Gilbert Lake Aquatic Plant Management Plan 2001 – 2005

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Introduction

Gilbert Lake is a deep, very clear lake of glacial origin located in Springwater Township, Waushara County, Wisconsin (R. 11E. – T. 20N. sections: 10,11,14,15). The lake is approximately one mile long and has 2.6 miles of shoreline. It covers 141 acres and has a maximum depth of 65 feet. The steep, forested shores of Gilbert Lake are predominantly upland and are heavily developed with summer cottages. A town road separates the lake from a wetland complex to the east (Figure 1). There are no inlets or outlets to the lake. Its primary water sources are groundwater seepage and surface runoff. A public boat ramp is maintained at the east end of the lake. Because of its good water quality and scenic beauty, boaters, swimmers and anglers heavily use Gilbert Lake. The Gilbert Lake Advancement Association represents the interests of riparian property owners and other lake users.

In recent years the main management concern of the Gilbert Lake Advancement Association has been the control of Eurasian water milfoil (EWM). This aquatic plant is an exotic invader that has been gradually taking over areas of prime littoral habitat in the lake. This report discusses the management issues pertaining to EWM and recommends a course of action for controlling the plant over the next five years.

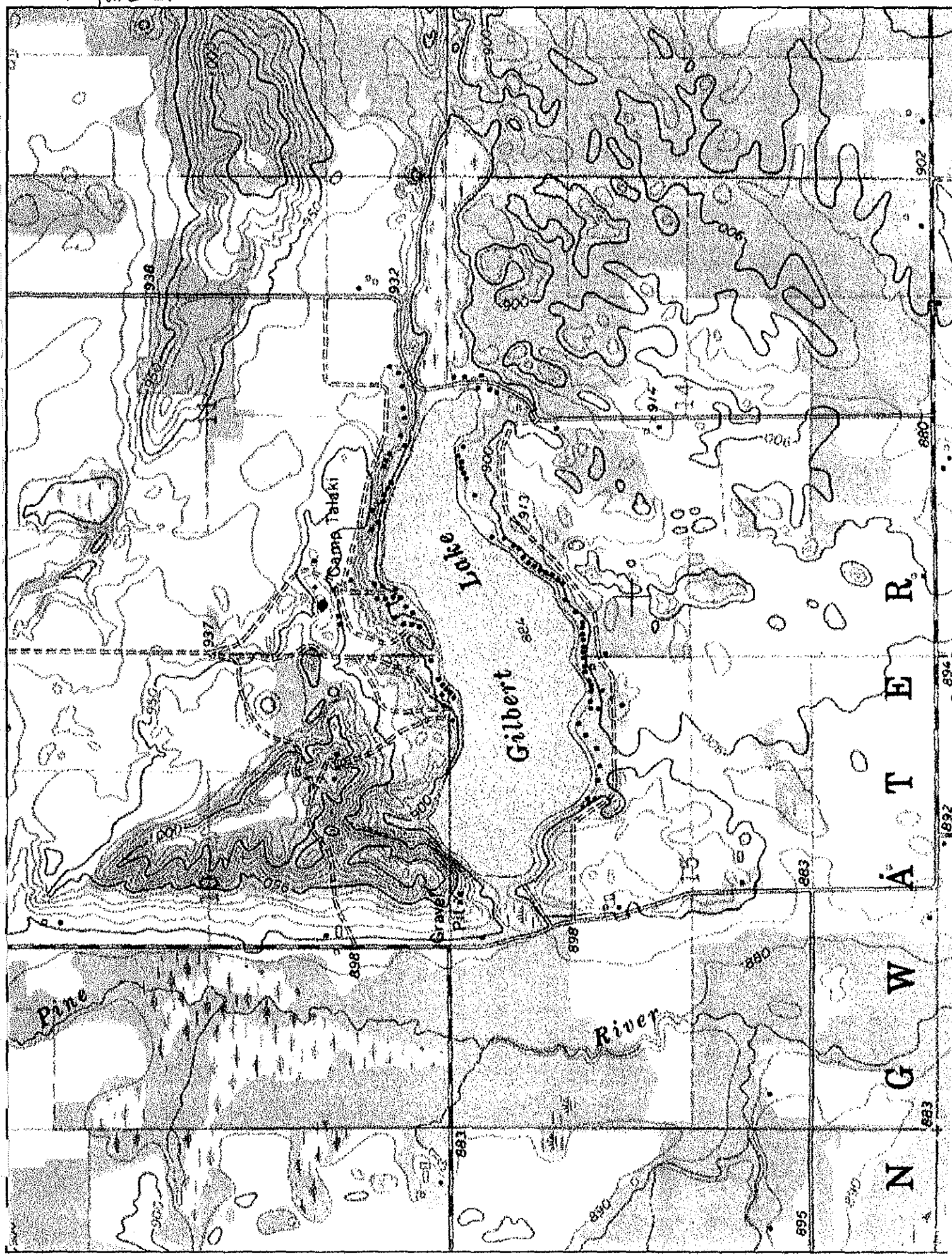
Eurasian Water Milfoil

Characterized as an aggressive, opportunistic plant, EWM is an exotic species originating from Europe and Asia. It is now found in many areas of the U. S. Its distribution in Wisconsin is primarily in the central and southeast regions, but it is spreading northward (Borman, et.al., 1997). The plant represents a substantial threat to the ecological and recreational value of Wisconsin's Lakes. Because EWM grows quickly to the water surface and

forms very dense canopies that block sunlight, it aggressively displaces nearly all native aquatic plant species. This has been attributed to significant declines in the species diversity of lakes. The dense canopy and surface mat formations of EWM can also form a nearly impenetrable barrier to boaters and swimmers. EWM infestation has also been linked to declines in fishery quality, invertebrate abundance and water quality (Pullman, 1993).

