstream of the impoundment, in the Village of Big Bend. This recommendation is retained. It is proposed that dam operators be kept apprised of upstream conditions by Town and Village personnel specifically responsible for notifying the

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[5]*Review of historic plat maps of the point of entry of the Fox River into the upper reaches of the Waterford Impoundment locally known as Conservancy Bay and aerial photographs of the same area taken between 1937 and 2010 show both the migration of the river which occurred as a result of natural hydrological processes as well as significant human intervention through ditching and construction of berms, attesting to the active nature of this portion of the Waterford Impoundment with respect to river-borne, lake, and terrestrial sediments.*

[6]*Wisconsin Conservation Department,* Surface Water Resources of Racine County*, 1961.*

[7]*SEWRPC Community Assistance Planning Report No. 283,* op. cit.

operators when water levels along the upper reaches approach pre-determined elevations on staff gauges that would be installed at selected locations. This River stage notification procedure may involve little or no direct costs other than those associated with the installation of the staff gauge(s). Cost-share funding to support the installation of such gauges may be available through the Chapter NR 195 river planning and protection grant program, or through the Chapter NR 190 lake management planning grant program.

Finally, the WDNR, SEWFRC, and its cooperators are urged to consider the Middle Fox River basin as part of a continuum of flows that includes a "cascade" of impoundments and flow control structures. The interactions of the impoundments within cascade systems have been briefly described by Professors Milan Straskraba and Jose Tundisi as follows:[8]

> "From a water quality standpoint, reservoir cascades are specific because any effect on an individual reservoir will be transferred to those below it. In a reservoir cascade, the water quality of the top reservoir is usually similar to the water quality of a solitary reservoir. The water quality of the second and lower reservoirs [is] usually all modified. The extent to which a reservoir modifies the water quality of another reservoir below it depends on whether the higher reservoir is a deep, stratified reservoir (profound effects) or a shallow reservoir (less effects). The intensity of these influences depends upon the connecting stream order, trophic levels in the reservoir and the distance between reservoirs. Reservoirs that are located on higher order streams and have greater retention times have greater effects on the outflowing rivers. The distance between one reservoir and another is also relevant; at a distance of several hundred kilometers from the reservoir, the river resumes a natural state and water quality effect from the upper reservoir are no longer observed. This effect is most important where reservoirs are closely situated."

This effect becomes important in the protection of lives and properties from flooding in the downstream reaches of the Fox River system, as the discharge of greater volumes of water from upstream impoundments contributes to a significant increase in volumes being received by the downstream impoundments. As noted in Chapter IV, there currently are concerns being voiced by riparian landowners in the vicinity of Bridge Road in the Town of Waterford and flood risks being observed by the operators of the Lower Phantom Lake dam with regard to the management of flood flows during the floods of the summers of 2008 through 2010,[9] that would suggest that consideration be given by the dam operators and regulatory authorities to operating all seven impoundments upstream of the Waterford dam as a system, with water being retained in upstream impoundments during extreme runoff events so as not to overwhelm downstream infrastructure. Because the introduction of the system concept into the management of river impoundments may require changes to Chapter 31 of the *Wisconsin Statutes* and associated Chapters of the *Wisconsin Administrative Code*, it is recommended that the SEWFRC initiate conversations with the various dam operators within and upstream of the Middle Fox River (and, ideally, also with those downstream of the Middle Fox River, including those in Wisconsin—principally the Norway-Dover Drainage District that operates the Rochester dam—and in Illinois—such as the Illinois Department of Natural Resources and Illinois Fox Waterway Agency), the WDNR, and the Wisconsin Legislature with a view toward a Legislative initiative that would facilitate implementation of such an integrated management program.

STREAMBANK AND SHORELINE EROSION CONTROL

Erosion and sediment deposition in the Fox River and its impoundments is a major water resources problem. A detailed description of the sedimentation problems in the reach of the Fox River from the Waterford dam to IH 43 was presented in the 1995 water level control plan. While the activities of the SEWFRC during the initial period

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[8] *M. Straskraba and J.G. Tundisi,* Guidelines of Lake Management, *Volume 9,* Reservoir Water Quality Management, *International Lake Environment Committee Foundation, Kusatsu, Japan, 1999. ISBN: 4-906356-26-5.*

[9] *See U.S. Geological Survey Scientific Investigations Report 2008-5235,* op. cit.

of plan implementation have addressed some of the worst areas of erosion, areas of erosion contributing sediments to the waterway remain, as shown on Map 5 in Chapter IV of this report.

Measures such as regrading, establishment of vegetation, or placement of riprap are recommended to be implemented by individual landowners, including the Fox River municipalities where the erosion is located within riparian public parklands. A permit for such activities may be required under Chapter 30 of the *Wisconsin Statutes*, as well under local zoning and U.S. Army Corps of Engineers regulations.

The extensive involvement of the SEWFRC in cost-share funding of shoreline protection structures has been noted in Chapter II. Continued support of local landowners in the implementation of future such measures therefore is recommended.

PUBLIC ACCESS AND WATER SAFETY

Maintenance of existing public access sites in the Village and Town of Waterford at a level of access considered to be adequate pursuant to the WDNR standards for the Waterford impoundment, as well as the access site to the Fox River in the Village of Big Bend, and of the public piers, walking trails, and recreational facilities available at Frame Park on the Barstow impoundment in the City of Waukesha, is recommended. Such maintenance is recommended to be the responsibility of the Fox River municipalities within whose jurisdiction the amenities fall, except in the case of the WDNR recreational boating access site on the Waterford impoundment whose maintenance is recommended to be the responsibility of the WDNR.

It also is recommended that the SEWFRC support Racine and Waukesha Counties in the development of a Fox River recreational corridor.[10] Over time, it is recommended that that those lands identified as incurring flooding damages on a regular basis be acquired and incorporated into the Fox River recreational corridor as they become available on the open market. Lands (or conservation easements) can be acquired by the Counties through various programs, including the State of Wisconsin Stewardship Program and Lake Protection Grant Program, while stream buffer easements can be obtained through the U.S. Department of Agriculture (USDA) Conservation Reserve Enhancement Program and/or the State of Wisconsin River Management Planning and Protection Grant Program.

Allied with public recreational boating access and land acquisition is the issue of user conflicts and recreational use safety. Continued operation of the Town and Village of Waterford water patrol on the Waterford impoundment during both open water and ice-covered conditions is recommended. Implementation of this measure has been supported in part through State of Wisconsin grants-in-aid administered by the WDNR and through contributions by the river municipalities and WWMD.

Further, it is recommended that the SEWFRC support the efforts of the River municipalities and the WWMD in establishing a navigational channel along the Fox River, including the acquisition and placement of buoys and other aids to navigation. In addition, it is proposed that the SEWFRC periodically review information on the presence and spread of nonnative species within their jurisdiction, such as the species identified in Chapter NR 40 of the *Wisconsin Administrative Code*, and appropriate control actions supported either through locally administered grants-in-aid awarded to local landowners or through partnerships with other governmental units within whose jurisdiction such infestations occur.

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[10]*See, inter alia, SEWRPC Community Assistance Planning Report No. 134, 2nd Edition,* A Park and Open Space Plan for Racine County*, July 2001;SEWRPC Community Assistance Planning Report No. 137,* A Park and Open Space Plan for Waukesha County*, December 1989; SEWRPC Community Assistance Planning Report No. 71,* A Park and Open Space Plan for the Town of Waterford, Racine County, Wisconsin*, January 1990; SEWRPC Community Assistance Planning Report No. 122,* A Park and Open Space Plan for the Town of Vernon, Waukesha County, Wisconsin*, March 1985.*

Periodic review of local ordinances by the river municipalities also is recommended as a no-cost item to ensure currency with State law and best practices.

MODIFICATION OF THE COMMISSION BOUNDARY AND COMPOSITION OF THE BOARD OF COMMISSIONERS

The Commission's overall service area is currently defined in Section 33.54 of the *Wisconsin Statutes*. The SEWFRC Board of Commissioners, in a 2010 discussion of boundary options, unanimously asked that this implementation plan consider extending the SEWFRC boundary southward. A critical element in this request was the intention of the Commissioners that an effort be considered to achieve contiguous boundaries with the Illinois Fox Waterway Agency to better facilitate joint actions for managing the River, its flows, and its contaminant loads. Such an expansion of the SEWFRC jurisdiction would include: the City of Burlington, the Village of Rochester, and Town of Burlington, all in Racine County, and the Village of Silver Lake, the Town of Wheatland, and the Town of Salem, all in Kenosha County. Expansion in an upstream direction also was mooted—involving the Cities of Brookfield and Pewaukee, the Villages of Lannon and Menomonee Falls, and the Town of Brookfield—but was considered to be of lesser immediate importance. It was noted that the latter configuration would include the entirety of the mainstem of the Fox River within the State of Wisconsin. Amendment of the SEWFRC boundary would require Legislative action by the State of Wisconsin as the current boundary is mandated in Subchapter VI of Chapter 33 of the *Wisconsin Statutes*. Inherent in any alteration of the boundary of the SEWFRC would be the modification of the Board of Commissioners. It was recommended that the SEWFRC initiate conversations with the Legislature with a view toward a Legislative initiative that would allow the Commission to attach lands to its jurisdiction. Such a change would essentially be a no-cost action, although some actual costs may be incurred as a result of costs of advertisements, meetings, and posting of notices. In the interim it is recommended that the SEWFRC consider entering into intergovernmental agreements with the relevant communities.

FUNDING AND PROJECTS

Pursuant to Section 33.54 of the *Wisconsin Statutes*, the SEWFRC can request that funds be appropriated by Racine and Waukesha Counties and/or by the Fox River municipalities—the City of Waukesha; the Villages of Big Bend, Mukwonago, and Waterford; and the Towns of Mukwonago, Vernon, Waterford, and Waukesha—to enable the SEWFRC to perform its duties of improving water quality, protecting and enhancing recreational use, and coordinating and integrating county water-related programs and projects. The SEWFRC was also empowered to solicit and receive gifts, grants, and other financial aids. Grants and other aids, directly appropriated by the Legislature and administered by the WDNR, have historically provided the funds utilized by the SEWFRC in the conduct of its mandated activities. The SEWFRC has been funded at the level of approximately $125,000 per year. While it may not be feasible under the current economic climate to seek funding at such a level from the Counties, it may be possible for the SEWFRC to seek sufficient funding to offset the local share of other grants-in-aid available from State and Federal sources, some of which have been identified above. In the interim, it is recommended that the SEWFRC initiate conversations with the County Executives of Racine and Waukesha Counties with respect to the solicitation of funds to sustain the SEWFRC efforts, as set forth in Subchapter VI of Chapter 33 of the *Wisconsin Statutes*. This essentially is a no net cost item.

PARTNERSHIPS

The SEWFRC is, among its other attributes, a coordinating body. Foremost among the partnerships created within the Commission's mandate is a partnership between Racine and Waukesha Counties and between the SEWFRC, the Counties, and the River municipalities. An active role for the citizens within the Fox River municipalities also was envisioned when the SEWFRC was formed. Since its creation, the SEWFRC has pursued partnerships with both the River municipalities and special-purpose governmental entities such as the WWMD and the Illinois Fox Waterway Agency. Recognizing the coincidence of purpose between the SEWFRC and other governmental and nongovernmental organizations within the Middle Fox River basin, it is recommended that the SEWFRC continue

to create, support, and cooperate in such partnerships. Such cooperation will lead to increased appreciation for the Fox River, its waters, and natural resources in southeastern Wisconsin. This essentially is a no-cost item.

EMERGING ISSUES

Under the mandate currently given to the SEWFRC by the State of Wisconsin pursuant to Subchapter VI of Chapter 33 of the *Wisconsin Statutes*, actions have been undertaken or are proposed in the following priority areas: selective dredging (proposed), channel clearance (ongoing), water use management (ongoing), Waterford dam operations (implemented in part), streambank erosion protection (ongoing), maintenance of shorelines and navigable waters (implemented in part), boating access (ongoing), water safety and regulations (ongoing), and informational and educational programming (implemented in part). Continuation of SEWFRC activities in these priority areas is recommended and has been discussed above.

Beyond this current mandate, however, are a number of emerging issues, discussed in Chapter III, such as the application of the City of Waukesha for access to a Lake Michigan water supply. The proposed diversion of water from Lake Michigan by the City of Waukesha has the potential to indirectly affect water quantity, water quality, and habitat within the Illinois-Fox River. Additionally, the infiltration requirements, adopted by the State of Wisconsin pursuant to Chapter NR 151 of the *Wisconsin Administrative Code*, are intended, in part, to replenish groundwater supplies that would otherwise be diminished as a result of stormwater being discharged from a site as surface runoff as opposed to infiltration. Some concerns have been expressed regarding the potential impact of stormwater-borne pollutants, particularly chloride, on groundwater sources. In view of these and other, yet to be identified emerging issues (such as the impacts of climatic variability of the Fox River system), it is recommended that the SEWFRC maintain a watching brief with respect to emerging issues and take action as necessary to ensure the coordination of county water-resources management efforts. This essentially is a no-cost item.

