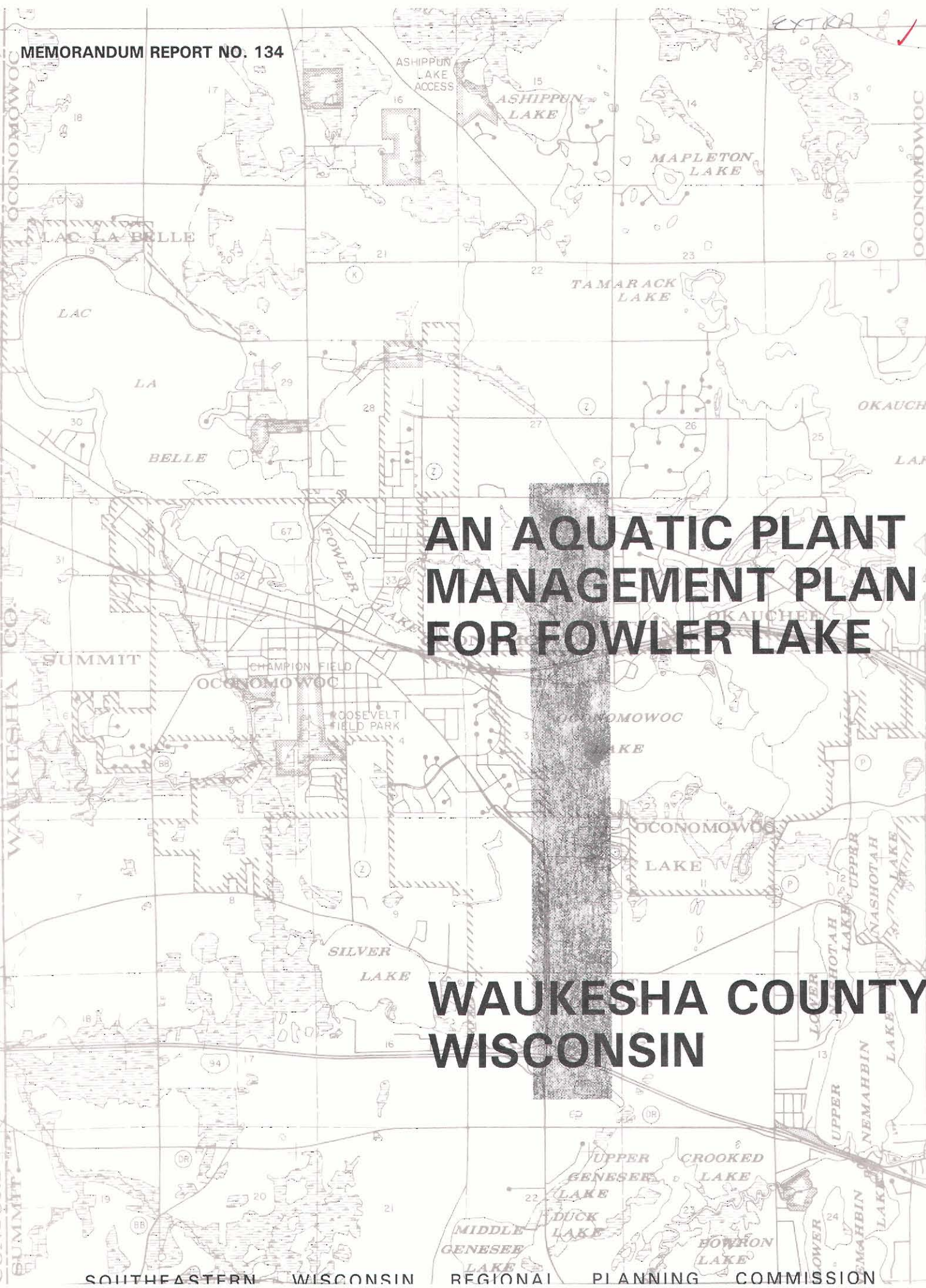
MEMORANDUM REPORT NO. 134



AN AQUATIC PLANT MANAGEMENT PLAN FOR FOWLER LAKE

WAUKESHA COUNTY WISCONSIN

SOUTHEASTERN WISCONSIN REGIONAL PLANNING COMMISSION

MEMORANDUM REPORT
NUMBER 134

AN AQUATIC PLANT MANAGEMENT PLAN FOR FOWLER LAKE WAUKESHA COUNTY, WISCONSIN

Prepared by the

Southeastern Wisconsin Regional Planning Commission
P. O. Box 1607
Old Courthouse
916 N. East Avenue
Waukesha, Wisconsin 53187-1607

The preparation of this publication was financed in part through a grant from the Wisconsin Department of Natural Resources Lake Management Planning Grant Program.

October 2000

Inside Region $ 5.00
Outside Region $10.00

(This page intentionally left blank)

TABLE OF CONTENTS

LIST OF APPENDICES

LIST OF TABLES

LIST OF FIGURES

LIST OF MAPS

Chapter I

INTRODUCTION

Fowler Lake, located in the City of Oconomowoc, Waukesha County, Wisconsin, is a valuable natural resource offering a variety of recreational and related opportunities to the resident community and its visitors. The Lake is an integral part of this lake-oriented community. However, the recreational and visual value of the Lake is perceived to be adversely affected by excessive aquatic plant growth within the Lake. Seeking to improve the usability and to prevent deterioration of the natural assets and recreational potential of Fowler Lake, the City of Oconomowoc and Fowler Lake Management District continue to undertake an annual program of lake and aquatic plant management.

Fowler Lake was included in the Wisconsin Department of Natural Resources (WDNR) Oconomowoc River Priority Watershed Project Area.[1] and has also been the subject of a comprehensive lake management plan prepared by the Regional Planning Commission.[2] This plan included an aquatic plant management plan element that has been adopted and implemented by the City of Oconomowoc and Fowler Lake Management District.

This report sets forth an inventory of aquatic plant communities present within Fowler Lake, and represents part of the ongoing commitment of the City of Oconomowoc to sound planning with respect to the Lake. This inventory was prepared during 1997 by the Southeastern Wisconsin Regional Planning Commission in cooperation with the City of Oconomowoc and Fowler Lake Management District, and includes the results of field surveys conducted by the Commission in June 1997. The aquatic plant survey was conducted by Commission staff using the modified Jesson and Lound[3] transect method employed by the Wisconsin Department of Natural Resources. The 1997 inventory was verified by field observation in 1998. The planning program was funded, in part, by a Wisconsin Department of Natural Resources Lake Management Planning Grant awarded to the City of Oconomowoc under the Chapter NR 190 Lake Management Planning Grant Program.

This inventory is intended to be a refinement of the aquatic plant management plan element of the comprehensive lake management plan for Fowler Lake, and has been prepared pursuant to recommendations made in the aforereferenced comprehensive plan. The scope of this report is limited to a consideration of the aquatic plant communities present within Fowler Lake, the documentation of historic changes in this plant community based upon currently existing data and information, and refinement of those management measures which can be effective in the control of aquatic plant growth. In addition, recommendations are made with respect to the Lake Management District operations relating to aquatic plant and in-lake management activities.

---

[1] *Wisconsin Department of Natural Resources Publication No. PUBL-WR-194-86,* A Nonpoint Source Control Plan for the Oconomowoc River Priority Watershed Project, *March 1986.*

[2] *SEWRPC Community Assistance Planning Report No. 187,* A Management Plan for Fowler Lake, Waukesha County, Wisconsin, *March 1994.*

[3] *R. Jesson, and R. Lound, Minnesota Department of Conservation Game Investigational Report No. 6,* An Evaluation of a Survey Technique for Submerged Aquatic Plants, *1962.*

The recreational lake use goals and objectives for Fowler Lake were developed in consultation with the City of Oconomowoc. The goals and objectives are:

1. To protect and maintain public health, and to promote public comfort, convenience, necessity, and welfare, through the environmentally sound management of the vegetation, fishery, and wildlife populations in and around Fowler Lake;

2. To provide for high-quality, water-based recreational experiences by residents and visitors to Fowler Lake, and manage the Lake in an environmentally sound manner; and,

3. To effectively maintain the water quality of Fowler Lake to better facilitate the conduct of water-related recreation, improve the aesthetic value of the resource to the community, and enhance the resource value of the waterbody.

This inventory and plan element, which conforms to the requirements and standards set forth in the relevant *Wisconsin Administrative Codes*,[4] should serve as an initial step in achieving these objectives over time.

[4]*This plan has been prepared pursuant to the standards and requirements set forth in three chapters of the* Wisconsin Administrative Code*: Chapter NR 1, "Public Access Policy for Waterways;" Chapter NR 103, "Water Quality Standards for Wetlands;" and Chapter NR 107, "Aquatic Plant Management."*

Chapter II

INVENTORY FINDINGS

INTRODUCTION

Fowler Lake is located in the northern portion of the City of Oconomowoc, Waukesha County, as shown on Map 1. As set forth in the adopted lake management plan,[1] Fowler Lake is the fifth in a chain of six lakes—comprised of Friess, North, Okauchee, Oconomowoc, Fowler, and La Belle Lakes—within the Southeastern Wisconsin Region. These lakes are situated along the Oconomowoc River upstream of its confluence with the mainstem of the Rock River. Fowler Lake is a throughflow lake situated upstream of Lac La Belle and downstream of Oconomowoc Lake. The Oconomowoc River is the primary inflow to the Lake entering from the east. The Lake outflow is controlled by two hydraulic structures consisting of a dam and a fixed-height overflow structure, both located on the western side of Fowler Lake just upstream of STH 67. The dam discharges in a westerly direction through a 60-foot-wide channel directly into Lac La Belle. The fixed-height overflow discharges through a concrete culvert, likewise, directly into Lac La Belle. Lac La Belle is located immediately west of STH 67. The Oconomowoc River, also the outlet of Lac La Belle, ultimately discharges into the Rock River at Afton in Jefferson County, approximately 13 miles downstream from the Lac La Belle outlet.

WATERBODY CHARACTERISTICS

Fowler Lake is a 99-acre waterbody, the hydrographical characteristics of which are set forth in Table 1. The Lake is a throughflow lake with extensive shallow areas and a single deep basin. Fowler Lake consists of a main basin with a surface area of 78 acres and an expanded inlet east of North Oakwood Avenue with a surface area of 21 acres. The waterbody has a maximum depth of approximately 50 feet, a mean depth of 13 feet, and a volume of 1,074 acre-feet. The bathymetry of the Lake is shown on Map 2. The total drainage area tributary to Fowler Lake, shown on Map 1, is approximately 78 square miles in areal extent. Portions of the total tributary drainage area extend into three counties. Portions of the Town of Ashippun, in Dodge County; the Village of Slinger, and the Towns of Erin, Hartford, Polk, and Richfield, in Washington County; and the City of Oconomowoc, the Villages of Chenequa, Hartland, Merton, Nashotah, and Oconomowoc Lake, and the Towns of Delafield, Lisbon, Merton, Oconomowoc, and Summit, in Waukesha County, drain to Fowler Lake.

TRIBUTARY DRAINAGE AREA AND LAND USE CHARACTERISTICS

The direct drainage area tributary to Fowler Lake is situated entirely within Waukesha County. This area, which drains directly to Fowler Lake without passing through any upstream waterbody, is 1,604 acres in areal extent. The total tributary drainage area to Fowler Lake includes the entire area upstream of Fowler Lake drained by the Oconomowoc River. This 78-square-mile drainage area is shown on Map 1.

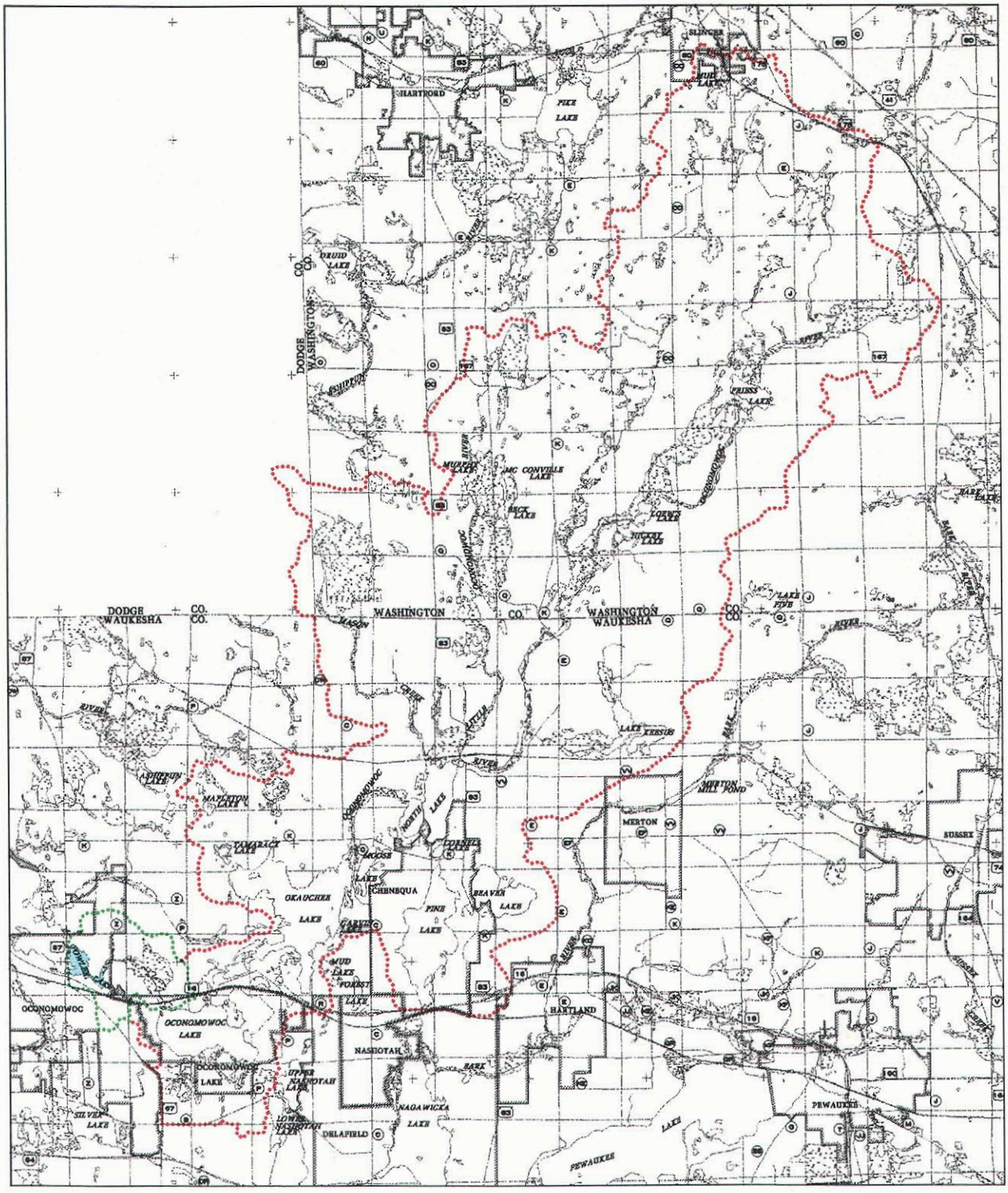
The surrounding land uses within that portion of the drainage basin directly tributary to Fowler Lake are primarily urban with low- to medium-density residential and commercial development as the dominant urban land use. Existing land uses as of 1990 are shown on Maps 3 and 4 and are summarized in Table 2. Changes in land use within the drainage area tributary to the Lake include very limited further urban development, infilling of already

---

[1]*SEWRPC Community Assistance Planning Report No. 187,* A Management Plan for Fowler Lake, Waukesha County, Wisconsin, *March 1994.*

Map 1

TOTAL TRIBUTARY DRAINAGE AREA AND AREA DIRECTLY TRIBUTARY TO FOWLER LAKE



LEGEND

FOWLER DIRECT DRAINAGE AREA BOUNDARY

FOWLER TOTAL TRIBUTARY DRAINAGE AREA BOUNDARY

0 1 2
Scale in miles

Source: SEWRPC.

platted lots, and possibly redevelopment of existing properties. Details on planned land use conditions are set forth in the adopted lake management plan for Fowler Lake.

SHORELINE PROTECTION STRUCTURES

Erosion of shorelines results in the loss of land, damage to shoreline infrastructure, and interference with lake access and use. Wind-wave erosion, ice movement and motorized boat traffic usually cause such erosion. A survey of Fowler Lake shoreline, conducted by Commission staff in June 1997, identified few areas with natural shorelines, except in the expanded inlet. Most of the shoreline was determined to be protected by riprap and bulkheads, as shown on Map 5. No obvious erosion-related problems were observed, and the potentially unstable areas identified in the adopted lake management plan had been largely stabilized.

Table 1

HYDROLOGY AND MORPHOMETRY OF FOWLER LAKE

Parameter	Measurement
Size (total)	99 acres
Total Area	
Area of Main Body	78 acres
Area of Enlarged Inlet East of N. Oakwood Avenue	21 acres
Total Drainage Area	49,757 acres
Direct Drainage Area	1,604 acres
Volume (total)	1,074 acre-feet
Residence Time[a] (1984 USGS study period)	6,9 days
Shape	
Maximum Length of Lake	0.6 mile
Length of Shoreline	1.7 miles
Maximum Width of Lake	0.35 mile
Depth	
Areas of Lake	
Less than Five Feet	33 percent
Five to 10 Feet	23 percent
10 to 15 Feet	16 percent
15 to 25 Feet	13 percent
Greater than 25 Feet	15 percent
Mean Depth	13 feet
Maximum Depth	50 feet

[a]Residence Time: Time required for a volume equivalent to full volume replacement by inflowing waters to enter the lakes.

Source: Wisconsin Department of Natural Resources and SEWRPC.

WATER QUALITY

Secchi-disk transparency measurements obtained by the U.S. Geological Survey[2] subsequent to the completion of the adopted lake management plan for Fowler Lake, from October 1995 through September 1996, were consistently greater than nine feet. In fact, Secchi-disk transparency readings were often between 12 feet and 13 feet. Such transparencies are indicative of a waterbody with good water clarity,[3] as shown in Figure 1. This suggests that the Lake had relatively low concentrations of algae and suspended sediment in the water column.

Fowler Lake had a Wisconsin Trophic State Index (WTSI) value of 46.7,[4] based upon the total phosphorus concentration observed during spring 1996. This WTSI value, shown in Figure 2, is consistent with the good transparency conditions noted above, and indicates that the Lake remains a mesotrophic waterbody. Mesotrophic lakes, while relatively fertile and supporting abundant aquatic plant growths and productive fisheries, generally do

---

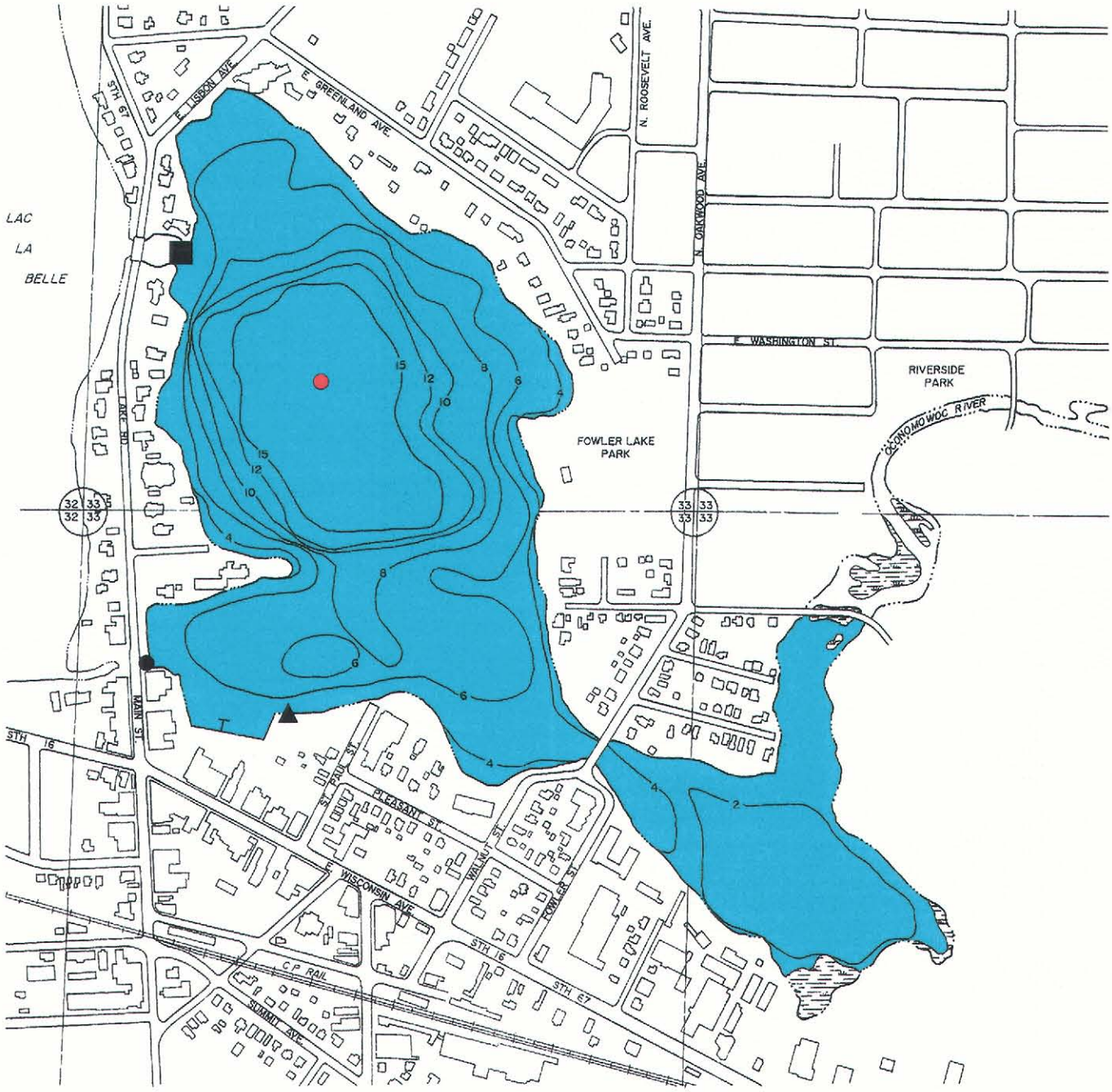
[2]*U.S. Geological Survey Water-Resources Investigations Report 91-4076,* Hydrology, Water Quality, Trophic Status, and Aquatic Plants of Fowler Lake, Wisconsin, *1993.*