The main threats of EWM in Gilbert Lake are recreational impairment, the loss of high value native plant species and subsequent losses of valuable fish and wildlife habitat, and dispersal of EWM from Gilbert Lake to other area lakes as a result of heavy recreational use.

Figure 1.



Management History

1994 plant survey

In August 1994, Department of Natural Resources (DNR) personnel conducted an informal plant survey of Gilbert Lake in order to verify the presence and extent of EWM. They reported that EWM was found sporadically around the lake, particularly in water depths greater than ten feet. The bay by the boat landing and one site at the northwest corner of the lake were reported as "heavily infested". The aquatic plant species found in this survey included:

aquatic mosses	(bryophytes)
bushy pondweed	*(Najas flexilis)*
Eurasian water milfoil	*(Myriophyllum spicatum)*
floating-leaf pondweed	*(Potamogeton natans)*
hardstem bulrush	*(Scirpus acutus)*
large-leaf pondweed	*(Potamogeton amplifolius)*
musk grass	*(Chara spp.)*
smartweed	*(Polygonum spp.)*
variable pondweed	*(Potamogeton gramineus)*
white water lily	*(Nymphaea odorata)*

Although apparently well established at the time of the survey, this likely represents the first official documentation of EWM in Gilbert Lake.

Weevil Study

From 1996 – 1998 Gilbert Lake was involved in a 12-lake study called the "Wisconsin Milfoil Weevil Project". This study, conducted by the Wisconsin Cooperative Fishery Research Unit – UW Stevens Point and the Wisconsin

DNR, was designed to evaluate the effectiveness of the milfoil weevil (*Euhrychiosis lecontei*) in controlling EWM. The milfoil weevil is a native species that is widely distributed throughout Wisconsin. It was also found naturally occurring in Gilbert Lake. At natural densities, the milfoil weevil appeared to have no significant impact on EWM. However, some studies suggested that at artificially elevated densities, the weevil could affect a decline in EWM (Lester, et.al., 1999).

In 1997 milfoil weevils were stocked into Gilbert Lake in quantities calculated to bring densities to the levels prescribed for controlling EWM. Follow up monitoring conducted in 1997 and 1998, however, found no significant increase in milfoil weevil densities, and no significant decline in EWM density. The heavy calcium carbonate layer that typically precipitates upon the leaves of aquatic plants in Gilbert Lake was blamed for the lack of effectiveness in this case, although no significant increases in weevil density and no significant declines in EWM were found in the eleven other study lakes. To date, no further efforts have been directed at this management approach on Gilbert Lake.

Self Help Monitoring

For the past 15 years Gilbert Lake been involved in the "Self-Help Lake Monitoring Program" sponsored by the Wisconsin DNR and the Wisconsin Lakes Partnership. This program relies on volunteers to monitor secchi disc depth, total phosphorus and chlorophyll concentrations. Results of the 1999 monitoring show excellent water clarity for Gilbert Lake, with average secchi disc readings of 15.6 feet. Chlorophyll and total phosphorus concentrations were also very good, averaging 1.12 ug/L and 8.3 ug/L, respectively. These parameters rank Gilbert Lake as late oligotrophic to early mesotrophic.

Spring 2000 Milfoil Assessment

During June 2000, volunteer lake residents charted and measured the visible canopied EWM beds throughout the lake. 32 EWM beds were identified, ranging in size from 4 X4 feet to 20 X 500 feet. The beds were found in depths ranging from 6 to 20 feet, and were found as close as 10 feet from shore to approximately 200 feet from shore. At these early season growth stages, the charted colonies likely represent the oldest and most well established portions of the EWM beds.

Fall 2000 Plant Survey

During September 2000, Aquatic Biologists, Inc. was retained by the Gilbert Lake Advancement Association to conduct a formal whole-lake plant survey on Gilbert Lake. The purpose of this survey was to provide baseline data for the five-year management plan outlined in this report. Its goals were to determine the species composition, distribution and percent frequency of aquatic plants using quantifiable and reproducible methods, and to accurately plot the location and area of the EWM beds in the lake. Along with the Self-Help Lake Monitoring data, the information will allow for accurate assessment of the impacts and effectiveness of EWM management.

Prior to collecting plant data, a series of 18 transects (labeled A through R) were mapped out on the lake. The transects were spaced at approximately even distances around the shore, and ran from the shoreline out approximately to the 20 foot depth contour – the maximum extent of rooted vegetation (see Figure 2). Depending upon the length of the transect, two to four sampling plots were established along each transect. Plots were established by estimating a 10-foot diameter circle around the anchored boat. The circular plot was then divided into four quarters, with each quarter representing a quadrant. Plants were collected in each quadrant by tossing

out a tethered short-toothed rake and hauling it into the boat. A total of 408 quadrants were sampled. From each rake haul, all plants collected were identified to *genus*, and to *species* whenever possible. Data were recorded separately for each rake haul. A separate data sheet was used for each transect (appendix 1).