SUMMARY

The implementation of the SEWFRC's work program over the next decade is recommended to build upon the practices and procedures adopted during the initial decade of the SEWFRC's operations. In addition to addressing the mandated issues of selective dredging and channel clearance, development of water use and dam operating plans, streambank and shoreline erosion control, and public access and water safety, the emerging issues of the modification of the Commission boundary and composition of the Board of Commissioners, funding and project selection, issues related to the Great Lakes-St. Lawrence River Basin Water Resources Compact, and partnerships were identified. While the SEWFRC's role in maintaining a watching-brief over issues such as ordinance development, nonnative species infestations, and coordination of activities within the Middle Fox River basin are largely no-cost activities, other (ongoing) activities require the continued and sustained application of funds and other resources. Thus, it is recommended that the SEWFRC work to implement the county-based funding process as envisioned by the Wisconsin Legislature in Subchapter VI of Chapter 33 of the *Wisconsin Statutes*, while continuing to seek additional external sources of funds through grants and other funding sources. To this end, the establishment and/or continuation of partnerships with other governmental entities and nongovernmental organizations is recommended. These actions are summarized in Table 4.

Table 4

SOUTHEASTERN WISCONSIN FOX RIVER COMMISSION IMPLEMENTATION PLAN SUMMARY

Plan Element	Subelement	Description	Agencies and Organizations Most Directly Involved in Cooperation with the SEWFRC
Selective Dredging and Channel Clearance	River system	Provide adequate depth for navigational access to the Waterford Waterway from the WDNR access site at Bridge Road	WDNR, SEWFRC, Racine County
		Encourage review and refinement of erosion control, pollution abatement, and related programs to minimize the generation of contaminants from the land surface and their transport to and through the Fox River	WDNR, WDATCP, SEWFRC, Racine and Waukesha Counties, and NRCS
		Remove debris jams, especially around infrastructure	SEWFRC, WDNR, private landowners, and river municipalities
		Maintain instream structure where possible as habitat for fish and aquatic life	WDNR, private landowners, and river municipalities
	Impoundments	Provide adequate depth for navigational use of the waterways	WDNR, SEWFRC
		Consider provision of additional storage capacity in the Waterford impoundment by deepening of the navigational channels and modifying the operating levels	WDNR, SEWFRC, and Racine County
Water Use and Dam Operating Plans	Waterford impoundment	Maintain current operating levels until additional capacity is installed	Racine County
		Install staff gauges upstream of the Waterford dam; implement volunteer monitoring program	SEWFRC and Racine County
Streambank and Shoreline Erosion Control	Entire system	Regrade and revegetate shoreland areas as necessary and appropriate; consider use of riprap where necessary	Private landowners, and river municipalities as necessary
Public Access and Water Safety	Entire system	Maintain existing public recreational boating access sites	River municipalities and WDNR
		Consider extending the Fox River Recreational Corridor through fee-simple acquisition or conservation easement as lands become available	Racine and Waukesha Counties
		Consider provision of carry-in access at CTH ES	Waukesha County
		Maintain navigational channels and aids-to-navigation in the Waterford impoundment	WWMD and SEWFRC
		Monitor for nonnative species and control as necessary	SEWFRC, PLMD, WWMD, and WDNR
Commission Boundary	Entire system	Consider extending the SEWFRC jurisdiction southward along the mainstem of the Fox River to the Wisconsin-Illinois border	SEWFRC and Wisconsin Legislature
		Consider extending the SEWFRC jurisdiction northward along the mainstem of the Fox River to the headwaters	SEWFRC and Wisconsin Legislature
		Modify the composition of the SEWFRC Board of Commissioners as necessary to accommodate additional lands	SEWFRC and Wisconsin Legislature
		Seek Legislative authority for the SEWFRC Board of Commissioners to modify the SEWFRC boundary in a manner similar to that provided for in Subchapter IV of Chapter 33, *Wisconsin Statutes*	SEWFRC and Wisconsin Legislature

Table 4 (continued)

Plan Element	Subelement	Description	Agencies and Organizations Most Directly Involved in Cooperation with the SEWFRC
Emerging Issues	Entire system	Assess the potential impact of Fox River flows of the proposed City of Waukesha plan to access water from Lake Michigan; consider impacts of return flows to Lake Michigan on Fox River flows	SEWFRC, SEWRPC, WDNR, and others
		Consider the potential impact of stormwater infiltration requirements on groundwater flows to the Fox River	SEWFRC, SEWRPC, WDNR, and others
		Consider updating the 1969 SEWRPC comprehensive plan for the Fox River watershed	Kenosha, Racine, Walworth, and Waukesha Counties and the Fox River watershed communities within those counties; SEWFRC; WDNR; and SEWRPC
Partnerships	Entire system	Maintain partnerships with governmental and nongovernmental entities with interests in the Middle Fox River basin	SEWFRC, PLMD, WWMD, FWA, WDNR, and others
		Develop new partnerships with governmental and nongovernmental entities with interests in the Middle Fox River basin, including special-purpose governmental units such as public inland lake protection and rehabilitation districts, town sanitary districts, and agricultural drainage districts	SEWFRC, Fox River CAUSE, Friends of the Mukwonago, Fox River Partnership, and others
		Continue outreach to local school districts, community organizations, and others	SEWFRC

NOTE: SEWFRC = Southeastern Wisconsin Fox River Commission
River Municipalities = City of Waukesha; Villages of Big Bend, Mukwonago and Waterford; and Towns of Mukwonago, Vernon, Waterford, and Waukesha, as defined in Chapter 33, *Wisconsin Statutes*
WDNR = Wisconsin Department of Natural Resources
WDATCP = Wisconsin Department of Agriculture, Trade and Consumer Protection
NRCS = U.S. Department of Agriculture, Natural Resources Conservation Service
SEWRPC = Southeastern Wisconsin Regional Planning Commission
PLMD = Phantom Lakes Management District
WWMD = Waterford Waterway Management District
FWA = Illinois Fox Waterway Agency
Fox River CAUSE = Fox River Citizens Against Underwater Sediment and Erosion

Source: SEWRPC.

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APPENDICES

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Appendix A

ALTERNATIVE FUNDING MECHANISMS

INTRODUCTION

The Southeastern Wisconsin Fox River Commission (SEWFRC) was established in 1997 by the State of Wisconsin pursuant to 1997 *Wisconsin Act* 27, which created Subchapter VI of Chapter 33 of the *Wisconsin Statutes*. Since the publication of the initial SEWFRC implementation plan in 1998,[1] the SEWFRC has had an active role in the execution of a number of significant projects along the reach of the Fox River between the City of Waukesha, in Waukesha County, and the Village of Waterford, in Racine County. Accomplishment of these tasks was funded through a series of "block grants" to the Commission from the Recreational Boating Facilities grant program, administered by the Wisconsin Department of Natural Resources. Since the State 2009-2010 fiscal year, however, the availability of these funds to the SEWFRC was no longer assured. Consequently, this Appendix reviews the statutory mechanisms by which the SEWFRC was envisioned to be funded at the time of its creation, as well as a number of Federal and State grant programs that might be applicable to the SEWFRC's activities.

SEWFRC BUDGETARY PROCESS

Through State fiscal year 2009-2010, the SEWFRC held its annual budget hearing during December, or coincident with the last meeting of the SEWFRC Board of Commissioners during the year preceding the year in which the funds were to be applied. As noted above, project proposals were generally submitted in the autumn of the year. This budget timeline allowed envisioned surplus funds from projects that had been executed during that calendar year as well as newly appropriated funds to be applied to the proposed project portfolio. This same budget timeline was employed in allocating the funds available to the Commission for its 2011 fiscal year. However, in the absence of new funding from the State, it may be anticipated that the SEWFRC will have to explore alternative revenue sources in order to sustain its activities within the Middle Fox River Basin.

To this end, Section 33.54 of the *Wisconsin Statutes* envisioned the funding of SEWFRC projects by means of appropriations of funds by the counties and/or River municipalities. In addition, Section 33.54 of the *Wisconsin Statutes* provided that the SEWFRC, counties, and/or River municipalities could solicit gifts, grants, and other aids to enable the SEWFRC to perform its functions. As noted, this latter funding source (grants-in-aid) has been the principle source of funding for SEWFRC projects to date. Potentially applicable grants-in-aid are discussed

[1]*Southeastern Wisconsin Fox River Commission,* Southeastern Wisconsin Fox River Commission Implementation Plan, *March 1998.*

further below. This section sets forth an overview of the budget cycles applicable to the counties and Fox River municipalities. Conforming to the local government budget cycles will require changes to the traditional budgetary process of the SEWFRC.

County Budget Process

Section 59.60 of the *Wisconsin Statutes* sets forth the budgetary procedure for counties. This process requires that annual budget requests be received by the budget director of a county no later than **July 15** of each year. For the purposes of Chapter 59, the county departments include all departments, boards, commissions, institutions, offices, and other agencies of the county government for which funds may be legally appropriated—including, in this case, the SEWFRC—while the budget director means the director of the county department of administration. With respect to the SEWFRC, this process would be applicable to both Racine and Waukesha Counties. An annual budget request must include estimated revenues and expenditures for the ensuing fiscal year, the estimated costs of any capital improvements ending in or proposed for the ensuing fiscal year and for subsequent four fiscal years, and any other information that the budget director may require.

The county budget director then has until **August 15** of each year to compile the departmental budgets into a draft budget for the county executive to consider. The county executive has until **October 1** of each year to refine this draft budget prior to submission of the budget to the county board of supervisors. The county board of supervisors then has two weeks to consider this budget and hold a public hearing on the proposals, with the entire process being completed no later than the **first Monday in November** annually.

Municipal Budget Process

The municipal budget process set forth in Section 65.90 of the *Wisconsin Statutes* applies to counties having a population of less than 500,000 persons (i.e., to both Racine and Waukesha Counties), cities other than first class cities (i.e., to the City of Waukesha), villages (i.e., to the Villages of Big Bend, Mukwonago, and Waterford), towns (i.e., to the Towns of Mukwonago, Vernon, Waterford, and Waukesha), school and technical college districts, and all other public bodies that have the power to levy a general property tax or certify a budget. It should be noted, in this regard, that the public inland lake protection and rehabilitation districts whose jurisdictions include portions of the SEWFRC jurisdiction—the Phantom Lakes Management District and Waterford Waterway Management District—are required to follow the annual budget process set forth in Subchapter IV of Chapter 33 of the *Wisconsin Statutes*. It also should be noted that, while the SEWFRC is not a taxing body, Subchapter VI of Chapter 33 of the *Wisconsin Statutes* sets forth a budget process that is meant to conform to the municipal budget process; Section 33.60 of the *Wisconsin Statutes* notes that, after the public hearing, the SEWFRC Board of Commissioners is required to submit the proposed SEWFRC budget to Racine and Waukesha Counties for incorporation into each county's budget, subject to the review procedures applicable to county budgets under Sections 59.60 and 65.90 of the *Wisconsin Statutes*.

In similar fashion to the budget requirements set forth in Subchapter VI of the *Wisconsin Statutes*, proposed municipal budgets compiled under Section 65.90 of the *Wisconsin Statutes* are required to show existing indebtedness and anticipated revenues from all sources during the ensuing year, actual revenues and expenditures for the preceding year, actual revenues and expenditures for not less than the first six months of the current year, and estimated revenues and expenditures for the balance of the current year. Anticipated unexpended and/or unappropriated balances and surpluses also must be shown.

Grants-in-Aid

Various grant programs may be available to the SEWFRC and its cooperators under various Federal and State grant programs. Several of these programs are summarized in Table A-1. Most grant programs involve some measure of cost-share funding under which the beneficiary is required to provide a percentage of the total cost of the project, either in cash or in-kind. Because of this cost-share requirement, the SEWFRC may choose to assist Fox River municipalities and others by creating awareness of these grant programs, or provide grant management services to the River municipalities and others in administering grant awards. The primary "value-added" by the participation of the SEWFRC, however, would be in coordinating actions and interventions by the Counties and

Table A-1

FEDERAL AND STATE GRANT PROGRAMS POTENTIALLY APPLICABLE TO SOUTHEASTERN WISCONSIN FOX RIVER COMMISSION PROJECTS

Grant Program	Contract Length	Sign-up Period	Cost-Share Required	Payments or Reimbursements	Practices Funded	Minimum Land Requirements
USDA Conservation Reserve Program (CRP)	10 or 15 years, or perpetual in the case of easements	Annual or continuous	50 percent	Specified dollar amount per acre based upon soil type	Permanent pasture, buffer strips, grassed waterways, windbreaks, trees	Requirements range from small sensitive areas along stream corridors to large tracts of land
USDA Conservation Reserve Enhancement Program (CREP)	10 or 15 years	Annual	50 percent	Specified dollar amount per acre based upon soil type	Permanent pasture, buffer strips, grassed waterways, windbreaks, trees	Requirements range from small sensitive areas along stream corridors to large tracts of land
USDA Conservation Stewardship Program (CSP)	- -	Annual	- -	Specified dollar amount per acre based upon the conservation performance score	Additional conservation activities; and Improving, maintaining, and managing existing conservation activities	Applicable to cropland, grassland, prairie land, improved pastureland, rangeland, nonindustrial private forest lands, and agricultural land under the jurisdiction of an Indian tribe
USDA Environmental Quality Incentives program (EQIP)	5 to 10 years	Two times per year	Up to 75 percent	No-till practices only, 50-acre minimum	Livestock waste management, erosion and sediment control, habitat improvement, groundwater protection	Whole farm, not portions thereof
USDA Wildlife Habitat Incentives program (WHIP)	10 years	Continuous	Up to 75 percent	- -	Instream structures for fish habitat, prairie restoration, wildlife travel corridors, wetland scrapes for waterfowl	Site- and species-specific, small to large areas with a five-acre minimum
USDA Wetland Reserve Program (WRP)	10 or 30 years, or permanent easements	Continuous	Up to 100 percent	- -	Wetland restoration	20-acre minimum
WDATCP Farmland Preservation Program	- -	Annual	- -	Tax credits	Established by farm plan for participating landowners	- -
WDATCP Soil and Water Resource Management Program	- -	Annual	Up to 90 percent	- -	Agricultural conservation practices, nutrient management planning, soil and water conservation planning, ordinance development, and support to county staff	- -
WDNR Targeted Runoff Management Program (TRM)	- -	Annual	Up to 75 percent, depending on practices	$150,000 maximum State share	Urban and rural best management practices (e.g., barnyard relocation, manure storage), property purchases, rural easements	- -