[3]*R.A. Lillie and J.W. Mason,* Limnological Characteristics of Wisconsin Lakes, *Wisconsin Department of Natural Resources Technical Bulletin No. 138, 1983.*

[4]*R.A. Lillie, S. Graham, and P. Rasmussen, "Trophic State Index Equations and Regional Predictive Equations for Wisconsin Lakes,"* Research and Management Findings, *Wisconsin Department of Natural Resources Publication No. PUBL-RS-735 93, May 1993.*

Map 2

BATHYMETRIC MAP OF FOWLER LAKE



LEGEND

- 6 — WATER DEPTH CONTOUR IN FEET
- PUBLIC BOAT ACCESS
- DAM SITE
- OVERFLOW STRUCTURE SITE
- SAMPLING SITE LOCATION

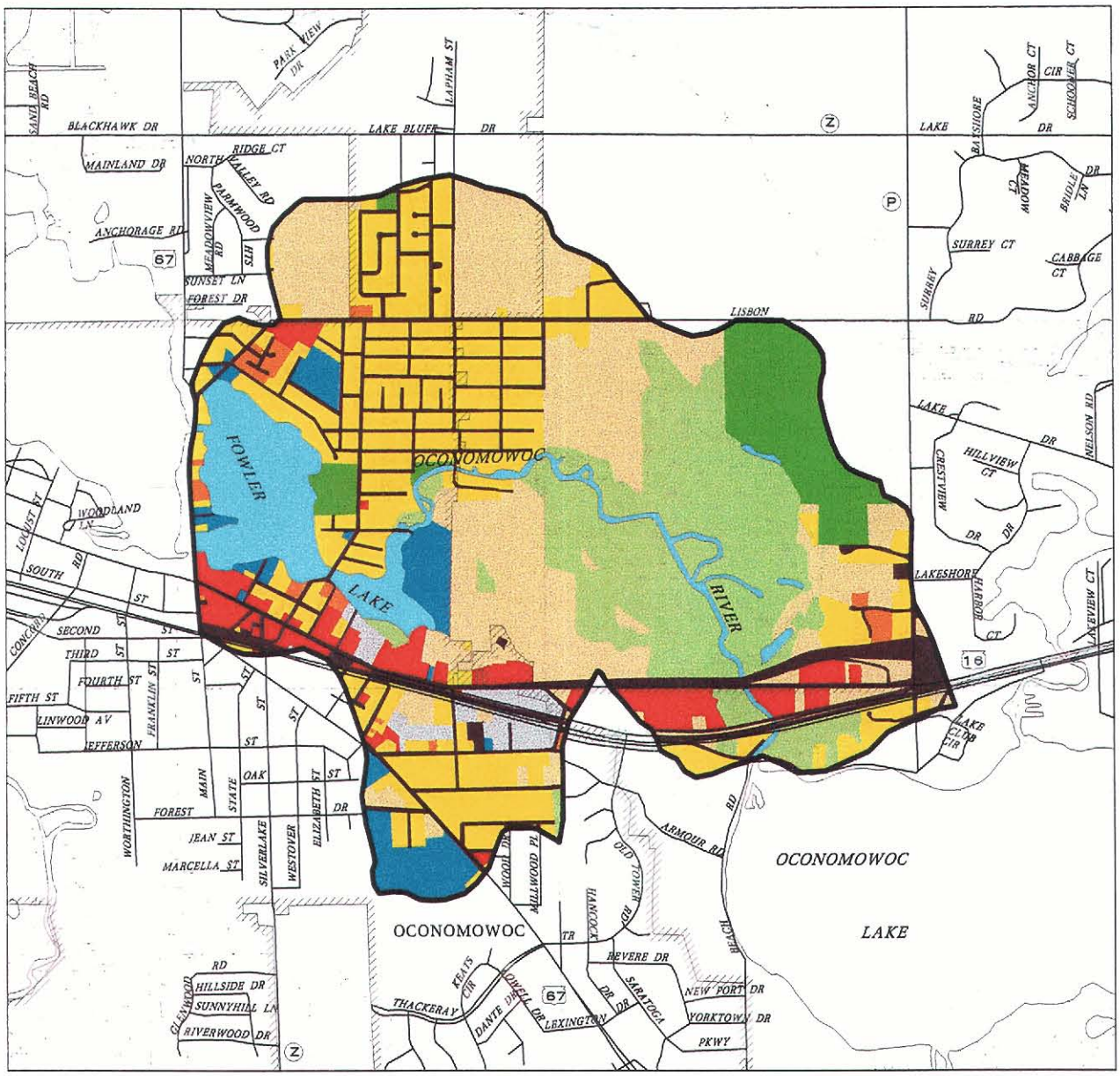
N

GRAPHIC SCALE
0 300 600 FEET

Source: SEWRPC.

Map 3

EXISTING LAND USE WITHIN THE DRAINAGE AREA DIRECTLY TRIBUTARY TO FOWLER LAKE: 1990



LAND USE CATEGORIES

- Single–family residential
- Multi–family residential
- Commercial
- Industrial
- Transportation, communications, and utilities
- Government and institutional
- Recreation
- Surface water
- Wetlands and woodlands
- Agricultural, unused, and other open lands
- Extractive and landfill

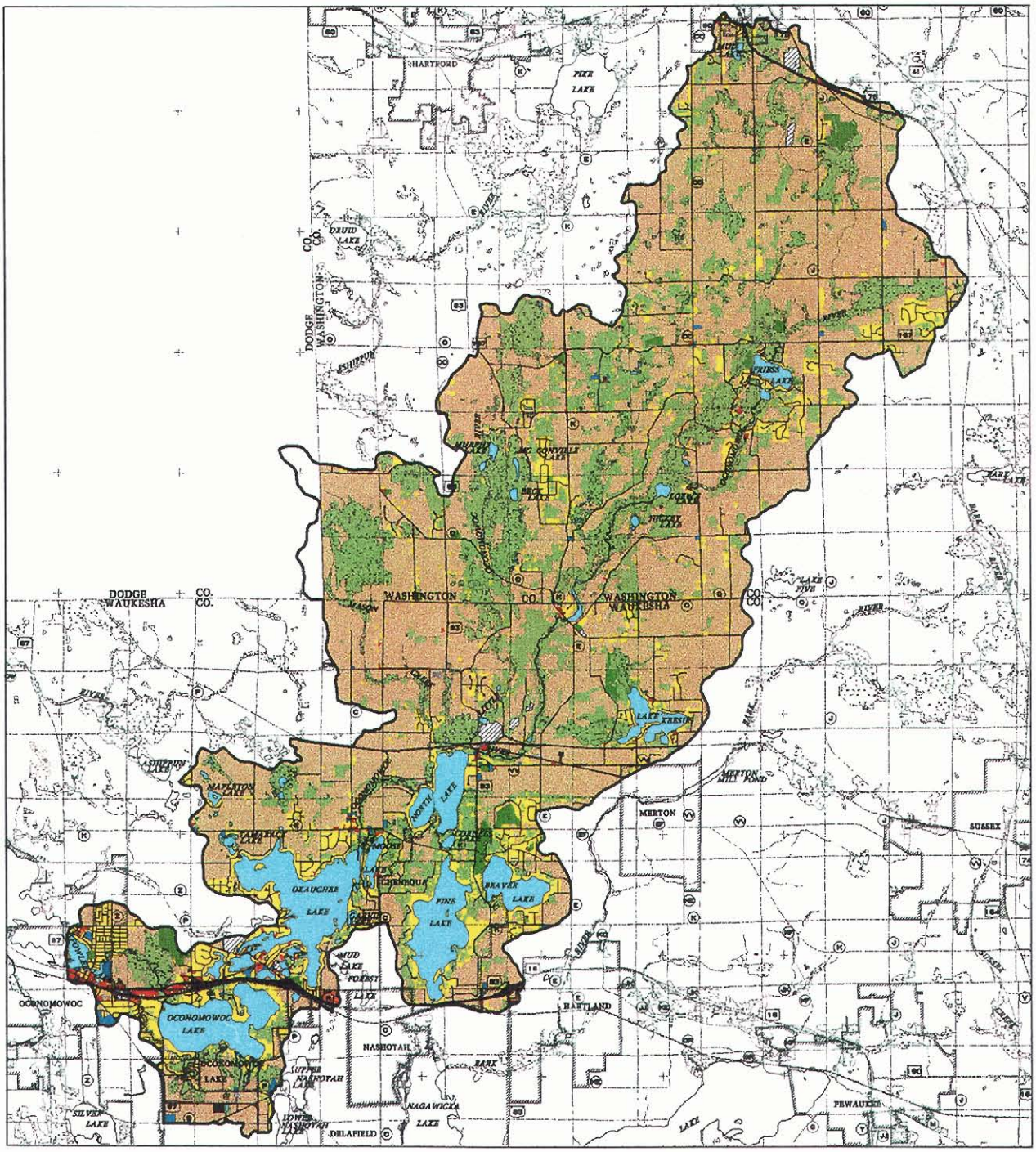
0 .25 .5

Scale in miles

Source: SEWRPC.

Map 4

EXISTING LAND USE WITHIN THE TOTAL TRIBUTARY DRAINAGE AREA TO FOWLER LAKE: 1990



LAND USE CATEGORIES

- Single–family residential
- Multi–family residential
- Commercial
- Industrial
- Transportation, communications, and utilities
- Government and institutional
- Recreation
- Surface water
- Wetlands and woodlands
- Agricultural, unused, and other open lands
- Extractive and landfill

0 1 2
Scale in miles

Source: SEWRPC.

not exhibit nuisance growths of algae and plants. Many of the cleaner lakes in Southeastern Wisconsin are classified as mesotrophic.[5]

AQUATIC PLANTS: DISTRIBUTION AND MANAGEMENT AREAS

Two comprehensive surveys of aquatic plant communities in Fowler Lake have been conducted. The first survey was that of Sorge and Lowry, conducted in 1984 and reported in the adopted lake management plan.[6] The currency of this survey was confirmed by an aquatic plant community reconnaissance conducted by the Commission staff during 1991 prior to the publication of that plan. Subsequently, the Commission staff conducted a second comprehensive survey of aquatic plant species in the Lake basin during the period from June 17 through June 19, 1997. The results of this survey are presented in Table 3, and graphically depicted on Map 6. The survey methodology was based upon the modified Jesson and Lound transect method as adopted by the Wisconsin Department of Natural Resources. Common aquatic plants found in Fowler Lake are illustrated in Appendix A.

Table 2

EXISTING LAND USE WITHIN THE DRAINAGE AREA DIRECTLY TRIBUTARY TO FOWLER LAKE: 1990

Land Use Categories	Direct Drainage Area Land Use Area (acres)	Total Tributary Drainage Area Land Use Area (acres)
Urban		
Residential	390	4,461
Commercial	59	189
Industrial	35	54
Government and Institutional	75	142
Transportation, Commercial and Utilities	167	1,967
Recreation	154	471
Open Lands	22	49
Subtotal	902	7,333
Rural		
Agricultural	250	23,938
Woodlands	62	6,447
Wetlands	226	6,166
Water	114	3,453
Other	50	2,420
Subtotal	702	42,424
Total	1,604	49,757

Source: SEWRPC.

Past and Present Aquatic Plant Management Practices

Combined, the two aquatic plant surveys conducted on Fowler Lake within the last 15 years depict changes which have occurred over a period during which an extensive aquatic plant management program was carried out. As set forth in the adopted lake management plan, this aquatic plant management program has been carried out in a documented manner since 1950, when records of aquatic plant management efforts were first maintained by the Wisconsin Department of Natural Resources. Prior to 1950, aquatic plant management interventions are likely, but were not recorded.

The aquatic plant control program conducted on Fowler Lake can be categorized as a chemical control program designed to minimize nuisance growths of aquatic macrophytes and algae. Between 1950 and 1969, 87,456 pounds of sodium arsenate and 2,506 pounds of copper sulfate were applied to Fowler Lake to control perceived nuisance growths of these plants.[7] These applications and subsequent applications through 1996 are summarized

---

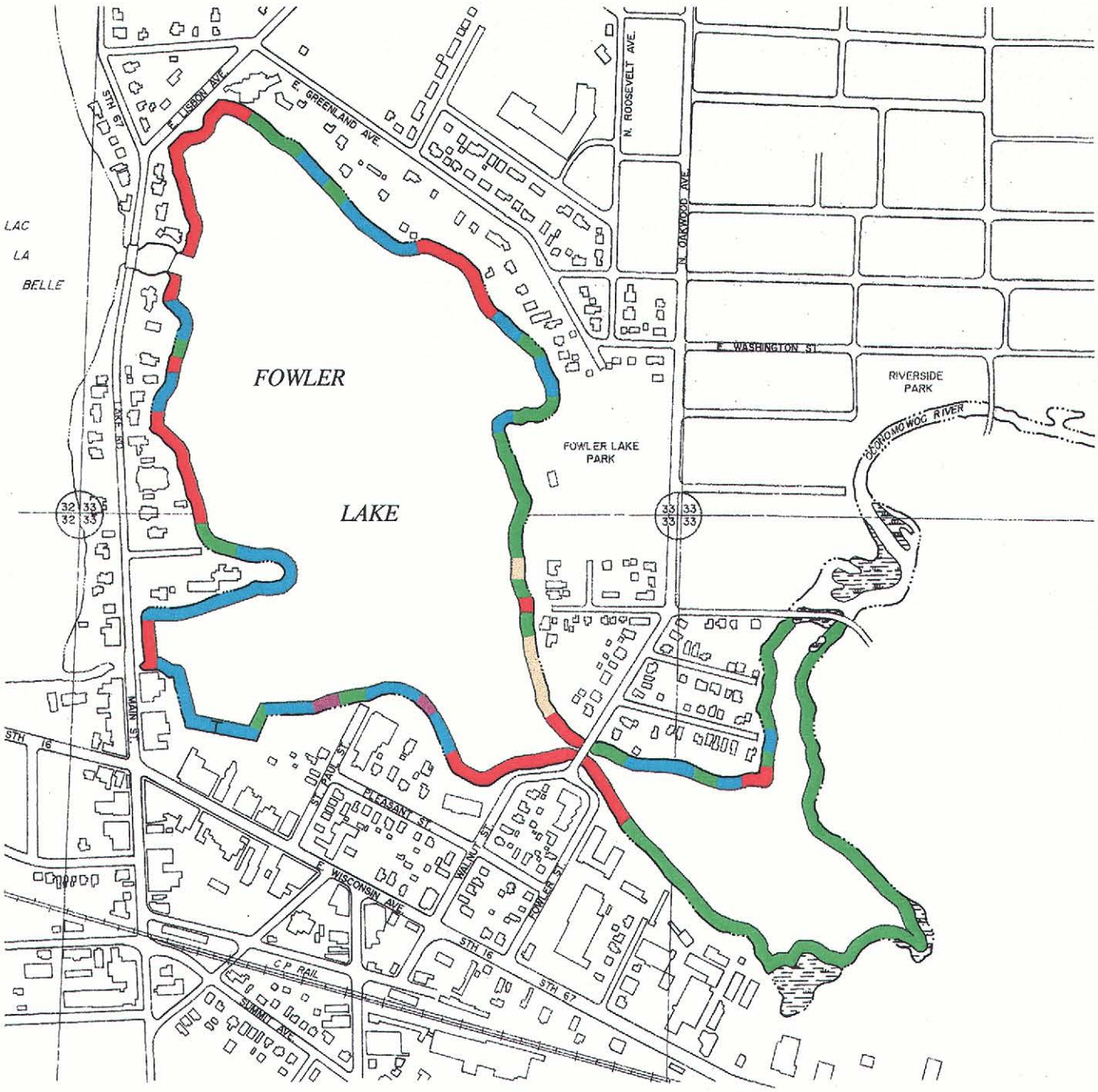
[5]*R.A. Lillie, and J.W. Mason,* Limnological Characteristics of Wisconsin Lakes, *Wisconsin Department of Natural Resources Technical Bulletin No. 138, 1983. Also see SEWRPC Memorandum Report No. 93,* A Regional Water Quality Management Plan for Southeastern Wisconsin: An Update and Status Report, *March 1995.*

[6]*P. Sorge, and T. Lowry,* Aquatic Plant and Sediment Survey On Fowler Lake, *1984. Also see SEWRPC Community Assistance Planning Report No. 187,* A Management Plan for Fowler Lake, Waukesha County, Wisconsin, *March 1994.*

[7]*Wisconsin Department of Natural Resources Technical Bulletin No. 57, op. cit. Also see Table 24, SEWRPC Community Assistance Planning Report No. 187,* A Management Plan for Fowler Lake, Waukesha County, Wisconsin, *March 1994.*

Map 5

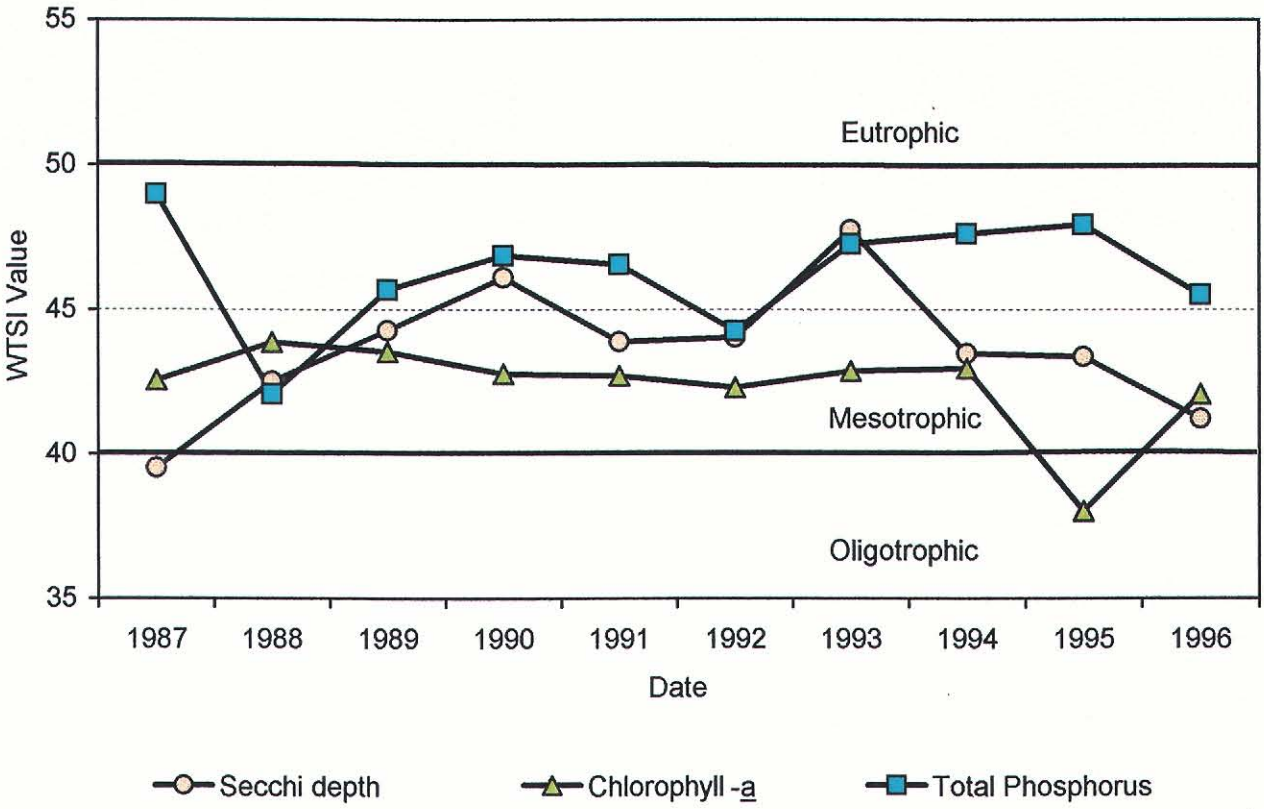
SHORELINE PROTECTION CONDITIONS ON FOWLER LAKE: 1997



Source: SEWRPC.

Figure 1

TROPHIC STATE INDEX FOR FOWLER LAKE: 1987-1996



Source: U.S. Geological Survey and SEWRPC.

in Table 4. In recent years, the aquatic plant control program conducted on Fowler Lake has also included aquatic plant harvesting as a major element of the plant management strategy.