The location of EWM beds was verified visually and by rake sampling. Minimum and maximum depths of the beds were established with a weighted tape measure. The beds were then drawn into a lake map at the appropriate depth contours and by using shoreline features as landmarks. The lake map was then superimposed upon an acreage grid to determine the area of each EWM bed.

The results of the aquatic plant survey are shown in Tables 1,2 and 3. At least thirteen species of plants were encountered. With the exception of aquatic mosses and hardstem bulrush, the same species found in the 1994 survey were encountered in the 2000 survey. In addition to these species, flatstem pondweed *(Potamogeton zosteriformis)*, sago pondweed *(P. pectinatus)*, water stargrass *(Zosterella dubia)*, spadderdock *(Nuphar variegata)* and northern water milfoil *(Myriophyllum sibericum)* were also identified.

The most abundant plant encountered was musk grass, followed by bushy pondweed, variable pondweed and Eurasian water milfoil. EWM was found in 20.9% of the quadrants, and comprised 11.3% of the species composition (Table 1). Musk grass was encountered in all 18 transects. Bushy pondweed and variable pondweed were each found in 17 transects. These three species appeared to be present throughout the littoral zone. EWM, found in 11 of the 18 transects, was also widely distributed. Four species, northern water milfoil, spadderdock, white water lily, water smartweed and water stargrass

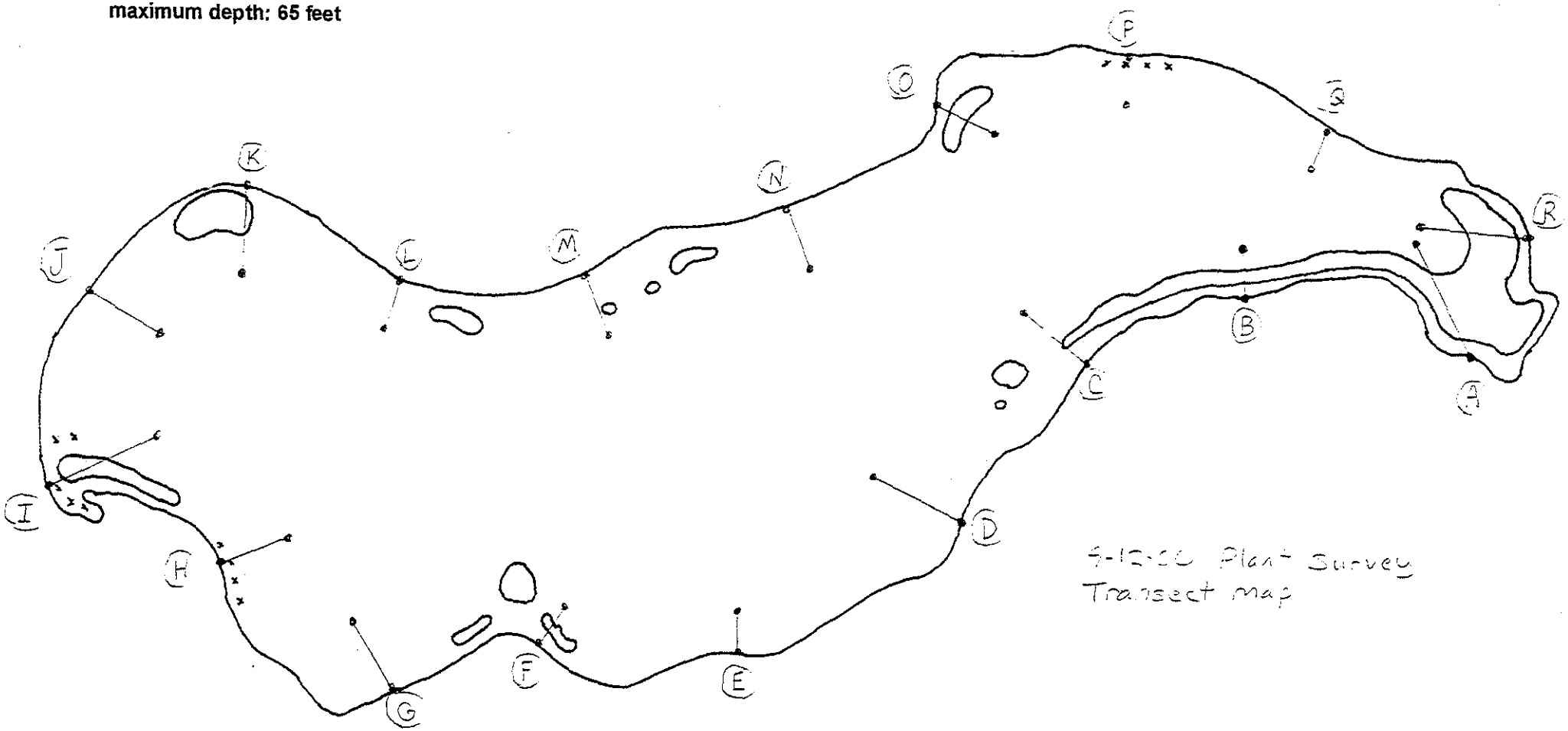
appeared to have the most limited distribution, having been found in only one transect each (Table 2). The greatest species diversity was found in transects A, I, M and O (seven or more species). EWM was present in each of these transects as well. In contrast, EWM was not found in those transects with the lowest diversity (three or fewer species) (Table 3). This suggests that EWM has tended to colonize the most valuable areas of aquatic plant habitat - re-emphasizing the threat that EWM poses to lake's ecosystem.