Table A-1 (continued)

Grant Program	Contract Length	Sign-up Period	Cost-Share Required	Payments or Reimbursements	Practices Funded	Minimum Land Requirements
WDNR Urban Nonpoint Source and Storm Water Planning Program (UNPS)	2-year grant period	Annual	Up to 70 percent for planning projects; up to 50 percent for construction projects	$150,000 maximum State share	Planning, information and education programs, and ordinance development; Stormwater detention, retention or infiltration basins, streambank stabilization, and shoreline stabilization	- -
WDNR Lake Management Planning Grant Program	- -	Two times per year	Up to 75 percent	$10,000 maximum State share	Planning and monitoring	- -
WDNR Lake Protection Grant Program	- -	Annual	Up to 50 percent	$200,000 maximum State share	Implementation of practices recommended in a WDNR approved plan; diagnostic feasibility studies; ordinance development; land acquisition	- -
WDNR River Planning and Protection Grant Program	- -	Annual	Up to 75 percent	$50,000 maximum State share	Planning, streambank and habitat restoration	- -
WDNR Aquatic Invasive Species Grant Program	- -	Annual or continuous	Up to 75 percent	$200,000 maximum State share	Early detection and control, control of established populations, and informational programming	- -
WDNR Knowles-Nelson Stewardship Grant Program	- -	Annual	Up to 60 percent	- -	Land acquisition	- -
WDNR Recreational Boating Facilities Grant Program	- -	Four times per year	Up to 60 percent	- -	Public recreational boating access development, access site improvements, Eurasian water milfoil control, navigational channel markers	- -

NOTE: USDA = U.S. Department of Agriculture
WDNR = Wisconsin Department of Natural Resources
WDATCP = Wisconsin Department of Agriculture, Trade and Consumer Protection

Source: SEWRPC.

Fox River municipalities in the execution of cost-shared activities. To this end, the SEWFRC could provide the necessary framework plan within which to conduct grant-funded activities, letters of support, and informational programming support and coordination.

In addition to providing such low-cost or no-cost support services, the SEWFRC may seek funding through the Counties or River municipalities which could be used to support local cost-share requirements associated with the various grant programs. Such activities by the SEWFRC would be consistent with the historic activities of the SEWFRC associated with the application of State of Wisconsin grant funds prior to the 2009-2010 State fiscal

year. As summarized above, by administering the "block grant" awarded to the Commission, the SEWFRC was able to maximize the effectiveness of the grant-supported interventions within the Middle Fox River through its cost-share program and coordination activities.

Federal Grant Programs

The U.S. Department of Agriculture (USDA) administers the Conservation Reserve Program (CRP), the Conservation Stewardship Program (CSP), the Environmental Quality Incentives Program (EQIP), the Wildlife Habitat Incentives Program (WHIP), and the Wetland Reserve Program (WRP). These programs are implemented by local landowners and are based upon the implementation of specific land management practices to reduce environmental impacts of land use activities, primarily those associated with agriculture. Some of these programs are related to State programs, as in the case of the Conservation Reserve Enhancement Program (CREP). All of these programs are voluntary.

The goal of the CRP 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 wetland resources. It encourages farmers to convert highly erodible cropland or other environmentally sensitive acreage 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 practices. This program is administered by the USDA Farm Service Agency (FSA), and supported by technical assistance provided by the USDA Natural Resources Conservation Service (NRCS).

The CSP is a voluntary conservation program that encourages producers to address resource concerns in a comprehensive manner by undertaking additional conservation activities, and by improving, maintaining, and managing existing conservation activities. The program provides equitable access to all producers, regardless of operation size, crops produced, or geographic location. The Secretary of Agriculture has delegated the authority for the CSP to the NRCS, which supports the program. NRCS will provide financial and technical assistance to eligible producers to conserve and enhance soil, water, air, and related natural resources on their land. The CSP is available on tribal and private agricultural lands and nonindustrial private forest lands, including cropland, grassland, prairie land, improved pastureland, rangeland, nonindustrial private forest lands, agricultural land under the jurisdiction of an Indian tribe, and other private agricultural land (including cropped woodland, marshes, and agricultural land used for the production of livestock) on which resource concerns related to agricultural production could be addressed. Annual payments for installing and adopting additional activities, and improving, maintaining, and managing existing activities or supplemental payments for the adoption of resource-conserving crop rotations are available under this program, with the actual payment being calculated using a conservation performance ranking scoring process.

EQIP is a voluntary conservation program that supports agricultural production 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 for practice implementation for periods ranging from one to 10 years, and pays up to 75 percent of the costs of eligible conservation practices. Incentive payments and cost-share payments encourage farmers to adopt land management practices, such as nutrient management, manure management, integrated pest management, or wildlife habitat management.

Similarly, WHIP is a voluntary program for people who want to develop or improve wildlife habitat on private lands. It provides both technical assistance and up to 75 percent Federal cost-share to local producers and landowners. There are four subprograms that help to reduce erosion, protect wildlife habitat, restore wetlands, and improve water quality. Landowners agree to work with NRCS to prepare and implement a wildlife habitat development plan which describes the landowner's goals for improving wildlife habitat, including a list of practices and a schedule for installing them, and details the steps necessary to maintain the practices for the life of the cost-share agreement. WHIP emphasizes reestablishment of declining species and habitats, including prairie

chickens, meadowlarks, sharp-tailed grouse, Karner blue butterfly, smallmouth bass, blue-winged teal, and many other species of grassland birds, reptiles, insects, and small mammals. Cost-shared practices include burning, seeding, and brush management of prairies, grasslands, and savannah; instream structures and bank stabilization; and, timber stand improvement and brush management on woodlots. Contracts normally last a minimum of five years from the date the contract is signed with up to $10,000 of Federal funding. Eligible lands must be a minimum of five acres and not currently enrolled in other Federal conservation programs.

The WRP also is a voluntary program designed to restore and protect wetlands on private property. It is an opportunity for landowners to receive financial incentives to restore wetlands that have been drained for agricultural purposes. While the landowner may sell a conservation easement to the USDA to restore and protect wetlands, most landowners voluntarily limit future use of the land while retaining private ownership. The landowner in cooperation with the NRCS develops a plan for the restoration and maintenance of a wetland with a minimum duration of 10 years.

State of Wisconsin Grant Programs

In addition to the Federal programs, various state-supported programs geared to environmental protection and rehabilitation are administered by, among others, the Wisconsin Department of Natural Resources (WDNR), Wisconsin Department of Agriculture and Consumer Protection (WDATCP), and the Wisconsin Department of Revenue (WDoR). A number of these programs are summarized below.

The Farmland Preservation Program (FPP) is administered by the WDATCP and the WDoR. This program allows agricultural landowners who meet certain eligibility requirements to file for tax credits in exchange for managing agricultural lands in accordance with soil and water conservation standards developed by the counties and approved by the State of Wisconsin Land and Water Conservation Board. A farm plan for each farm involved usually is developed by the County or NRCS to ensure that soil erosion is being effectively reduced to at or below tolerable soil loss rates (the so-called "T" value) through tillage practices, crop rotations, or other appropriate conservation practices.

The Targeted Runoff Management Grant Program (TRM) is administered by the WDNR to help control polluted runoff from both agricultural and urban sites. The TRM program, authorized under Chapter NR 153 of the *Wisconsin Administrative Code*, is limited to local units of government, special purpose units of government (i.e., school or stormwater utility districts), tribal commissions, and regional planning agencies and is directed at high-priority resource management problems. Cost-share funding of up to 70 percent of eligible project costs may be available to support implementation of various (urban or rural) best management practices (BMPs), up to a maximum state share of $150,000. Up to 50 percent of WDNR-approved appraised value may be available for land acquisition from willing sellers, up to a maximum state share of $150,000 and up to 75 percent of the WDNR-approved appraised value may be available for purchase of conservation easements in rural areas, up to a maximum state share of $150,000. Projects are executed by local units of government pursuant to grant agreements with the WDNR.

The Urban Nonpoint Source and Storm Water Planning Program (UNPS), authorized under Chapter NR 155 of the *Wisconsin Administrative Code*, provides up to 50 percent cost-share, up to a maximum state share of $150,000, to be used in the control of polluted runoff in urban project areas. Funds may be awarded for both planning and construction projects during a grant period of two years. Projects funded through this grant program are site-specific and targeted at high-priority problems. An "urban project area" must meet one of these criteria:

- An area with a residential population density of at least 1,000 people per square mile;
- Lands in either commercial or industrial use;

- A portion of a privately owned industrial site not covered by a Wisconsin Pollution Discharge Elimination System (WPDES) permit issued under Chapter NR 216 of the *Wisconsin Administrative Code*; or,

- A municipally owned industrial site (regardless of Chapter NR 216 permit requirements).

Eligible planning and technical assistance activities—such as stormwater management planning, related information and education activities, and ordinance and utility development—may be cost-shared at 70 percent. Eligible UNPS construction costs—such as the costs of stormwater detention ponds, filtration and infiltration practices, streambank stabilization, and shoreline stabilization—may be cost-shared at 50 percent.

The Soil and Water Resource Management Program, authorized under Chapter ATCP 50 of the *Wisconsin Administrative Code*, and administered by WDATCP, establishes requirements and/or standards for:

- Soil and water conservation on farms;

- County soil and water conservation programs, including land and water resource management plans;

- Support to county land and water 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 grants to establish practice eligibility, design, construction, and maintenance.

The Chapter NR 190 Lake Management Planning Grant Program, administered by the WDNR, provides up to 75 percent cost-share for grants of up to $10,000 state-share for planning projects, while the Chapter NR 191 Lake Protection Grant Program provides up to a 50 percent cost-share for implementation projects. The Lake Management Planning Grant Program includes cost-share funding for both small-scale projects of up to $3,500 state share and larger-scale projects of up to a $10,000 State share. These grants are available to local units of government, public inland lake protection and rehabilitation districts, lake sanitary districts, and qualified lake associations.

The Chapter NR 191 Lake Protection Grant program, administered by the WDNR, provides up to a $200,000 State share for land acquisition and implementation of remedial measures identified in a WDNR-approved lake management plan, and up to a $100,000 State share for ordinance development projects and diagnostic feasibility studies. These grants are available to local units of government, public inland lake protection and rehabilitation districts, lake sanitary districts, and qualified lake associations. In addition, counties are eligible to apply for funding to develop and implement local land and water resource management programs that are targeted to specific classes of lakes in response to various developmental and recreational use pressures. Grant awards may fund up to 75 percent of eligible costs of these projects, up to a $50,000 State share.

Additional funding for specific land acquisition activities may be available through the Knowles-Nelson Stewardship Program, authorized under Chapters NR 50/51 of the *Wisconsin Administrative Code*, to preserve valuable natural areas and wildlife habitat, protect water quality and fisheries, and expand opportunities for outdoor recreation.

The Recreational Boating Facilities Grant Program, authorized under Chapter NR 7 of the *Wisconsin Administrative Code*, can provide additional funds for public recreational boating access, access site improvements, Eurasian water milfoil control, and establishment and/or marking of navigational channels, among other activities.

The Chapter NR 195 River Planning and Protection Grant Program supports local government efforts to develop and implement river (and stream) management practices designed to minimize or mitigate human impacts on flowing water systems. Grant awards of up to $10,000 are made for planning projects and of up to $50,000 for implementation projects. Property acquisition, implementation of best management practices, and educational and informational programming are eligible projects under this program.

The Aquatic Invasive Species Grant Program, authorized under Chapter NR 198 of the *Wisconsin Administrative Code*, can provide up to 75 percent of the project cost, with the maximum grant awards—depending upon the type of education, prevention, and planning projects being executed—being limited to a maximum State share award of $150,000. Grant awards under this program are limited to a State share of up to 75 percent of project costs with State share maxima of : 1) $4,000 annually for watercraft inspection program projects at each public boat launch facility, 2) $20,000 for early detection and response projects, 3) $200,000 for established population control projects, and 4) $50,000 for education, prevention, and planning projects.

RECOMMENDATION

It is recommended that the SEWFRC modify its budget process to better conform to the budget process set forth in Chapter VI of the Chapter 33 of the *Wisconsin Statutes*. This recommendation would be applicable only to the timeline associated with the budget process as has been applied historically by the SEWFRC Board of Commissioners, as the budget process is in conformance with the mandated process in other respects. In short, the annual budget process would be advanced to the second quarter of the year prior to the year in which the funds are proposed to be applied, rather than soliciting budget proposals and compiling a proposed budget during the last quarter of the year preceding that in which the funds are required. This would require solicitations of project proposals during the spring of the year prior to that in which the funds are required and the conduct of the budget hearing no later than the June meeting of the SEWFRC Board of Commissioners. This would provide the necessary lead time for the SEWFRC to submit their budgetary needs to Racine and Waukesha Counties and/or the Fox River municipalities in time to address the requirements of Chapters 59 and 65 of the *Wisconsin Statutes* as well as those set forth in Chapter 33.