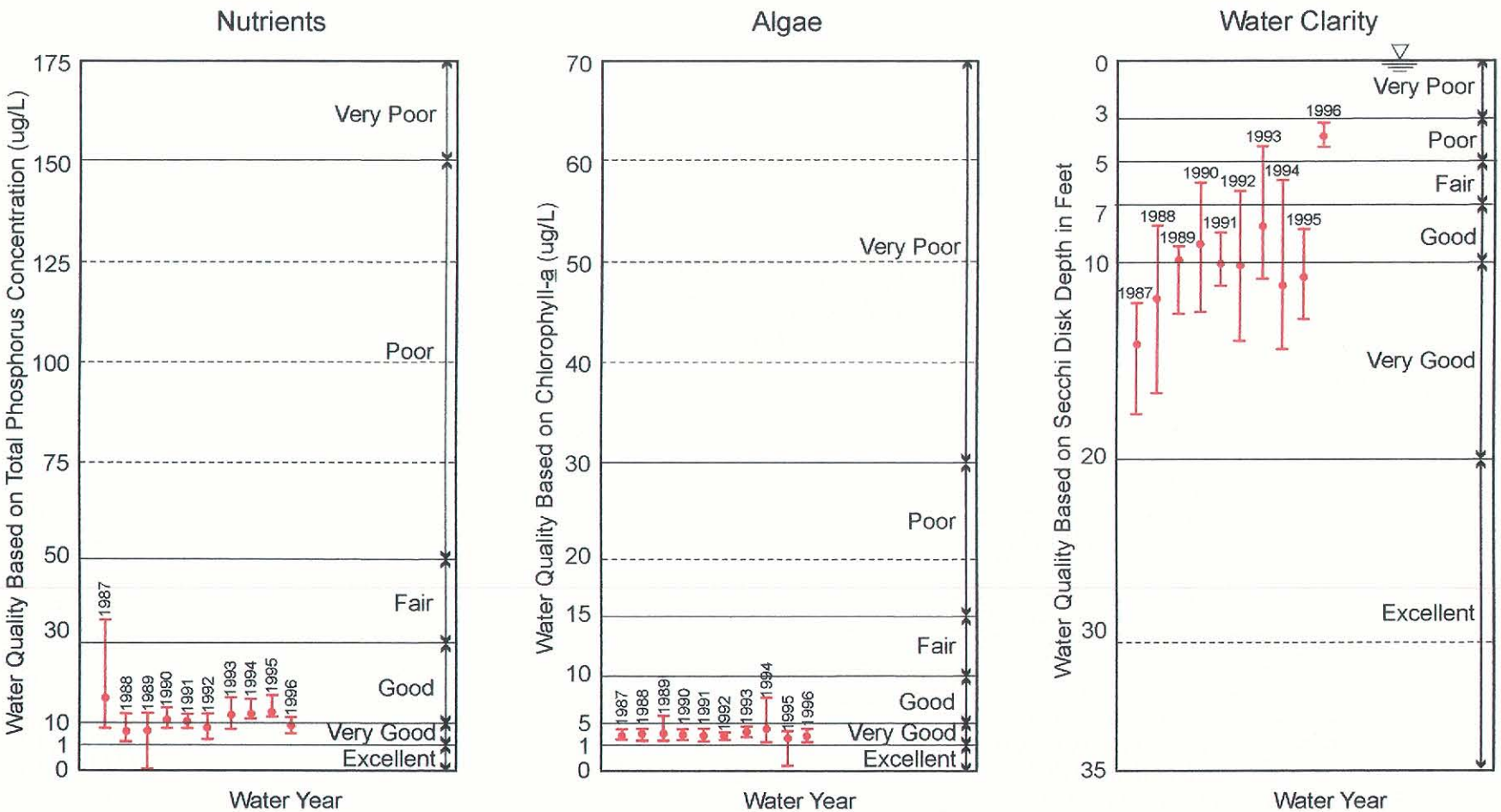
Aquatic Plant Communities in Fowler Lake

The results of the 1984 and 1997 macrophyte surveys are set forth in Tables 5 and 6, which show the species present, their percent frequency of occurrence, and their mean density rating for both surveys. The 1984 survey identified 13 species of plants, many of which were common to abundant. Plant growth occurred in water up to 22 feet deep, but was concentrated in those areas where the water depth was less than 15 feet. Aquatic plants occurred at 93 of the 95 points, or at 97.8 percent of sites sampled. The most abundant plant growth occurred in the southwest bay by the boardwalk and the southeast bay above the bridge. The 1997 Commission survey identified 14 species of plants. Aquatic plants again were observed to be concentrated in the areas where the water depth was less than 15 feet. Aquatic plants occurred at 70 of the 104, or at 67.3 percent of points sampled. This is a significant decrease in the frequency of occurrence from that observed during 1984.

In 1997, muskgrass (*Chara vulgaris*), coontail (*Ceratophyllum demersum*), and eel grass (*Vallisneria americana*) were abundant at all depths and were found in the highest frequency throughout the Lake. Eel grass and muskgrass are low-growing plants that pose few problems for recreational lake users. Eurasian water milfoil (*Myriophyllum spicatum*) was also common in much of the Lake. Eurasian water milfoil is one of eight milfoil species found in Wisconsin and the only one known to be exotic or nonnative. Because of its nonnative nature,

Figure 2

FOWLER LAKE PRIMARY WATER QUALITY INDICATORS: 1987-1996



Legend
I Range
• Average
1987-96 Water Years

Source: U.S. Geological Survey and SEWRPC.

Table 3

FREQUENCY OF OCCURRENCE AND DENSITY RATINGS
OF ALL PLANT SPECIES IN FOWLER LAKE: JUNE 1997

Plant Species	Sites Found[a]	Frequency of Occurrence (percent)	Density at Sites Found	Density in Whole Lake
Ceratophyllum demersum (coontail)	31	44.29	2.48	1.10
Chara vulgaris (musk grass)	53	75.71	3.02	2.29
Elodea candensis (waterweed)	16	22.86	2.19	0.50
Myriophyllum spicatum (Eurasian water milfoil)	14	67.14	2.00	1.90
Najas flexilis (bushy pondweed)	26	40.00	1.85	0.71
Najas marina (spiney naiad)	4	5.71	1.25	0.07
Potamogeton amplifolius (large-leaf pondweed)	2	2.86	1.50	0.04
Potamogeton crispus (curly-leaf pondweed)	12	17.14	1.75	0.30
Potamogeton pectinatus (sago pondweed)	23	32.86	1.96	0.64
Potamogeton praelongus (white-stemmed pondweed)	29	38.57	1.83	0.67
Potamogeton richardsonii (Richardson's pondweed)	2	2.96	1.00	0.03
Potamogeton zosterformis (flat-stemmed pondweed)	23	32.86	1.96	0.64
Utricularia sp. (bladderwort)	21	30.00	1.33	0.43
Vallisneria americana (water celery)	41	58.57	2.63	1.53

[a] *70 sampling points.*

Source: SEWRPC.

Eurasian water milfoil has few natural enemies that can inhibit its explosive growth under suitable conditions. The plant exhibits this characteristic growth pattern in lakes with organic-rich sediments, or where the lake bottom has been disturbed. In such cases, the Eurasian water milfoil populations displace native plant species and interfere with the aesthetic and recreational use of the waterbodies.

Eurasian water milfoil reproduces by the rooting of plant fragments. This plant has been known to cause severe recreational use problems in lakes within the Southeastern Wisconsin Region. Such conflicts can result in the expansion of Eurasian water milfoil communities, especially when boat propellers fragment Eurasian water milfoil plants. These fragments, as well as fragments that occur for other reasons such as wind-induced turbulence or fragmentation of the plant by fishes, are able to generate new root systems, allowing the plant to colonize new sites. The fragments can also cling to boats, trailers, motors, and/or bait buckets, and can stay alive for weeks contributing to the transfer of milfoil to other lakes. For this reason, it is very important to remove all vegetation from boats, trailers, and other equipment after removing them from the water and prior to launching in other waterbodies.

In addition to the aforereferenced species, Fowler Lake contained significant numbers of bladderwort (*Utricularia vulgaris*), waterweed (*Elodea canadensis*) and numerous species of pondweed (*Potamogeton* spp.), that provide good fish and aquatic wildlife habitat and little interference with the recreational uses of the Lake. Pondweed-dominated plant communities tended to be situated in the shallow water areas of the Lake, with fringing beds of Eurasian water milfoil and coontail in the deeper, offshore areas of up to 15 feet in depth.

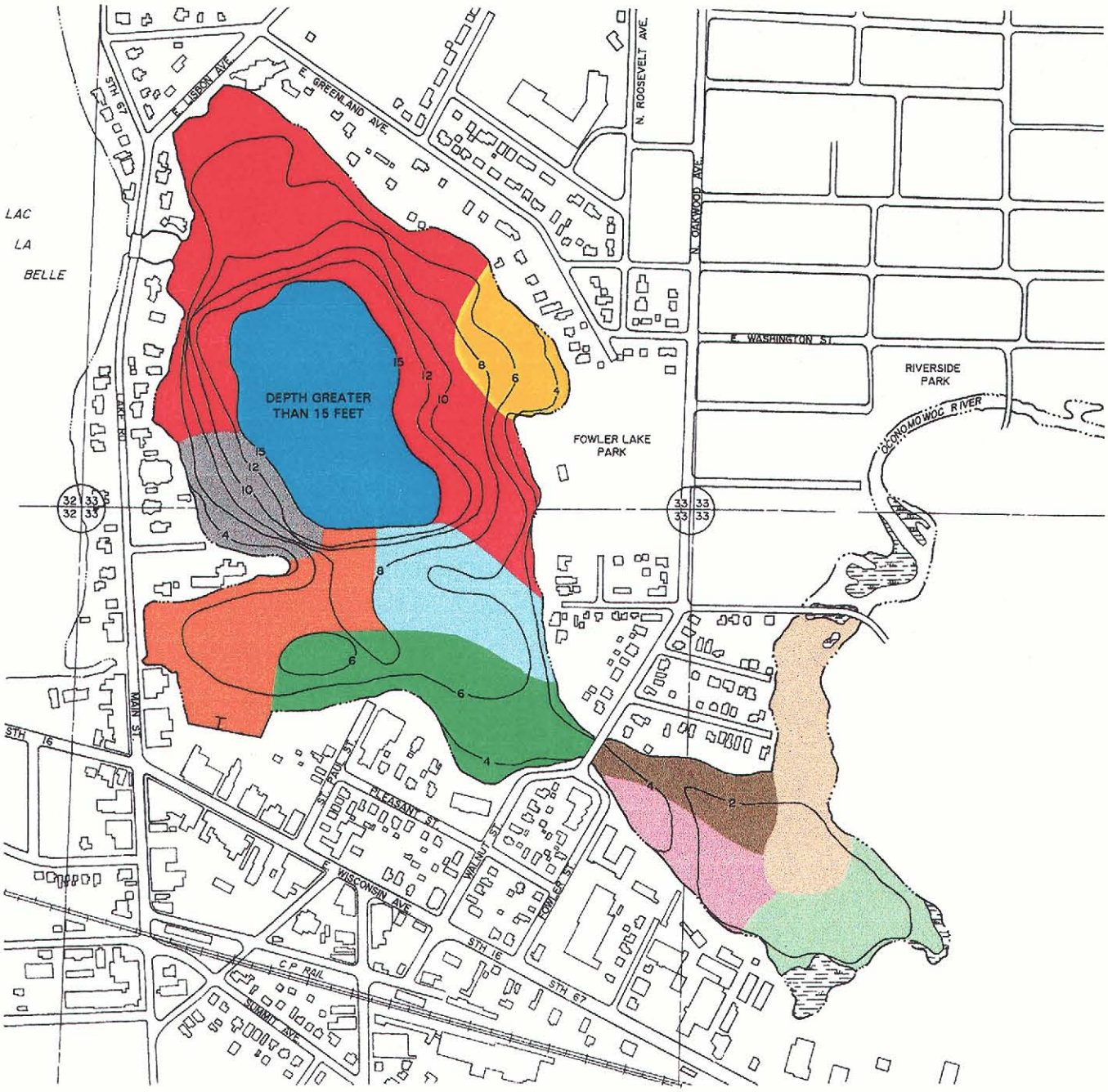
Statistical Analysis

Seven indices were used to determine if the aquatic plant community species composition had changed significantly since the previous comprehensive survey, conducted during 1984. These tests, which examined a variety of factors, parallel the suite of statistical analyses identified by Nichols:[8]

[8] *Memo from Stan Nichols, to J. Bode, J. Leverence, S. Borman, S. Engel, D., Helsell, entitled "Analysis of macrophtye data for ambient lakes-Dutch Hollow and Redstone Lakes example," Wisconsin Geological and Natural History Survey, University of Wisconsin-Extension, February 4, 1994.*

Map 6

AQUATIC PLANT COMMUNITY DISTRIBUTION IN FOWLER LAKE: 1997



LEGEND

- MUSKGRASS
- MUSKGRASS, COONTAIL, AND WATER CELERY
- MUSKGRASS AND WATER CELERY
- MUSKGRASS AND BUSHY PONDWEED
- MUSKGRASS, WHITESTEM PONDWEED, AND WATER CELERY
- MUSKGRASS AND WATER LILIES
- MUSKGRASS, COONTAIL, AND WATERWEED
- MUSKGRASS, EURASIAN WATER MILFOIL, WHITESTEM PONDWEED, AND WATER CELERY
- EURASIAN WATER MILFOIL, WATERWEED, AND WATER CELERY
- EURASIAN WATER MILFOIL, COONTAIL, WATERWEED, AND CURLY LEAF PONDWEED

N

GRAPHIC SCALE
0 300 600 FEET

Source: SEWRPC.

Table 4

CHEMICAL CONTROLS ON FOWLER LAKE: 1950-1996

Year	Macrophyte Control						Algal Control	
	Sodium Arsenite (pounds)	Diquat (gallons)	Aquathol K (gallons)	Hydrothol		2,4-D (gallons)	Cutrine-Plus (gallons)	Copper Sulfate (pounds)
				Gallons	Pounds			
1950-1969	87,456	--	--	--	--	--	--	2,506
1970	--	--	--	20.0	--	28.0	--	--
1971	--	12.3	43.0	--	--	--	--	--
1972	--	--	62.0	--	--	--	--	--
1973	--	--	63.0	--	--	--	--	--
1974	--	41.0	--	--	--	--	--	--
1975[a]	--	--	--	--	--	--	--	--
1976[a]	--	--	--	--	--	--	--	--
1977	--	20.0	--	--	--	--	20.0	--
1978	--	26.5	--	--	--	--	--	--
1979	--	25.0	26.0	--	--	--	--	--
1980	--	22.0	--	--	--	--	--	--
1981	--	25.0	33.0	--	--	--	--	--
1982	--	14.0	23.0	--	--	--	--	--
1983	--	7.0	5.0	2.0	--	52.0	12.0	--
1984	--	--	9.0	2.5	--	34.5	6.0	--
1985	--	--	38.0	--	160.0	--	--	--
1986	--	--	11.0	--	450.0	23.0	5.5	--
1987	--	--	3.5	--	--	47.0	4.8	--
1988	--	--	15.0	--	--	84.0	12.0	--
1989	--	--	--	--	--	45.0	--	--
1990	--	--	--	--	--	64.5	--	--
1991	--	--	--	--	--	47.8	--	--
1992	--	--	--	--	--	57.0	--	--
1993[a]	--	--	--	--	--	--	--	--
1994	--	--	--	--	--	2.5	--	--
1995[a]	--	--	--	--	--	--	--	--
1996	--	--	--	--	--	75.0	--	--
Total	87,456	192.8	331.5	24.5	610.0	465.3	60.3	2,506

[a]*No chemical controls were used during these years.*

Source: Wisconsin Department of Natural Resources and SEWRPC.

1. The frequency of occurrence (FREQ) is the number of occurrences of a species divided by the number of sampling with vegetation, expressed as a percentage. It is the percentage of times a particular species occurred when there was aquatic vegetation present, and is analogous to the Jesson and Lound point system.

2. The relative frequency of occurrence (RFREQ) is the frequency of a species divided by the total frequency of all species. The sum of the relative frequencies should equal 100 percent. This statistic presents an indication of how the plants occur throughout a lake in relation to each other. It is used in the calculation of the Importance Value and Simpson's Diversity Index set forth below.

3. The average density (ADEN) is the sum of the density ratings for a species divided by the number of sampling points with vegetation. The maximum density possible of 4.0 is assigned to plants that

Table 5

RESULTS OF STATISTICAL ANALYSES FOR FOWLER LAKE: 1984

Species	Frequency of Occurrence (percent)	Average Density	Relative Frequency	Importance Value
Chara vulgaris (muskgrass)	64.2	3.77	27.02	101.87
Myriophyllum spicatum (Eurasian water milfoil)	50.5	2.73	21.25	58.01
Ceratophyllum demersum (coontail)	34.7	2.36	14.60	34.46
Vallisneria americana (water celery)	24.2	1.91	10.19	19.46
Potamogeton pectinatus (sago pondweed)	20.0	1.37	8.42	11.54
Potamogeton illinoensis (Illinois pondweed)	14.7	2.36	6.19	14.61
Utricularia sp. (bladderwort)	11.6	1.45	4.88	7.08
Nitella sp. (stonewort)	6.3	2.50	2.65	6.63
Potamogeton crispus (curly-leaf pondweed)	5.2	1.80	2.19	3.94
Potamogeton richardsonii (Richardson's pondweed)	4.2	1.00	1.77	1.77
Najas marina (spiney naiad)	2.0	1.00	0.84	0.84
Potamogeton praelongus (white-stemmed pondweed)	0.0	0.00	0.00	0.00
Potamogeton zosterformis (flat-stemmed pondweed)	0.0	0.00	0.00	0.00
Elodea candensis (waterweed)	0.0	0.00	0.00	0.00
Najas flexilis (bushy pondweed)	0.0	0.00	0.00	0.00
Potamogeton amplifolius (large-leaf pondweed)	0.0	0.00	0.00	0.00

Source: SEWRPC.

occur at all points sampled points at a given depth—the modified Jesson and Lound protocol adopted by the Wisconsin Department of Natural Resources uses four sampling points per depth sampled. The average density presents and indication of how abundant the growth of a particular plant is throughout the lake. This measure along with the percent occurrence gives a good indication of the distribution of aquatic plant communities in a lake.

4. The Simpson Diversity Index (SDI) is defined as one minus the sum of the relative frequencies squared, and is expressed in equation form as:

$$SDI = 1 - \sum(RFREQ)^2$$

where SDI is the Simpson Diversity Index and RFREQ is the relative frequency value defined above. Based upon this index of community diversity, the closer the SDI value is to one, the greater the diversity is between the communities being compared, which, in this case, is the aquatic plant communities of 1984 and 1997.

5. The importance value (IV) is defined as the product of the relative frequency and the average density, expressed as a percentage:

$$IV = (RFREQ)\ (ADEN)\ (100)$$

where IV is the importance value, RFREQ is the relative frequency, and ADEN is the average density. This number provides an indication of the dominance of a species within a community based upon both frequency and density. It also somewhat addresses the problem of difference in stature between different plant species.

6. The similarity index (SI) is a means of comparing two communities by estimating the degree to which the communities share common components. The index is calculated as:

$$SI = 2W / A + B$$

Table 6

RESULTS OF STATISTICAL ANALYSES FOR FOWLER LAKE: 1997

Species	Frequency of Occurrence (percent)	Average Density	Relative Frequency	Importance Value
Chara vulgaris (muskgrass)	75.71	2.29	16.06	36.78
Myriophyllum spicatum (Eurasian water milfoil)	67.14	1.90	14.24	27.06
Vallisneria americana (water celery)	58.57	1.53	12.42	19.00
Ceratophyllum demersum (coontail)	44.29	1.10	9.39	10.33
Najas flexilis (bushy pondweed)	40.00	0.71	8.48	6.02
Potamogeton praelongus (white-stemmed pondweed)	38.57	0.67	8.18	5.48
Potamogeton pectinatus (sago pondweed)	32.86	0.64	6.97	4.46
Potamogeton zosterformis (flat-stemmed pondweed)	32.86	0.64	6.97	4.46
Utricularia sp. (bladderwort)	30.00	0.43	6.36	2.73
Elodea candensis (waterweed)	22.86	0.50	4.85	2.43
Potamogeton crispus (curly-leaf pondweed)	17.14	0.30	3.64	1.09
Najas marina (spiney naiad)	5.71	0.07	1.21	0.08
Potamogeton amplifolius (large-leaf pondweed)	2.86	0.04	0.61	0.02
Potamogeton richardsonii (Richardson's pondweed)	2.86	0.03	0.61	0.02
Potamogeton illinoensis (Illinois pondweed)	0.00	0.00	0.00	0.00
Nitella sp. (stonewort)	0.00	0.00	0.00	0.00

Source: SEWRPC.

where SI is the similarity index value, W is the amount two communities have in common or the lowest relative frequency of a species pair, and A plus B is the sum of the relative frequency for both communities, which should always be about 200 since the relative frequency of each community should equal 100 percent. This index could be calculated based upon average density or the importance values. However, relative frequency is a better measure since does not change much during the growing season so the results remain comparable, even if the timing of sampling is not exactly the same, and, given that there are several methods for assigning average density, use of average density may yield a result that is not directly comparable. Use of relative frequency avoids such interpretation problems. It should be noted that, although a 100 percent similarity is theoretically possible, repeated sampling studies from the same community has shown that a similarity index of 85 percent or higher should be considered indicative of no community change.

7. The p-value, or Pearson chi-squared test, is calculated using a statistical program for personal computers.[9] The p-values used in this study were calculated by the Wisconsin Department of Natural Resources, based upon a two by two frequency table. A p-value of less than or equal to 0.05 is the limit used to identify a significant difference between two populations. This means that, at $p = 0.05$, there is a 95 percent probability that two populations are different, or that, after comparing 100 mean values from each data set, 95 would be different and five would overlap.

The results of these analyses are set forth in Tables 7 and 8. As can be seen from these tables, there have been changes in the aquatic plant community within the Lake. While the precise reasons for the observed changes are unclear, they are most likely related to a combination of factors, including the aquatic plant management practices, changes in land use (which affect nutrient supply and availability), lake uses, and climatic factors and natural biological processes contributing to inter-annual variability among plant communities.