Figure 3 shows the approximate EWM distribution at the time of the plant survey. At total of 8.3 acres of EWM growth was found, in eight separate areas of the lake. These areas ranged in size from 0.2 acres to 5.1 acres. Colonies of canopied EWM had merged and expanded considerably from the spring assessment. Extensive areas of new growth were also found in and around the canopied colonies as well. Several small sites identified in the spring assessment were devoid of EWM in the fall survey. These areas were reportedly hand pulled by lake residents. Several areas of pioneer EWM growth (shown as scattered growth in Figure 3) were found in the fall survey that were not found in the spring assessment. Rooted EWM was found growing in less that one foot of water to a maximum depth of 13 feet. This is a significant difference from the 20-foot maximum depth found in the spring assessment. This difference may be due to seasonal changes in water clarity and/or differences in sampling and measuring methods. (The exact extent of EWM growth should be established by divers and marked with buoys prior to implementing management plans). Collectively, these survey findings indicate that EWM populations have not stabilized in Gilbert Lake, but are actively expanding.

Figure 1.

Gilbert Lake

T.20 N. - R.11 E., Waushara County, Wisconsin
surface area: 141 acres
maximum depth: 65 feet



9-12-00 Plant Survey
Transect map

Table 1. Results of the aquatic plant survey conducted on Gilbert Lake during September, 2000.

Species		Percent Frequency	Percent Composition
Musk Grass	*Chara spp.*	80.9	43.6
Bushy Pondweed	*Najas flexilis*	31.8	17.2
Variable Pondweed	*Potamogeton gramineus*	30.5	16.4
Eurasian Water Milfoil	*Myriophyllum spicatum*	20.9	11.3
Floating Leaf Pondweed	*Potamogeton natans*	6.4	3.4
Flatstem Pondweed	*Potamogeton zosteriformis*	4.5	2.5
Sago Pondweed	*Potamogeton pectinatus*	3.6	2.0
Large Leaf Pondweed	*Potamogeton amplifolious*	2.7	1.5
Water Smartweed	*Polygonum amphibium*	1.8	1.0
Water Stargrass	*Zosterella dubia*	0.9	0.5
Spadderdock	*Nuphar variegata*	0.5	0.2
White Water Lily	*Nymphaea odorata*	0.5	0.2
Northern Water Milfoil	*Myriophyllum sibericum*	0.5	0.2
no plants found		1.8	

Table 2. The percent frequency of plants by individual transect found in the September, 2000 survey conducted on Gilbert Lake.