With respect to the various grant programs noted above, the SEWFRC has yet to adopt an operating procedure; however, the SEWFRC is an eligible entity under these programs. As noted elsewhere in this Implementation Plan, the SEWFRC historically has been funded through grant appropriations under the Chapter NR 7 Recreational Boating Facilities grant program. Continued utilization of funds provided through this and related sources is recommended. To this end, allocation of funds acquired and managed by the SEWFRC should be carried out in accordance with the Commission's Standard Operating Procedures (Appendix B), as refined by the current plan; to wit, it is recommended that the solicitation of project concepts, as currently proposed by the SEWFRC, should be continued. With respect to the distribution of funds awarded to successful project applicants, it is recommended that the SEWFRC provide not more than one-half of the grant award to the applicants, upon request, in advance of project completion, with the balance of the SEWFRC share of the projects funds being provided upon completion of the project.

In addition, it is further recommended that the SEWFRC continue to partner with other governmental agencies and nongovernment organizations, including individual landowners, in the conduct of its planning and protection activities. Such collaboration should not only include funding of projects and programs, but also potentially grant administration and establishment of partnerships leading to the implementation of management actions within its jurisdiction. The administrative costs associated with such collaboration and partnerships should be met through

the county- (and municipal-) based budget process set forth herein. The SEWFRC can and should play a coordinating role in the definition and execution of river and lake protection projects within its jurisdiction, disseminating knowledge and information on successful projects and programs, and facilitating the conduct of actions that ultimately are complementary across County and municipal boundaries. In this regard, the Commission's website can play a major role.

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Appendix B

STANDARD OPERATING PROCEDURES

INTRODUCTION

The Southeastern Wisconsin Fox River Commission (SEWFRC) was established in 1997 by the State of Wisconsin pursuant to 1997 *Wisconsin Act* 27, which created Subchapter VI of Chapter 33 of the *Wisconsin Statutes*. The initial SEWFRC implementation plan was published in 1998.[1] Since 1998, the SEWFRC has undertaken and completed a number of significant projects along the reach of the Fox River between the City of Waukesha, in Waukesha County, and the Village of Waterford, in Racine County, which have addressed a number of serious erosion and water quality concerns affecting the water quality and navigability of the River.

To accomplish these tasks as well as future projects, the SEWFRC was empowered to promulgate rules necessary to implement the duties and powers granted to the Board of Commissioners. Among the operating procedures adopted by the SEWFRC were the requirements that: 1) project proposals be submitted to the SEWFRC Board of Commissioners for consideration, 2) projects have a clearly identified sponsor including either a governmental sponsor and/or private sector sponsor, and 3) projects be developed on a cost-share basis within a proposed project timeline. These procedural requirements, as of December 31, 2010, are summarized in this appendix.

SEWFRC BOARD OF COMMISSIONERS

Section 33.55(1) of the *Wisconsin Statutes* specifies the membership of the Board of Commissioners of the SEWFRC as follows:

- Village presidents of Big Bend, Mukwonago, and Waterford, or their designees;
- Town chairpersons of Waterford, Vernon, Waukesha, and Mukwonago or their designees;
- Mayor of the City of Waukesha or designee;
- Two residents each from the Towns of Waterford and Vernon (appointed by Town Boards);
- One resident from the Village of Big Bend (appointed by Village Board);

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[1]*Southeastern Wisconsin Fox River Commission*, Southeastern Wisconsin Fox River Commission Implementation Plan, *March 1998.*

- Racine and Waukesha County Executives or their designees;

- One representative from the Southeastern Wisconsin Regional Planning Commission (SEWRPC) (nonvoting, *ex officio* member); and

- One representative from the Wisconsin Department of Natural Resources (WDNR) (nonvoting, *ex officio* member).

Terms of Office
The terms of the elected officials serving as SEWFRC Commissioners run concurrently with their terms of office, while the terms of residents are set at two years. For purposes of record keeping, the terms of the *ex officio* members also have been set at two years.

Quorum
Section 33.55(3) of the *Wisconsin Statutes* notes that nine Commissioners shall form a quorum for the transaction of the Commission's business. For the purpose of establishing a quorum, the nine Commissioners may include the WDNR- and SEWRPC-appointed Commissioners, even though those individuals are nonvoting members for other purposes.

SEWFRC PROJECT CYCLE AND GUIDELINES

The SEWFRC Board of Commissioners has adopted the following guidelines with respect to projects supported and undertaken by the SEWFRC in collaboration with its cooperators. These guidelines may be refined or repealed by the Board of Commissioners at any appropriately noticed meeting of the Board of Commissioners, by majority vote of the Commissioners present and voting. Any such refinement may be applied to all projects or to specific projects at the discretion of the Board of Commissioners, especially but not exclusively with regard to the cost-sharing guidelines.

Project Types
Projects within the SEWFRC planning area, shown on Map B-1, are eligible for funding by the SEWFRC. Eligible activities, identified in Section 33.59 of the *Wisconsin Statutes*, include:

- Feasibility Studies;

- Construction Projects (installation of rain gardens, bio-retention swales, etc.);

- Rehabilitation Projects (shoreline restoration, erosion control, etc.);

- Navigational Enhancement Projects; and

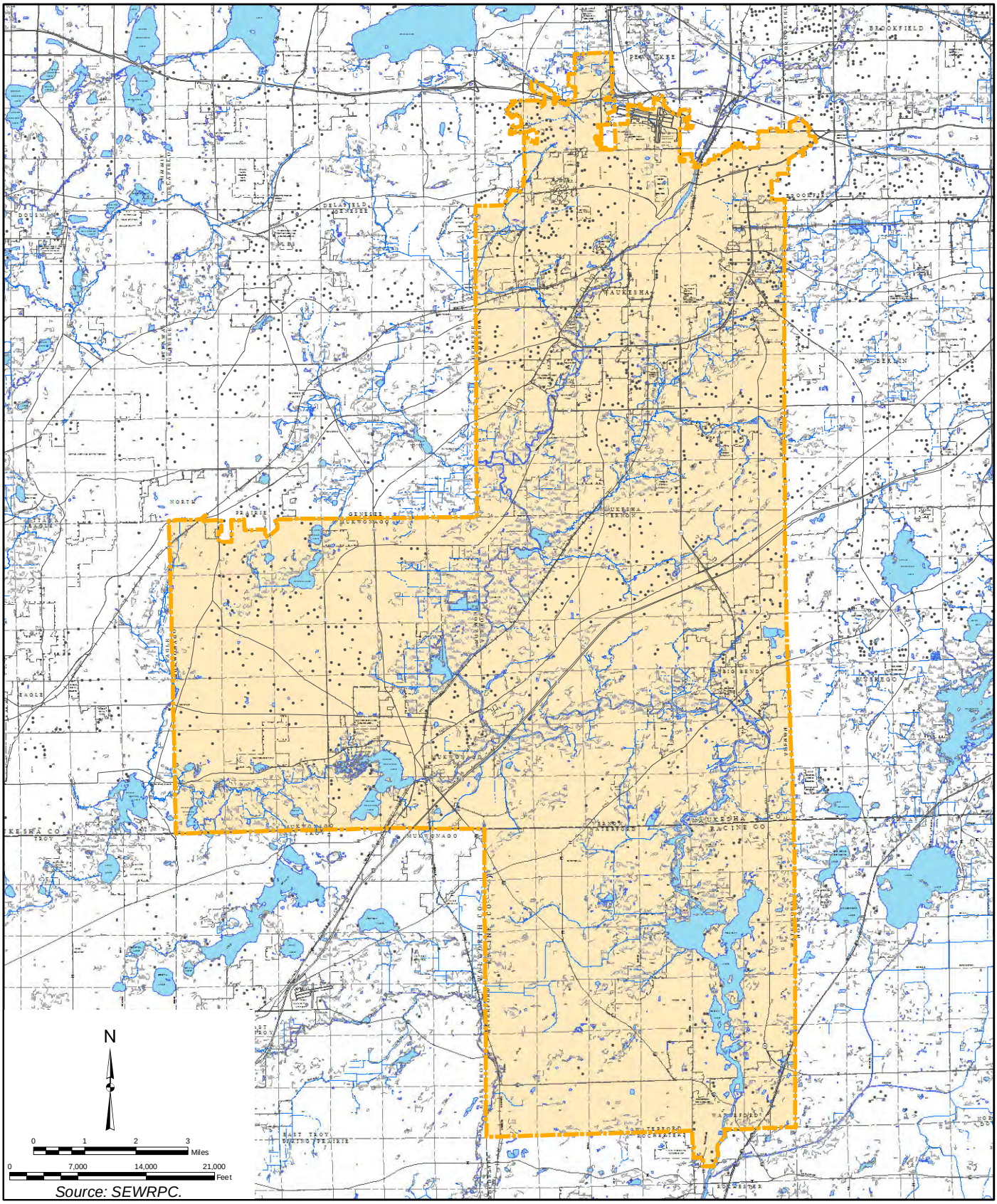
- Channel Dredging.

Completed projects and their sponsors are set forth in Tables 1 and 2 in Chapter II of the implementation plan. Other types of projects, in addition to those identified in the *Wisconsin Statutes,* may be proposed and could be supported by the SEWFRC by majority vote of the Commissioners present and voting.

Project Proposals
Project proposals may be submitted to the SEWFRC at any time; however, decisions on funding projects are required to conform to a calendar year work plan program adopted annually by the SEWFRC, as set forth in Section 33.60 (1) (a) of the *Wisconsin Statutes*. Project proposals should address issues and concerns related to the Commission's mandate to develop and implement plans, projects or programs to improve water quality and the scenic, economic and environmental value of the surface waters and the groundwaters of the Illinois Fox River

Map B-1

SOUTHEASTERN WISCONSIN FOX RIVER COMMISSION PLANNING AREA



Source: SEWRPC.

basin within River municipalities, protect or enhance the recreational use of the navigable waters of the Illinois Fox River basin that are located in River municipalities, and coordinate and integrate county programs or projects.

The following are also required for project proposals to be submitted to the SEWFRC:

- A formal presentation to the Commission;
- An identified Project Manager;
- A project narrative;
- A project budget including provision for cost-share funding by the project applicant;
- A timeline for completion;
- A commitment to completing the project in a timely manner and the maintenance of all documents and the securing of all appropriate permits; and
- A commitment to provided periodic status reports to the Commission.

It should be noted that public bidding requirements, pursuant to Section 66.0901 of the *Wisconsin Statutes*, apply to units of government undertaking projects in cooperation with the SEWFRC, except as specified in Section 66.0131(2) where services are agreed to be provided by other governmental units.

Project Cycle
The SEWFRC operates on a calendar year project cycle.

Project Funding
Section 33.60 of the *Wisconsin Statutes* specifically requires the SEWFRC to annually develop budget proposals that include all of the following elements:

- A list of all anticipated revenue from all sources during the upcoming year;
- A list of all proposed appropriations for each activity and reserve account for the upcoming year;
- Actual revenues and expenditures for the preceding year;
- Actual revenues and expenditures for the current year;
- Estimated revenues and expenditures for the balance of the current year; and
- A list, by fund, of all anticipated balances and surpluses.

The SEWFRC has historically compiled its annual budget in the autumn of the year preceding the year in which the funds are to be applied. Until the State fiscal year of 2009-2010, funds were allocated to the SEWFRC as a grant-in-aid by the Wisconsin Legislature as part of the State budget process. These funds, administered by the Wisconsin Department of Natural Resources (WDNR) under the Chapter NR 7 Recreational Boating Facilities grant program, were invested by the SEWFRC in order to create a small amount of interest income that was used to support the Commission's nongrant-eligible activities, such as the administrative expenses associated with the Commission's operations. With the State budget for fiscal year of 2009-2010, 2009 *Wisconsin Act* 28, this revenue stream ceased, although ongoing projects and unexpended funds continued to provide a basis for SEWFRC support of its work program through the 2011 project cycle.

PROJECT DOCUMENTATION

Documentation Required from Grantees

Grantees are required to adhere to the fund management practices of the WDNR, and provide to the SEWFRC Treasurer all required documentation to substantiate their activities. For purposes of documenting the readiness to implement an SEWFRC-supported project, a signed cost-share working agreement is required. In addition, copies of all required permits should be provided, including any necessary county and/or municipal permits and State permits as may be required pursuant to Chapter 30 of the *Wisconsin Statutes* or other applicable legal requirements. Photographs of the project site also should be provided to the SEWFRC along with the copies of the permits to show the project site prior to work being initiated.

For the purposes of documenting project completion, grantees are required to provide copies of all invoices associated with the project. These invoices should be accompanied by proof of payment. Proof of payment can be documented by copies of cancelled checks (copies of both sides of the checks are required) or copies of bank statements with the payments clearly identified. Where the SEWFRC Board of Commissioners have agreed to a cost-share with respect to a project, a check for the local share to be paid by the grantee should be submitted with this documentation, or proof of previous payment of the local share provided. In the latter case, copies of both sides of cancelled checks or copies of bank statements with the payments clearly identified should be provided to the Treasurer. Where the local share to be paid by the grantee is comprised of in-kind services such as dedicated labor or donations of equipment appropriate documentation should be provided, for example, in the form of time logs or receipts for equipment use.

Photographs of the project site also should be provided to the SEWFRC to show the project site following completion of the work. Photographs can be submitted in either print form or electronic form, although the latter is preferred. Photographs should be high resolution copies suitable for reproduction on the SEWFRC website and/or in such print materials as the SEWFRC may from time to time prepare.

In addition to the foregoing, it is noted that projects often result in the production of reports, plans, or other documents. Copies of these documents, preferably in electronic form (Adobe® Portable Document Format (PDF) is preferred), also should be provided to the SEWFRC for incorporation into its records. Where appropriate, such documents may be posted on the SEWFRC website as a permanent record of the Commission's achievements.