[9]*Statistics for Windows, General Conventions and Statistics, 1995, Statsoft, Inc., Tulsa, Oklahoma.*

Table 7

AQUATIC PLANT COMMUNITY SIMILARITY INDEX COMPARISON: 1984 AND 1997

Plant Species	Relative Frequency of Occurrence (RFREQ) 1984	Relative Frequency of Occurrence (RFREQ) 1997	Lowest Relative Frequency (W)	Importance Value (IV) 1984	Importance Value (IV) 1997
Ceratophyllum demersum (coontail)	14.60	9.39	9.39	34.46	10.33
Chara vulgaris (muskgrass)	27.02	16.06	16.06	101.87	36.78
Elodea canadensis (waterweed)	--	4.85	--	--	2.43
Myriophyllum spicatum (Eurasian water milfoil)	21.25	14.24	14.24	58.01	27.06
Najas flexilis (bushy pondweed)	--	8.48	--	--	6.02
Najas marina (spiney naiad)	0.84	1.21	0.84	0.84	0.08
Nitella sp. (stonewort)	2.65	--	--	6.63	--
Potamogeton amplifolius (large-leaf pondweed)	--	0.61	--	--	0.02
Potamogeton crispus (curly-leaf pondweed)	2.19	3.64	2.19	3.94	1.09
Potamogeton illinoensis (Illinois pondweed)	6.19	--	--	14.61	--
Potamogeton pectinatus (sago pondweed)	8.42	6.97	6.97	11.54	4.46
Potamogeton praelongus (white-stemmed pondweed)	--	8.18	--	--	5.48
Potamogeton richardsonii (Richardson's pondweed)	1.77	0.61	0.61	1.77	0.02
Potamogeton zosterformis (flat-stemmed pondweed)	--	6.97	--	--	4.46
Utricularia sp. (bladderwort)	4.88	6.36	4.88	7.08	2.73
Vallisneria americana (water celery)	10.19	12.42	10.19	19.46	19.00
Total	100.00	99.99	65.34	260.21	119.96

NOTE: Similarity Index = 0.65.

Source: SEWRPC.

The similarity index calculated for Fowler Lake is 0.65. Since a SI value of 0.85 or greater is indicative of essentially no change, the observed SI value indicates that there has been a change in the communities. The plant communities observed during 1984 are presently only 65 percent similar to those observed in 1997. However, this value alone does not provide any indication of whether the change is positive or negative, from a recreational, aesthetic, or habitat value perspective, so care must be taken when using this number.

The Simpson Diversity Index for 1984 was 0.835 and, in 1997, 0.898. This would seem to suggest that the community is slightly more diverse. However, the problem with this index is that there is no currently agreed definition as to what degree of difference between the values is significant. In contrast, the p-value does indicate a meaningful level of change. This value clearly that there has been a significant change in the frequency of occurrence of most species. The only species whose numbers have not changed significantly are coontail (*Ceratophyllum demersum*), muskgrass (*Chara vulgaris*), spiney naiad (*Najas marina*), large-leaf pondweed (*Potamogeton amplifolius*), and Richardson's pondweed (*Potamogeton richardsonii*). The other seven or eight plant species have experienced a significant change in their numbers. With the exception of Eurasian water milfoil (*Myriophyllum spicatum*), the change has been toward greater numbers of plants, which is a change for the better from a resource-based perspective.

The major change between the aquatic plant communities of 1984 and 1997 has been in their structure and distribution. When the previous survey was conducted during 1984, muskgrass and Eurasian water milfoil dominated the aquatic plant community. Muskgrass and Eurasian water milfoil continue to be the two plants that occur most often, and their frequencies of occurrence have both increased. However, the average density of Eurasian water milfoil has decreased, while the average density of muskgrass has increased. Much of the increase in muskgrass density is attributable to the growth of the plant in the inlet area upstream of the bridge. The growth of muskgrass in this wetland-type area is extremely dense.

Table 8

P-VALUES COMPARING PLANT COMMUNITIES OF 1984 AND 1997

Species	1984 = 95 Sites		1997 = 70 Sites		P-Value[a]
	Number of Sites Present	Number of Sites Absent	Number of Sites Present	Number of Sites Absent	
Ceratophyllum demersum (coontail)	33	62	31	39	0.2135
Chara vulgaris (muskgrass)	61	34	53	17	0.1140
Elodea canadensis (waterweed)	0	95	16	54	0.0000
Myriophyllum spicatum (Eurasian water milfoil)	49	46	47	23	0.0000
Najas flexilis (bushy pondweed)	0	95	27	43	0.0000
Najas marina (spiney naiad)	2	93	4	66	0.2210
Nitella sp. (stonewort)	6	89	0	70	0.0322
Potamogeton amplifolius (large-leaf pondweed)	0	95	2	68	0.0974
Potamogeton crispus (curly-leaf pondweed)	5	90	12	58	0.0131
Potamogeton illinoensis (Illinois pondweed)	14	81	0	70	0.0008
Potamogeton pectinatus (sago pondweed)	19	76	23	47	0.0610
Potamogeton praelongus (white-stemmed pondweed)	0	95	29	41	0.0000
Potamogeton richardsonii (Richardson's pondweed)	4	91	2	68	0.6462
Potamogeton zosterformis (flat-stemmed pondweed)	0	95	24	46	0.0000
Utricularia sp. (bladderwort)	11	84	21	49	0.0031
Vallisneria americana (water celery)	23	72	41	29	0.0000

[a] *A p-value of less than or equal to 0.05 is considered a significant change in the frequency of occurrence of the species between the two years. P-value information was obtained from Dan Helsel, WDNR-Southeast Region, surface water and aquatic habitat protection expert, July 1997.*

Source: SEWRPC.

Notwithstanding, the frequency of occurrence of Eurasian water milfoil has increased from 50.5 percent to 67.1 percent, which is cause for concern. Nevertheless, its average density has decreased from 2.73 to 1.90. These values suggest that, while Eurasian water milfoil may now occur in more areas of the Lake, its growth is not as dense. It is apparent that Eurasian water milfoil is continuing to spread within the Lake, even though the monospecific stands that were observed during the 1970s and 1980s now seem to be interspersed with native plant species. In short, despite more frequent occurrences of Eurasian water milfoil, there has been an overall shift to a healthier, more diverse plant community.

The importance values, shown in Table 7, calculated for the 1984 and 1997 aquatic plant communities suggest that there has been a change in the distribution of plants within the community. Muskgrass and Eurasian water milfoil are still the most commonly occurring species, but the importance values show that they no longer totally dominate the plant community, as was the case in 1984. There was also a significant decline in the importance of other plant species recorded during the 1984 survey. Further, there is a uniform, overall decline in the importance values of the plant species recorded during the 1997 survey, suggesting a healthier lake ecosystem.

While the importance value incorporates both the relative frequency and average density of the plant species present in the Lake, the relative frequencies are also suggestive this shift toward an healthier plant community. The relative frequency gives a good indication as to how the plants occur relative to one another. These data clearly show a community that is changing to one with a more balanced plant distribution. In 1984, the relative frequencies of the three most common plants (muskgrass, milfoil, and coontail) were 27.02 percent, 21.25 percent, and 14.6 percent, respectively, adding up to 62.87 percent out of 100 percent. In contrast, the 1997 numbers are much different. The three most common plants (muskgrass, milfoil, and eel grass) had relative frequencies of 16.06 percent, 14.24 percent, and 12.42 percent, respectively, adding up to 42.72 percent out of 100 percent. This means the plants are more evenly distributed throughout the Lake. Also, there has been a

marked increase in beneficial native species such as eel grass(*Vallisneria americana*), bladderwort (*Utricularia* sp.), and waterweed (*Elodea candensis*). The appearance of large-leaf pondweed (*Potamogeton amplifolius*) since 1984 is also a sign of a healthier ecosystem given that it is a very sensitive species.

There have also been some other changes in the composition of the aquatic plant communities in Fowler Lake. Two species, found in 1984—Illinois pondweed (*Potamogeton illinoensis*) and stonewort (*Nitella* spp.)—were not recorded during the 1997 survey. Five other species, not found in 1984—waterweed, bushy pondweed (*Najas flexilis*), large-leaf pondweed, white-stemmed pondweed (*Potamogeton praelongus*), and flat-stemmed pondweed (*Potamogeton zosterformis*)—were recorded during the 1997 survey. The appearance of the pondweeds is a positive sign. Table 9 outlines the positive ecological significance of all aquatic plant species found in Fowler Lake.

FISHERIES

The Wisconsin Department of Natural Resources[10] reports that the fish population of Fowler Lake includes bluegill, pumpkinseed, largemouth bass, black crappie, green sunfish, rock bass, white bass, yellow perch, walleyed pike, northern pike, carp and bullhead. A survey conducted by the Wisconsin Department of Natural Resources in 1911 found cisco or lake herring in the Lake. However, the presence of these species in the Lake has not been confirmed in the subsequent surveys. As noted in the adopted lake management plan, the Lake is managed for bluegill, largemouth bass, and northern pike production. In addition, the Department has stocked walleyed pike, brown trout, and rainbow trout in order to enhance and maintain the sport fishing opportunities for anglers using Fowler Lake.

RECREATIONAL USES AND FACILITIES

As set forth in the adopted lake management plan, Fowler Lake is a multi-purpose recreational use waterbody serving all forms of recreation. Recreational uses include boating, waterskiing, swimming, and fishing during the summer months, and speed skating, snowmobiling, and ice-fishing during the winter. The Lake use zones identified in the adopted lake management plan for Fowler Lake are shown on Map 7. The Lake is also used year around as a visual amenity—walking, bird watching and picnicking are popular passive recreational uses of the waterbody.

The types of boats found on the Lake include powered or ski boats, fishing boats, paddleboats, canoes, sailboats, and personal watercraft (jetskis). Several public parks and a public recreational boating access site are located on the shores of the Lake, which is located adjacent to the City of Oconomowoc Central Business District. Map 8 shows the publicly owned parks and recreational facilities near Fowler Lake. Recreational boating access is provided at the St. Paul Street public recreational boating access site. This one-acre lake-access site on the south shore of Fowler Lake provides adequate public access to Fowler Lake, as defined in Section NR 1.91 of the *Wisconsin Administrative Code*.

LOCAL ORDINANCES

Fowler Lake is subject to a boating ordinance promulgated by the City of Oconomowoc. This ordinance provides generally applicable rules for all waters within the jurisdiction of the City, as set forth in Appendix B. These rules limit the times during which boats may operate on Fowler Lake and allow for the enactment and enforcement of boating restrictions and limitations. The ordinance conforms to State of Wisconsin boating and water safety laws as set forth in Chapter 30, *Wisconsin Statutes*.

---

[10] *Wisconsin Department of Natural Resources Publication No. PUBL-FM-800-95REV,* Wisconsin Lakes, *1995. See also D. Fago, Wisconsin Department of Natural Resources Research Report No. 148,* Retrieval and Analysis Used in Wisconsin's Statewide Fish Distribution Survey, Second Edition, *December 1988.*

Table 9

POSITIVE ECOLOGICAL SIGNIFICANCE OF AQUATIC PLANT SPECIES PRESENT IN FOWLER LAKE

Aquatic Plant Species Present	Relative Abundance[b]	Ecological Significance[a]
Ceratophyllum demersum (coontail)	Common	Provides good shelter for young fish and supports insects valuable as food for fish and ducklings
Chara vulgaris (muskgrass)	Common	Excellent producer of fish food, especially for young trout, bluegill, small- and largemouth bass, stabilizes bottom sediments, and has softening effect on the water by removing lime and carbon dioxide
Elodea canadensis (waterweed)	Common	Provides shelter and support for insects valuable as fish food
Myriophyllum spicatum (Eurasian water milfoil)	Common	None known
Najas flexilis (bushy pondweed)	Common	Provides food for waterfowl and some marsh birds; cover for young largemouth bass and northern pike and small bluegills and perch
Najas marina (spiney naiad)	Scarce	Provides good food and shelter for fish and food for ducks
Nuphar sp. (yellow water lily)	- -[c]	Leaves, stems, and flowers are eaten by deer; roots eaten by beaver and porcupine; seeds eaten by wildfowl; leaves provide harbor to insects, in addition to shade and shelter for fish
Nymphaea tuberosa (white water lily)	- -[c]	Provides shade and shelter for fish; seeds eaten by wildfowl; rootstocks and stalks eaten by muskrat; roots eaten by beaver, deer, moose, and porcupine
Potamogeton amplifolius (large-leaf pondweed)	Scarce	Provides cover for panfish, largemouth bass, muskellunge, and northern pike; nesting grounds for bluegill; supports insects valuable as food for fish and ducklings
Potamogeton crispus (curly-leaf pondweed)	Scarce	Provides food, shelter, and shade for some fish and food for wildfowl
Potamogeton pectinatus (sago pondweed)	Common	This plant is the most important pondweed for ducks, in addition to providing food and shelter for young fish
Poamogeton praelongus (white-stemmed pondweed)	Common	Provides food for trout and wildfowl, in addition to providing provides feeding grounds for muskellunge
Potamogeton richardsonii (Richardson's pondweed)	Scarce	Provides cover for panfish, largemouth bass, muskellunge and northern pike; bluegills nest near them and eat insects found on leaves; supports insects valuable as food for fish and ducklings.
Potamogeton zosterformis (flat-stemmed pondweed)	Common	Provides some cover for bluegills, perch, northern pike and muskellunge, food for waterfowl; supports insects valuable as food for fish and ducklings
Typha augustafolia (cattail)	- -[c]	Supports insects, stalks, and roots; important food for muskrat and beaver, attracts marsh birds, wildfowl and songbirds, in addition to being used as spawning grounds by sunfish and shelter for young fish
Utricularia sp. (bladderwort)	Scarce	Provides good food and cover for fish
Vallisneria americana (water celery)	Common	Provides good shade and shelter, supports insects, and is valuable fish food

[a]Information obtained from A Manual of Aquatic Plants by Norman C. Fassett and Guide to Wisconsin Aquatic Plants, Wisconsin Department of Natural Resources.

[b]Species mean density for all sample points including sample points where a particular species did not occur in Fowler Lake: Abundant (density rating = 4 to 5). Common (Density rating = 2 to 3), Scarce (density rating = 1), and - = Absent (density rating = 0).

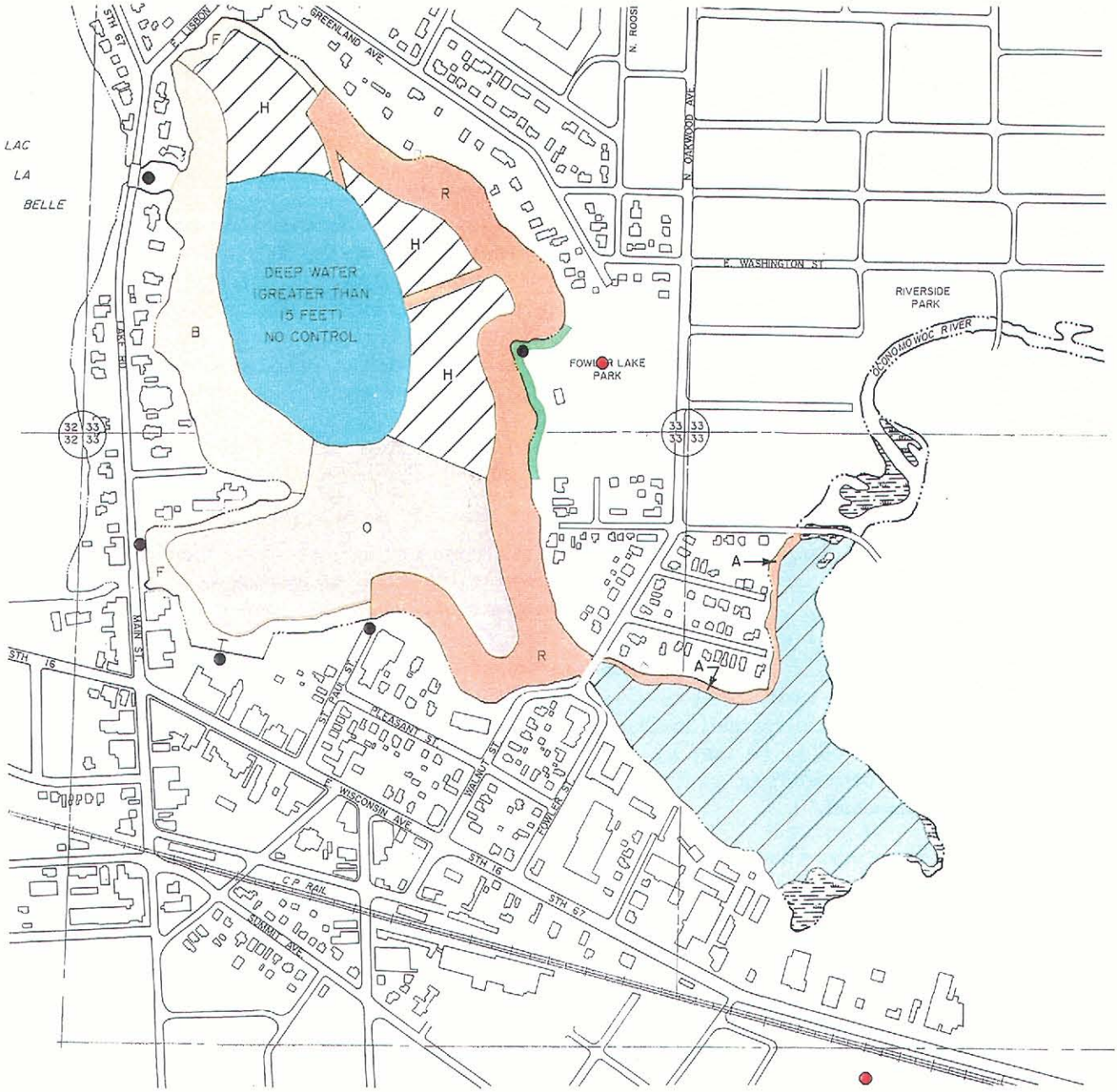
[c]Not measurable using the Jesson and Lound Survey Technique for Submerged Aquatic Plants.

Source: SEWRPC.

The City of Oconomowoc has adopted a construction site erosion control ordinance that is administered and enforced by the City in both the shoreland and nonshoreland areas of the City of Oconomowoc. This ordinance is based upon the model ordinance developed by Wisconsin Department of Natural Resources in cooperation with the League of Wisconsin Municipalities.

Map 7

RECOMMENDED MANAGEMENT PLAN FOR FOWLER LAKE



LEGEND

LAKE USE ZONES

A:	ACCESS	H:	HABITAT
B:	BOATING	O:	OPEN WATER
F:	FISHING	R:	RECREATIONAL

- PUBLIC ACCESS SITE
- PROPOSED STORMWATER DETENTION BASIN

AQUATIC PLANT MANAGEMENT

- HARVESTING: HIGH PRIORITY CHEMICALS: LIMITED
- HARVESTING: MODERATE PRIORITY CHEMICALS: LIMITED
- HARVESTING: LOW PRIORITY CHEMICALS: NONE
- HARVESTING: NONE CHEMICALS: NONE
- ENVIRONMENTALLY VALUABLE AREAS RECOMMENDED FOR PROTECTION

MONITORING PROGRAM

- CONDUCT FISH SURVEY
- CONDUCT AQUATIC PLANT SURVEY
- CONTINUE WATER QUALITY MONITORING

WATERSHED MANAGEMENT

- CONTINUE IMPLEMENTATION OF PRIORITY WATERSHED PLAN

LAND USE MANAGEMENT

- PROTECT ENVIRONMENTALLY VALUABLE AREAS:
  - -NO BOAT ACCESS
  - -NO PLANT HARVESTING
  - -NO HERBICIDE USE
- INCLUDE SHOREYARD PROVISIONS IN ZONING ORDINANCE

SHORELINE PROTECTION

- MAINTAIN AND REPAIR EXISTING STRUCTURES
- PROTECT UNSTABLE AREAS

REPAIR ERODED AREAS USING VEGETATION

FISH MANAGEMENT

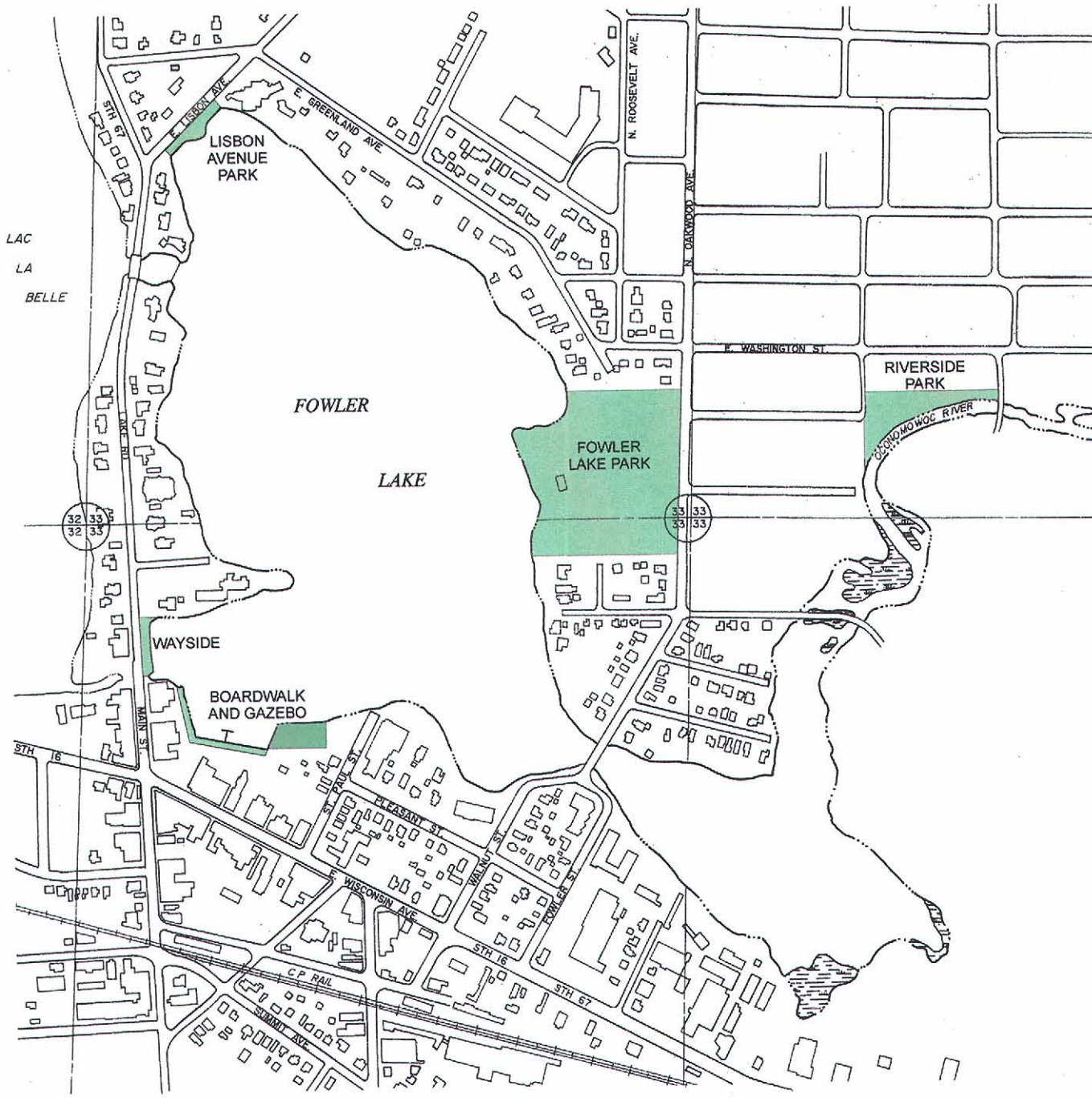
- CONTINUE STOCKING AS REQUIRED

GRAPHIC SCALE 0 200 400 600 FEET

Source: SEWRPC.