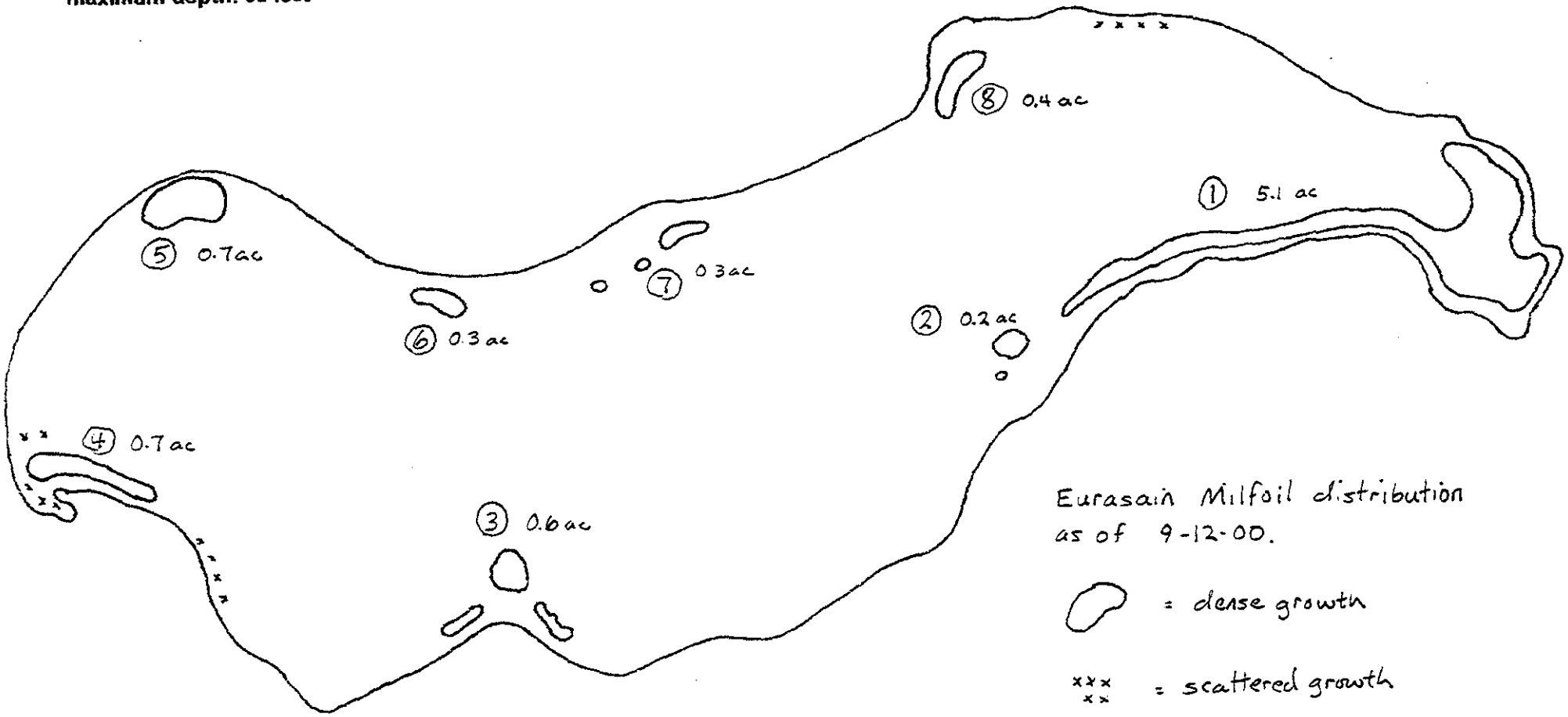
Species		% frequency by transect																	
		A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R
Musk Grass	*Chara spp.*	75	100	58	100	88	75	100	100	88	100	69	100	58	83	92	83	92	25
Eurasian Water Milfoil	*Myriophyllum spicatum*	31	13	42			13		8	13		69		25		17	8		88
Northern Water Milfoil	*Myriophyllum sibericum*															8			
Bushy Pondweed	*Najas flexilis*	69	63	42	50	75	50	17	25	44		6	8	42	25	33	8	33	13
Spadderdock	*Nuphar variegata*									6									
White Water Lily	*Nymphaea odorata*									6									
Water Smartweed	*Polygonum amphibium*																33		
Large Leaf Pondweed	*Potamogeton amplifolius*									25		6		8					
Variable Pondweed	*Potamogeton gramineus*	50	13	42	33	38	50	25	42	50	8	38	17	42	17	42	17		19
Floating Leaf Pondweed	*Potamogeton natans*	19	25	25						19				17		8			
Sago Pondweed	*Potamogeton pectinatus*	13									8		17	8	8	8			
Flatstem Pondweed	*Potamogeton zosteriformis*	13				25			8	32									
Water Stargrass	*Zosterella dubia*											13							
no plants found							13								17			8	
Rake hauls per transect (n = 408)		16	8	12	12	8	8	12	12	16	12	16	12	12	12	12	12	12	16

Table 3. The number of plant samples collected in each individual transect during the September, 2000 survey conducted on Gilbert Lake.

Species		samples collected by transect																	
		A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R
Musk Grass	*Chara spp.*	12	8	7	12	7	6	12	12	14	12	11	12	7	10	11	10	11	4
Eurasian Water Milfoil	*Myriophyllum spicatum*	5	1	5	0	0	1	0	1	2	0	11	0	3	0	2	1	0	14
Northern Water Milfoil	*Myriophyllum sibericum*	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0
Bushy Pondweed	*Najas flexilis*	11	5	5	6	6	4	2	3	7	0	1	1	5	3	4	1	4	2
Spadderdock	*Nuphar variegata*	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
White Water Lily	*Nymphaea odorata*	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
Water Smartweed	*Polygonum amphibium*	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0	0
Large Leaf Pondweed	*Potamogeton amplifolius*	0	0	0	0	0	0	0	0	4	0	1	0	1	0	0	0	0	0
Variable Pondweed	*Potamogeton gramineus*	8	1	5	4	3	4	3	5	8	1	6	2	5	2	5	2	0	3
Floating Leaf Pondweed	*Potamogeton natans*	3	2	3	0	0	0	0	0	3	0	0	0	2	0	1	0	0	0
Sago Pondweed	*Potamogeton pectinatus*	2	0	0	0	0	0	0	0	0	1	0	2	1	1	1	0	0	0
Flatstem Pondweed	*Potamogeton zosteriformis*	2	0	0	0	2	0	0	1	5	0	0	0	0	0	0	0	0	0
Water Stargrass	*Zosterella dubia*	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0
Species per transect		7	5	5	3	4	4	3	5	9	3	6	4	7	4	7	5	2	4
Rake hauls per transect (n = 408)		16	8	12	12	8	8	12	12	16	12	16	12	12	12	12	12	12	16

Figure 3.

Gilbert Lake
T.20 N. - R.11 E., Waushara County, Wisconsin
surface area: 141 acres
maximum depth: 65 feet



Methods of Controlling EWM

Physical removal

Boat-mounted mechanical weed harvesters have been occasionally employed to control Eurasian milfoil. Mechanical harvest is not a recommended control method for waters that are not completely dominated by Eurasian milfoil, however. Eurasian milfoil can reproduce by fragmentation (Borman, et.al. 1997), and the free-floating plant matter left from cutting operations can accelerate dispersal of the plant. Mechanical harvest does offer several distinct advantages, though. Harvested plant matter can be removed from the lake system, eliminating the possibility of low dissolved oxygen due to bacterial decomposition. The possibility of algae blooms due to nutrient release is also greatly reduced. There are no water use restrictions following mechanical harvest either. A disadvantage of mechanical weed harvest is that it is not species selective. While cutting does not typically kill plants, there is little evidence to suggest that cutting can induce a shift back to native species. In the process of removing plants, weed harvesters also kill substantial numbers of fish, reptiles, amphibians and invertebrates (Shardt, 1999). Perhaps the greatest drawback of a mechanical harvest program is the cost. Cost / benefit analyses conducted by the Florida Department of Environmental Protection found that mechanical harvest of nuisance weeds cost 41.7 times as much as fluridone treatments to achieve the same level of control (Shardt, 1999). Given these considerations, employing a mechanical weed harvester would be a poor choice for Gilbert Lake.