Documentation Required from the SEWFRC with respect to WDNR Grants-in-Aid

For SEWFRC projects supported by grants-in-aid administered by the WDNR, reimbursement requests from the SEWFRC to the WDNR must follow the procedures set forth by the WDNR. Information with which to complete the submissions to the WDNR is to be provided by the grantees, as noted above. Submissions for reimbursement of funds relating to WDNR grants-in-aid are made on WDNR Form 8700-001 (R 6/06), Grant Payment Request, (*http://dnr.wi.gov/org/caer/cfa/grants/forms/8700001_fill.pdf*). Information required for completing this form includes grant payments to date, local share provided, and balance requested. WDNR Form 8700-002 (R 8/03), Grant Payment Worksheet, (*http://dnr.wi.gov/org/caer/cfa/grants/Forms/8700002.pdf*) provides a template for determining the information required for the reimbursement request. Assistance in completing these forms and in determining the required documentation is available from the WDNR Environmental Grant Specialist for the Southeast Region. Additional worksheets for donated equipment and labor also can be accessed through the WDNR website (*http://dnr.wi.gov/org/caer/cfa/grants/forms/forms.html*).

Examples of completed WDNR Forms 8700-001 and 8700-002 are appended hereto as Figure B-1. Examples of bidding and cost-sharing procedures, and working agreements utilized by the SEWFRC are appended hereto as Figures B-2 and B-3.

Figure B-1

EXAMPLES OF WDNR FORMS 8700-001 (R 6/06), GRANT PAYMENT REQUEST, AND 8700-002 (R 8/03), GRANT PAYMENT WORKSHEET

State of Wisconsin
Department of Natural Resources
Box 7921
Madison, WI 53707-7921
Grant Payment Request
Form 8700-001 (R 8/03) Page 1 of 2
Notice: Project Sponsors are required to provide information requested on this form when applying for payment of a grant funded by the Department. See Reporting Requirements on reverse. The Department will not process your payment request unless you provide all information requested. This information will be used to determine the amount of your payment and issue your check. Personally identifiable information collected will be used for program administration and may be made available to requesters as required under Wisconsin's Open Records law [ss. 19.31-19.39, Wis. Stats.]. Submit one copy of this request form, your completed Grant Payment Worksheet (Form 8700-002), and required documentation, listed on reverse, to your DNR Grant Specialist. See the DNR web site for additional information: http://www.dnr.state.wi.us/org/caer/cfa
Project Sponsor Information
Payment Information (see reverse for instructions)
B. Cost Share Amount
C. This Payment Request and Grant Balance Remaining
I certify that, to the best of my knowledge and belief, the eligible costs requested are in accordance with the terms of the grant agreement and that all expenditures are based on actual payments of record. This reimbursement represents the grant share due that has not been previously requested.
Space Below this Line for DNR Use Only
Grant Specialist Signature
Reimbursement Approval Date

Project Sponsor / Management Unit Name: Southeastern Wisconsin Fox River Commission	Grant Number: RBF – ENUM 16
Project Name: WWMD Grand Drive / Buena Park Project	County: Racine County
The DNR will mail the check to the name identified on the application as "Check Recipient." Questions? Contact DNR Grant Specialist.	Type of Request: ☐ Partial X Final ☐ Supplemental (Snowmobile Only)

A. Payment Record to Date		Amount	This Column for DNR Use Only
1. Amount of Grant (from original or amended Grant Agreement)		$250,000.00	
2.a. Advance Payment Received, if any		$125,000.00	
2.b. Total Payments Received after Advance Payment, if any		$0.00	
2.c. Total Payments Received to Date (Lines 2.a. + 2.b.)		$125,000.00	
3. Funds Remaining (Line 1 minus Line 2.c.)		$125,000.00	

4. Total Eligible Project Costs this Period. Transfer data from "Total Project Costs" field on Worksheet (Form 8700-002)	$16,853.56	
5. Your Share of Costs. See Line 5 instructions on reverse.	$1,685.36	
6. State Share of Costs (Line 4 minus Line 5) NOTE: This line cannot exceed the amount in Line 1.	$15,168.20	

7. Amount of Advance Payment Received (from Line 2a) (if no advance payment received or already accounted for. enter $0)	$125,000.00	
8. Amount Eligible this Claim (Line 6 minus Line 7) NOTE: This line cannot exceed the amount in Line 3.	$	Amount approved this claim ->
9. Grant Balance Remaining (Line 3 minus Line 8)	$	
Lake & River Grants Only: Does project include State Lab of Hygiene Sample Analysis? ☐ Yes ☐ No		
Certification		

Name of Authorized Representative - type or print: James J. Pindel		(Area Code) Telephone Number: (262) 895 3703
Signature of Authorized Representative James J. Pindel		(Area Code) FAX Number: none
Date Signed 11/17/12		E-mail Address: jpindel@wi.rr.com

Figure B-1 (continued)

State of Wisconsin
Department of Natural Resources
Community Financial Assistance

Grant Payment Worksheet

Form 8700-002 (R 8/03) Page 1 of 1

Notice: Information requested on this form is required by the Department when applying for a reimbursement of eligible expenses. The Department will not consider your payment request unless you complete and submit this form.

Instructions: Itemize all project expenses, including donated labor, and attach photocopies of proof of expenses and payments for each item listed. See reverse for instructions. Use additional worksheets as necessary, numbering each. Submit with Grant Payment Request, Form 8700-001, or specific grant reimbursement form, to your DNR Grant Specialist.

Project Sponsor / Management Unit Name

Grant Number

Does this grant project include State Lab of Hygiene sample analysis costs? ☐ Yes ☐ No

Date Expense Incurred	Invoice #	Proof of Payment #	Payee	Eligible Project Cost Description (Check Grant Agreement)	Amount Paid	Amount Donated
11/28/08	008393	1383	Crispell-Snyder	Preliminary Engineering Cost	949.97	
6/25/10	11724	1474	Crispell-Snyder	Engineering	3,910.00	
7/18/10		1475	Wis. DNR	Permit	50.00	
7/30/10	11874	1488	Crispell-Snyder	Engineering	1,105.00	
8/20/10	18465	1483	Southern Lakes Newspapers	Bid notice	24.48	
8/27/10	12039	1487	Crispell-Snyder	Engineering	510.00	
10/9/10	2026	1492	Chils	Contractor	6,300.00	
10/18/10	12350	1494	Crispell-Snyder	Engineering	2,975.00	
				Paid Subtotal	15,824.45	
				Donated Subtotal		0.00

Grant Begin Date	Grant End Date

Total Project Costs: Please sum all pages manually.
(Sum of **Paid Subtotal** and **Donated Subtotal** for all pages) $ 15,824.45

Figure B-1 (continued)

Waterford Waterway Management District
P.O. Box 416
Waterford, Wisconsin 53185

November 17,2010

To: Jim Pindel-Treasurer for SEWFRC

Jim, Here is the cost breakdown for the Grand Drive/Buena Project

Total allocated budget allowance from the FRC		$20,000.00
Less 10% WWMD share		2,000.00
Balance left for project		$18,000.00
Deduct for cost overrun on Idelwo lwood project		$2,831.80
Balance left for Grand Dr. project		$15,168.20
Total actual cost of Grand Dr. project		$15,824.45
Overrun of cost to be covered by the WWMD		$656.25
Total overrun cost of Idelwood & Grand Dr To be paid by the WWMD	$3,488.05	

Dick Kosut- WWMD

Source: SEWFRC.

Figure B-1 (continued)

State of Wisconsin
Department of Natural Resources
Box 7921
Madison, WI 53707-7921
Grant Payment Request
Form 8700-001 (R 8/03) Page 1 of 2
Notice: Project Sponsors are required to provide information requested on this form when applying for payment of a grant funded by the Department. See Reporting Requirements on reverse. The Department will not process your payment request unless you provide all information requested. This information will be used to determine the amount of your payment and issue your check. Personally identifiable information collected will be used for program administration and may be made available to requesters as required under Wisconsin's Open Records law [ss. 19.31-19.39, Wis. Stats.]. Submit one copy of this request form, your completed Grant Payment Worksheet (Form 8700-002), and required documentation, listed on reverse, to your DNR Grant Specialist. See the DNR web site for additional information: http://www.dnr.state.wi.us/org/caer/cfa
Project Sponsor Information
Payment Information (see reverse for instructions)
B. Cost Share Amount
C. This Payment Request and Grant Balance Remaining
I certify that, to the best of my knowledge and belief, the eligible costs requested are in accordance with the terms of the grant agreement and that all expenditures are based on actual payments of record. This reimbursement represents the grant share due that has not been previously requested.
Space Below this Line for DNR Use Only
Grant Specialist Signature
Reimbursement Approval Date

Project Sponsor / Management Unit Name: Southeastern Wisconsin Fox River Commission	Grant Number: RBF – ENUM 16
Project Name: Village of Big Bend Boat/Canoe Launch Project	County: Waukesha County
The DNR will mail the check to the name identified on the application as "Check Recipient." Questions? Contact DNR Grant Specialist.	Type of Request: ☐ Partial X Final ☐ Supplemental (Snowmobile Only)

A. Payment Record to Date		Amount	This Column for DNR Use Only
1. Amount of Grant (from original or amended Grant Agreement)		$250,000.00	
2.a. Advance Payment Received, if any		$125,000.00	
2.b. Total Payments Received after Advance Payment, if any		$0.00	
2.c. Total Payments Received to Date (Lines 2.a. + 2.b.)		$125,000.00	
3. Funds Remaining (Line 1 minus Line 2.c.)		$125,000.00	

4. Total Eligible Project Costs this Period. Transfer data from "Total Project Costs" field on Worksheet (Form 8700-002)	$60,824.44	
5. Your Share of Costs. See Line 5 instructions on reverse.	$6,082.44	
6. State Share of Costs (Line 4 minus Line 5) NOTE: This line cannot exceed the amount in Line 1.	$54,742.00	

7. Amount of Advance Payment Received (from Line 2a) (if no advance payment received or already accounted for. enter $0)	$125,000.00	
8. Amount Eligible this Claim (Line 6 minus Line 7) NOTE: This line cannot exceed the amount in Line 3.	$	Amount approved this claim ->
9. Grant Balance Remaining (Line 3 minus Line 8)	$	
Lake & River Grants Only: Does project include State Lab of Hygiene Sample Analysis? ☐ Yes ☐ No		
Certification		

Name of Authorized Representative - type or print: James J. Pindel		(Area Code) Telephone Number: (262) 895 3703
Signature of Authorized Representative James J Pindel		(Area Code) FAX Number: none
Date Signed 11/12/10		E-mail Address: jpindel@wi.rr.com

Figure B-1 (continued)

State of Wisconsin
Department of Natural Resources
Community Financial Assistance

Grant Payment Worksheet
Form 8700-002 (R 8/03) Page 1 of 1

Notice: Information requested on this form is required by the Department when applying for a reimbursement of eligible expenses. The Department will not consider your payment request unless you complete and submit this form.

Instructions: Itemize all project expenses, including donated labor, and attach photocopies of proof of expenses and payments for each item listed. See reverse for instructions. Use additional worksheets as necessary, numbering each. Submit with Grant Payment Request, Form 8700-001, or specific grant reimbursement form, to your DNR Grant Specialist.

Does this grant project include State Lab of Hygiene sample analysis costs? ☐ Yes ☒ No

Project Sponsor / Management Unit Name

Grant Number RBF-ENUM16

Date Expense Incurred	Invoice #	Proof of Payment #	Payee	Eligible Project Cost Description (Check Grant Agreement)	Amount Paid	Amount Donated
10/12/10	Pay't 1		Applied Technologies	Big Bend Boat/Canoe Launch	54,742.00	

Grant Begin Date	Grant End Date

Total Project Costs: Please sum all pages manually.
(Sum of **Paid Subtotal** and **Donated Subtotal** for all pages) $54,742.00

Paid Subtotal	Donated Subtotal
0.00	0.00

Source: SEWFRC.

Figure B-2

BIDDING AND COST-SHARING PROCEDURES

SEWFRC Procedures

Bidding and Cost Sharing Procedures for the Southeastern Wisconsin Fox River Commission

This document shall serve as the procedures that the Southeastern Wisconsin Fox River Commission (SEWFRC), or its designees, will follow to bid watershed projects (shoreland stabilizations, riprap, wetland reestablishments, dredging, etc.) Cost sharing to landowners within the watershed zone of operation of the SEWFRC (currently Waukesha and Racine Counties) will also be covered herein.

The SEWFRC shall use these bidding and cost-sharing procedures:

1) To assist the landowner in soliciting competitive bids from interested contractors, or to create standardized procedures for bidding for the SEWFRC itself;
2) Satisfy cost containment requirements of grant programs;
3) Encourage fairness and consistency for contractors bidding on projects of the SEWFRC.

The SEWFRC may or may not be the direct awarding body of contracts to bidders. In some cases the landowner may contract directly with the bidders. The exact situation will be assessed for each project to ensure the most successful outcome for the investment by the SEWFRC. The selected method will be clearly presented to all parties.

A summary of the steps in the process follows:

I. <u>Cost-Share Agreement:</u>

a. Following applicable eligibility criteria, the SEWFRC enters into a cost-share agreement with the landowner (see Figure B-3), signed by both parties. All cost-sharing sources and amounts are identified on the agreement. The practice costs listed in the cost-share agreement are preliminary estimates prepared by the applicant based on average costs for similar projects.

b. After a cost-share agreement is signed, planning and designs of conservation practices are completed. Detailed construction plans and estimated quantities and costs are prepared. The landowner signs these plans to show acceptance. Applicable permits are also obtained. The cost-share agreement may need to be amended at this time if estimated costs have increased significantly. Any cost-share agreement amendment over $5,000 must be approved by the SEWFRC. Amendments under $5,000 may be approved by the Commission Chair or Vice Chair in accordance with adopted policies and when brought forth by Project Coordinator in a given project for review.

c. All construction plans must follow the technical standards and construction specifications utilized by the SEWFRC (usually for the county within which the work is occurring—Racine or Waukesha County—and/or municipalities).