Map 8

PUBLICLY OWNED PARKS AND RECREATIONAL FACILITIES IN THE FOWLER LAKE STUDY AREA: 1990



Source: SEWRPC.

(This page intentionally left blank)

Chapter III

ALTERNATIVE AND RECOMMENDED AQUATIC PLANT MANAGEMENT PRACTICES

INTRODUCTION

The abundance of aquatic plants, including muskgrass, coontail, and Eurasian water milfoil continues to be perceived as a nuisance by Fowler Lake users. Ongoing aquatic plant management measures have, in part, resulted in a change within the aquatic plant communities in the Lake such that, while the frequency of occurrence of these plants has increased, their densities and diversity have decreased, which is a positive sign. One exception to this trend is in the expanded inlet area upstream of the N. Oakwood Avenue bridge, where the densities of the aquatic plants are much higher and continue to increase, causing encroachment of the existing open water area and possibly contributing to increased siltation.

In addition, there are also other localized recreational use problems experienced in various areas of the Lake. These problems depend on the uses in those portions of the Lake, but generally involve the abundant growths of coontail and Eurasian water milfoil. These plants often grow to the surface of the Lake, making certain recreational uses in those areas of the Lake less enjoyable, in addition to impairing the aesthetic quality of the Lake. These plants primarily interfere with recreational boating activities by clogging propellers and cooling water intakes, and likewise impair slow boating activity. The inlet upstream the bridge especially has severe boating limitations. Without control measures, this area could become impassable.

In addition to boating activities, use of the Lake for fishing and swimming is also adversely affected by aquatic plant growth. The swimming area off the point at Fowler Lake Park on the eastern shore of the Lake is coincident with an area of Eurasian water milfoil dominance. Milfoil occurs in this area at swimming depth, and exists in portions of the Lake with up to about five feet in depth. Other plants that are found at slightly deeper depths—nine feet to 11 feet—in this area include coontail, muskgrass, sago pondweed, flat-stemmed pondweed, and bladderwort. These plants also pose potential problems for swimming. The fishing area with the largest aquatic plant problem continues to be the southwestern bay near the boardwalk.

In general, the abundance of aquatic plants throughout the lake basin is perceived as adversely affecting the aesthetic enjoyment of lake residents and visitors to the Lake. Thus, aquatic plant management is an important issue to be considered.

Following a brief summary of the ongoing lake management program, alternatives and recommended refinements to the existing aquatic plant management element of the adopted lake management plan[1] are described in this chapter. The alternatives and recommendations set forth herein are focussed on those measures which are applicable to the Fowler Lake Management District, with lesser emphasis given to measures which are applicable to others with jurisdiction within the drainage area tributary to Fowler Lake.

---

[1] *SEWRPC Community Assistance Planning Report No. 187,* A Management Plan For Fowler Lake, Waukesha County, Wisconsin, *March 1994.*

PAST AND PRESENT AQUATIC PLANT MANAGEMENT ACTIONS

The residents of Fowler Lake, in conjunction with the City of Oconomowoc, have long recognized the importance of informed and timely action in the management of Fowler Lake. The City of Oconomowoc, in the past, created the Fowler Lake Management District as the principle organ for the conduct of lake management activities within the Fowler Lake basin. As noted in the aforereferenced adopted lake management plan, this District, in cooperation with the City of Oconomowoc, has undertaken regular water quality and aquatic plant monitoring. Prior to 1994, these activities were conducted under the auspices of the Wisconsin Department of Natural Resources Self-Help Monitoring Program and Priority Watershed Program.[2] Between 1994 and 1997, Fowler Lake participated in the U.S. Geological Survey trophic state monitoring program.[3] Abundant aquatic plant growths in Fowler Lake led the City of Oconomowoc to operate an aquatic plant harvester throughout the summer months, and, until 1995, treat specific areas of the Lake with chemical herbicides. Even so, concerns continue to exist over the lake water quality, primarily in relation to the control of aquatic plants. This report is designed to supplement and refine the existing Fowler Lake management plan.

AQUATIC PLANT MANAGEMENT MEASURES

Aquatic plant management[4] refers to a group of management and restoration measures aimed at both removal of nuisance vegetation and manipulation of species composition in order to enhance and provide for recreational water use. Generally, aquatic plant management measures are classed into four groups; namely, physical measures which include water level management; manual and mechanical measures which include harvesting and removal; chemical measures which include using aquatic herbicides; and biological controls which include the use of various organisms, including insects. Of these, chemical control and biological controls are stringently regulated and require a State permit. Costs range from minimal for manual removal of plants using rakes and hand-pulling to upwards of $80,000 for the purchase of a mechanical plant harvester—the operational costs for which can approach $10,000 to $20,000 per year, depending on staffing and operating policies. Harvesting is probably the measure best applicable to large areas, while chemical controls may be best suited to confined areas and initial control of invasive plants. Planting of native plant species and control of Eurasian water milfoil by the weevil, *Eurhychiopsis lecontei*, are largely experimental in lakes, but can be considered in specialized shoreland areas.

Aquatic Herbicides

Chemical treatment with aquatic herbicides is a short-term method of controlling heavy growths of aquatic macrophytes and algae. The use of herbicides can contribute to an ongoing aquatic plant problem by increasing the natural rates of accumulation of decaying organic matter, in turn contributing to an increased oxygen demand which may cause anoxia. The use of herbicides can also potentially damage or destroy nontarget plant species that provide needed habitat for fish and other aquatic organisms. As a result, less desirable, invasive, introduced plant species may outcompete the more beneficial, native species. Hence, this is not a feasible management option to be used on a large scale. However, chemical control is often a viable technique for the control of the relatively small-scale infestations of milfoil and certain other plants. Chemicals are applied to the growing plants in either liquid or granular form. Chemical treatment can be administered at a relatively low cost and is, therefore, considered a viable management option to continue. This measure is considered as viable for selected areas in Fowler Lake.

---

[2] *Wisconsin Department of Natural Resources Publication No. PUBL-WR194-86,* A Nonpoint Source Control Plan for the Oconomowoc River Priority Watershed Project, *March 1986.*

[3] *See U.S. Geological Survey Open-File Report 95-190,* Water-Quality and Lake-Stage Data for Wisconsin Lakes, Water Year 1994, *1995, and subsequent editions through 1997.*

[4] *U.S. Environmental Protection Agency Report No. EPA-440/4-90-006,* The Lake and Reservoir Restoration Guidance Manual, *August 1990.*

Aquatic Plant Harvesting
On the basis of previous use of a mechanical harvester on Fowler Lake, mechanical harvesting of aquatic plants appears to be a practical and efficient means of controlling plant growth as it removes the plant biomass and nutrients from Fowler Lake. Aquatic macrophytes are mechanically harvested with specialized equipment consisting of a cutting apparatus which cuts up to five feet below the water surface and a conveyor system that picks up the cut plants and hauls them to shore. Harvesting leaves enough plant material in the lake to provide shelter for fish and other aquatic organisms and to stabilize sediments. Mechanical harvesting does have some potentially negative impacts to fish and other aquatic life, may cause fragmentation and spread of some plants, and could disturb loosely consolidated bottom sediments. However, if done correctly and carefully, it has shown to be of benefit in ultimately reducing the regrowth of nuisance plants. Mechanical harvesting is a recommended method to continue as a control of aquatic plants in Fowler Lake.

Manual Harvesting
Due to an inadequate depth of water, it is not always possible for harvesters to reach the shoreline of every property. Another measure involves the purchase of a dozen specially designed rakes that are designed to manually remove aquatic plants from the shoreline area. The rakes may be made available for the riparian owners to use on a trial basis to test their operability before purchasing them. The advantage of the rake is that it is easy and quick to use, immediately removing the plants where as chemical treatment involves a waiting period. Using this method also removes the plants from the lake, avoiding the accumulation of organic matter on the lake bottom adding to the nutrients that favor more plant growth. This method also gives the harvester more time to cover larger areas of the lake as maneuvering between the piers takes time and skill.

Biological Controls
Another alternative approach to controlling nuisance weed conditions, particularly in the case of Eurasian water milfoil, is biological control. Classical biological control has been successfully used to control both weeds and herbivorous insects.[5] Recent documentation states that *Eurhychiopsis lecontei*, an aquatic weevil species, has potential as a biological control agent for Eurasian water milfoil.[6] However, as very few studies have been completed using *Eurhychiopsis lecontei* as a means of aquatic plant management control, it is not recommended for use on Fowler Lake at this time. The Wisconsin Department of Natural Resources is conducting an evaluation of this measure on several Wisconsin lakes on an experimental basis. The findings of that program may be considered in the future to evaluate the viability of this measure to Fowler Lake. Grass carp, *Ctenopharyngodon idella*, are not permitted in Wisconsin.

Lake Bottom Covering
Lake bottom covers and light screens provide limited control of rooted plants by creating a physical barrier which reduces or eliminates the sunlight available to the plants. They have been used to create swimming beaches on muddy shores, to improve the appearance of lakefront property, and to open channels for motorboating. Sand and gravel are usually readily available and relatively inexpensive to use as cover materials, but plants readily recolonize areas so covered in about a year. Synthetic material, such as polyethylene, polypropylene, fiberglass, and nylon can provide relief from rooted plants for several years. Because of the limitations involved, lake bottom covering as a method to control aquatic plant growth are not recommended for Fowler Lake.

---

[5]*C.B. Huffacker, D.L. Dahlsen, D.H. Janzen, and G.G. Kennedy,* Insect Influences in the Regulation of Plant Population and Communities, *1984, pp. 659-696; C.B. Huffacker and R.L. Rabb, editors,* Ecological Entomology, *John Wiley, New York, New York, USA.*

[6]*Sally P. Sheldon, "The Potential for Biological Control of Eurasian Water Milfoil (*Myriophyllum spicatum*) 1990-1995 Final Report," Department of Biology Middlebury College, February 1995.*

Boating Ordinances

The promulgation of more stringent controls on the use of powered watercraft within Fowler Lake is one means of regulating the conduct of boat traffic which could be harmful to the most important ecologically valuable areas in the Lake. These areas include the eastern portions of the Lake basin where the greatest diversity of native aquatic plant species occur. In addition, boating traffic within the remainder of the basin should be restricted to necessary boat traffic only to prevent the further colonization and proliferation of Eurasian water milfoil. Controls on boat traffic could be put in place by limiting boating activity within specific areas of the Lake to defined traffic lanes within the Lake to minimize the disturbance and propagation of nuisance plant species by the operation of watercraft. Such controls may also limit the speeds at which boat traffic travels in specific areas of the Lake. This concept is inherent in the lake access zones identified in the adopted lake management plan.

Boat excluded areas and traffic lanes must be designated by approved regulatory markers. These areas are preferable to motorboat prohibition areas as the latter can lead to legal challenges based on the right of free use of navigable waters. Similarly, slow-no-wake restrictions are preferable to speed limits designated in miles per hour terms owing to implementation and enforcement considerations. Placement of regulatory markers must conform to Section NR 5.09 of the *Wisconsin Administrative Code*, and all restrictions placed on the use of the waters of the State must be predicated upon the protection of public health, safety, or welfare. Boating ordinances, enacted in conformity with State law, must be clearly posted at public landings in accordance with the requirements of Section 30.77(4) of the *Wisconsin Statutes*.

Buoyage has the advantage of being visible to recreational boaters, but can be expensive to obtain, install, and maintain. Affected areas can be clearly demarcated. Two general options exist regarding the use of buoyage: the establishment of regulated areas using regulatory buoys, such as slow-no-wake or exclusionary areas, or the enhancement of public awareness using informational buoys. Only regulatory markers are enforceable.

Buoys placed within the waters of the State of Wisconsin are subject to the requirements set forth in Chapter 30, *Wisconsin Statutes*. Such buoys are white in color, cylindrical in shape, seven or more inches in diameter, and extend 36 or more inches above the water line. Regulatory buoys include buoys used to demarcate restricted areas, prohibit boating or types of boating activities in specific areas, and control the movements of watercraft. Buoys used to demarcate regulated areas display their instructions in black lettering. Prohibition buoys display an orange diamond with an orange cross inside. Control buoys display an orange circle. Local authorities having jurisdiction over the waters involved may place danger buoys or informational buoys without an ordinance, although a Wisconsin Department of Natural Resources permit is still required. Informational buoys are similar in construction to the regulatory buoys, but contain an orange square on the white background. Informational buoys are not enforceable.

Public Information

Aquatic plant management usually centers on the eradication of nuisance aquatic plants for the improvement of recreational lake use. The majority of the public views all aquatic plants as "weeds" and residents often spend considerable time and money removing desirable plant species from a lake without considering their environmental impacts. Thus, public information is an important component of an aquatic plant management program. Posters and pamphlets are available from the University of Wisconsin-Extension and Wisconsin Department of Natural Resources that provide information and illustrations of aquatic plants, their importance in providing habitat and food resources aquatic environments, and the need to control the spread of undesirable and nuisance plant species.

RECOMMENDED AQUATIC PLANT MANAGEMENT MEASURES

The goal of the management program is to accommodate recreational uses of the Lake to the extent practicable and to enhance the public perception of the Lake as a centerpiece of the City of Oconomowoc, without inflicting irreparable damage to the ecosystem of Fowler Lake and its structure and functioning. To accomplish this goal, specific control measures are recommended to be applied in various areas of the Lake. The refined recommended Fowler Lake aquatic plant management measures are graphically summarized on Map 9 and the recommended

Map 9

RECOMMENDED AQUATIC PLANT MANAGEMENT PLAN FOR FOWLER LAKE

LEGEND

- HARVESTING: HIGH PRIORITY
- HARVESTING: MODERATE PRIORITY
- HARVESTING: LOW PRIORITY
- NO CONTROL
- EURASIAN WATER MILFOIL CHEMICAL TREATMENT

N

GRAPHIC SCALE

0 300 600 FEET

Source: SEWRPC.

measures are summarized in Table 10. It is recommended that the Fowler Lake Management District continue to take the lead in implementing the refined plan.

Harvesting Plan

The Lake has been divided into high-, moderate-, and low-priority harvesting areas. High-priority harvesting areas are areas that are used for boating access. Moderate-priority harvesting areas are the areas used for general recreation. Low-priority harvesting areas are areas that are used primarily for passive recreation and/or where plant growth is observed to be sparse. As noted in the adopted lake management plan, the areas designated as "no control" areas are important areas for fish spawning and should not be subjected to aquatic plant control measures before mid-June of each year. Milfoil control areas have been identified where the growths of Eurasian water milfoil are especially thick.

Harvesting operations should continue to be timed to minimize any impact on the fish spawning season. For this reason, harvesting should begin in mid- to late-June of each year. Also, harvesting should not take place in shallow waters—generally three feet or less in depth—to avoid disturbance to fish habitat and beds of native aquatic plants. As of 1997, approximately 95 percent of the harvested plants consists of two beneficial native plant species; namely, muskgrass (*Chara vulagaris*) and eel grass (*Vallisneria americana*). The refined plan better targets the nuisance aquatic plants such as Eurasian water milfoil (*Myriophyllum spicatum*) and dense growths of coontail (*Ceratophyllum demersum*).

The operators of the harvester will be provided with laminated copies of the approved harvesting plan showing the limits of harvesting operations, as shown on Map 9. A copy of this map is to be kept on the harvester at all times.

Depth of Harvesting and Treatment of Fragments

The Aquamarine H5-200 Aquatic Plant Harvester has a maximum cutting depth of five feet. While this exceeds the water depth of one-third of the Lake, it is not the intention to clear the Lake of aquatic plants given the heavy angling use, its morphology (which is not conducive to extensive motorized boat traffic), and the program goals. Sufficient plant life will be retained in the Lake to minimize resuspension of lake bottom sediments and to maintain desirable plant communities. The harvester will collect all plant cuttings and fragments on site. The District or the riparian householders should collect fragments accumulating on the shore. Fragments can be used as garden mulch.

Buoyage

Temporary marker buoys may be used to direct harvesting operations in the Lake by marking the areas to be cut. However, the size of the Lake generally precludes the need for such buoys, except as they are required for the control of boating traffic. The harvester operators will be provided with a laminated copy of the updated harvesting plan and made familiar with the plan and local landmarks to the degree necessary to carry out the plan without the use of buoys. City staff regularly supervises harvesting operations.

Harvested Plant Material Transfer and Disposal Sites

Off-loading of harvested plant material takes place at the boating access site at St. Paul Street, as shown on Map 9. Plant material is removed from the harvester, where it is transferred to a dump truck using a conveyor, and transported to disposal sites identified by the City of Oconomowoc. Plant material should be collected and disposed of daily to avoid leaching of nutrients back into the Lake and to minimize the visual degradation of the area near the boat-launching site. The operators will strictly police the off-loading site to ensure minimal disruption of boaters and of the people using the riparian areas of the Lake. The harvested plant material will be combined with the City's grass clippings and landspread on area farms.

Chemical Treatment

Chemical herbicides should be limited to controlling nuisance growths of exotic species in shallow water around docks and piers. As noted above, policies governing the use of these chemicals should first be developed by the Fowler Lake Management District, in consultation with the City of Oconomowoc, Fowler Lake Property Owners' Association, and Wisconsin Department of Natural Resources. Only registered herbicides that are selective in their

Table 10

RECOMMENDED AQUATIC PLANT MANAGEMENT PLAN ELEMENTS FOR FOWLER LAKE

Plan Element	Subelement	Location	Management Measures	Initial Estimated Cost	Management Responsibility
Recreational Use Management	Recreational use zoning	Entire Lake	Restrict recreational boating to prevent the spread of Eurasian water milfoil throughout the Lake	$ 500	Fowler Lake Management District
	Nonnative aquatic plant management program	Eurasian water milfoil control zone, purple loosestrife control in the inlet	Restrict recreational boating to prevent the spread of Eurasian water milfoil throughout the Lake; limited use of herbicides in spring, manual removal during summer and fall recommended	--	Fowler Lake Management District
	Public informational programming	Direct drainage area tributary to Fowler Lake	Continue public awareness and information programming	--	City of Oconomowoc and Fowler Lake Management District
Aquatic Plant Management	Manual harvesting	Areas of nuisance growth	Harvest nuisance plants, including Eurasian water milfoil and purple loosestrife, as required around docks and piers; collect plant fragments arising from boating and harvesting activities	--[b]	Fowler Lake Management District
	Mechanical harvesting	Areas of nuisance growth	Harvest nuisance plants, including Eurasian water milfoil to maintain public recreational boating access and promote public safety and convenience	$20,000[c]	Fowler Lake Management District
	Chemical control of nonnative plants	Eurasian water milfoil control zone and inlet	Restrict recreational boating to prevent the spread of Eurasian water milfoil throughout the Lake; limited use of herbicides in spring, manual removal during summer and fall recommended	$ 5,000	Fowler Lake Management District
	Public informational programming	Direct drainage area tributary to Fowler Lake	Continue public awareness and information programming; continue monitoring of aquatic plant communities	$ 1,500[c,d]	City of Oconomowoc and Fowler Lake Management District
Institutional Development	Refine boundaries of the Lake Management District	Riparian area including lands with riparian access	Detach properties currently within the district, retaining those properties in the District that are situated within the area described by Wisconsin Avenue, N. Main Street, Lisbon Road, and Lapham Street extended; City to promote self-governance for the refined lake district	$ 500	City of Oconomowoc and Fowler Lake Management District

[a] *Recommendation set forth in Regional Land Use Plan. No specific cost allocation for Fowler Lake.*

[b] *Measures recommended generally involve low or no cost and would be borne by private property owners. Cost is included under public informational and educational component.*

[c] *Partial funding available through the Wisconsin Department of Natural Resources grant programs.*

[g] *Periodic additional surveys are recommended at five- to 10-year intervals.*

Source: SEWRPC.

control, such as 2,4-D, should be used. Algacides, such as Cutrine Plus, are not recommended, as there are no significant filamentous algae or planktonic algal problems in the Lake.