Hand pulling and raking, on the other hand, are generally recommended as a viable supplement to most management approaches. While not practical for larger colonies, hand raking and pulling of small patches can help to slow the spread of the plant. For lake users willing to take this effort, care should be

taken to properly identify target plants, and to make sure all uprooted and broken plant matter is completely removed from the water.

Benthic Barriers

Bottom barriers and sediment blankets will completely prevent EWM growth all season long. DNR permits are required to place these materials in public waters. This management approach is commonly discouraged by the DNR, however, because benthic barriers inhibit the growth of all rooted plant species and do little to restore littoral habitats. Other disadvantages include the need for semi-annual removal and cleaning, and a high material cost (Jester, et.al., 1999). These factors make benthic barriers technique with limited application for Gilbert Lake.

Biological Controls

Two insect species have been associated with EWM decline, the milfoil weevil and a chironimid, *Crycotopus myriophylli.* The milfoil weevil has been unsuccessfully tried in Gilbert Lake. Very little research has been done on *Crycotopus*, thus it is not considered a management option at this time. The challenges of biological control vectors are that they must be capable of producing the desired level of control and, where native plant restoration is desired, be entirely species specific (Pullman, 1993).

Aquatic Herbicides

Fluridone (*Sonar*®) has been widely used and well researched in the states of Florida and Michigan as a tool for controlling EWM. It is gradually gaining acceptance in Wisconsin as well. One of the most important research findings about Fluridone is that it is almost entirely selective to EWM when applied at low (<10ppb) concentrations. Studies conducted in controlled environments on early season applications of fluridone to EWM

along with *Elodea, Chara, Vallisneria, Najas* and *Potamogeton spp.* found >90% control of Eurasian milfoil at 5ppb concentrations with no negative impacts on the other species. Musk grass *(Chara spp.)* and bushy pondweed *(Najas spp.)* actually increased in biomass at concentrations as high as 20ppb (Netherland, et.al., 1997). Likewise, studies conducted on Michigan lakes found that early season treatments of fluridone at levels between 5 and 10ppb provided excellent EWM control with minimal non-target species impacts (Getsinger, 1998). Another advantage of fluridone is that there are no restrictions on swimming and fishing following treatment. The disadvantages of liquid fluridone treatments are that they must be applied on a whole lake basis. The great depth and volume of Gilbert Lake would make this approach very costly. The limited acreage of EWM in Gilbert Lake does not justify a whole-lake treatment either. A granular formulation of fluridone that is suitable for spot treatments is available. Unfortunately, little formal research has been done on the use of this product as a selective herbicide.

Diquat (*Reward*™, *Weedtrine D*®) has been used for temporary selective control of EWM. Applied at low rates, Diquat will cause EWM to drop out of the water column in 10 – 14 days, with little effect on most native species. Unfortunately EWM will quickly recover – requiring multiple annual treatments to achieve desired control (Pullman, 1993). While such treatments would be economical for Gilbert Lake, they would likely do little for long term control of EWM.

Perhaps one of the most well researched aquatic herbicides on the market, 2,4D (*Navigate*®), has long been accepted as a safe and effective treatment for EWM. Applied at a rate of 100 – 150 lbs. per surface acre, it is highly selective. According to the product label, the only native species found in Gilbert Lake that may be affected by this product are northern milfoil,

spadderdock and white water lily. As a granular herbicide, 2,4D can be applied directly upon growths of EWM; which further aids in species selectivity. Water use restrictions are also minimal for this product. There are no restrictions on fish consumption and lawn watering, a one-day restriction on swimming and a 14-day restriction on watering food crops. The primary drawback of 2,4D is that two or three treatments may be required in one season to achieve desired control. Because of the nature of granular applications, complete eradication of EWM is seldom expected. The most realistic management approach usually involves aggressively treating EWM for two to three years to drastically reduce the density of the plant, then conducting limited annual treatments to keep it at sub-nuisance levels. These considerations make 2,4D treatments the most practical choice for controlling in Gilbert Lake.

A Five Year Management Plan

The Gilbert Lake Advancement Association voted to use 2,4D treatments as part of a five-year plan to control EWM in Gilbert Lake. Aquatic Biologists, Inc. was retained to conduct these treatments in 2001.