II. <u>Cost Containment Requirements:</u>

a. To maintain eligibility for cost-sharing grants, the landowner must comply with the cost containment procedures listed below.

b. If the total estimated project cost within a work category (i.e. concrete, excavation, riprap placement, etc.) is $10,000 or greater, the project must follow all sections of the bidding procedures described below. The SEWFRC encourages all construction plans to be bid.

c. If the total estimated cost within a work category is under $10,000, bidding the project through these procedures is optional and cost-sharing is limited by the current SEWFRC Average Cost List (based on the project guidelines of Racine or Waukesha County). If an unbid project exceeds the average cost for that practice, as determined by the SEWFRC, the landowner is responsible for the cost difference when calculating eligible cost-share amounts. For this reason, it is highly recommended that landowners, at a minimum, obtain written estimates or quotes from contractors for all construction projects, and present them to the SEWFRC prior to scheduling any materials delivery or construction activity. When the SEWFRC is directly involved, this process will be followed where possible.

d. In the event that specialized engineering or other unusual circumstances are necessary in a project for the SEWFRC that would unduly influence average costs, the SEWFRC shall vote to provide financial support of such services. In the event that the SEWFRC votes not to support the costs considered “above and beyond” normal costs, the landowner will be responsible for these additional costs over the standard cost-share rate.

e. Cost over-runs of as much as 20 percent of the total project cost, but not to exceed $5,000, can be approved by the Chairman and/or Vice-Chairman after consulting with the Treasurer to make sure that adequate funds are available.

III. <u>Bid Document & Announcement:</u>

a. Bid documents will be prepared for all projects required to be bid in accordance with the cost containment requirements described above in Section II.

b. For municipal projects, the opportunity to bid will be announced in the appropriate official newspaper in accordance with municipal requirements. The announcement will include the following applicable items:

i. Type of practice(s) to be installed, including brief description;
ii. Location of nearest community or township in which the project is located;
iii. A project site showing date (approximately one to two weeks following ad);
iv. A bid deadline (approximately one to two weeks after site showing date);
v. The address and phone for project coordinator;
vi. General bid instructions for interested contractors;
vii. The date and location of the bid opening session;
viii. Disclaimer statements clarifying the role of the SEWFRC for the given project (direct or as advisor for the landowner typically).

c. At the request of the landowner or contractor, the SEWFRC or municipal Project Coordinator (hereinafter "SEWFRC/Project Coordinator") will also mail the same information to contractors making them aware of the bid opportunity.
d. Any person may request a copy of the bid documents. A fee for production may be necessary and charged to the requestor.

IV. Site Showing:

a. Attendance at a site showing may be required for a contractor to receive a bidder's package (bid documents, construction plans, etc.) or to have a bid accepted. This requirement will be noted in the ad.
b. During a site showing, the following items will be distributed and reviewed, as applicable:
    i. Construction plans with estimated quantities included;
    ii. Construction specifications possible with drawings;
    iii. SEWFRC bid sheets by component or in total;
    iv. Draft Working Agreement among the parties involved.

V. Bid Submittal:

a. Contractors and suppliers must submit completed bid forms to the SEWFRC/ Project Coordinator in a sealed envelope by the announced bid deadline, including the following information:
    i. Name, address, phone number, and contact person for bidder;
    ii. Estimated starting and completion dates;
    iii. Itemized and total cost of bid;
    iv. Length of time bid is valid;
    v. Terms of payment (must be documented on bid sheets);
    vi. Certification (signature line) that the bidder has read and understands all the construction plans, specifications, bid policies, working agreement terms, and applicable disclaimer statements;
    vii. Copy of valid and current certificate of insurance with amounts and types of insurance clearly noted;
    viii. Copy of bonding certificate indicating amount of bond and type of coverage for work being proposed.

VI. Bid Opening, Review, and Acceptance:

a. At the announced time (bid deadline), there will be a public opening of the bid by the SEWFRC/Project Coordinator at a standard meeting, or a special meeting, as noticed in the newspaper ad for the opening of the bids. The bid totals will be announced at that time.
b. The bids will then be reviewed in private by SEWFRC/Project Coordinator and the landowners involved in the project. The lowest responsible bid will be used as a basis for:
    i. Determining maximum cost-sharing eligibility where the landowner is to contract directly with the bidder,
    ii. Selecting the contractor where the SEWFRC will work directly with the bidder.

c. If the SEWFRC/Project Coordinator does not recommend acceptance of any bid, the landowner or SEWFRC/Project Coordinator may:
    i. Request another round of bids immediately using the SEWFRC procedures; or
    ii. Renegotiate with current bidders independently to obtain an acceptable price; or
    iii. Proceed under other cost containment procedures as approved by the SEWFRC.

d. If SEWFRC/Project Coordinator recommends a bid that is not accepted by the landowner, the landowner has the same options as above with the following exceptions:
    i. The SEWFRC reserves the right to postpone rebidding until the schedule of work allows, possibly until the following season; and
    ii. The SEWFRC will not cost-share work completed by someone who did not submit a bid before the most current bid deadline.

e. SEWFRC/ Project Coordinator assumes no responsibility for private negotiations that may occur between the landowner and contractor(s). All bid documents received and the final bid(s) accepted by the parties will be documented and made available to the general public upon request.

VII. <u>Construction Documentation:</u>

a. After the landowner or SEWFRC/Project Coordinator selects a contractor, both parties will sign the accepted bid sheet and a Working Agreement. The working agreement outlines the responsibilities of the landowner, the contractor(s) and SEWFRC/Project Coordinator before, during, and after construction activities. The agreement also specifies the procedure to be followed if unforeseen costs are encountered and the bid amount would need to be amended.

b. The SEWFRC/Project Coordinator must certify that the construction of all practices meets all applicable standards and specifications to satisfy program cost-sharing policy. To do so, periodic inspections are conducted during construction and the results of site visits documented in periodic presentations to the SEWFRC as required.

VIII. <u>Payment Processing & Documentation</u>

a. The landowner must request reimbursement of costs on SEWFRC forms in accordance with their cost-share agreement. The request must include copies of bills from each contractor/supplier and documentation of any applicable in-kind costs.

b. If the reimbursement request reflects any exceptions to the applicable cost containment procedures or the approved cost-share agreement, it must also be accompanied by:
    i. Written documentation (change order if project is bid) of the reason(s) for any cost overrun(s) which has been approved by the SEWFRC (or Project Coordinator and Chair/Vice Chair as in I. b. above if under $5,000); and/or
    ii. A cost-share agreement amendment if the cost-share amount of any practice is over or under the amount(s) listed on the cost-share agreement.

c. The SEWFRC/Project Coordinator must approve all cost-share payments. Summaries of approved cost-share payments are periodically provided to the SEWFRC for review.

d. The SEWFRC will deliver all cost-share payments to landowners at the closing meeting upon project completion. However, this will not be done until proof of payment in full is on file for every contractor/supplier for which a bill was submitted. Proof of payment will usually be a SEWFRC payment certification form signed by the contractor/supplier. Cancelled checks or paid receipts signed by the contractor/supplier may also be accepted. The contractor/supplier may either:

i. Provide proof of payment in full prior to cost-sharing payment being issued; or

ii. Attend a closing meeting with the SEWFRC/Project Coordinator at which time all financial exchanges would occur and proper documentation provided.

iii. Partial payments may also be processed following the same procedures described above. Partial payments are normally only processed upon the completion of a practice component or work category, unless otherwise approved by the SEWFRC. A portion of the total eligible cost-share amount will usually be withheld until final certification of the entire practice has been completed.

IX. Audits

a. All cost-sharing agreements and payments made under the terms of these procedures are subject to State and local audit requirements.

b. The SEWFRC will maintain a project file and ledger showing all revenues, expenditures, and applicable account balances (Secretary of SEWFRC).

c. Documentation of all cost-sharing activity and the cost containment procedures followed under these guidelines will be kept in a separate landowner/project file in the SEWFRC files for audit purposes.

Figure B-3

WORKING AGREEMENT FOR THE INSTALLATION OF CONSERVATION PRACTICES

Working Agreement for the Installation of Conservation Practices

This agreement has been developed to help clarify the roles and responsibilities of the landowner, the contractor and the Southeastern Wisconsin Fox River Commission (herein referred to as the "SEWFRC") staff when the installation of a conservation practice is cost-shared by the SEWFRC on private lands. All parties must sign this agreement prior to any construction work. Please read carefully before signing.

I. Owner's Responsibilities:

1) Approve all construction plans and understand that county technical standards and specifications must be followed to be eligible for program cost-sharing.
2) Determine if underground utilities exist where construction work is planned. (Diggers Hotline number (414) 259-1181; 1-800-242-8511 three working days' notice is required).
   - Must provide written certification that no utilities exist or have them located and marked prior to scheduled construction activity.
3) Obtain all required approvals and/or permits necessary to carry out the plan. (town, county, State, Federal)
   - Examples: floodplain/shoreland/wetland (county, WDNR, U.S. Army Corps of Engineers), building permits (town), road rights-of-way (various), manure storage (county). County staff will assist the landowner upon request.
4) Read the SEWFRC bidding and cost-sharing procedure. Understand the owner's role in the process and how cost-sharing limits are established.
5) Participate in site showing and/or pre-construction conference with municipal staff and contractor(s). Discuss any interim management requirements during construction work (parking, fill placement, fences, etc.).
6) Select contractor(s)/supplier(s) that are capable of completing the project according to the construction plans and specifications.
   - Agree to terms of payment with the contractor(s)/supplier(s) before construction work begins.
7) Coordinate scheduling and oversee all construction activities.
   - Notify the municipal at least 24 hours in advance of all major construction stages (unless the contractor agrees to contact the office directly).
   - Alert the contractor and municipal staff of any safety hazard, variance from construction plans or other problems that may arise during construction. (The landowner may stop work at their discretion.)
   - Approve any modifications made to construction plans or costs. *Note: To ensure reimbursement of any additional costs, check with municipal and SEWFRC staff prior to approving.*
   - Carry out, document and submit for reimbursement any in-kind services agreed to be provided for the project. *Note: These costs must comply with standard county rates for reimbursement.*
8) Provide periodic status reports to the SEWFRC during the project period. Such reports can be made in person at a regular Commission meeting or provided in writing prior to a regularly scheduled Commission meeting. At such time(s), the landowner shall collect and submit all appropriate bills to the SEWFRC to begin processing the cost-share reimbursement.
9) Pay the contractor(s)/supplier(s) for all services rendered, as agreed to prior to construction work. Understand that payment certification is required for all bills submitted before a cost-share payment will be released. *Note: Payment to contractors and landowner may be done simultaneously in a "closing meeting"*. The SEWFRC recommends that landowners obtain lien wavers from their contractors/suppliers prior to final payment of bills.
10) Ensure the long-term proper function of the conservation practice by following the operation and maintenance plan regularly. (Note: The maintenance requirements may need to be recorded onto the property deed under applicable program requirements.)

I understand and agree to carry out my responsibilities as listed above:

_____ _____

Owner's Signature Date

II. Contractor's Responsibilities:

1) Read and understand the SEWFRC bidding and cost-sharing procedures.
2) Participate in site showing and/or pre-construction conference with the owner and municipal staff.
3) Review and fully understand the construction plans and associated specifications before submitting a bid or beginning construction.
4) Agree to terms of payment with the owner prior to any construction activity.
5) Provide certificate of insurance to the landowner.
6) Obtain required materials, supplies and equipment to complete construction work according to plans and specifications.
7) Notify the owner and the municipality a minimum of 24 hours in advance of start of construction. Also notify the municipality and SEWFRC prior to critical stages of construction as agreed to prior to start of construction. *Note: This may be necessary for the SEWFRC to certify construction for cost-sharing purposes (see inspection schedule).*
8) Ensure that the owner has all buried utilities located and marked prior to any construction activity.
9) Layout and construct conservation practice(s) according to plans and specifications. Ask for assistance from the municipality as needed.
   - Follow applicable OSHA safety standards during construction
   - Notify the owner and the municipality of any proposed changes in construction plans or of any additional costs anticipated. All changes must be documented and approved on a CHANGE ORDER form. Understand that all additional costs must be pre-approved by the owner. *Note: The SEWFRC must also pre-approve additional costs for the owner to be reimbursed.*
10) Provide proper documentation of materials, supplies and/or construction methods as needed.
11) Submit itemized bills (or bid invoice) within 30 days to the owner so that cost-sharing payment can be processed.
   - Provide proper payment certification to the county so cost-sharing funds can be issued to owner.
   - Provide lien waivers from suppliers upon request.

I understand and agree to carry out my responsibilities as listed above:

_____ _____
Contractor's Signature Date

III. Municipal and SEWFRC Staff Responsibilities:

1) Prepare construction plans based on planning decisions made by the owner and following applicable technical standards and specifications.
2) Oversee project bidding procedures and conduct site showing and/or pre-construction conference(s) with the owner and contractor(s).
3) Explain thoroughly and provide copies of construction plans, bidding procedures and working agreement to the owner and contractor(s).
4) Assist with practice layout and staking as agreed prior to construction.
5) Provide periodic inspection of materials and work performed by the contractor(s) or owner. Immediately notify owner and/or contractor of any work not in accordance with construction plans or specifications.
6) Authorize changes in construction plans if they are in accordance with design standards, approved by the owner and contractor, and are within the engineering authority of the project staff.
- Provide proper documentation of approved changes as applicable for cost-sharing purposes.
7) Certify that all completed construction work meets county technical standards and specifications.
8) Assist the owner with processing cost-sharing payments(s) according to county procedures and program administrative rules.
9) Prepare operation and maintenance plan for the owner and provide follow-up visits to ensure long-term proper function of the conservation practice.