The Fowler Lake Management District, City of Oconomowoc, Fowler Lake Property Owners' Association and the Wisconsin Department of Natural Resources should work together to develop a reasonable herbicide usage policy to control the expansion of purple loosestrife and Eurasian water milfoil growths in and around the Lake.

Early spring treatment to control Eurasian water milfoil growth in the Lake has proven effective in other lakes in Southeastern Wisconsin and is recommended. It is recommended that chemical application be made in the early spring to maximize its effectiveness and to act as a preventative measure to target Eurasian water milfoil. This treatment should be done in late May for best results.

Precautions to Protect Wildlife, Fish, and Ecologically Valuable Areas

Harvester operators and chemical applicators will be provided with a laminated copy of the approved harvesting plan, set forth on Map 9. It is proposed that aquatic plant management activities be restricted in certain ecologically valuable areas of the Lake. The inlet area upstream of the North Oakwood Avenue bridge, which has more of a wetland character, is one such ecologically valuable area and should be excluded from aquatic plant management, except insofar as necessary to maintain the existing boating access channel on the northern bank. Areas considered being important for fish spawning—areas of three feet or less in depth—should also be excluded from aquatic plant management operations.

Harvesting Schedule

The harvesting season is recommended to begin in mid- to late-June to accommodate the fish spawning activities and should end no later than mid-September of each year. Harvesting should average between 30 and 35 hours per week over a five-day week, depending on weather conditions and plant growth, to minimize recreational use conflicts. In addition, harvesting will be confined to daylight hours to minimize public disturbances resulting from these operations.

Evaluation and Monitoring

Daily Record-Keeping Relating to the Harvesting Operation

The operators of the harvesting equipment will record daily harvesting activities in a harvesting log. This includes daily maintenance and service records showing engine hours, fuel consumed, and oil used. An annual summary of the harvesting program will be submitted to the Fowler Lake Management District Commission (or other designated committee) at the annual meeting of the District, and made available to the electors of the District at that time.

It is the intention of the Fowler Lake Management District to undertake a periodic, formal review of the harvesting program as set forth in the adopted lake management plan for Fowler Lake, a copy of which has been lodged with the Wisconsin Department of Natural Resources Southeast Region office. Further, it is the intention of the District to publish periodic refinements of the aquatic plant management element of the lake management plan as recommended in the adopted lake management plan. It recommended that a further inventory be prepared in two to three years to confirm that the changes in the plant community are for reasons other than annual variability. It should be noted that 1997 has been described as an "unusual" year in the Southeastern Wisconsin Region, with milfoil being below expected levels in historic milfoil lakes and algal problems being more widespread.

Recreational Use Management

Recommended actions for the management of ecologically valuable areas and aquatic plants should be effected by the City of Oconomowoc through its existing boating ordinance. It is recommended that the City reduce motorized boat traffic within the Eurasian water milfoil control areas shown on Map 9 to essential traffic only and define watercraft transit speeds and lanes consistent with the milfoil control areas and established patterns of recreational boating usage on the Lake. Such regulation may require buoyage depending on the sufficiency of the signage and notices provided to lake users and the level of compliance achieved. Copies of such an ordinance must be placed at the public access site as set forth in Section 30.77(4) of the *Wisconsin Statutes*.

Public Information

It is the policy of the Fowler Lake Management District and City of Oconomowoc to maintain an active dialogue with the community. This is done through the medium of the public press and through various city committees, public meetings and other scheduled hearings. In addition, the Fowler Lake Management District holds regular public meetings. The education and information program, should discourage human disturbances in ecologically

valuable areas, except as may be necessary to provide riparian residents with a reasonable level of access to the main body of the Lake. Lake residents and visitors should be made aware of the invasive nature of species, such as purple loosestrife and Eurasian water milfoil, and be encouraged to participate in citizen-based control programs coordinated by the Wisconsin Department of Natural Resources and University of Wisconsin-Extension. Where necessary, personal contacts with homeowners should be made, most likely through the Fowler Lake Property Owners' Association.

INSTITUTIONAL DEVELOPMENT

As the Fowler Lake community seeks a more active role in the management of the Fowler Lake, it is essential that an adequate institutional base to support such activities be developed. Currently, the community-based lake management activities are being carried out by the Fowler Lake Management District, a Chapter 33, *Wisconsin Statutes*, public inland lake protection and rehabilitation district. The District was created by the City of Oconomowoc in 1983 to encompass those lands within the City, except for that portion of the City included in the Lac La Belle Management District. This latter District includes those portions of the City west of STH 67 and north of STH 16. The Oconomowoc City Council serves as the Fowler Lake Management District Commission. In addition to the provision of public information relating to lake use and management, the District, in cooperation with the City of Oconomowoc, maintains an active aquatic plant management program as previously noted in Chapter II. Nevertheless, the electors of the District, through the Fowler Lake Property Owners' Association, have expressed continuing concerns regarding the long-term impacts of the aquatic plant management program, and, especially, its utilization of chemical herbicides as an aquatic plant management measure. As a result, the refinement of the institutional structure for lake management is an issue of concern and the Fowler Lake Management District Commissioners requested the Southeastern Wisconsin Regional Planning Commission to assist them in a review of the current boundaries.

Array of Institutional Measures

Four alternatives were identified, including boundaries based upon geographic features, the tributary drainage area, and a combination of geographic features and the tributary drainage area. The fourth alternative was to leave the current boundaries of the District unchanged. Defining the boundary based upon a delineated sanitary sewer service area was not considered as the entire area currently within the District is served by sanitary sewerage services provided by the City of Oconomowoc. The City of Oconomowoc sanitary sewer service area is extensive and included portions of drainage areas tributary to other Lakes.[7]

The boundary review was predicated upon consideration of the following criteria:

1. Consistency with Chapter 33, *Wisconsin Statutes*, requirements that properties included within a public inland lake protection and rehabilitation district be benefited by inclusion in the district;

2. Consistency with University of Wisconsin-Extension guidance set forth in *A Guide to Wisconsin's Lake Management Law, Tenth Edition*, that recommends that the district, at a minimum, include the entire lakeshore, all riparian property, areas directly affecting the lake and/or which are included in planned service areas, and entire parcels; and

3. Consistency with applicable regional and local plans including the aforereferenced lake management plan, county development plan, and other applicable plans.

---

[7]*See SEWRPC Community Assistance Planning Report No. 172,* Sanitary Sewer Service Area for the City of Oconomowoc and Environs, Waukesha County, Wisconsin, *February 1989.*

The first alternative would detach those properties within the City of Oconomowoc, but outside the current boundaries of the drainage area directly tributary to Fowler Lake. This is the largest boundary to be considered. Under this alternative, as shown on Map 10, the boundaries of the Fowler Lake Management District would encompass those lands within the City of Oconomowoc, within an area approximated by N. Main Street to the west, Lisbon Road, Blue Dahlia Road, and Rose Street extended to Lapham Street to the north, Lapham Street extended down and over to STH 67 to the east, and Marymere extended to Silver Lake Street, Silver Lake Street to Summit Avenue, and Summit Avenue to N. Main Street to the south. This alternative includes a large number of properties that, while within the area draining to Fowler Lake, are not perceived of as being "lake" properties. As a result, significant political and social difficulties may arise that limit the ability of the district encompassing the entire drainage area to carry out a program of lake protection and rehabilitation activities. For example, the provisions of Section 33.30, *Wisconsin Statutes*, require lake protection and rehabilitation districts to convene annual meetings for the purpose of electing commissioners and approving a budget. All registered voters, plus a nominated representative, officer, or employee of any trust, foundation, corporation, association, or organization, that are property owners within the district may participate in this meeting. Because of their situation, riparian property owners and electors may find that their perceptions of actions necessary to protect and rehabilitate the lakes may differ from those of a wider constituency, a difference that could result in inaction or conflict within the community.

The second alternative would be to detach those properties within the City of Oconomowoc and within the drainage area tributary to Fowler Lake, that are not riparian properties. Under this alternative, shown on Map 11, the boundaries of the Fowler Lake Management District would encompass those lands within the City of Oconomowoc within an area approximated by Wisconsin Avenue to the south, N. Main Street to the west, Greenfield Avenue to the north, and Oakwood Avenue and Walnut Avenue to the east. This is the smallest boundary to be considered, and, given the relatively large numbers of tax exempted properties riparian to Fowler Lake, could result in significant financial burdens being placed upon the relatively few residential and commercial owners remaining within the District.

The third alternative, based upon a combination of geographic and drainage basin characteristics, is considered to be more representative boundary insofar as lake access and use are concerned. This alternative would include those lands identified above, plus other, lake-oriented lands within the drainage area directly tributary to Fowler Lake. Under this alternative, shown on Map 12, the boundaries of the Fowler Lake Management District would encompass those lands within the City of Oconomowoc within an area approximated by Wisconsin Avenue to the south, N. Main Street to the west, Lisbon Road to the north, and Lapham Street extended down to Wisconsin Avenue to the east. This would encompass the Fowler Lake inlet, a portion of the Oconomowoc River draining directly to the Lake, and approximately 120 to 200 residences and businesses. This alternative would provide a more substantial operating base for the District and continue to be consistent with applicable guidance and Statutes.

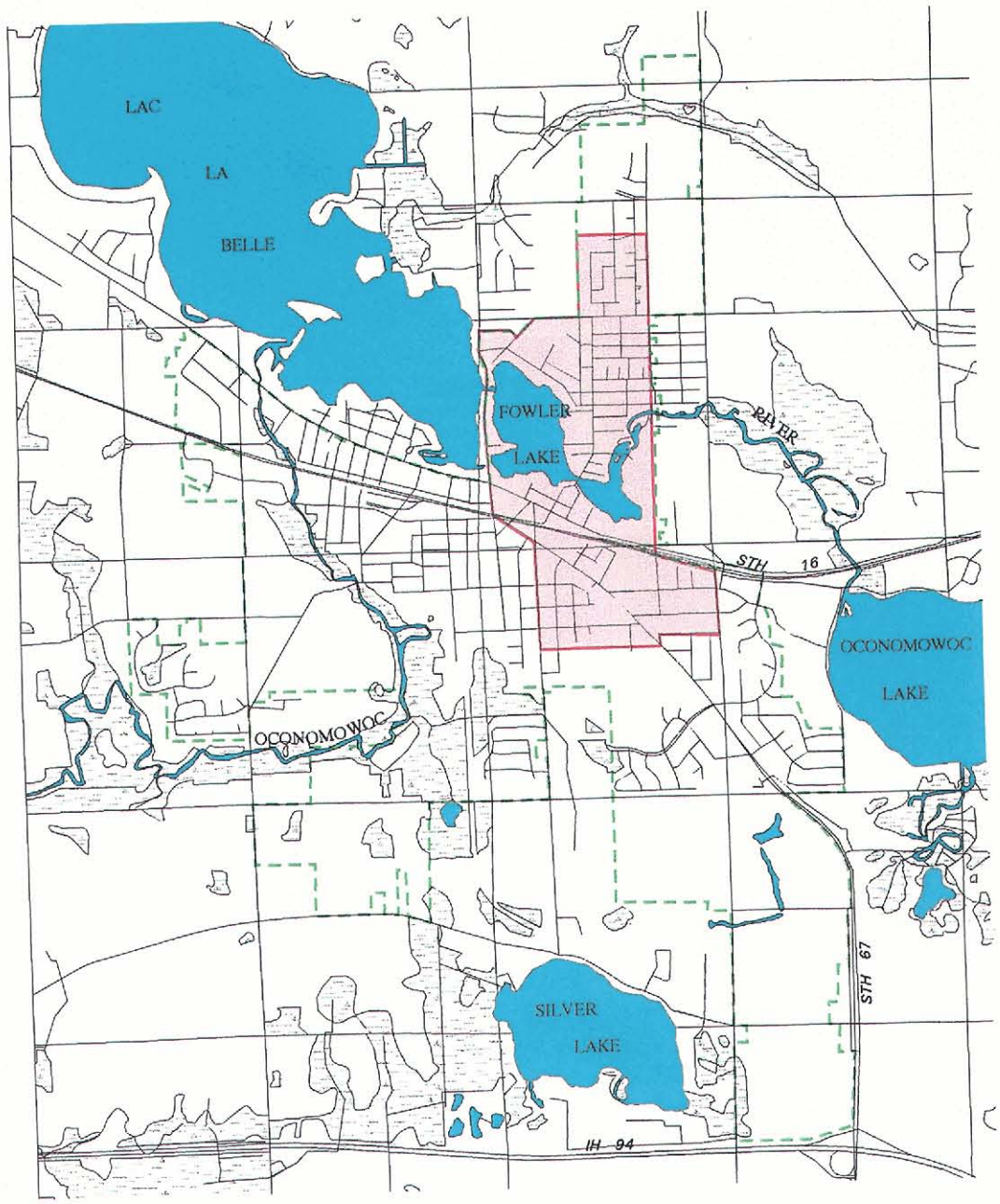
The fourth alternative would leave the boundaries of the Fowler Lake Management District unchanged—the boundaries would remain those of the City of Oconomowoc at the time the District was created, excluding the portion of the City that was within the Lac La Belle Lake Management District. This latter includes properties located west of STH 67 and north of STH 16. Map 13 shows the extent of the District boundaries.

Process

Lands may be detached from an existing lake management district pursuant to requirements set forth in Section 33.33(3), *Wisconsin Statutes*. Detachment may be initiated either by petition of the affected landowners within the district, or by motion of the district commissioners to detach lands from the district. In both cases, the district commissioners must make a finding that the lands to be detached are not benefited by inclusion within the district. This finding can also be appealed to the circuit court for judicial review. While bound by the specific process and requirements of Section 33.33(3), and of Section 33.26 insofar as they may be applicable, the district commissioners have full discretion regarding the granting of a petition for detachment. Nevertheless, detachment of lands from a district should not create a hole with the existing district. Financial hardship is not considered a reason for detachment.

Map 10

ALTERNATIVE 1
POTENTIAL FOWLER LAKE MANAGEMENT DISTRICT BOUNDARY BASED UPON TRIBUTARY DRAINAGE AREA



LEGEND

EXISTING DISTRICT BOUNDARY

PROPOSED DISTRICT BOUNDARY

N

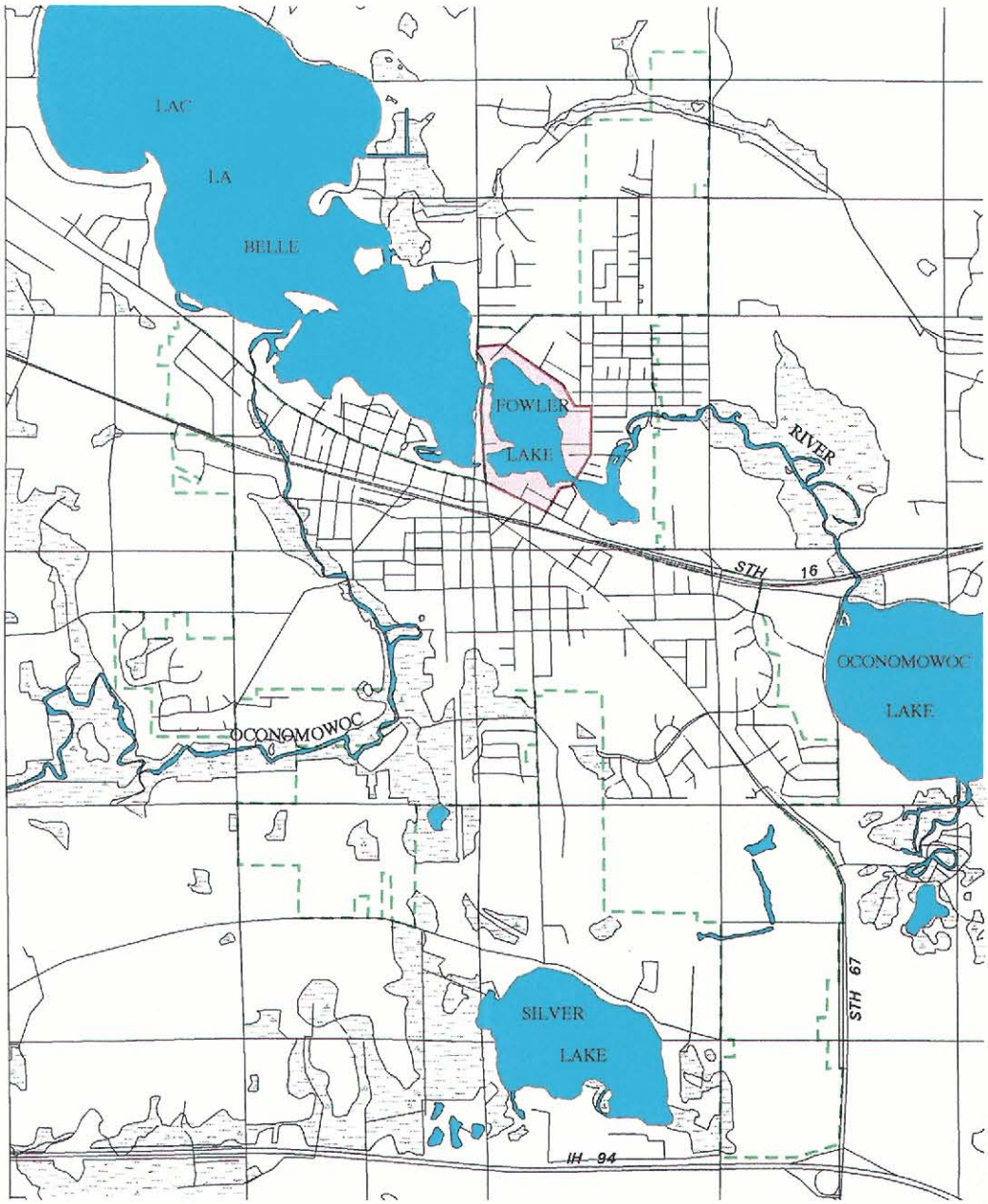
GRAPHIC SCALE

0 2000 4000 FEET

Source: SEWRPC.

Map 11

ALTERNATIVE 2
POTENTIAL FOWLER LAKE MANAGEMENT DISTRICT BOUNDARY INCORPORATING RIPARIAN LANDS



LEGEND

EXISTING DISTRICT BOUNDARY

PROPOSED DISTRICT BOUNDARY

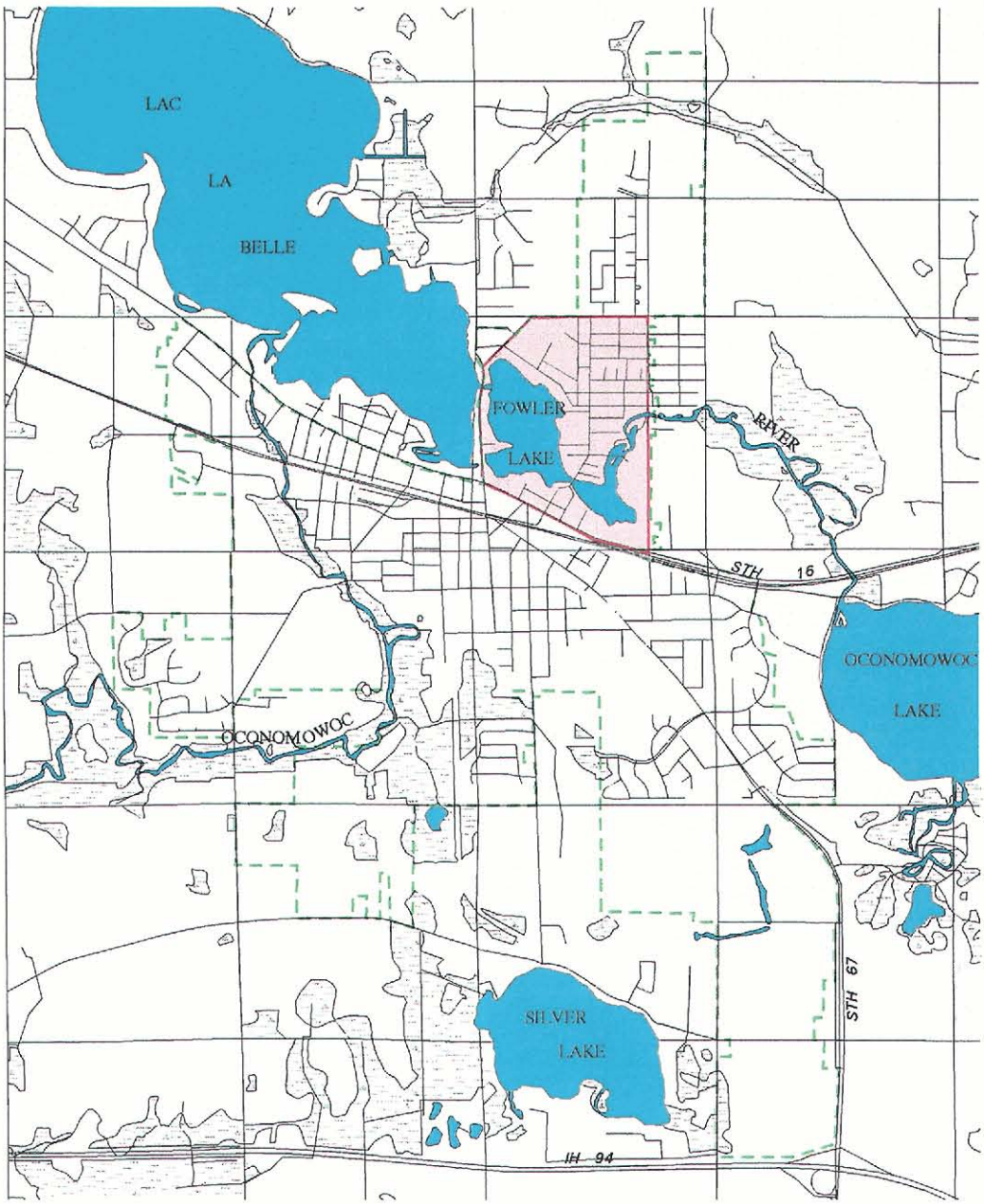
N

GRAPHIC SCALE
0 2000 4000 FEET

Source: SEWRPC.

Map 12

ALTERNATIVE 3
POTENTIAL FOWLER LAKE MANAGEMENT DISTRICT BOUNDARY BASED UPON COMBINATION OF FACTORS



LEGEND

EXISTING DISTRICT BOUNDARY

PROPOSED DISTRICT BOUNDARY

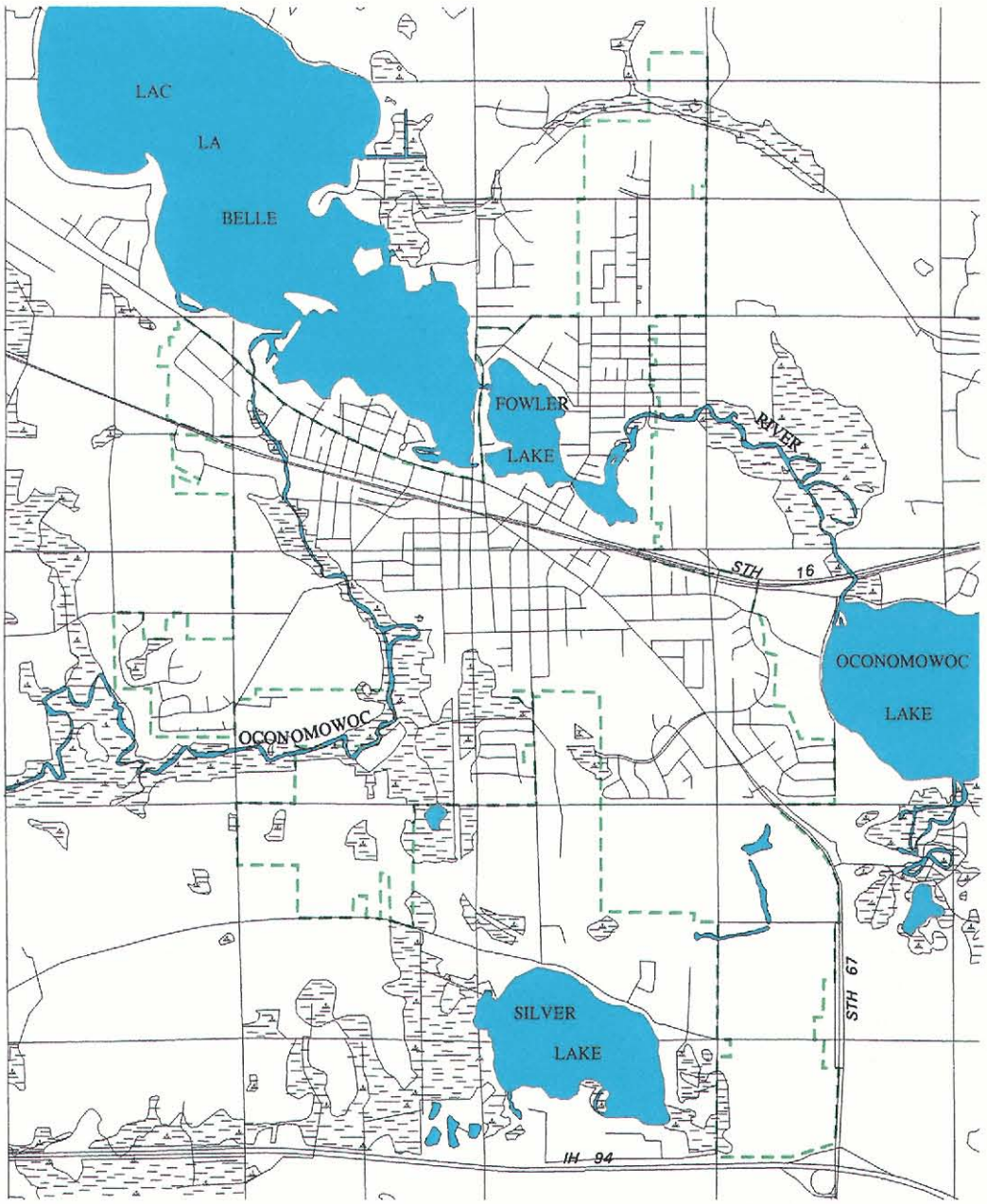
N

GRAPHIC SCALE
0 2000 4000 FEET

Source: SEWRPC.

Map 13

ALTERNATIVE 4
MAINTAIN THE EXISTING FOWLER LAKE MANAGEMENT DISTRICT BOUNDARY



LEGEND

EXISTING DISTRICT BOUNDARY

N

GRAPHIC SCALE

0 2000 4000 FEET

Source: SEWRPC.

One further consideration relating to the institutional aspects of redefining the boundaries of the Fowler Lake Management District would be that such a district could be considered for self-governance as provided for under Section 33.23(3). Self-governance would have to be granted by the City Council of the City of Oconomowoc upon petition by at least 20 percent of the landowners within the District. Notwithstanding, under the four alternatives set forth above, the City Council of the City of Oconomowoc would continue as the District Board of Commissioners until and unless a petition for self-governance was submitted and actioned by the City Council.

Recommended Institutional Development Measures

It is recommended that the Fowler Lake Management District consider reducing the existing boundaries to encompass those lands within the City and within the drainage area tributary to Fowler Lake as set forth under Alternative 3 above. It is recommended that the refined district boundaries encompass those lands in close proximity to Fowler Lake, including the inlet and a portion of the Oconomowoc River, bounded by Wisconsin Avenue to the south, N. Main Street to the west, Lisbon Road to the north, and Lapham Street extended down to Wisconsin Avenue to the east. These boundaries would continue to allow the Fowler Lake community to manage Fowler Lake on a sustainable basis, provide for a sound fiscal base from which to conduct lake management activities, and minimize political and social concerns relative to landowners within the District that do not perceive themselves to be within the ambit of Fowler Lake. Additionally, it is recommended that the electors of the Fowler Lake Management District consider changing the existing governance structure to one that is self-governing with an elected board of commissioners from within the District. Under this governance arrangement, the City of Oconomowoc would continue to appoint one Commissioner to serve on the Board of Commissioners. One additional member of the Board of Commissioners would be appointed by Waukesha County. An elected Board of Commissioners would initially consist of five members, three of whom would be elected at the first annual meeting following the granting of self governance, or at such time as may be appointed by the City of Oconomowoc at the time of granting a petition for self-governance. At the next annual meeting of the District, this Board of Commissioners could be expanded to seven, with five members being elected by the electors of the District, should this be the desire of the District electors.

Additionally, and until there is a change made in the governance of the District, it is recommended that the Commissioners of the Fowler Lake Management District consider appointing a citizens' advisory committee from within the District to provide community input to the City Council relative to lake management issues. The City Council would retain their current responsibilities as the Board of Commissioners of the Fowler Lake Management District, without the petitioning and granting of self-governance under Section 33.23 of the *Wisconsin Statutes*. While the citizens' advisory committee would not have statutory powers to make decisions affecting the Lake, such a committee could provide a useful and appropriate linkage between the electors of the District and their Board of Commissioners, and undertake much of the day-to-day activity of the District. This would allow the Alderpersons of the City to continue to focus on the affairs of the City, while developing a significant body of knowledge and expertise within the community. A similar mechanism has been employed by the City of Muskego with respect to the governance of the Big Muskego Lake-Bass Bay Protection and Rehabilitation District, and by the Village of Paddock Lake with respect to the governance of the Paddock Lake Protection and Rehabilitation District, with a high degree of success.

SUMMARY

This plan, which documents the findings and recommendations of a study requested by the City of Oconomowoc in cooperation with the Fowler Lake Management District, is a refinement of the aquatic plant management measures recommended in the adopted lake management plan for Fowler Lake. In addition, this plan sets forth recommended changes to the Fowler Lake Management District to enhance the lake-orientation of the District and facilitate continued lake management activities on Fowler Lake.

The refined Fowler Lake aquatic plant management plan, shown on Map 9 and summarized in Table 10, recommends actions to be taken to limit further human impacts on the in-lake macrophyte beds and reduce human impacts on the ecologically valuable areas adjacent to the lake and in its watershed. The plan recommends continued reliance of aquatic plant harvesting as the primary aquatic plant management measure employed on

Fowler Lake. In addition to aquatic plant harvesting, the plan recommends only limited additional aquatic plant management actions, including selected manual removal and surveillance activities at this time, mainly in the cases where purple loosestrife and Eurasian water milfoil are present, with the limited use of chemical treatment only to treat such species, if needed. The plan also recommends that the macrophyte beds that contain Eurasian water milfoil (*Myriophyllum spicatum*) be marked as motor exclusionary zones to attenuate the further proliferation of this plant. Support for the conservation of lands within the primary environmental corridors to ensure the protection and preservation of ecologically valuable areas within the drainage area tributary to Fowler Lake is also recommended.

The plan also recommends refining the boundaries of the Fowler Lake Management District to better focus the lake management program of the District on Fowler Lake and its tributary drainage area as shown on Map 12. Granting a petition for self-governance of the District, should such a petition be forthcoming from the electors of the refined District, is also recommended as an ancillary management measure. If self-governance is not realized or until self-governance is finally attained, it is also recommended that the present District Commissioners create a citizens' advisory committee to enhance liaison between the District Commissioners and the Fowler Lake community, as an ancillary management measure.

Finally, the recommended plan includes the continuation of an ongoing program of public information and education providing riparian residents and lake users. For example, additional options regarding household chemical usage, lawn and garden care, shoreland protection and maintenance, and recreational usage of the Lake should be made available to riparian householders, thereby providing riparian residents with alternatives to traditional alternatives and activities.

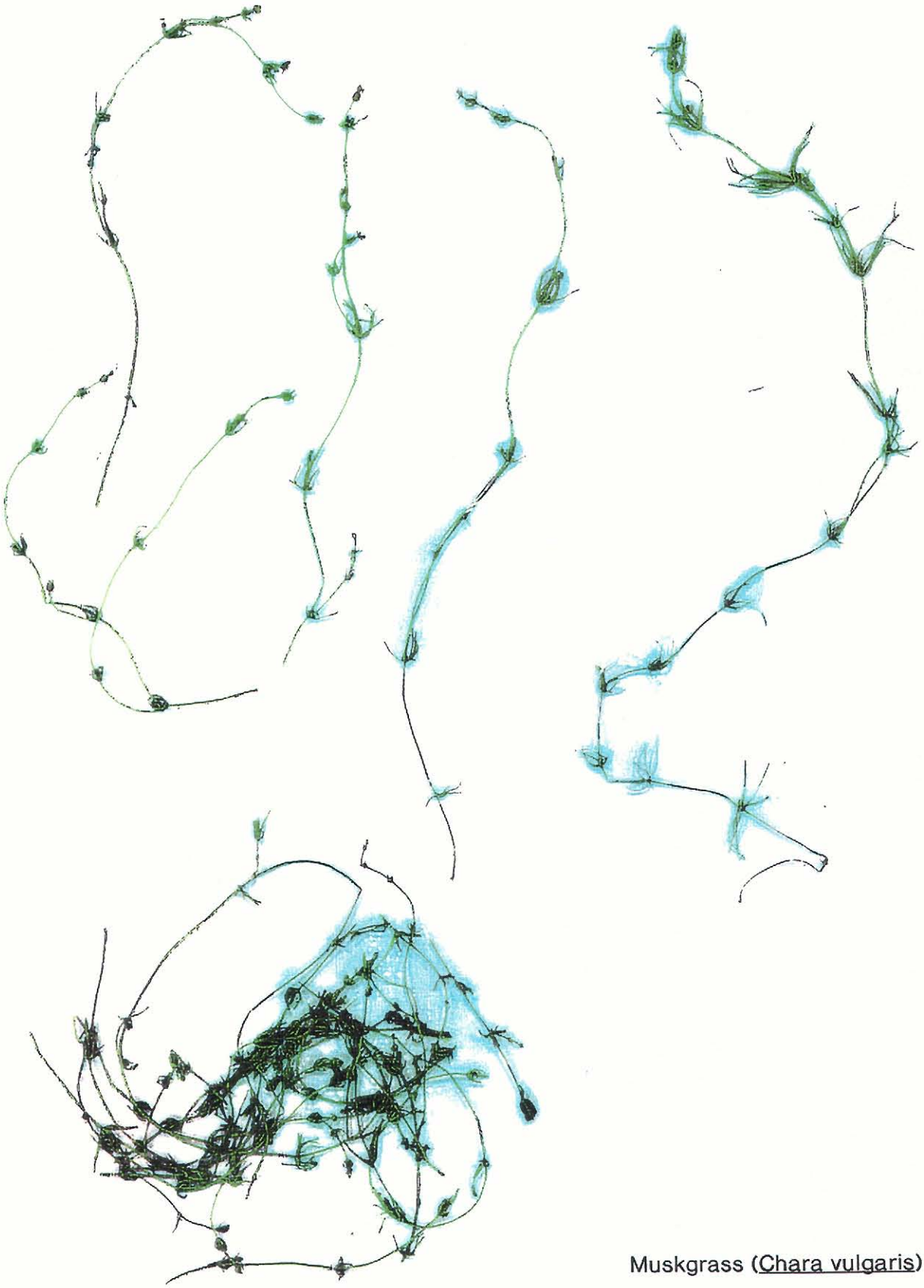
This recommended plan refines the adopted lake management plan for Fowler Lake, and seeks to balance the demand for high-quality residential and recreational opportunities at Fowler Lake with the requirements for environmental protection.

APPENDICES

(This page intentionally left blank)

Appendix A

REPRESENTATIVE ILLUSTRATIONS OF AQUATIC PLANTS FOUND IN FOWLER LAKE



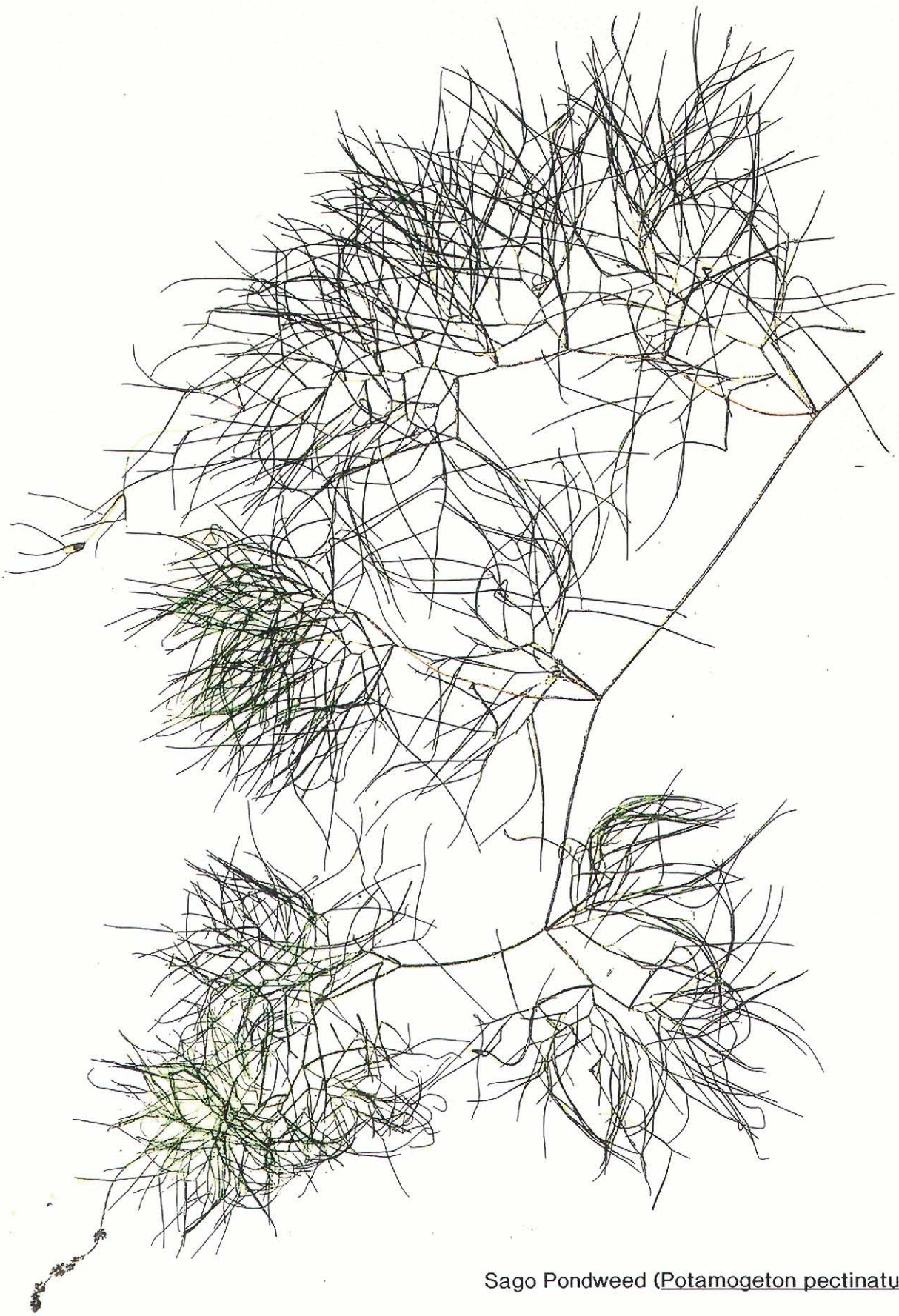
Muskgrass (Chara vulgaris)

Eurasian Water Milfoil (Myriophyllum spicatum)

Eel Grass/ Wild Celery (Vallisneria americana)

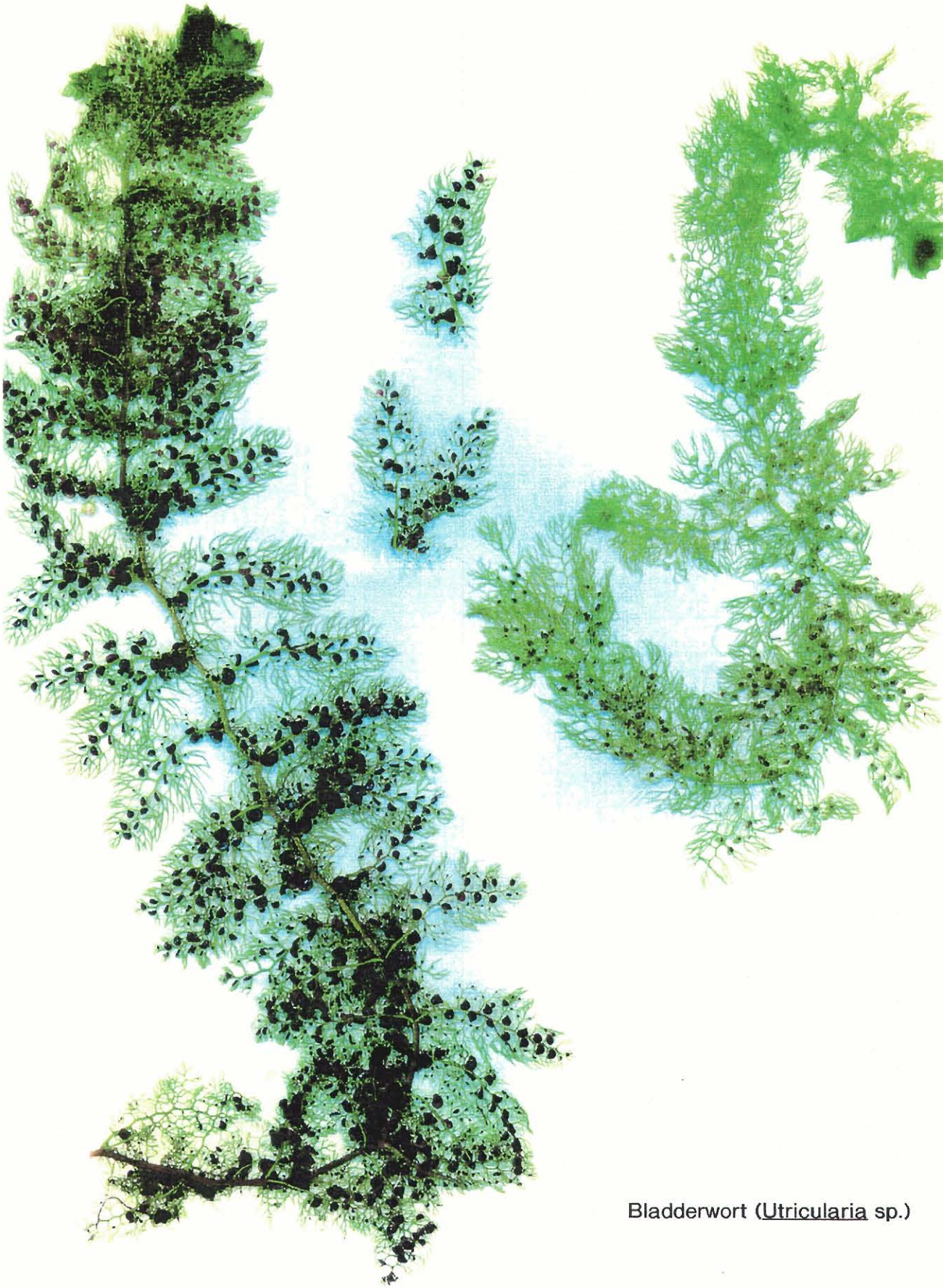
Coontail (Ceratophyllum demersum)

Bushy Pondweed (Najas flexilis)



Sago Pondweed (Potamogeton pectinatus)

Flat-stem Pondweed (Potamogeton zosteriformis)



Bladderwort (Utricularia sp.)

Waterweed (Elodea canadensis)

Curly Leaf Pondweed (Potamogeton crispus)

Spiney Naiad (Najas marina)

Clasping Leaf Pondweed (Potamogeton richardsonii)

Illinois Pondweed (Potamogeton illinoensis)

Appendix B

BOATING ORDINANCE APPLICABLE TO FOWLER LAKE

CHAPTER 21

PARKS AND PUBLIC WATERS

CITY PARKS

PUBLIC WATERS

CITY OF OCONOMOWOC 5/04/93

CITY PARKS
(Am. #85-0154)

21.01 PARKS AND RECREATION BOARD. (1) HOW CONSTITUTED. See §1.39(1) of this Municipal Code.

(2) OFFICERS AND RULES. See §1.39(2) of this Municipal Code.

(3) DUTIES. See §1.39(3) of this Municipal Code.

(4) QUORUM. See §1.39(4) of this Municipal Code.

(5) EMPLOYEES. All employees of the Parks and Recreation Department shall be under the direct supervision of the Director of Parks and Recreation, and all such employees shall be hired and discharged by the Director as provided by §1.23(2)(c) of this Municipal Code.

(6) DISBURSEMENT OF FUNDS. Any money appropriated by the Council for recreation purposes shall be disbursed by the Parks and Recreation Board in accordance with its submitted and approved budget. The Director of Parks and Recreation shall have a petty cash fund in the sum of $50, to be provided by the City Administrator-Treasurer from the Parks and Recreation Board budget. All other expenditures shall be first approved by the Parks and Recreation Board and submitted to the Finance Committee for its approval. All expenditures other than petty cash shall be made through the City Administrator-Treasurer.

(7) ANNUAL REPORT. The Parks and Recreation Board shall annually submit to the Council a report of its activities, receipts and expenditures. Such report shall be submitted not less than 30 days prior to the Council's consideration of the annual budget.

21.02 DIRECTOR OF PARKS AND RECREATION. See §1.23 of this Municipal Code.

21.03 PUBLIC ENTERTAINMENT RESTRICTED. No person shall hold any carnival, sideshow, public celebration, festival or other public entertainment within or on the property of any City park or parkway, with the exception of Roosevelt Field. This section does not prohibit the holding of any festival, entertainment, celebration or civic undertaking given under the supervision of the Council or by permit of the Mayor.

21.05 PUBLIC BOAT LAUNCHING FACILITIES AND FEES. (1) FEES. Under the authority of §30.77(3)(b), Wis. Stats., the City, through the appropriate public agents or agencies, shall charge reasonable fees for the use of such public boat launching facilities as may be designated by and owned or operated by the City.

(2) ESTABLISHMENT. The fees for the use of public boat launching facilities shall be established from time to time by the City Council.

(3) POSTING OF RULES AND FEE SCHEDULES. The City may adopt and administer rules and regulations with respect to the use and operation of the public launching facilities. Such rules and regulations, if adopted, shall be prominently posted and filed with the Department of Natural Resources. All fee schedules shall also be posted and filed at the public access points.

21.051 FOWLER LAKE BOARDWALK, PIER AND GAZEBO USE CONTROLLED. (Cr. #84-0138) (1) PURPOSE. The Fowler Lake boardwalk, pier and gazebo were constructed to provide a facility from which the beauty of Fowler Lake could be enjoyed, and to promote economic development in the downtown business district. Use of these facilities should provide the most enjoyment for the greatest number of people with public use taking precedence over private use.

(2) ADMINISTRATION. The Parks and Recreation Board shall receive and process applications for use of the boardwalk, pier and gazebo and may grant permits therefor. The Board need not grant permits if it determines that the proposed use would not further the purposes for which the facility was constructed.

(3) PERMIT REQUIRED. No person shall make use of the boardwalk, pier or gazebo for a privately sponsored event unless such person shall have obtained a permit from the Parks and Recreation Board authorizing such use.

(4) CONDITIONS AND FEE. The Parks and Recreation Board may impose reasonable conditions on the granting of a permit for the use of the boardwalk, pier and gazebo, and shall charge a reasonable rental fee therefor.

(5) PROHIBITED ACTIVITIES. (a) No person shall ride a motor scooter, motorcycle, snowmobile or bicycle, or roller skate, walk with ice skates or skateboard on the boardwalk, pier or gazebo.

(b) No person shall throw any glass, refuse, waste or litter upon the boardwalk, pier or gazebo, or the adjacent parking lot, or in the waters of Fowler Lake.

(c) No person shall loiter upon the boardwalk, piers and within the gazebo, so as to obstruct the free entry of persons to and from or on such facilities. It shall be an offense under this subsection for a person to refuse to discontinue such loitering after being requested to do so by a police officer.

(d) No person shall display for sale or sell merchandise on the boardwalk, pier or gazebo without having first obtained a permit.

(e) No person shall sell, offer for sale or consume fermented malt beverages or intoxicating liquor upon the boardwalk, pier or gazebo, or the parking lot adjacent thereto, unless an appropriate permit has been issued by the City Council, or except at municipally approved community functions or events authorized by resolution of the City Council.

(f) No person shall mark, deface, disfigure, injure, tamper with or displace or remove any part of the boardwalk, pier or gazebo, benches, railings or other appurtenances thereto.

(g) No person shall climb, stand or sit upon planters, railings, fences or upon any other property not designated or customarily used for such purpose.

(h) No person shall post, paint, affix or place any plaque, sign, handbill, circular or advertisement upon the boardwalk, pier or gazebo, or any appurtenance thereto, unless authorized by the Parks and Recreation Board in conjunction with a valid use permit.

21.04 PUBLIC SWIMMING FACILITIES. (1) FEES. (a) Established. To promote public health, safety, morals and general welfare and for the appropriate control and maintenance of publicly owned and operated facilities, and under the State law authorizing such purposes, it is deemed necessary to create a reasonable schedule of fees for the use of public swimming facilities owned and operated by the City through any of its appropriate agencies.

(b) Schedule. The fees for the use of the swimming facilities shall be established from time to time by the Parks and Recreation Board.

(2) ADMINISTRATION. The appropriate City agencies shall administer the fee schedule along with other appropriate rules and regulations controlling the use and operation of swimming facilities. Any rules and regulations and fee schedules, or changes thereof, shall be posted by the City.

(3) HOURS. (Am. #81-84) (a) The hours of use of public swimming areas shall be set by the Parks and Recreation Board; and when posted, a violation of such hours shall be a violation of this subchapter.

(b) The following municipally owned parks and Lac La Belle access points within the City shall be closed to all persons between the hours of 9 p.m. and 8 a.m. No person shall swim in waters lying off the following parks and Lac La Belle access points between the hours of 9 p.m. and 8 a.m.:

1. Fowler Park.

2. Bender Park.

3. Chestnut St.

4. Park St.

5. Locust St.

6. Woodland Ln.

(4) SWIMMING PROHIBITED IN CERTAIN AREAS. (Am. #84-0138) In the interest of public safety, swimming is prohibited in the waters lying immediately beneath the bridge on N. Lake Rd. at the City dam area and extending from beneath the bridge easterly to the municipal dam; and from the Fowler Lake boardwalk and pier.

(i) No person shall fish from the boardwalk. Fishing is allowed from the pier by any method except overhead casting.

(j) No person shall moor a boat to the boardwalk. Boats may be moored to the pier for up to 3 consecutive hours.

21.06 RIDING BICYCLES, ETC., IN PARKS PROHIBITED. (Am. #84-0138) No person shall operate or ride upon a bicycle, motor scooter, motorcycle or snowmobile in any park within the City. For purposes of this section, the Fowler Lake boardwalk, pier and gazebo shall be considered a public park.

21.07 PARK CURFEW. (1) PARK HOURS RESTRICTED. (Am. 9-8-77) All municipally owned parks within the City shall be closed to all persons between 10 p.m. and 5 a.m. daily, except Riverside Park, which shall be closed between 9 p.m. and 5 a.m. daily.

(2) WAIVER. The City Council may, upon written application of any group desiring to organize an athletic, recreational or social function, grant a permit waiving the requirements of sub. (1) for a specified number of days.

21.08 INTOXICANTS AND FERMENTED MALT BEVERAGES RESTRICTED. (Cr. 2-23-78) (1) Intoxicating liquors or fermented malt beverages shall not be consumed upon the premises of any City park after 8 p.m.

(2) This restriction shall not apply to Roosevelt or Champion Fields.

21.09 DOGS IN PARKS PROHIBITED. (Am. #84-0138) (1) No person who owns, harbors or keeps a dog, or has a dog under his control, shall bring it into or allow it to remain in any park within the City at any time. For purposes of this section, the Fowler Lake boardwalk, pier and gazebo shall be considered a public park.

(2) This prohibition shall not apply to registered seeing eye dogs when accompanied by their owners.

21.091 HORSES IN PARKS AND OTHER PUBLIC AREAS PROHIBITED. (Cr. #80-53) No person shall ride, lead, graze, tie up or drive a horse within any public park or parking lot within the City, or upon any property of the Oconomowoc Area School District, except while performing in authorized civic affairs or events.

21.092 GLASS CONTAINERS PROHIBITED IN PARKS. (Am. #85-0147) No person shall carry, transport or have in his possession, any glass bottle or container in the following designated park areas:

(1) Public parks, parkways and recreation areas, including bleacher, spectator and parking areas; Fowler Lake boardwalk, pier and gazebo.

(2) Street boulevards, tree borders or vistas.

(3) Street accesses to Lac la Belle extending landward 150' from the ordinary high-water mark.

PUBLIC WATERS

21.10 LOCAL REGULATIONS ADOPTED. Any uniform ordinance adopted pursuant to §§66.30, 30.77 and 30.81, Wis. Stats., to regulate the use of the public waters within the jurisdiction of the City and other municipalities adopting such uniform ordinance and to provide for the cooperative administration and enforcement of such ordinance is adopted by reference and incorporated herein as though set forth in full.

21.11 STATE BOATING AND WATER SAFETY LAWS ADOPTED. (Am. #88-0197) The following statutory provisions describing and defining regulations with respect to water traffic, boats, boating and related water activities in the following enumerated sections of the statutes, exclusive of any provisions therein relating to the penalties to be imposed or the punishment for violation of such statutes, are hereby adopted and by reference made a part of this section as if fully set forth herein:

30.50	Definitions
30.51	Operation of Unnumbered Motorboats Prohibited; Exemptions
30.52	Certificate of Number; Applications; Issuance; Renewals; Fees
30.53	Identification Number to be Displayed on Boat; Certificate to be Carried
30.54	Transfer of Ownership of Numbered Boat
30.55	Notice of Abandonment or Destruction of Boat or Change of Address
30.60	Classification of Motorboats
30.61	Lighting Equipment
30.62	Other Equipment
30.64	Patrol Boats Exempt from Certain Traffic Regulations
30.65	Traffic Rules
30.66	Speed Restrictions
30.67	Accidents and Accident Reports
30.68	Prohibited Operation
30.681	Intoxicated Boating
30.682	Preliminary Breath Screening Test
30.683	Implied Consent
30.684	Chemical Tests
30.686	Report Arrest to Department

30.687 Officers Action After Arrest for Violating §30.681
30.69 Water Skiing
30.70 Skin Diving
30.71 Boats Equipped with Toilets

21.12 FOWLER LAKE BULKHEAD LINES. (1) ESTABLISHED. The bulkhead line of that part of the northwesterly shore of Fowler Lake herein described and shown on the plat of survey dated September 10, 1974, and revised September 19, 1974, is established and determined as set forth in the following description:

> Commencing at the southwest corner of Lot 170, original plat of Oconomowoc (said point being the intersection of the north line of Wisconsin Ave. and the east line of N. Main St.); thence north along said east line 346' to a point 14' south of the northwest corner of Lot 174 in said plat; thence east at right angles 140' to the point of beginning of the proposed bulkhead line; thence north 51-49-06 west on the proposed bulkhead line 65.52'; thence west 88.50' to the east line of Main St. and the end of proposed bulkhead line (said point being 26.50' north of the southwest corner of Lot 175).

(2) COPY TO BE ON FILE. Upon the approval of the map described in sub. (1) by the Department of Natural Resources, copies of such map shall be filed as follows: one with the Department of Natural Resources, one in the office of the City Clerk and one in the office of the County Register of Deeds.

21.13 ISLANDALE CAUSEWAY BULKHEAD LINE. (Cr. #80-066) A new bulkhead line along a part of the shore of Lac La Belle, Waukesha County, is established. The bulkhead line shall be along both sides of the Islandale Causeway which commences approximately 803.43' north of the centerline of STH 16, extending from said point northerly to the town boundary, all in Sections 29 and 32, City and town, as shown by the map attached to Ordinance #80-066.

21.14 WATER TRAFFIC, BOATS, BOATING AND RELATED WATER ACTIVITIES ON LAC LA BELLE. (Cr. #81-82) (1) APPLICABILITY AND ENFORCEMENT. (a) Applicability. The provisions of this section are adopted in the interest of public health and safety and shall apply to persons, vehicles, boats and other objects upon, in and under the waters and ice of Lac La Belle within the jurisdiction of the City, the Village of Lac La Belle and the Town of Oconomowoc, which are all municipalities surrounding, riparian to and having jurisdiction over Lake Lac La Belle.

(b) Enforcement. This section shall be enforced by the officers, employees and agents of the respective law enforcement agencies of any or all of the municipalities having jurisdiction over the lake.

(2) STATE BOATING AND WATER SAFETY LAWS AND ADMINISTRATIVE ORDERS AND RULES ADOPTED. (a) Statutes. (Am. MSC '88) See §21.11 of this chapter.

(b) Administrative Code. All rules and orders created by the Wisconsin Department of Natural Resources designated Ch. NR, Wis. Adm. Code, modifying or supplementing the foregoing provisions of State law or which may be adopted or made in the future, are hereby incorporated in and made a part of this chapter by reference to the same as if they are or were to be set out herein verbatim.

(c) Amendments, Etc. All deletions, additions and amendments which may be made to the sections of the State laws enumerated above are hereby adopted and incorporated herein by reference as of the time of their respective effective dates as if they were to be set out herein verbatim.

(3) SPECIAL SPEED LIMIT. (Cr. #90-0243) No person shall at any time operate a boat in excess of slow-no-wake in an area from a shore to shore line in Lac LaBelle, such line to be parallel to and approximately 1,100' north of the City beach, extending east and west from a point on the shore of property located at 326 N. Lake Rd. to a point on the shore of property located at 259 Woodland Ln. The area in which this special speed limit shall apply lies between the aforementioned line and the south shore of Lac LaBelle and shall include the entire width of the bay as well as the channel circling the island located at the southwest corner of such bay.

(4) GENERAL SPEED LIMITS. (a) No person shall operate a motorboat on Lac LaBelle at a speed in excess of 10 mph between sunset one day and sunrise on the following day. (Cr. #92-0293)

(b) No person shall operate a motorboat on Lac LaBelle at a speed in excess of 45 mph. (Cr. #92-0294)

(5) PENALTIES AND DEPOSITS. (Ren. #90-0293) (a) Penalty. Any person who violates any provision of this section shall upon conviction thereof forfeit not less than $1 nor more than $200, together with the costs of prosecution and in default of payment thereof shall be imprisoned in the county jail until full payment is made, but not to exceed 60 days.

(b) Money Deposits. Any officer arresting a person for violation of a provision of this section who is unable to bring the person arrested before a court of appropriate jurisdiction without unnecessary delay shall permit such person to make a money deposit as provided by law. Such deposit shall be made to the Chief of Police.

21.15 MOTORIZED VEHICLES AND SNOWMOBILES ON SILVER LAKE. (Cr. #90-0234) (1) No person shall operate or park or permit to be operated or parked any motorized vehicle or snowmobile on the ice of Silver Lake.

(2) The definitions contained in Chs. 340 through 350, Wis. Stats., and any amendments thereto are hereby incorporated by reference as if fully set forth herein.

(3) The provisions of this section shall be enforced as provided by this section and State law including, but not excluding because of enumeration, Chs. 66, 345, 751, 757 and 800, Wis. Stats.

(4) Any person violating any provision of this section shall, upon conviction thereof, forfeit not less than $10 nor more than $100, together with costs and in default of payment of such forfeiture and costs shall be imprisoned in the county jail for not more than 60 days for the first offense and shall forfeit not less than $20 nor more than $200, together with costs, upon conviction of the same offense a second or subsequent time within one year and in default of payment shall be imprisoned in the county jail for not more than 90 days or suspension of motor vehicle operating privileges as provided by law.

21.16 MOTOR BOATS AND WATER SPORTS REGULATED ON SILVER LAKE. (Cr. #93-0309) (1) APPLICATION. The provisions of this section shall apply to the waters of Silver Lake, within the jurisdiction of the Town of Summit and the City of Oconomowoc. Officers of the Water Safety Patrol Unit and police of the jurisdiction of the Town of Summit and City of Oconomowoc shall enforce the provisions of this section.

(2) STATE BOATING AND WATER SAFETY LAWS ADOPTED. (a) Except as otherwise specifically provided in this section, the current and future statutory provisions describing and defining regulations with respect to water traffic, boats, boating and related water activities in §§30.50 to and including 30.71, Wis. Stats., exclusive of any provisions therein relating to penalties imposed or punishment for violation of such statutes are adopted by reference and made a part of this section as if fully set out in this section. Any act required to be performed or prohibited by any current or future statute incorporated herein by reference is required or prohibited by this section. Any further additions, amendments, revisions or modifications of the statutes incorporated herein are intended to be made a part of this section in order to secure uniform state-wide regulation of the waterways of the State.

(b) All rules and orders created by the Wisconsin Department of Natural Resources, modifying or supplementing the foregoing provisions of State law or which may be adopted or made in the future, are hereby incorporated in and made a part of this section by deferring to the same as if they are or were to be set out herein verbatim.

(3) OPERATION OF MOTOR BOATS. No motor boat shall be operated on Silver Lake from sunset until sunrise at a speed in excess of "slow no wake".

(4) SWIMMING REGULATIONS. No person, unless engaging in activities and subject to the provisions of §30.70, Wis. Stats., (skin diving), shall:

(a) Swim from any unmanned boat, unless such boat is anchored.

(b) Swim more that 150′ from the shoreline unless in a designated swimming zone or unless accompanied by a competent person in a boat.

(c) Swim more than 150′ from the shoreline between sunset and sunrise.

(5) PENALTY. (a) State Boating and Water Safety Laws. Any forfeiture for violation of a State statute, rule or order adopted by reference in sub. (2) shall conform to forfeitures imposed in the Uniform Wisconsin Deposit and Bail Schedule for conservation, boating, snowmobile and ATV violations, including any variations or increases for subsequent offenses. The schedule is adopted by reference in sub. (2).

(b) Local Boating Laws. 1. Any person 16 years or older violating the provisions of this section shall be subject to a forfeiture of not more than $500 plus court costs and penalty assessment. Failure to pay any forfeiture hereunder shall subject the violator to imprisonment in the county jail or loss of license.

2. Any person 14 or 15 years of age shall be subject to a forfeiture of not less than $10 nor more than $25 plus court costs and penalty assessment per each offense or referred to the proper authorities as provided in Ch. 48, Wis. Stats. Failure to pay any forfeiture hereunder shall subject the violator to §48.17(2), Wis. Stats.

3. Any person under the age of 14 shall be referred to the proper authorities as provided in Ch. 48, Wis. Stats.

(6) ENFORCEMENT. (a) Procedure. The statutory provisions of §§66.115, 66.119, 66.12, 30.29, 30.50-30.71 and Ch. 799, Wis. Stats., are adopted and by reference made a part of this section as if fully set out herein. Any act required to be performed or prohibited by any statute incorporated herein by reference is required or prohibited by this section. Any further additions, amendments, revisions or modifications of the statutes incorporated herein are intended to be made a part of this section in order to secure uniform state-wide regulation and enforcement of the boating ordinance violations. Further, the Town of Summit and the City of Oconomowoc specifically elect to use the citation method of enforcement.

PENALTIES AND ENFORCEMENT

21.30 ENFORCEMENT. Any cooperative agreement entered into by the City and any other municipalities adopting the uniform ordinance specified in §21.10 for the cooperative enforcement of the provisions of this subchapter, including the mutual financing of the same under equitable terms and arrangements, shall apply.

21.31 PENALTIES AND DEPOSITS. (1) PENALTY. Any person who violates any provision of this chapter shall upon conviction thereof forfeit not less than $1 nor more than $100 together with the costs of prosecution and in default of payment thereof shall be imprisoned in the county jail until full payment is made, but not to exceed 60 days.

(2) MONEY DEPOSITS. Any officer arresting a person for violation of a provision of this chapter who is unable to bring the person arrested before a court of appropriate jurisdiction without unnecessary delay shall permit such person to make a money deposit as provided in §30.76, Wis. Stats. Such deposit shall be made to the Chief of Police.

(3) Any person violating §§30.681 or 30.684(5), Wis. Stats., shall forfeit not less than $150 nor more than $300 and in default of such forfeitures shall be imprisoned in the county jail until full payment thereof is made, but not to exceed 60 days. In addition to any penalty, the court shall enter the orders required by §30.80(6)(d) and (e), Wis. Stats. (Cr. #88-0197)

(b) Nonexclusivity. 1. Other Ordinances. Adoption of this section does not preclude the Town Board or City Council from adopting any other ordinance or providing for the enforcement of any other law or ordinance relating to the same or other matter.

2. Other Remedies. The issuance of a citation hereunder shall not preclude the Town Board or City Council or any authorized office from proceedings under any other ordinance or law or by any other enforcement method to enforce any ordinance, regulation or order.