Treatment Plans

The 2001 treatment plans call for applying *Navigate*® to 1/3 of the total EWM acreage. The area selected is the bay at the east end of the lake; which contains approximately 2.9 acres of EWM (Figure 4). The plans call for applying *Navigate*® at a rate of 150 lbs./acre - as recommended by the manufacturer. EWM located in and adjacent to beds of spadderdock and white water lily will be treated at a rate of 75 lbs./acre to lessen the likelihood of affecting these plants. The purpose of treating 1/3 of the EWM acreage is to evaluate the effectiveness of 2,4D in Gilbert Lake so that future treatment needs can be assessed, and realistic goals set. The bay at the east end of the lake was selected because it receives heavy use around the boat landing, and because it is likely to oldest and most mature colony of EWM. Because calcium carbonate precipitation on plant leaves may reduce treatment effectiveness, treatments will be conducted as early as possible (late April – early May). A follow up treatment will be scheduled 21 days later. If necessary, a second follow up treatment will be scheduled 21 days after that. The total cost of initially treating the 2.9 acres will be $1992. The total costs of follow up treatments will vary, depending upon the amount of EWM that needs to be retreated, but is not expected to exceed $1200. Warning signs that list product name, date and use restrictions will be posted at the boat landing and at docks adjacent to treatment areas. Because 2,4D knocks down EWM in a matter of days, restricting boating activities in treatment areas is not necessary.

During 2002 and 2003, *Navigate*® treatments will be conducted on EWM colonies throughout the lake, contingent upon DNR permit approval and agreement with riparian property owners. The objectives of these treatments will be to eradicate or drastically reduce EWM distribution in the lake. Follow up treatments will be conducted as needed. These treatments will be done in the same format as the 2001 treatment. (Treating 8 acres at 150 lbs./ acre would cost approximately $5000).

Single annual applications of *Navigate*® will be made to any remaining colonies of EWM during 2004 and 2005. The goals of these treatments will be to maintain EWM at sub-nuisance levels throughout the lake.

Anticipated Results

It is expected that 2,4D will prove to be an effective tool in combating EWM in Gilbert Lake, as it has in hundreds of other lakes. Deep water, calcium carbonate precipitation, plant maturity and density are all factors affecting 2,4D effectiveness. These are all concerns for Gilbert Lake as well. However application methods and rates and treatment timing can be adjusted to account for these factors. The partial treatment conducted in 2001 should allow for "fine tuning" of the treatment methods needed for Gilbert Lake. It is anticipated that the large-scale treatments conducted in 2002 an 2003 will be able to significantly reduce EWM distribution to the point that subsequent annual treatments can be limited to two acres or less. The single annual treatments of 2004 and 2005 will test whether single applications can maintain EWM at low densities.

If the management approach outlined in this plan fails to meet expectations, alterations to the plan or different management options will be discussed and explored.