I understand and agree to carry out my responsibilities as listed above:

_____ _____
Project Staff's Signature Date

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Appendix C

INTERAGENCY AGREEMENTS CONCLUDED BY THE SOUTHEASTERN WISCONSIN FOX RIVER COMMISSION

INTRODUCTION

The Southeastern Wisconsin Fox River Commission (SEWFRC) was established in 1997 by the State of Wisconsin pursuant to 1997 *Wisconsin Act* 27, which created Subchapter VI of Chapter 33 of the *Wisconsin Statutes*. Since its inception, the SEWFRC has been empowered to maintain a liaison with Federal, State, and local agencies and other organizations involved in protecting, rehabilitating, and managing the water resources of the Fox River within the river municipalities. To this end, the SEWFRC has concluded interagency agreements with Waukesha County and the Illinois Fox Waterway Agency. These agreements are appended hereto as Figures C-1 and C-2, respectively.

Figure C-1

COOPERATIVE AGREEMENT BETWEEN THE SOUTHEASTERN WISCONSIN FOX RIVER COMMISSION AND WAUKESHA COUNTY

Cooperative Agreement
Between the Southeastern Wisconsin Fox River Commission and Waukesha County

WHEREAS the Southeastern Wisconsin Fox River Commission was created in 1997 by Wisconsin Act 27 (1997-1999 Budget Bill) in response to citizen and community concerns over flooding, drainage and other water resource problems along the Fox River mainstem and its impoundments.

WHEREAS the legislation creating the Southeastern Wisconsin Fox River Commission created a Board of Commissioners that include the Waukesha County Executive or designee.

WHEREAS enabling legislation required the Southeastern Wisconsin Fox River Commission to develop an Implementation Plan, which was completed and adopted by the Southeastern Wisconsin Fox River Commission in March 1998.

WHEREAS the Southeastern Wisconsin Fox River Commission receives funding to implement the approved plan focussing on nonpoint source water pollution reduction.

WHEREAS the Southeastern Wisconsin Fox River Commission desires the Waukesha County Department of Parks and Land Use-Land Resources Division to assist the Commission in carrying out the Implementation Plan.

NOW THEREFORE in consideration of these premises and the undertaking of each party to the other, the parties agree jointly and severally, as follows:

The Waukesha County Department of Parks and Land Use-Land Resources Division will:

A. Contact eligible landowners living within the Fox River basin.

B. Develop site plans and best management pratices that improve water quality and environmental value of the Fox River.

C. Initiate and administer cost-share agreements between the landowner and the Commission, in accordance with Commission policies.

D. Oversee construction of water quality improvement projects and certify practice installation for cost sharing purposes.

E. Provide any other assistance to the Commission as mutually agreed to.

The Southeastern Wisconsin Fox River Commission will:

A. Adopt cost share rates, agreements, forms, in-kind rates and other polices and procedures necessary to administer a cost sharing program and to accomplish the objectives of the Commission.

B. Utilize local volunteer groups or Wisconsin Conservation Corps to the greatest extent practicable for appropriate projects.

C. Approve projects and cost sharing agreements that utilize Commission funds.

D. Distribute cost share funds and maintain project ledgers and other records for audit purposes.

THIS AGREEMENT shall become effective on the date of the last signature and will continue in effect until cancelled by either party. Either party may terminate this Agreement by at least sixty (60) days advance written notice to the other party of such termination.

THIS AGREEMENT contains the entire agreement between the parties and any amendment or revision of this agreement must be approved in writing by the parties.

IN WITNESS WHEREOF the Southeastern Wisconsin Fox River Commission and the Waukesha County Department of Parks and Land Use-Land Resources Division have executed this agreement.

Chairman 12-7-99

10/4/99
Waukesha Co.

Figure C-2

COOPERATIVE AGREEMENT BETWEEN THE SOUTHEASTERN WISCONSIN FOX RIVER COMMISSION AND THE ILLINOIS FOX WATERWAY AGENCY

SOUTHEASTERN WISCONSIN FOX RIVER COMMISSION
RESOLUTION 0-04

ADOPTING A FORMAL PARTNERSHIP BETWEEN THE FOX WATERWAY AGENCY of Illinois AND THE SOUTHEASTERN WISCONSIN FOX RIVER COMMISSION of Wisconsin

WHEREAS, the Fox River, with Lake Tichigan and it's Chain O' Lakes, from its headwaters in Waukesha County, Wisconsin, through Lake and McHenry Counties in Illinois, is an important recreational and ecological asset for the quality of life of both Illinois and Wisconsin citizens; and

WHEREAS, efforts to promote clean and navigable waters, is a national issue that requires cooperation across state lines; and

WHEREAS, the State of Illinois has created, through the Illinois legislature, the Fox Waterway Agency to specifically address the Fox River system in Illinois, and the State of Wisconsin has created, through the Wisconsin legislature, the Southeastern Wisconsin Fox River Commission to address the Fox River system in Wisconsin; and

WHEREAS, the mission of both organizations is to address a myriad of water quality and recreation issues on this important watershed, which is a main tributary to the Illinois River;

THEREFORE, BE IT RESOLVED, that the Southeastern Wisconsin Fox River Commission, as an agent of the State of Wisconsin, endorses a formal partnership between the two bodies to improve and maintain the Fox River Watershed for the common good in Wisconsin and Illinois.

APPROVED by the Southeastern Wisconsin Fox River Commission this 10th day of October 2002.

SOUTHEASTERN WISCONSIN FOX RIVER COMMISSION,

By: _____
Robert Langmesser, Chairman

By: _____
David L. Shaw, Co-Chairman

ATTEST:

_____
Shelley Tessmer, Secretary

Vote: _____ _____
Ayes Nays

Appendix D

NONPOINT SOURCE POLLUTION CONTROL MEASURES

Nonpoint, or diffuse, sources of water pollution include urban sources such as runoff from residential, commercial, industrial, transportation, and recreational land uses; construction activities; and onsite sewage disposal systems and rural sources such as runoff from cropland, pasture, and woodland, atmospheric contributions, and livestock wastes. These sources of pollutants discharge to surface waters by direct overland drainage, by drainage through natural channels, by drainage through engineered stormwater drainage systems, and by deep percolation into the ground and subsequent return flow to the surface waters.

A summary of the methods and estimated effectiveness of nonpoint source water pollution control measures is set forth in Table D-1. These measures have been grouped for planning purposes into two categories: basic practices and additional. Application of the basic practices will have a variable effectiveness in terms of level of pollution control depending upon the subwatershed area characteristics and the pollutant considered. The additional category of nonpoint source control measures has been subdivided into four subcategories based upon the relative effectiveness and costs of the measures. The first subcategory of practices can be expected to generally result in about a 25 percent reduction in pollutant runoff. The second and third subcategory of practices, when applied in combination with the minimum and additional practices, can be expected to generally result in up to a 75 percent reduction in pollutant runoff, respectively. The fourth subcategory would consist of all of the preceding practices, plus those additional practices that would be required to achieve a reduction in ultimate runoff of more than 75 percent.

Table D-1 sets forth the diffuse source control measures applicable to general land uses and diffuse source activities, along with the estimated maximum level of pollution reduction which may be expected upon implementation of the applicable measures. The table also includes information pertaining to the costs of developing the alternatives set forth in this appendix.[1] These various individual nonpoint source control practices are summarized by group in Table D-2.

[1]*Costs are presented in more detail in the following SEWRPC Technical Reports: No. 18,* State of the Art of Water Pollution Control in Southeastern Wisconsin, *Volume Three,* Urban Storm Water Runoff, *July 1977, and Volume Four,* Rural Storm Water Runoff, *December 1976; and No. 31,* Costs of Urban Nonpoint Source Water Pollution Control Measures, *June 1991.*

Table D-1

GENERALIZED SUMMARY OF METHODS AND EFFECTIVENESS OF NONPOINT SOURCE WATER POLLUTION ABATEMENT

Applicable Land Use	Control Measures[a]	Summary Description	Approximate Percent Reduction of Released Pollutants[b]	Assumptions for Costing Purposes
Urban	Litter and pet waste control ordinance	Prevent the accumulation of litter and pet wastes on streets and residential, commercial, industrial, and recreational areas	2 to 5	Ordinance administration and enforcement costs are expected to be funded by violation penalties and related revenues
	Improved timing and efficiency of street sweeping, leaf collection and disposal, and catch basin cleaning	Improve the scheduling of these public works activities, modify work habits of personnel, and select equipment to maximize the effectiveness of these existing pollution control measures	2 to 5	No significant increase in current expenditures is expected
	Management of onsite sewage treatment systems	Regulate septic system installation, monitoring, location, and performance; replace failing systems with new septic systems or alternative treatment facilities; develop alternatives to septic systems; eliminate direct connections to drain tiles or ditches; dispose of septage at sewage treatment facility	10 to 30	Replace one-half of estimated existing failing septic systems with properly located and installed systems and replace one-half with alternative systems, such as mound systems or holding tanks; all existing and proposed onsite sewage treatment systems are assumed to be properly maintained; assume system life of 25 years. The estimated cost of a septic tank system is $5,000 to $6,000 and the cost of an alternative system is $10,000. The annual maintenance cost of a disposal system is $250. An in-ground pressure system is estimated to cost $6,000 to $10,000 with an annual operation and maintenance cost of $250. A holding tank would cost $5,500 to $6,500, with an annual operation and maintenance cost of $1,800
	Increased street sweeping	On the average, sweep all streets in urban areas an equivalent of once or twice a week with vacuum street sweepers; require parking restrictions to permit access to curb areas; sweep all streets at least eight months per year; sweep commercial and industrial areas with greater frequency than residential areas	30 to 50	Estimate curb-miles based on land use, estimated street acreage, and Commission transportation planning standards; assume one street sweeper can sweep 2,000 curb-miles per year; assume sweeper life of 10 years; assume residential areas swept once weekly, commercial and industrial areas swept twice weekly. The cost of a vacuum street sweeper is approximately $120,000. The cost of the operation and maintenance of a sweeper is about $25 per curb-mile swept
	Increased leaf and clippings collection and disposal	Increase the frequency and efficiency of leaf collection procedures in fall; use vacuum cleaners to collect leaves; implement ordinances for leaves, clippings. and other organic debris to be mulched, composted, or bagged for pickup	2 to 5	Assume one equivalent mature tree per residence, plus five trees per acre in recreational areas; 75 pounds of leaves per tree; 20 percent of leaves in urban areas not currently disposed of properly. The cost of the collection of leaves in a vacuum sweeper and disposal is estimated at $180 to $200 per ton of leaves
	Increased catch basin cleaning	Increase frequency and efficiency of catch basin cleaning; clean at least twice per year using vacuum cleaners; catch basin installation in new urban development not recommended as a cost-effective practice for water quality improvement	2 to 5	Determine curb-miles for street sweeping; vary percent of urban areas served by catch basins by watershed from Commission inventory data; assume density of 10 catch basins per curb-mile; clean each basin twice annually by vacuum cleaner. The cost of cleaning a catch basin is approximately $10
	Reduced use of deicing salt	Reduce use of deicing salt on streets; salt only intersections and problem areas; prevent excessive use of sand and other abrasives	Negligible for pollutants addressed in this plan, but helpful for reducing chlorides and associated damage to vegetation	Increased costs, such as for slower transportation movement, are expected to be offset by benefits, such as reduced automobile corrosion and damage to vegetation

Table D-1 (continued)

Applicable Land Use	Control Measures[a]	Summary Description	Approximate Percent Reduction of Released Pollutants[b]	Assumptions for Costing Purposes
Urban (continued)	Improved street maintenance and refuse collection and disposal	Increase street maintenance and repairs; increase provision of trash receptacles in public areas; improve trash collection schedules; increase cleanup of parks and commercial centers	2 to 5	Increase current expenditures by approximately 15 percent
	Parking lot stormwater temporary storage and treatment measures	Construct gravel-filled trenches, sediment basins, or similar measures to store temporarily the runoff from parking lots, rooftops, and other large impervious areas; if treatment is necessary, use a physical-chemical treatment measure, such as screens, dissolved air flotation, or a swirl concentrator	5 to 10	Design gravel-filled trenches for 24-hour, five-year recurrence interval storm; apply to off-street parking acreages. For treatment, assume four-hour detention time. The capital cost of stormwater detention and treatment facilities is estimated at $40,000 to $80,000 per acre of parking lot area, with an annual operation and maintenance cost of about $200 per acre
	Onsite storage—residential	Remove connections to sewer systems; construct onsite stormwater storage measures for subdivisions	5 to 10	Remove roof drains and other connections from sewer system wherever needed; use lawn aeration, if applicable; apply dutch drain storage facilities to 15 percent of residences. The capital cost would approximate $500 per house, with an annual operation and maintenance cost of about $25
	Stormwater Infiltration—urban	Construct gravel-filled trenches for areas of less than 10 acres or basins to collect and store temporarily stormwater runoff to reduce volume, provide groundwater recharge and augment low stream flows	45 to 90	Design gravel-filled trenches or basins to store the first 0.5 inch of runoff; provide at least a 25-foot grass buffer strip to reduce sediment loadings. The capital cost of stormwater infiltration is estimated at $12,000 for a six-foot-deep, 10-foot-wide trench, and at $70,000 for a one-acre basin, with an annual maintenance cost of about $10 to $350 for the trench and about $2,500 for the basin
	Stormwater storage—urban	Store stormwater runoff from urban land in surface storage basins or, where necessary, subsurface storage basins	10 to 35	Design all storage facilities for a 1.5-inch runoff event, which corresponds approximately to a five-year recurrence interval event, with a storm event being defined as a period of precipitation with a minimum antecedent and subsequent dry period of from 12 to 24 hours; apply subsurface storage tanks to intensively developed existing urban areas where suitable open land for surface storage is unavailable; design surface storage basins for proposed new urban land, existing urban land not storm sewered, and existing urban land where adequate open space is available at the storm sewer discharge site. The capital cost for stormwater storage would range from $35,000 to $110,000 per acre of basin, with an annual operation and maintenance cost of about $40 to $60 per acre
	Stormwater treatment	Provide physical-chemical treatment which includes screens, microstrainers, dissolved air flotation, swirl concentrator, or high-rate filtration, and/or disinfection, which may include chlorination, high-rate disinfection, or ozonation to stormwater following storage	10 to 50	To be applied only in combination with stormwater storage facilities above; general cost estimates for microstrainer treatment and ozonation were used; some costs were applied to existing urban land and proposed new urban development. Stormwater treatment has an estimated capital cost of from $900 to $7,000 per acre of tributary drainage area, with an average annual operation and maintenance cost of about $35 to $100 per acre

Table D-1 (continued)

Applicable Land Use	Control Measures[a]	Summary Description	Approximate Percent Reduction of Released Pollutants[b]	Assumptions for Costing Purposes
Rural	Conservation practices	Includes such practices as strip cropping, contour plowing, crop rotation, pasture management, critical area protection, grading and terracing, grassed waterways, diversions, woodlot management, fertilization and pesticide management, and chisel tillage	Up to 50	Cost for Natural Resources Conservation Service (NRCS) recommended practices are applied to agricultural and related rural land; the distribution and extent of the various practices were determined from an examination of 56 existing farm plan designs within the Region. The capital cost of conservation practices ranges from $3,000 to $5,000 per acre of rural land, with an average annual operation and maintenance cost of from $5.00 to $10 per rural acre
	Animal waste control system	Construct streambank fencing and crossovers to prevent access of all livestock to waterways; construct a runoff control system or a manure storage facility, as needed, for major livestock operations; prevent improper applications of manure on frozen ground, near surface drainageways, and on steep slopes; incorporate manure into soil	50 to 75	Cost estimated per animal unit; animal waste storage (liquid and slurry tank for costing purposes) facilities are recommended for all major animal operations within 500 feet of surface water and located in areas identified as having relatively high potential for severe pollution problems. Runoff control systems recommended for all other major animal operations. It is recognized that dry manure stacking facilities are significantly less expensive than liquid and slurry storage tanks and may be adequate waste storage systems in many instances. The estimated capital cost and average operation and maintenance cost of a runoff control system is $100 per animal unit and $25 per animal unit, respectively. The capital cost of a liquid and slurry storage facility is about $1,000 per animal unit, with an annual operation and maintenance cost of about $75 per unit. An animal unit is the weight equivalent of a 1,000-pound cow
	Base-of-slope detention storage	Store runoff from agricultural land to allow solids to settle out and reduce peak runoff rates. Berms could be constructed parallel to streams	50 to 75	Construct a low earthen berm at the base of agricultural fields, along the edge of a floodplain, wetland, or other sensitive area, design for 24-hour, 10-year recurrence interval storm; berm height about four feet. Apply where needed in addition to basic conservation practices; repair berm every 10 years and remove sediment and spread on land. The estimated capital cost of base-of-slope detention storage would be $500 per tributary acre, with an annual operation and maintenance cost of $25 per acre
	Bench terraces	Construct bench terraces, thereby reducing the need for many other conservation practices on sloping agricultural land	75 to 90	Apply to all appropriate agricultural lands for a maximum level of pollution control. Utilization of this practice would exclude installation of many basic conservation practices and base-of-slope detention storage. The capital cost of bench terraces is estimated at $1,500 per acre, with an annual operation and maintenance cost of $100 per acre
Urban and Rural	Public education programs	Conduct regional and county-level public education programs to inform the public and provide technical information on the need for proper land management practices on private land, the recommendations for management programs, and the effects of implemented measures; develop local awareness programs for citizens and public works officials; develop local contract and education efforts	Indeterminate	For first 10 years, includes cost of one person, materials, and support for each 25,000 population. Thereafter, the same cost can be applied for every 50,000 population. The cost of one person, materials, and support is estimated at $55,000 per year

Table D-1 (continued)

Applicable Land Use	Control Measures[a]	Summary Description	Approximate Percent Reduction of Released Pollutants[b]	Assumptions for Costing Purposes
Urban and Rural (continued)	Construction erosion control practices	Construct temporary sediment basins; install straw bale dikes; use fiber mats, mulching, and seeding; install slope drains to stabilize steep slopes; construct temporary diversion swales or berms upslope from the project	20 to 40	Assume acreage under construction is the average annual incremental increase in urban acreage; apply costs for a typical erosion control program for a construction site. The estimated capital cost and operation and maintenance cost for construction erosion control is $250 to $5,500 and $250 to $1,500 per acre under construction, respectively
	Materials storage and runoff control facilities	Enclose industrial storage sites with diversion; divert runoff to acceptable outlet or storage facility; enclose salt piles and other large storage sites in crib and dome structures	5 to 10	Assume 40 percent of industrial areas are used for storage and to be enclosed by diversions; assume existing salt storage piles enclosed by cribs and dome structures. The estimated capital cost of industrial runoff control is $2,500 per acre of industrial land. Material storage control costs are estimated at $75 per ton of material
	Stream protection measures	Provide vegetative buffer zones along streams to filter direct pollutant runoff to the stream; construct streambank protection measures, such as rock riprap, brush mats, tree revetment, jacks, and jetted willow poles, where needed	5 to 10	Apply a 50-foot-wide vegetative buffer zone on each side of 15 percent of the stream length; apply streambank protection measures to 5 percent of the stream length. Vegetative buffer zones are estimated to cost $21,200 per mile of stream and streambank protection measures cost about $37,000 per stream mile
	Pesticide and fertilizer application restrictions	Match application rate to need; eliminate excessive applications and applications near or into surface water drainageways	0 to 3	Cost included in public education program
	Critical area protection	Emphasize control of areas bordering lakes and streams; correct obvious erosion and other pollution source problems	Indeterminate	Indeterminate

[a] *Not all control measures are required for each subwatershed. The characteristics of the watershed, the estimated required level of pollution reduction needed to meet the applicable water quality standards, and other factors will influence the selection and estimation of costs of specific practices for any one subwatershed. Although the control measures costed represent the recommended practices developed at the regional level on the basis of the best available information, the local implementation process should provide more detailed data and identify more efficient and effective sets of practices to apply to local conditions.*

[b] *The approximate effectiveness refers to the estimated amount of pollution produced by the contributing category (urban or rural) that could be expected to be reduced by the implementation of the practice. The effectiveness rates would vary greatly depending on the characteristics of the watershed and individual diffuse sources. It should be further noted that practices can have only a "sequential" effect, since the percent pollution reduction of a second practice can only be applied against the residual pollutant load which is not controlled by the first practice. For example. two practices of 50 percent effectiveness in series would achieve a theoretical total effectiveness of only 75 percent control of the initial load. Further, the general levels of effectiveness reported in the table are not necessarily the same for all pollutants associated with each source. Some pollutants are transported by dissolving in water and others by attaching to solids in the water; the methods summarized here reflect typical pollutant removal levels.*

[c] *For highly urbanized areas which require retrofitting of facilities into developed areas, the costs can range from $400,000 to $1,000,000 per acre of storage.*

Source: SEWRPC.

Of the sets of practices recommended for various levels of diffuse source pollution control presented in Table D-2, not all practices are needed, applicable, or cost-effective for all watersheds, due to variations in pollutant loadings and land use and natural conditions among the watersheds. Therefore, it is recommended that the practices indicated as needed for nonpoint source pollutant control be refined by local level nonpoint source control practices planning, which would be analogous to sewerage facilities planning for point source pollution abatement. A locally prepared plan for nonpoint abatement measures should be better able to blend knowledge of current problems and practices with a quickly evolving technology to achieve a suitable, site-specific approach to pollution abatement.

Table D-2

ALTERNATIVE GROUPS OF DIFFUSE SOURCE WATER POLLUTION CONTROL MEASURES PROPOSED FOR STREAMS AND LAKE WATER QUALITY MANAGEMENT

Pollution Control Category	Level of Pollution[a] Control	Practices to Control Diffuse Source Pollution from Urban Areas[b]	Practices to Control Diffuse Source Pollution from Rural Areas[a]
Basic Practices	Variable	Construction erosion control; onsite sewage disposal system management; streambank erosion control	Streambank erosion control
	25 percent	Public education programs; litter and pet waste control; restricted use of fertilizers and pesticides; construction erosion control; critical areas protection; improved timing and efficiency of street sweeping, leaf collection, and catch basin cleaning; material storage facilities and runoff control	Public education programs; fertilizer and pesticide management; critical area protection; crop residue management; chisel tillage; pasture management; contour plowing; livestock waste control
Additional Diffuse Source Control Practices[c]	50 percent	Above, plus: Increased street sweeping; improved street maintenance and refuse collection and disposal; increased catch basin cleaning; stream protection; increased leaf and vegetation debris collection and disposal; stormwater storage; stormwater infiltration	Above, plus: crop rotation; contour strip-cropping; grass waterways; diversions; wind erosion controls; terraces; stream protection
	75 percent	Above, plus: An additional increase in street sweeping, stormwater storage and infiltration; additional parking lot stormwater runoff storage and treatment	Above, plus: Base-of-slope detention storage
	More than 75 percent	Above, plus: Urban stormwater treatment with physical-chemical and/or disinfection treatment measures	Bench terraces[b]

[a]*Groups of practices are presented here for general analysis purposes only. Not all practices are applicable to, or recommended for, all lake and stream tributary watersheds. For costing purposes, construction erosion control practices, public education programs, and material storage facilities and runoff controls are considered urban control measures and stream protection is considered a rural control measure.*

[b]*The provision of bench terraces would exclude most basic conservation practices and base-of-slope detention storage facilities.*

[c]*In addition to diffuse source control measures, lake rehabilitation techniques may be required to satisfy lake water quality standards.*

Source: SEWRPC.

Appendix E

WDNR OPERATING ORDER FOR THE WATERFORD DAM

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BEFORE THE
STATE OF WISCONSIN
DEPARTMENT OF NATURAL RESOURCES

In the Matter of the Modification of the Operating) 3-SE-82-804
Levels for the Waterford Dam, Racine County.)

FINDINGS OF FACT, CONCLUSIONS OF LAW AND ORDER

FINDINGS OF FACT

The Department finds that:

1. The Waterford Dam is located on the Fox River in Section 36, Township 4 North, Range 19 East, Racine County, Wisconsin.

2. The Waterford Dam is owned by Racine County and its operation is supervised by the Racine County Highway Commission.

3. The Waterford Dam is currently subject to Public Service Commission (PSC) order 2-WP-26, dated December 16, 1931. This order sets a minimum level of 98.35 feet, PSC datum.

4. The minimum level 98.35 feet, PSC datum, equals elevation 772.63 feet, mean sea level (MSL) datum.

5. The Department has determined that a minimum flow release of 37 cubic feet per second (cfs) is required at all times to protect downstream fish life and to protect the rights of downstream dischargers. This minimum flow release corresponds to one radial gate open 2.4 inches, or both radial gates open 1.2 inches each.

6. This modification of the Waterford Dam will not alter the established water levels, nor will it alter the operating pattern. The order converts the levels to Mean Sea Level from local datum and clarifies the operation of this dam.

CONCLUSIONS OF LAW

The Department concludes that:

1. The Department has authority under Section 31.02(1), Wisconsin Statutes, to regulate and control the level and flow of water in all navigable waters, including the Fox River.

2. The Department has authority under Section 31.02(2), Wisconsin Statutes, to determine reasonable methods of operation and maintenance of any dam so as to conserve and protect all public rights in navigable waters and so as to protect life, health and property; the operation and maintenance of dams is subject to the supervision, orders and regulations of the Department.

3. The Department has authority under Section 31.34, Wisconsin Statutes, to require a minimum discharge of water through the dam.

4. The order contained herein is reasonable, proper and necessary to protect public rights in navigable waters and to protect life, health and property.

ORDER

The Department therefore orders:

1. The minimum level is maintained at elevation 772.63 feet, MSL datum = 98.35 feet, PSC datum. This level is referenced to benchmark 296-I, which is a 2-inch chiseled square in the center of the right and (facing downstream) of the walkway over the radial gate section. Benchmark 296-I has an elevation of 778.20 feet, MSL datum.

2. The minimum flow release is set at 37 cfs at all times. One radial gate must be open at least 2.4 inches at all times, or both radial gates must be open at least 1.2 inches at all times.

3. This order supersedes all previous orders regarding levels at the Waterford Dam.

4. The Department retains jurisdiction to modify this order at any time.

Dated at Milwaukee, Wisconsin, 10-15-82.

STATE OF WISCONSIN
DEPARTMENT OF NATURAL RESOURCES
For the Secretary

By Robert F. Winnie
Robert F. Winnie
District Director