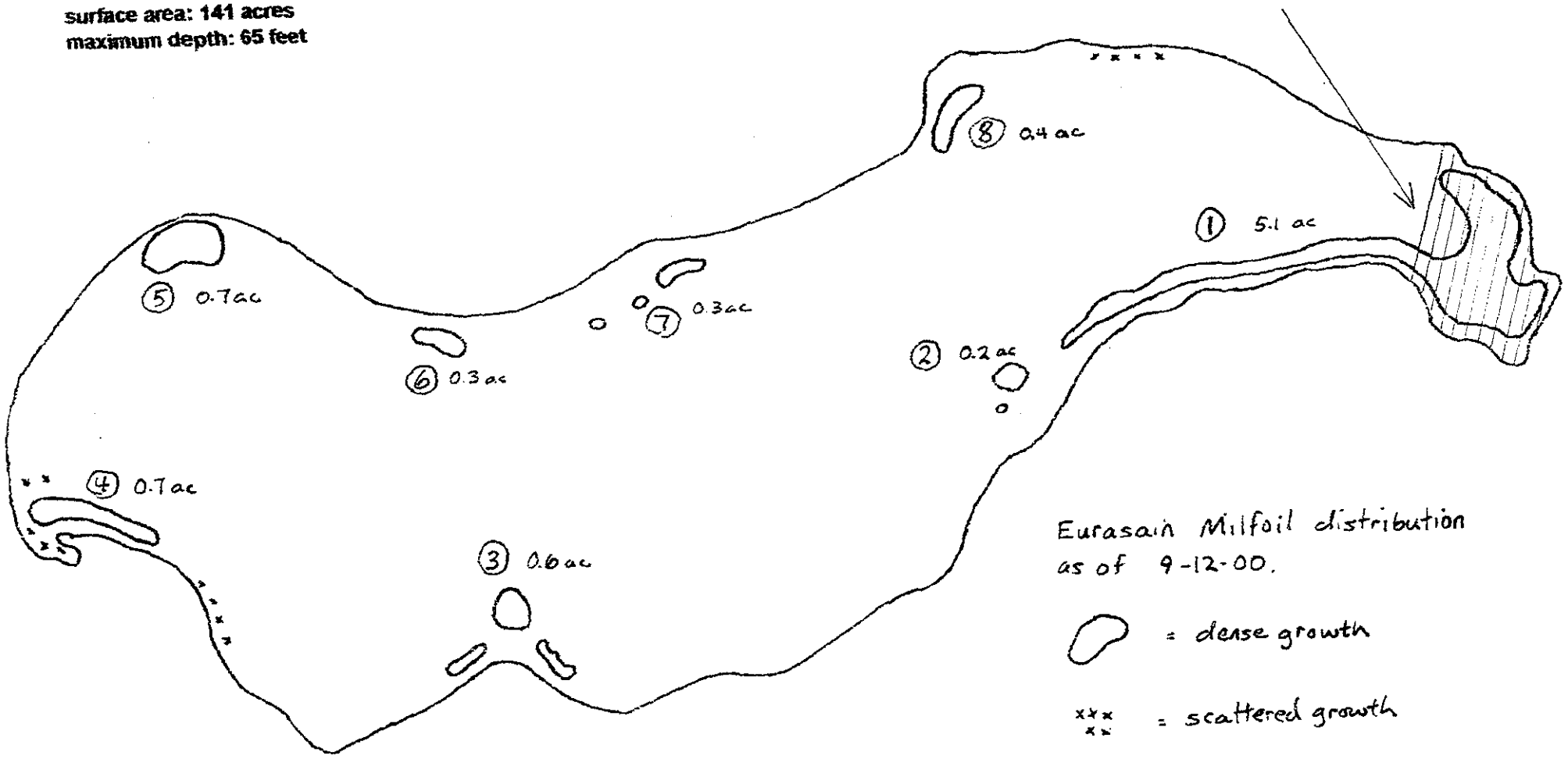
Monitoring

Prior to conducting the initial treatment in 2001, the exact extent of EWM beds in the treatment area will be marked with temporary buoys and logged as GPS waypoints so that treatment effectiveness can be assessed. During September 2001, an aquatic plant survey duplicating the one conducted in September 2000 will be done. The distribution of EWM beds throughout the lake will be charted again, as well. Volunteers will continue to monitor secchi depths, total phosphorus and chlorophyll concentrations as part of the Self-Help Lake Monitoring Program. The results of these surveys will be presented in a year-end report.

Similar plant surveys, charting of EWM distribution, monitoring of treatment effectiveness and water quality analysis will be conducted annually from 2002 through 2005. Annual report will summarize the survey results, and make recommendations for future management. The Gilbert Lake Advancement Association will annually seek small scale grant funding from the DNR's Lake Planning Grant Program to help pay for this work. This level of monitoring will insure that the best management practices for Gilbert Lake are being implemented, and that the goals of the Lake Association are being met.

Figure 4.

Gilbert Lake
T.20 N. - R.11 E., Waushara County, Wisconsin
surface area: 141 acres
maximum depth: 65 feet



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Aquatic Plant Survey Data Sheet

Lake Name: ______________________ **Date:** ____________

Collectors: ______________________ **Water Temp.:** ____________

______________________ **Turbidity:** ____________

TRANSCECT # ________

Species:	**QUAD 1**	**QUAD 2**	**QUAD 3**	**QUAD 4**	**Total**	**% Freq**
Coontail	1 2 3 4	1 2 3 4	1 2 3 4	1 2 3 4		
Musk Grass (*Chara sp.)*	1 2 3 4	1 2 3 4	1 2 3 4	1 2 3 4		
Elodea	1 2 3 4	1 2 3 4	1 2 3 4	1 2 3 4		
Water Stargrass	1 2 3 4	1 2 3 4	1 2 3 4	1 2 3 4		
Eurasian Water Milfoil	1 2 3 4	1 2 3 4	1 2 3 4	1 2 3 4		
Northern Water Milfoil	1 2 3 4	1 2 3 4	1 2 3 4	1 2 3 4		
Bushy Pondweed	1 2 3 4	1 2 3 4	1 2 3 4	1 2 3 4		
Large Leaf Pondweed	1 2 3 4	1 2 3 4	1 2 3 4	1 2 3 4		
Curly Leaf Pondweed	1 2 3 4	1 2 3 4	1 2 3 4	1 2 3 4		
Sago Pondweed	1 2 3 4	1 2 3 4	1 2 3 4	1 2 3 4		
Clasping Leaf Pondweed	1 2 3 4	1 2 3 4	1 2 3 4	1 2 3 4		
Robbins Pondweed	1 2 3 4	1 2 3 4	1 2 3 4	1 2 3 4		
Variable Leaf Pondweed	1 2 3 4	1 2 3 4	1 2 3 4	1 2 3 4		
White Stem Pondweed	1 2 3 4	1 2 3 4	1 2 3 4	1 2 3 4		
Illinois Pondweed	1 2 3 4	1 2 3 4	1 2 3 4	1 2 3 4		
Flatstem Pondweed	1 2 3 4	1 2 3 4	1 2 3 4	1 2 3 4		
Bladderwort	1 2 3 4	1 2 3 4	1 2 3 4	1 2 3 4		
Water Celery	1 2 3 4	1 2 3 4	1 2 3 4	1 2 3 4		
	1 2 3 4	1 2 3 4	1 2 3 4	1 2 3 4		
	1 2 3 4	1 2 3 4	1 2 3 4	1 2 3 4		
	1 2 3 4	1 2 3 4	1 2 3 4	1 2 3 4		
	1 2 3 4	1 2 3 4	1 2 3 4	1 2 3 4		
	1 2 3 4	1 2 3 4	1 2 3 4	1 2 3 4		
	1 2 3 4	1 2 3 4	1 2 3 4	1 2 3 4		
	1 2 3 4	1 2 3 4	1 2 3 4	1 2 3 4		
	1 2 3 4	1 2 3 4	1 2 3 4	1 2 3 4		
	1 2 3 4	1 2 3 4	1 2 3 4	1 2 3 4		
DEPTH:						
SUBSTRATE:						
DISTURBED?						
SECCHI DEPTH:						

Samples Collected: