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MEMORANDUM REPORT NUMBER 94

A RECOMMENDED PUBLIC BOATING ACCESS AND WATERWAY PROTECTION PLAN FOR BIG MUSKEGO 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

July 1994

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A RECOMMENDED PUBLIC BOATING ACCESS AND WATERWAY PROTECTION PLAN FOR BIG MUSKEGO LAKE, WAUKESHA COUNTY, WISCONSIN

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A RECOMMENDED PUBLIC BOATING ACCESS AND WATERWAY PROTECTION PLAN FOR BIG MUSKEGO LAKE, WAUKESHA COUNTY, WISCONSIN

INTRODUCTION

Big Muskego Lake is a 2,260-acre through-flow lake situated on Muskego Creek and the Muskego Canal in the City of Muskego, Waukesha County, Wisconsin. Together with Bass Bay, an 100 acre deep water embayment adjacent to the northern shore of Big Muskego Lake and connected to it by a short channel, Big Muskego Lake is a valuable ecological resource offering a variety of recreational opportunities and attractive vistas to the City and its visitors. The Lake forms one of two major waterbodies located within the City, being located downstream of Little Muskego Lake and near to STH 36 and CTH Y and CTH 00.

Historically, the recreational value and scenic beauty of Big Muskego Lake has been impaired by the discharge of treated wastewaters directly to the Lake, a circumstance which stimulated excessive growths of algae and aquatic plants in the Lake. This practice, initiated in 1968, ceased in 1984 when the City of Muskego wastewater treatment plant was abandoned pursuant to recommendations made in the regional water quality management plan. In recent years, the City and community have made concerted efforts to control and manage the effects of this past neglect, and restore the Lake to full, multiple purpose use. These efforts have included the formation of the Big Muskego-Bass Bay Lake Management District in 1974, and the initiation, in collaboration with the Wisconsin Department of Natural Resources (DNR) and other agencies, of the Muskego-Wind Lakes Nonpoint Source Pollution Abatement Program Priority Watershed Project, Project Number PL-91-1, during 1992. This latter project confirmed and made grant funds available to implement certain of the lake management recommendations for Big Muskego-Wind Lakes initially made by the Southeastern Wisconsin Regional Planning Commission

¹SEWRPC Planning Report No. 30, <u>A Regional Water Quality Management Plan for Southeastern Wisconsin--2000, Volume Three: Recommended Plan</u>, June 1979 and SEWRPC Planning Report No. 12, <u>A Comprehensive Plan for the Fox River Watershed</u>, <u>Volume Two: Alternative Plans and Recommended Plan</u>, February 1970.

(SEWRPC) in December 1991.² Subsequently, the City and District requested SEWRPC to prepare the recommended boating access and waterway protection plan for the Lake presented in this report.

This boating access and waterway protection plan was prepared as a component of the overall Big Muskego-Bass Bay lake management plan, and represents an important element of the on-going commitment of the City of Muskego and Big Muskego-Bass Bay Lake Management District to sound environmental management of the Lake. The boating access and waterway protection plan element of the lake management plan was prepared during 1994 by the Regional Planning Commission, based upon field surveys conducted by the DNR and the Regional Planning Commission during 1994. This plan follows the format adopted by the DNR for boating access and waterway protection plans pursuant to Section NR 1.91(6) of the Wisconsin Administrative Code. Its scope is limited to measures which can be effective in the management of recreational boating use; measures which can be readily undertaken by the City and Lake Management District in concert with the riparian residents; and measures which will directly affect the use and environment of Big Muskego Lake.

This report is comprised of six main sections: 1) a brief description of the Lake and its watershed; 2) a statement of the current access restrictions and waterway protection practices; 3) an evaluation of alternative means of meeting public access and waterway protection requirements; 4) a description of the recommended plan; 5) a description of the operational aspects of the recommended plan; and 6) a description of recommended means of monitoring and evaluating the efficacy of the plan and waterway protection measures over time.

²SEWRPC Community Assistance Planning Report No. 198, <u>A Management Plan for Wind Lake</u>, <u>Racine County</u>, <u>Wisconsin</u>, December 1991; <u>Wisconsin Department of Natural Resources Publication WR-340-93, <u>A Nonpoint Source Control Plan for the Muskego-Wind Lakes Priority Watershed Project</u>, October 1993; <u>Muskego-Wind Lakes Priority Watershed Newsletter</u>, <u>Special Edition</u>: <u>Big Muskego-Bass Bay Management Alternatives</u>, March 1994.</u>

^{3&}lt;sub>Ibid</sub>.

Statement of Management Goals and Objectives

The goals and objectives of the Big Muskego Lake Management District were developed in consultation with the City of Muskego. These goals and objectives are to:

- Effectively 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;
- Manage the waterbody in an environmentally sound manner, preserving and enhancing its water quality and biotic communities, their habitats, and essential structure and function in the waterbody and adjacent areas; and
- Protect and maintain public health, and promote public comfort, convenience, necessity and welfare, in concert with the natural resource, through the environmentally sound management of native vegetation, fish, and wildlife populations in and around Big Muskego Lake.

BIG MUSKEGO LAKE AND ITS WATERSHED

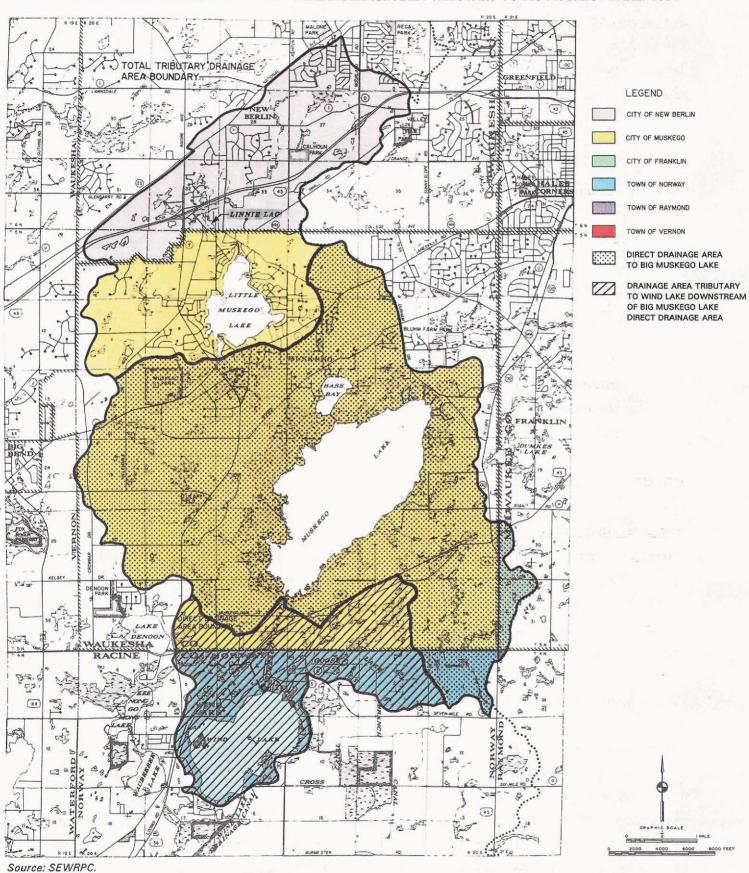
Physical Characteristics

Watershed Characteristics: Big Muskego Lake is located in the southern portion of the City of Muskego in Waukesha County as shown on Map 1. The lake is the third in a chain of four lakes situated on Muskego Creek, downstream of Linnie Lac and Little Muskego Lake and upstream of Wind Lake. The Muskego Creek forms the principle inflow to Big Muskego Lake. Outflow is via the Muskego Canal which ultimately discharges, via the Wind Lake Canal, to the Middle Fox River in the vicinity of the Village of Waterford in Racine County.

The total drainage area of Big Muskego Lake is about 28.3 square miles. Portions of the watershed, upstream of Linnie Lac and Little Muskego Lake, extend into the City of New Berlin. Linnie Lac and Little Muskego Lake are included within this watershed. The area considered as the direct drainage area of the Lake--that area which drains to Big Muskego Lake excluding the area that drains through any of the other major lakes--is approximately 12,150 acres or about 19.0 square miles, and is situated wholly within the City of Muskego in Waukesha County.

Map 1

CIVIL DIVISION BOUNDARIES IN THE TOTAL DRAINAGE AREA TRIBUTARY TO BIG MUSKEGO LAKE: 1990



<u>Waterbody Characteristics</u>: Big Muskego Lake is comprised of two connected, yet distinct, waterbodies: the 2,260-acre Big Muskego Lake and the 100-acre Bass Bay situated adjacent to the northern shore of Big Muskego Lake and connected to the Lake proper by a short channel.

However, prior to the early 1840's, a single waterbody, known as Mus-kee-quac, consisting of an approximately 3,257-acre deep water marsh/shallow water lake system encircled by hundreds of smaller wetlands scattered throughout the extensive tall-grass prairie-oak savanna landscape, existed in this southeastern portion of Waukesha County. Subsequently, however, this system was drastically altered and manipulated.

Beginning in 1887, two drainage districts were organized to promote drainage of the wetlands in and around Big Muskego (Mus-kee-guac) and Wind Lakes. During the following three years, Muskego Creek between Big Muskego Lake and Wind Lake, and between Wind Lake and the Fox River was dredged creating the Muskego and the Wind Lake Drainage Canals, respectively. By 1890, this initial dredging, known as the "first drainage" or "farmers drainage", was completed, and separate Big Muskego and Wind lake basins created. During the following year, the Wisconsin Legislature granted the beds of Big Muskego and Wind Lakes to Mr. James Reynold, who formed the Wisconsin State Land & Improvement Company for the purpose of draining Big Muskego and Wind Lakes and selling the reclaimed lands to farming interests. The "second drainage", as this became known, was undertaken between 1892 and 1894 and essentially drained Big Muskego Lake, although the exposed lake bed remained too wet for farming.4

During 1896, the Wisconsin Supreme Court, in *Priewe vs. Wisconsin State Land & Improvement Company*, decided that the grant of the lake bed was unconstitutional and void, and declared that Big Muskego Lake was to be restored to the condition that had existed after the "first drainage" but before the "second drainage". Between 1899 and 1903, Priewe and others attempted to build and maintain a dam at the outlet of Big Muskego with the intent of enforcing the Supreme Court order. However, most of the first dam was destroyed and removed the day after

⁴Wisconsin Department of Natural Resources, <u>Draft Management Plan for Big Muskego Lake</u>, <u>Waukesha County</u>, <u>Wisconsin</u>, March 1994; SEWRPC Community Assistance Planning Report No. 198, op. cit.

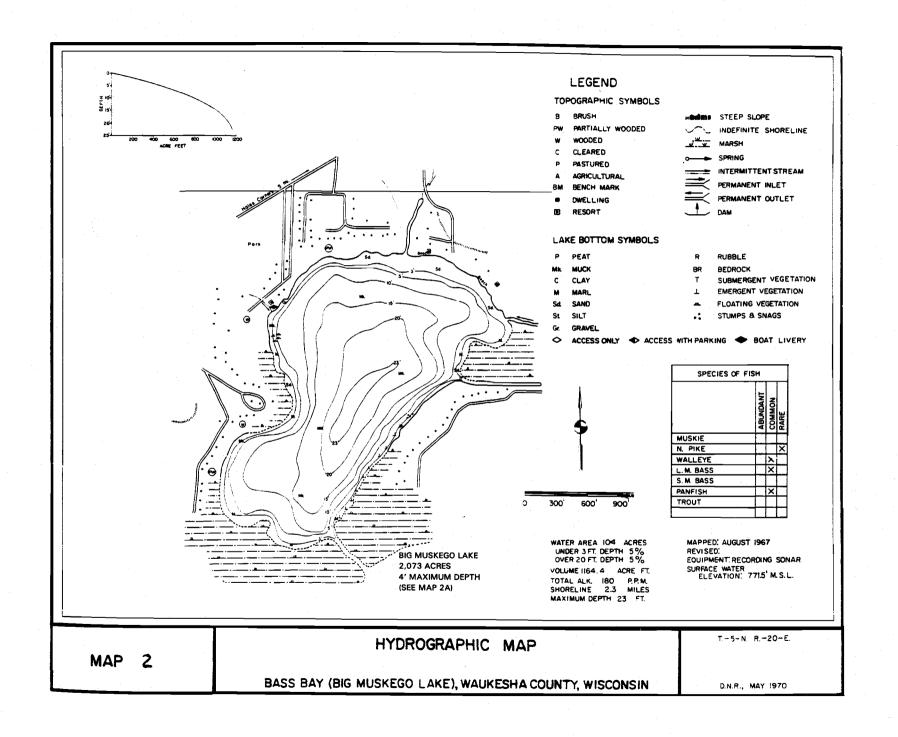
its construction. Following a further court decision in 1903, Priewe and others built various earthen dams, each of which was destroyed, until 1909, when a concrete dam was built. This dam remained until 1930 when it was replaced by another concrete structure.⁵

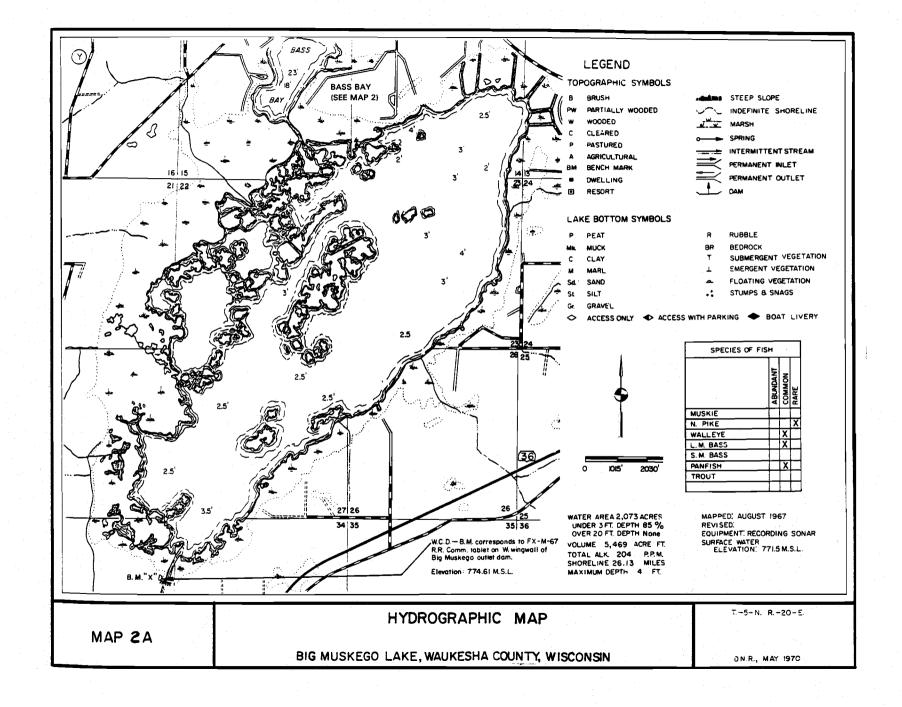
Notwithstanding this success in completing the dam, the water level within the Big Muskego Lake basin remained in dispute until 1915, when the Railroad Commission, after holding public hearings on level of Muskego Lake Dam, fixed the level of the Lake at between 771.44 and 771.66 feet above National Geodetic Vertical Datum of 1929. This is the present elevation of the Lake, and is about two to three feet below historic levels. At this elevation, Big Muskego Lake and Bass Bay are two distinct basins: the larger, 2,260-acre main basin being roughly trapezoidal in shape with a marsh-like character; and the smaller basin, located northeast of the inlet of Muskego Creek, being a rectangular 100-acre waterbody with a more lake-like character. The main waterbody has a maximum depth of about 4 feet, a mean depth of about 2.6 feet and a volume of 5,469 acre-feet. Bass Bay, in contrast, has a maximum depth of about 25 feet and a mean depth of 11.5 eet. Hydrographic maps of Big Muskego Lake and Bass Bay are provided in Maps 2 and 2A.

Of the approximately 2,260-acre main lake basin, a considerable proportion is comprised of wetland fringe and in-lake islands. Cattails Typha latifolia, Typha glauca, and Typha angustifolia, are the dominant macrophyte in these fringing areas. Based on 1990 Commission one inch equals 400 feet scale ratioed and rectified aerial photographs, the open water areas of Big Muskego Lake proper were determined to be 1,989.0 acres in extent. The fringing wetland was determined to extend over 1,258.0 additional acres, with 105.9 acres of in-lake islands present at the time of the photography. Bass Bay was similarly assessed by Commission staff, and determined to have 105.0 acres of open water. A June 1994 field inventory indicated that open water conditions were similar to the 1990 conditions. This assessment, therefore, resulted in a determination of a total of 2,094 acres of open water in the combined Big Muskego Lake-Bass Bay

^{5&}lt;sub>Thid</sub>.

 $^{^{6}}$ Open water area is defined in Section NR 1.91 (2) (e) as the water body surface which appears as water predominantly devoid of emergent vegetation on recent aerial photographs representative of the navigation season.





system in 1990. This is smaller than the approximately 2,360 acres of open water reported for the combined system in DNR Publication No. FM-800-91, <u>Wisconsin Lakes</u>, published in 1991, but similar to the 2,070 acres set forth in DNR Publication No. WR-340-93, <u>A Nonpoint Source Control Plan for the Muskego-Wind Lakes Priority Watershed Project</u>, published in October 1993. Of the latter acreage, 1,966 acres are reported as being within the main lake basin and 104 acres in Bass Bay.

This fluctuation in lake surface area may be due in part to inter-annual and seasonal variations in water level arising from variations in precipitation amounts, surface runoff, and groundwater infiltration within the Big Muskego Lake-Bass Bay tributary drainage area. In addition to such hydrological variability, some further variation in measured open water area is likely to be due to variations in the extent of the marginal aquatic plant growth and extent of the plant growth on and around the islands present in the main body of Big Muskego Lake.

The excessive shallowness of Big Muskego Lake and the organic nature of the lake sediments means that the waters of the lake are often naturally turbid due to wind-induced resuspension of bottom sediments. This condition can be aggravated by the resuspension of bottom sediments as a result of the operation of high speed watercraft. Available inventory data would suggest a paucity of benthic-bottom-dwelling--fauna in the Lake. This may be due in part to the re-deposition of artificially suspended sediments, especially in areas of the lake sheltered from normal wind-induced resuspension which can potentially smother these animals. In addition, continued disturbance of the sediments can favor the growth of species of "invasive" aquatic plants that generally are considered as interfering with water-based recreation, such as the Eurasian water milfoil (Myriophyllum spicatum) and curly-leaf pondweed (Potamogeton crispus).

A field reconnaissance, conducted during June 1994 by Commission staff in collaboration with DNR staff, resulted in an assessment that nuisance conditions of plant growth exist throughout virtually all of the Big Muskego Lake basin. The term "nuisance conditions" as used here is defined as the inability to motor a

⁷Wisconsin Department of Natural Resources, <u>Muskego-Wind Lakes Priority Watershed</u>
<u>Project Water Resource Appraisal</u>, April 1994.

boat unimpeded for a distance in excess of fifty feet. ⁸ The dominance of two rooted plant species, water milfoil and curly leaf pondweed, throughout the lake basin contributed to the observed nuisance conditions. In addition, the extremely shallow depth prevented effective travel in even clear areas of the lake basin. These conditions were not observed in Bass Bay given the greater depth of that embayment.

Land Use and Developmental Factors

Land Use: As shown on Map 3, land use surrounding Big Muskego Lake is primarily natural—wetlands and floodlands predominant along the southern and western shores—with urban development occurring primarily in the form of single family residential units interspersed with commercial and recreational development along a portion of the northern and eastern shores. The existing residential areas may be considered fully developed, although some limited infilling and backlot development may be possible.

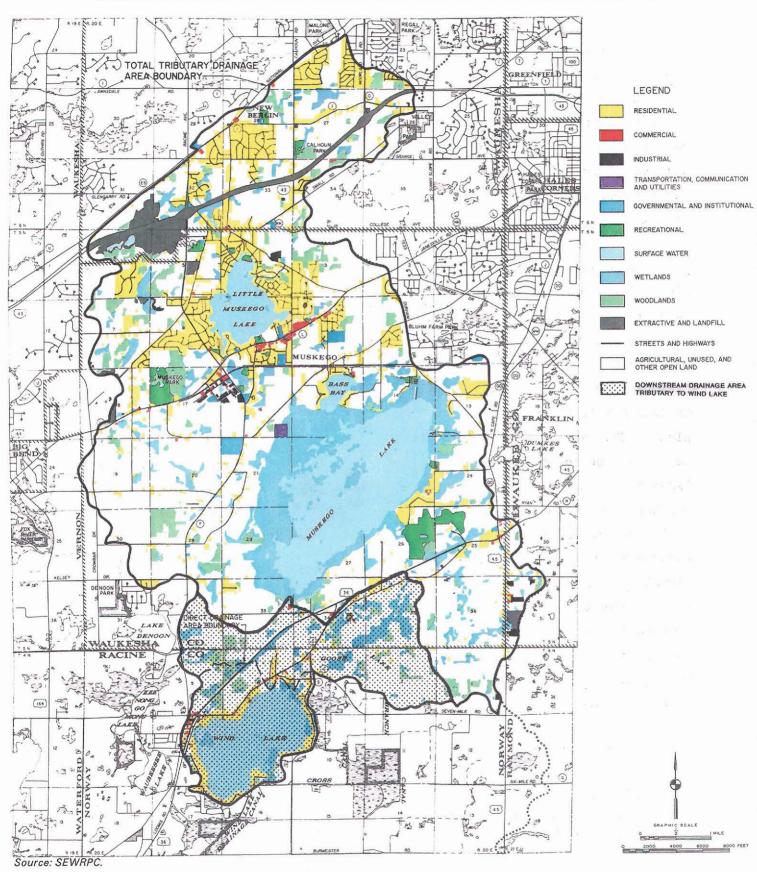
The location of the City of Muskego in the Milwaukee urbanized area may be expected to lead to the further residential development in the vicinity of the Lake, together with an increased demand for water-based recreation on the Lake, and increased traffic of all kinds in the Big Muskego Lake watershed within the City of Muskego. Some limited low and medium density urban residential development along a portion of the northern and eastern shores of Big Muskego Lake and Bass Bay is envisioned in the recommended 2010 regional land use plan. This development is envisioned to occur primarily in areas presently devoted to agricultural use away from the lake shore but within close proximity to existing lakefront development as shown on Map 4. While such development may not be riparian, the projected population growth may be expected to increase the demand for lake access and place additional pressures on the ability of Big Muskego Lake-Bass Bay to satisfy the need for water-based recreation without degradation of the resource.

⁸A 14-foot vee-hulled, shallow draft skiff equipped with a 4.5 horsepower outboard motor was used for the purpose of this survey, conducted on June 14, 1994.

⁹SEWRPC Planning Report No. 40, <u>A Regional Land Use Plan for Southeastern Wisconsin--2010</u>, February 1992.

Map 3

EXISTING LAND USE IN THE TOTAL DRAINAGE AREA TRIBUTARY TO BIG MUSKEGO LAKE: 1985



The need to provide for additional recreational opportunities within the City generally and for enhanced access to Big Muskego Lake-Bass Bay, in particular, should be anticipated. Provision of such opportunities should, insofar as possible, be undertaken without relaxation of and intrusion into the present boundaries of the environmental corridors surrounding the resource. The current zoning in the drainage area tributary to Big Muskego Lake is shown on Map 5. To obviate unrealistic public expectations concerning the nature and extent of water-based recreational opportunities at Big Muskego Lake, development of a clearly articulated community vision for this Lake is strongly recommended.

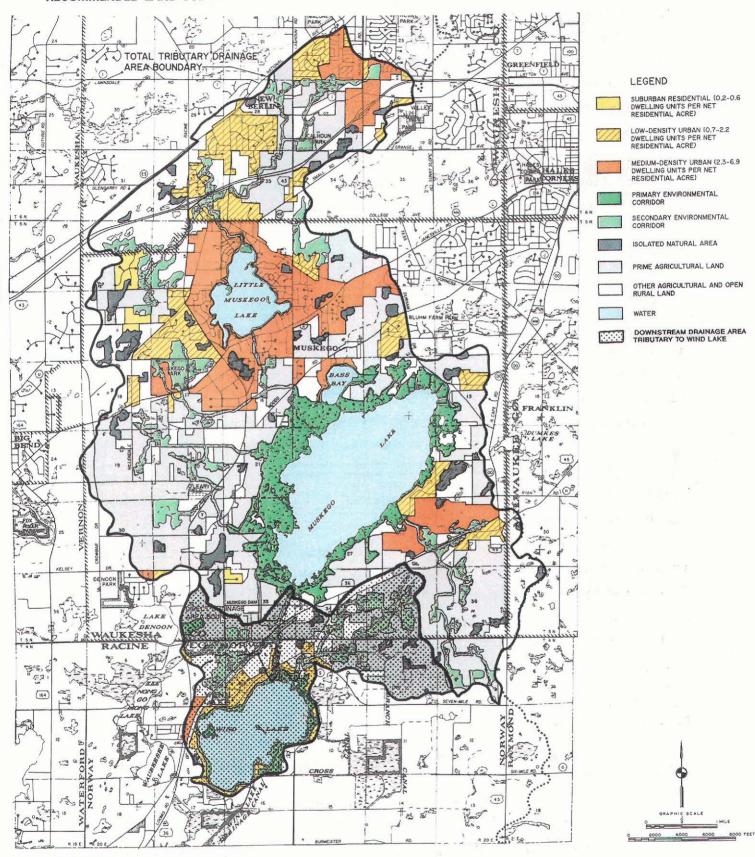
Public and Private Access: The limited areas of shoreline and adjacent areas of Big Muskego Lake, outside of the extensive wetlands and floodlands fringing the lake are used primarily for residential purposes, as shown on Map 3, although a number of commercial establishments and recreational facilities are also present. Three private access sites, open to the public, are located on the lake. further private or local access site development may occur based upon recommendations set forth in the Waukesha County and City of Muskego park and open space The former plan prepared by the Commission concluded that Big Muskego Lake could be considered to have adequate access, even though no publicly-owned lands bordered the Lake. It should be emphasize, however, that this assessment was based on county-wide lake recreational use criteria which differ from the public boating access criteria recently established under Section NR 1.90 of the Wisconsin Administrative Code. 10 Application of more site-specific lake recreational use criteria, and recognition of the special seasonal uses and demands made of the Lake, especially during the waterfowl hunting season, during the preparation of a City-wide park and open space plan for the City of Muskego by the Commission, resulted in a recommendation that a publicly-owned access site be acquired on Big Muskego Lake-Bass Bay. 11 This boating access and waterway protection plan is consistent with this latter recommendation.

 $^{^{10}}$ In terms of SEWRPC Community Assistance Planning Report No. 137, <u>A Park and Open Space Plan for Waukesha County</u>, published in December 1989, the distinction was drawn between fast boating access requiring a ramp and car-trailer parking, and slow boating access which required car parking only; private access open to the general public, as well as publicly owned access sites, were included in the assessment of the degree to which access opportunities were adequate.

¹¹SEWRPC Community Assistance Planning Report No. 202, <u>A Park and Open Space Plan for the City of Muskego</u>, January 1992.

Map 4

RECOMMENDED LAND USE PLAN FOR THE TOTAL DRAINAGE AREA TRIBUTARY TO BIG MUSKEGO LAKE: 2010



Source: SEWRPC.

Environmentally Valuable Areas and Habitat Factors

Background: The extensive wetlands surrounding Big Muskego Lake are an increasingly threatened feature of the natural resource base of the Southeastern Wisconsin Region. 12 While significant efforts are being undertaken to protect, rehabilitate, and restore these areas, 13 wetland acreage in the Region generally continues to decline as lands are converted for various urban and agricultural purposes. 14 The impacts of this decline are severalfold, including hydrological--loss of flood retention capability and the consequent loss of perennial water flows, economic -- increased flood-related losses and loss of beneficial use of waters that cease to flow year round, aesthetic -- loss of open space and increased passage of previously filtered pollutants downstream, and ecological -- loss of biodiversity. It is primarily in this latter area that Big Muskego Lake has been recognized as an important regional resource. A significant portion of the western shore--encompassing 30 acres of shoreland and 440 acres of lake surface-is currently a State wildlife refuge subject to seasonal, September 1 to December 31, no-entry restrictions as shown on Maps 6 and 7.15 This area comprises a Class I, high value wildlife habitat -- as shown on Map 6, and within the primary environmental corridor established around Big Muskego Lake--as shown on Map 7.

Aquatic Plant Communities: Several surveys of aquatic plant communities in Big Muskego Lake have been conducted, the most comprehensive being that conducted by the DNR in 1983. 16 A species list, compiled from the results of this aquatic plant survey, is set forth in Table 1. This survey identified some 20 species of plant, a number of which were common to abundant. While much of the lake bed is covered by cattails, Typha latifolia, and bulrush, Scirpus validus, species

¹²SEWRPC Planning Report No. 40, op. cit.

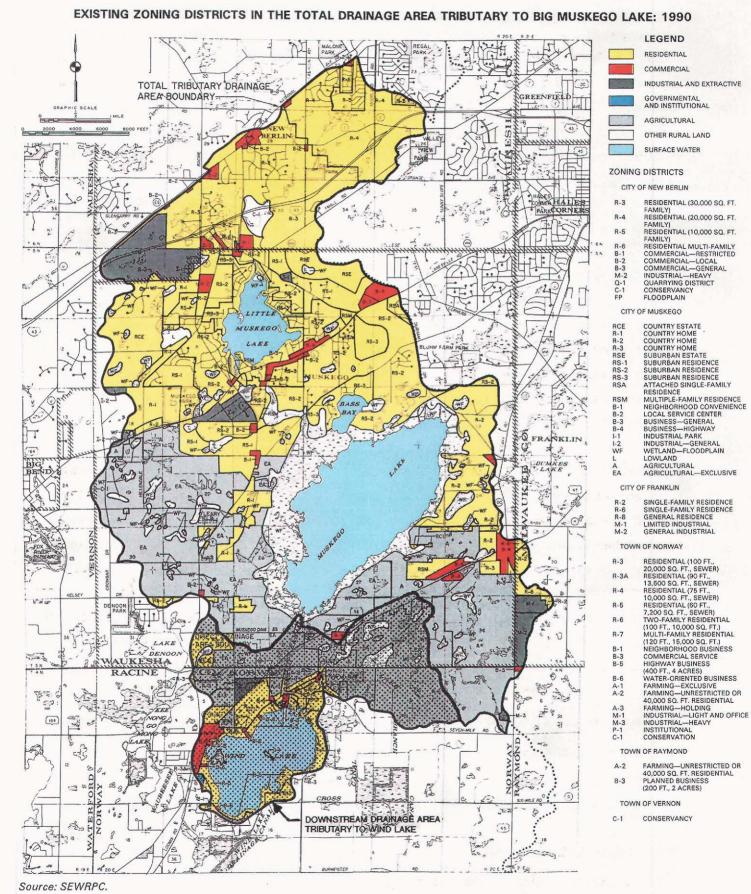
¹³In Wisconsin, Chapters NR 103 and NR 107 of the Wisconsin Administrative Code provide for protection of aquatic plant communities, while Chapters NR 115 and NR 117 provide for shoreland wetland zoning protection. Chapters NR 50/51 and NR 191 provide for state cost-sharing in wetland restoration projects.

¹⁴SEWRPC Planning Report No. 40, A Regional Land Use Plan for Southeastern Wisconsin: 2010, January 1992, Table 92.

 $^{^{15}}$ A 470 acre no entry wildlife refuge was established at Big Muskego Lake under Section NR 15.02(4), Wisconsin Administrative Code.

¹⁶Wisconsin Department of Natural Resources, <u>Big Muskego Lake</u>, <u>Waukesha County</u>; <u>Feasibility Study Results</u>; <u>Management Alternatives</u>, 1983.

Map 5



Myriophyllum spp., Potamogeton crispus, and Ceratophyllum demersum, were also found in the lake. These submerged species have been described as generally sparse but abundant at times. A field inspection undertaken by Commission and DNR staff during June 1994 confirmed the continued abundance of Myriophyllum spp., Typha latifolia, and Scirpus validus in the main lake basin, and found that various pondweeds, Potamogeton illinoensis and P. crispus, water crowfoot, Ranunculus sp., and yellow water lily, Nuphar variegatum, were also relatively common. 17

As noted above, some of these species can rapidly colonize recently disturbed areas of lake bottom, and, while they may be expected to be found in shallow lakes, have the potential to markedly increase in biomass in artificially disturbed waters. In addition, the introduction of these species often follows human intrusion into previously undisturbed aquatic ecosystems—the failure to remove plant materials from boats and trailers is a principle means of such unintentional introductions of these invasive species, especially Eurasian water milfoil. 19

Plant growth can occur in water depths of up to about 20 feet, but is generally concentrated in those areas covered by water of less than 10 to 15 feet of depth, depending on water clarity and other environmental factors. 20 In the case of Big Muskego Lake, such depths substantially exceed the maximum depth of the lake, while, in Bass Bay, such depths occur over about 40 percent of the waterbody. Typha sp. was the dominant species, occurring in depths of less than 5 feet, found in both the main lake basin and bay. Water lilies, Nuphar variegatum and Nymphaea odoratum, were common in the main lake, but were sparse in the bay--only

¹⁷A far greater species diversity was observed in some of the access channels along the eastern lakeshore during the limited survey conducted in June 1994. Species recorded from one of the access channels included <u>Potamogeton pectinatus</u>, <u>P. crispus</u>, <u>Elodea canadensis</u>, <u>Utricularia vulgaris</u>, <u>Ceratophyllum demersum</u>, native species of <u>Myriophyllum spp.</u>, and <u>Polygonum sp</u>.

¹⁸U. S. Environmental Protection Agency Report No. EPA-440/4-90-006, <u>The Lake and Reservoir Restoration Guidance Manual</u>, <u>Second Edition</u>, August 1990.

¹⁹ Wisconsin Department of Natural Resources, <u>Eurasian Water Milfoil in Wisconsin:</u> A Report to the Legislature, July 1993.

 $^{^{20}\}mathrm{U}$. S. Environmental Protection Agency, op. cit.

Map 6
WILDLIFE HABITAT AREAS WITHIN THE TOTAL DRAINAGE AREA TRIBUTARY TO BIG MUSKEGO LAKE: 1990

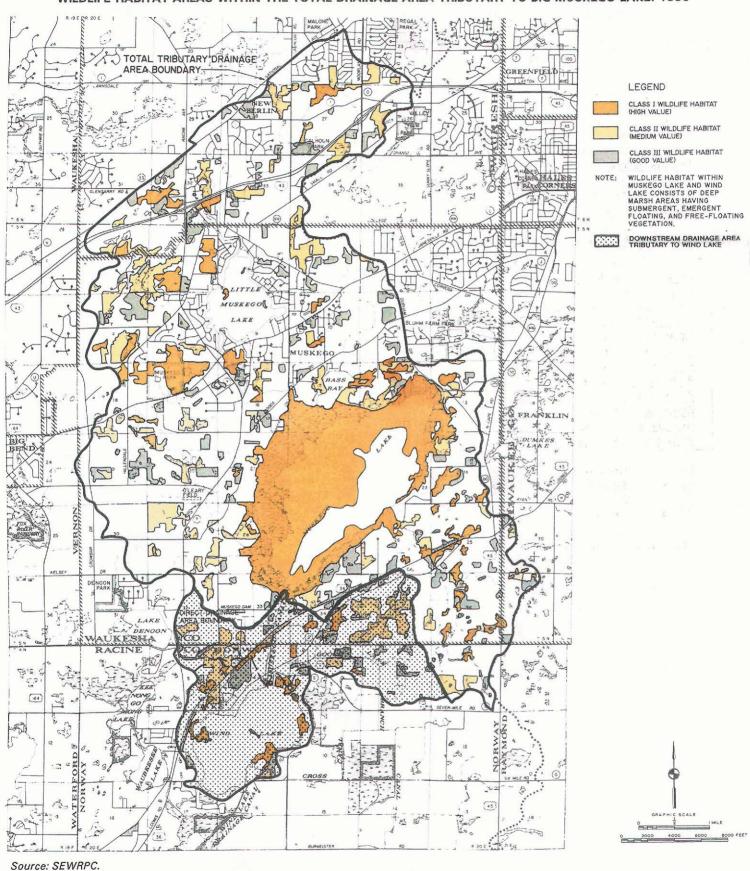


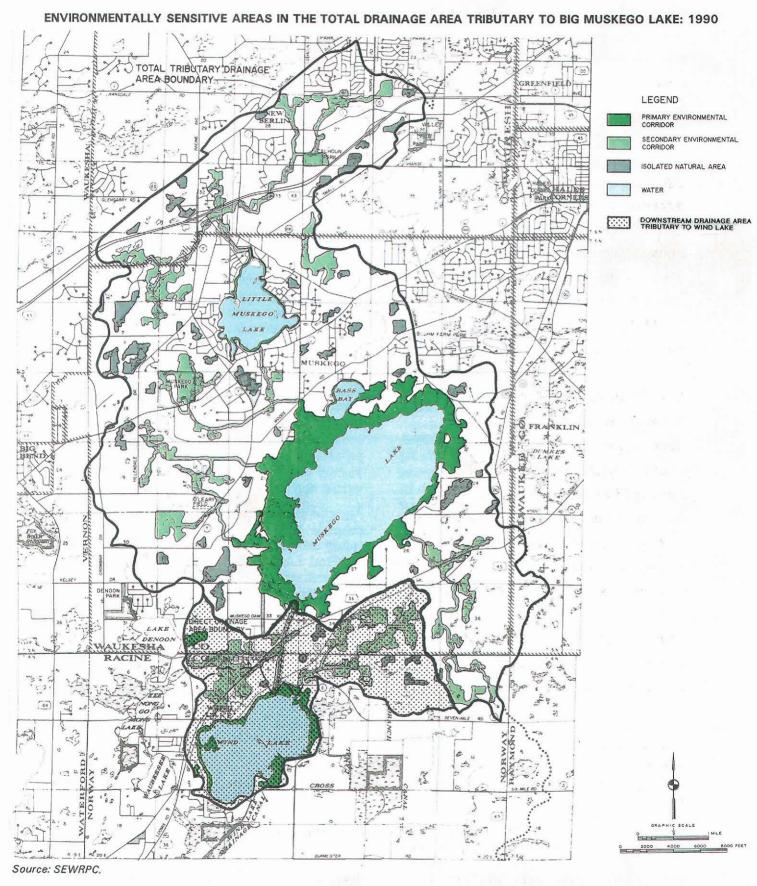
Table 1 AQUATIC PLANT SPECIES PRESENT IN BIG MUSKEGO LAKE

	Relative Abundance			
Aquatic Plants	1967	1975	1980	1994
Emergent Plants				
Polygonum sp. (smartweed)		- '-		S
Pontederia cordata (pickerel weed)	С			S
Sagittaria sp. (arrowhead)	s	Α	s	
Scirpus validus (bulrush)	C .	Α	Α	С
Sparganium sp. (burreed)	S			
Typha sp. (cattail)	A	Α	Α	A
Floating-leaved Plants				
Nuphar sp. (yellow water lily)	A	Α	С	С
Nymphaea sp. (white water lily)	Α	Α	c	Ċ
Submerged Plants			`.	
Ceratophyllum demersum (coontail)	С	Α .	s	S
Chara sp. (stonewort)	s		s	S
Elodea canadensis (waterweed)			Č	s
Myriophyllum spp. (water milfoil)	s	Α	s	Ā
Najas spp. (naiad)	S		S-A	
Potamogeton spp. (pondweed)	S			s
P. crispus (curly-leaf pondweed)			s	Ċ
P. illinoensis (Illinois pondweed)	s			S
P. pectinatus (Sago pondweed)	s	A	C	S
Ranunculus sp. (water crowfoot)				Ċ
Utricularia sp. (bladderwort)	s			S
Valisneria americana (wild celery)		С		

NOTE: -- = Not Present
S = Sparce
C = Common
A = Abundant

Source: Wisconsin Department of Natural Resources and SEWRPC.

Map 7



N. variegatum was observed during June 1994, however.

The phytoplankton--algal--community was dominated by green algae, including desmids and colonial forms, but followed the typical seasonal progression from green algae to blue-green algae to diatoms. 21 The algal flora was typical of an highly enriched, hypertrophic ecosystem at the time of this inventory.

Aquatic Animal Communities: Big Muskego Lake has been known for its good but erratic fishing, with carp being the dominant fish in the Lake. Periodic winterkills, high levels of turbidity, and a poor forage base have contributed to this dominance since the 1920s when the first records were compiled by the DNR. Subsequent surveys during the 1940s resulted in the removal of more than 100,000 pounds of carp. Nevertheless, deteriorating water quality following World War II encouraged continuity of the carp population, which continues to dominate the lake fishery.

The DNR Publication No. FM-800-91, <u>Wisconsin Lakes</u>, 1991, indicates that panfish, large-mouth bass, and northern pike are present in both Bass Bay and Big Muskego Lake. Walleye are present in Bass Bay only. Bass are common in both water-bodies, while panfish are abundant in Bass Bay. A DNR fisheries survey conducted during 1993 confirmed the currency of this species distribution. Black and white crappies and bluegills were abundant in Bass Bay during this survey. Walleye, northern pike, large-mouth bass, and yellow perch were also present. The dominant carp population was estimated at about 276 pounds per acre in Big Muskego Lake. The continued dominance of carp, together with bullheads, is considered to be a major contributor to poor water quality in Big Muskego Lake, ²² and carp removal provisions are being formulated as part of the DNR draft management plan for the Lake. ²³ Restoration of a balanced fishery is a proposed goal in terms of this plan.

²¹Kohler, G.J., <u>Factors Affecting Phytoplankton Species Composition</u>, <u>Dominance and Succession in Shallow</u>, <u>Hypereutrophic Big Muskego Lake</u>, Mc thesis, University of Wisconsin-Milwaukee, 1982.

²²SEWRPC Community Assistance Planning Report No. 198, op. cit.; Wisconsin Department of Natural Resources Publication No. WR-340-93, op. cit.

 $^{^{23}}$ Wisconsin Department of Natural Resources, 1994, op. cit.

The microcrustacean--zooplankton--community was dominated by <u>Chydorus sphaericus</u>, an animal commonly found in enriched waters. 24

Wildlife: Given the marsh-like nature of the shorelands, large numbers of wildlife and waterfowl are present in and around Big Muskego Lake. The Lake has long been known as a waterfowl hunting area, with over 2,500 ducks being taken annually by hunters. Larger mammals, such as deer, inhabit some of the lesser developed areas of the watershed, while muskrat, mink, raccoon, beaver, fox, and skunk are common in the shorelands. Mallards and teal are the most numerous waterfowl and many other game birds, song birds, waders and raptors also visit the lake and its environs. A number of these species, including Forster's terns, nest and breed at Big Muskego Lake, while others visit the Lake on their annual migrations, including great egrets and Cooper's hawks, ospreys and bald eagles—all of these being threatened or endangered species. Of the resident species of wildlife and waterfowl, most were observed during the field visit during June 1994.

Recreational and Social Factors

Recreational Uses: Big Muskego Lake is a multi-purpose waterbody serving many forms of recreation, including boating, hunting and fishing. The Lake also provides an important visual amenity. However, the extremely shallow water depths prevailing in the main lake basin of Big Muskego Lake effectively prevent its use for waterskiing and sailing, and restrict such motorized boat traffic as can navigate to slow speeds. This is in contrast to Bass Bay and elsewhere in the Muskego-Wind Lakes chain where sailing, waterskiing, and speed-boating can and does take place.

From a recreational point of view, therefore, the principal active recreational use of Big Muskego Lake is during the autumn waterfowl hunting season. Over the last decade--since 1980--up to 160 cars have been observed at Big Muskego Lake on opening day of the waterfowl season, as shown on Table 2. This peak usage declines by about half on the days following opening day, but remains significant

²⁴Wisconsin Department of Natural Resources, 1983, op. cit.

 $^{^{25}}$ Wisconsin Department of Natural Resources, 1983, op. cit.

throughout the season in comparison with other times of the year. ²⁶ A significant proportion of the watercraft used by the hunters are small, trailered-boats, 12- to 14-foot skiffs, jon boats and similar small craft, and carry-in boats such as canoes and row boats--unlike those used on the neighboring, deeper water lakes. This situation is not expected to change in the future given the reputation of the Lake as a hunting locale; however, it should be noted that the opening day of waterfowl season coincides with the period during which the wildlife refuge on the western shore is closed to entry.

Recreational Facilities: There are three private recreational facilities, shown on Map 8, offering boating access to the general public on Big Muskego Lake; namely, Rep's Dam Tavern at the southern end of Big Muskego Lake--which charges approximately \$4 per launch; Boxhorn Gun Club-Chesapeake Restaurant (Lakeshore Inn) on the eastern shore--which charges approximately \$15 per waterfowl season; and the Hunters Nest Resort with channel access on the northern shore, east of Bass Bay--which charges approximately \$5 per launch or \$20 per waterfowl season. None of these facilities are private providers as defined in Section NR 1.91(7) of the Wisconsin Administrative Code, but one, the Boxhorn Gun Club, provides additional access opportunities for the public during the autumn in recognition of the seasonal usage of Big Muskego Lake. The Black Duck Inn has water access via a shallow channel on the northern shore but does not offer access to the public, while the Aud-Mar Resort on Bass Bay no longer offers access to the public despite its riparian location. The Muskego Lakes Country Club, adjacent to the eastern shore of Big Muskego Lake, does not have lakeshore access.

In 1994, the City of Muskego took title to the former Bass Bay Sportsmen's Club site at Durham Road on Big Muskego Lake for use as a public access site to supplement the private access sites. A detailed design for the launch site and access is to be developed by the DNR. Further, the City of Muskego, in collaboration with the Big Muskego-Bass Bay Lake Management District, was in 1994 negotiating the use or purchase of a County-owned site close to this access, and seeking an easement from the Wisconsin Electric Power Company (WEPCo) over a

²⁶Estimates of boating use on opening day of the fishing season, 1994, made by the Big Muskego-Bass Bay Lake Management District Commission suggested that fewer than 10 watercraft were present on Big Muskego Lake at that time. This is consistent with the assessment made by the DNR at the time of the 1983 feasibility study--Wisconsin Department of Natural Resources, 1983, op. cit.

Table 2

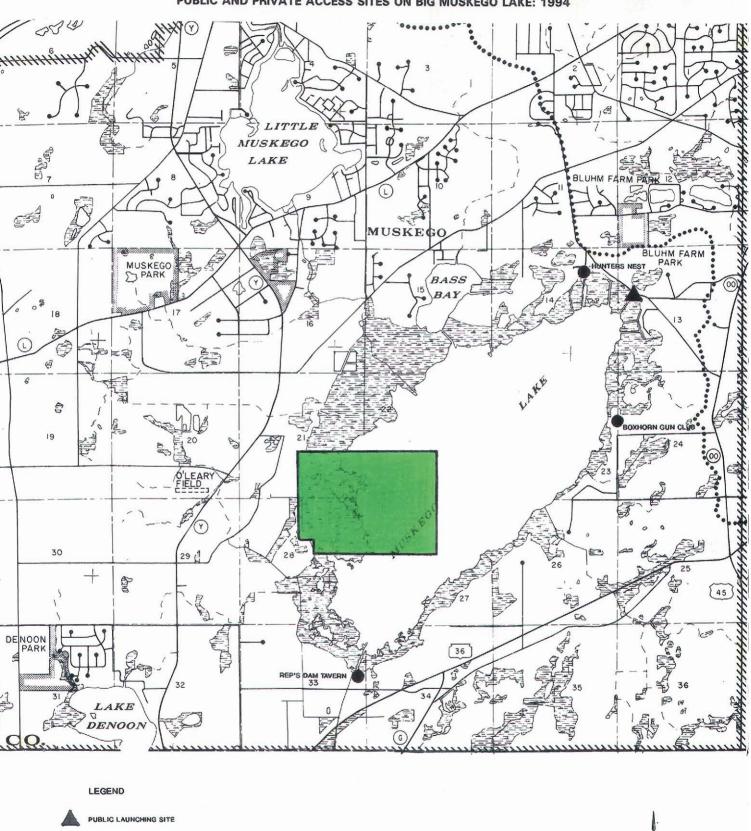
LAKE USAGE: OPENING DAY WATERFOWL SEASON

Year	Car Count	Estimated Total Hunters	Estimated Total Waterfowl Harvest 52	
1980		59		
1981	48	80	222	
1982				
1983	161	294	1,058	
1984	150	302	178	
1985	122	238	148	
1986	139	286	98	
1987	85	128	42	
1988	32	61	16	
1989	54	104	82	
1990	70	112	101	
1991	69	114	135	
1992	81	162	70	

Source: Wisconsin Department of Natural Resources and SEWRPC.

Map 8

PUBLIC AND PRIVATE ACCESS SITES ON BIG MUSKEGO LAKE: 1994



GRAPHIC SCALE

NONPUBLIC LAUNCHING SITE

WILDLIFE REFUGE

24

portion of that company's utility right-of-way adjacent to the County-owned site, to provide additional parking for the proposed access. Pending the successful completion of the design and on-going negotiations, the City and District have indicated that they intend to seek Recreational Boating Facility grants to cost-share the construction of formalized publicly owned access on Big Muskego Lake-Bass Bay.

Several local retail outlets also exist in close proximity to the Lake, including the City of Muskego central business district. A number of food emporia and other sales outlets, including the Aud-Mar Resort, make use of the waterfront as a visual amenity for their patrons, providing patios and similar areas for viewing the lake. Other local retailers which specialize in sporting goods, and angling and boating supplies, are situated in the immediate vicinity of the lake.

Local Ordinances

The City of Muskego has adopted and implemented a Shoreland and Floodplain Protection Zoning Ordinance in accordance with Administrative Code NR 117, Wisconsin's City and Village Shoreland-Wetland Protection Program. These regulations have been in force since 1986. The City has also adopted specific lakeshore zoning provisions in an effort to protect and maintain the ambience of these resources. 27

ACCESS RESTRICTIONS AND WATERWAY PROTECTION PRACTICES IMPOSED BY ENVIRONMENTAL, DEVELOPMENTAL AND SOCIAL FACTORS

Heavy plant growth throughout the main lake basin restricts boating traffic to small areas of open water between the extensive wetland fringe and the islands located toward the center of the waterbody. In particular, excessive plant-cattail--growth in the riparian zone makes access to the open water difficult. This excessive plant growth is compounded and encouraged by the lack of water depth. During summer, navigation of most motorized watercraft is significantly impeded by these conditions. In addition, lack of depth, abundance of aquatic plants, turbidity, and accumulated organic sediments adversely affect the diversity of aquatic life and restrict swimming. The result is numerous public

²⁷City of Muskego, <u>Zoning Ordinance</u>, <u>City of Muskego</u>, <u>Waukesha County</u>, <u>Wisconsin</u>: <u>Planning for Balance</u>, October 1993.

complaints throughout the primarily summer season, which can adversely affect riparian property values, reduce the aesthetic enjoyment of the residents, and undesirably impact tourism and the aesthetic enjoyment of visitors to the City of Muskego.

On the other hand, the main lake basin has the potential to be developed as a deep-water marsh habitat capable of supporting a regional demand for a waterfowl hunting venue and wildlife area. 28 To achieve this objective, the institution of specific waterway protection measures has been proposed. These measures are to include both watershed-based practices proposed under the Chapter NR 120 priority watershed plan²⁹ and in-lake management practices set forth in the Wind Lake ³⁰ and Big Muskego Lake ³¹ management plans. Lake management interventions proposed under these plans include a year-long drawdown of Big Muskego Lake to effect rough fish controls and removals, and the control and management of aquatic vegetation, as well as other actions needed to restore an healthy and balanced lake flora and fauna following the drawdown. Such measures would require access-related waterway protection measures such as the promulgation of boat excluded area, motorboat prohibition, and speed restriction ordinance provisions to allow establishment and protection of nesting areas, native plant beds and similar ecologically valuable areas. Development of such ordinances should conform to DNR guidelines. 32 Precedent for the creation of boat excluded areas lies in the seasonal entry prohibitions already established for portions of Big Muskego Lake under Section NR 15.02 (4) of the Wisconsin Administrative Code. No entry restrictions apply within this refuge area from September 1 to December 31 annually. Additional restrictions to protect ecologically-valuable areas would be likely to include motorized boat exclusion areas and slow-no-wake speed limits as discussed below.

 $^{^{28}}$ Wisconsin Department of Natural Resources Publication No. WR-340-93, op. cit.

²⁹Ibid.

³⁰ SEWRPC Community Assistance Planning Report No. 198. op. cit.

³¹ Muskego-Wind Lakes Priority Watershed Newsletter, op. cit.

³²Wisconsin Department of Natural Resources, <u>Guidelines: Ordinance Writing and Buoy Placement for Wisconsin Waters</u>, s.d. Cost shared funding for ordinance review and development is an eligible activity under the Chapter NR 191, Lake Protection Grant Program.

ALTERNATIVE PUBLIC BOATING ACCESS

Historic Boating Access Patterns and Waterway Protection Efforts

Community commitment to manage the Big Muskego Lake-Bass Bay system is reflected in the creation of the Big Muskego-Bass Bay Lake Management District by the City of Muskego in 1974 and this commitment has been reiterated at regular intervals since that time. The active participation of the District and City in the Muskego-Wind Lakes Priority Watershed Project also underscores this commitment, and provides an opportunity to initiate additional management actions in this portion of the Muskego-Wind Lakes chain.

Department of Natural Resources activities on the Big Muskego Lake system have historically been restricted due to the paucity of public access opportunities on the Lake. For this reason, little statistical information on the usage of the lake exists. Notwithstanding this limitation, however, good data are available for opening day of the waterfowl hunting season, which is generally considered to be the peak use period for this waterbody. An average of 171 hunters per day used the lake on opening day during the last decade. These persons generally arrived at the lake, by vehicle, in parties of two. Between 32 and 161 cars were recorded at Big Muskego Lake on this day, which was usually coincident with the period during which no-entry restrictions were in force along a portion of the western shore of the lake. As previously noted, the majority of users employed small boats of under 20 feet in length that were transported on small trailers or car-top.

During a site visit in June 1994, Commission and DNR staff observed a number of pontoon boats moored along the shorelands of Big Muskego Lake. A few larger speedboats were present in Bass Bay. However the largest number of small craft consisted of canoes, rowboats, and small powered skiffs suitable for fishing. Testimony provided by the Big Muskego-Bass Bay Lake District Deputy Commissioners reinforced the results of this qualitative shoreline survey by suggesting that large powered craft were unable to successfully navigate on the waters of Big Muskego Lake due to depth limitations and plant growth that impeded their progress. Thus, while there appears to be a public desire to continue to utilize Big Muskego Lake for boating, there is also public recognition that Big Muskego Lake cannot be considered a suitable environment for high speed watercraft. To enjoy such recreational opportunities, residents had to make use of neighboring

lakes with greater water depths. Such assessments by riparian owners, taken in combination with the generally more significant passive or aesthetic use of Wisconsin waterbodies³³ and the historical use of Big Muskego Lake-Bass Bay set forth above, are supportive of an alternative public boating access arrangement as provided for in Section 1.91 (6) of the Wisconsin Administrative Code.

Public Access

Big Muskego Lake-Bass Bay does not currently have an improved public boating access site, although property to provide such a site has recently been acquired by the City of Muskego and is intended to be improved by the City and District.

Pursuant to Section 1.91 of the Wisconsin Administrative Code, public boating access should typically be developed as a function of the open water acreage, or area of the lake exclusive of that area covered by emergent aquatic vegetation. Maximum and minimum access standards are given in Sections NR 1.91 (4) and (5) Conformance with these guidelines is required for a lake to of the Code. eligible for natural resource enhancement services offered through the DNR. 34 Based on the open water acreage of the Big Muskego Lake-Bass Bay system in 1994, determined by Commission staff and set forth above, and the public access standards established under Sections NR 1.91 (4) and (5) of the Wisconsin Administrative Code, the Big Muskego Lake-Bass Bay system would require the provision of one or more access sites which in total provided parking for between 42 and 70 car-trailer units, plus additional parking to permit access by handicapped individuals. Such parking should ideally be situated contiguous to the launch In the case of the Big Muskego Lake-Bass Bay system, the abundant wetland fringe and limited size of the recently acquired public access site -- 7.7 acres in extent, including some fringing wetland--limits the ability of the site to conform to this latter requirement; hence, the proposed acquisition of additional parking area on nearby sites -- Waukesha County lands and WEPCo right-of-way lands.

³³See Thornton, J.A., "Perceptions of Public Waters: Water Quality and Water Usage in Wisconsin", in <u>The Small City and Regional Community</u>, Volume 10: <u>Proceedings of the 1992 Conference</u>, T. van Valey, S.R. Crull and L. Walker (Editors), University of Wisconsin-Stevens Point Foundation Press, 1993.

 $^{^{34}}$ "Natural resource enhancement services" are defined in Section NR 1.91 (2) (d) of the Wisconsin Administrative Code as including fish stocking, removal or other population management; habitat development; financial assistance for aquatic plant harvesting; and lake restoration grants.

Options for providing alternative public boating access to the Big Muskego Lake-Bass Bay system range from limiting public access opportunities by providing less than the minimum amount of parking required under Section NR 1.91 (4) of the Wisconsin Administrative Code; to meeting the minimum standard but modifying the nature of the parking required from parking for car-trailer units to parking for a mixture of trailered and non-trailered watercraft; to continued reliance on private providers as provided under Section NR 1.91 (7) of the Code. Of these options, the two former options are discussed further below--the latter option is set forth as a consideration in the discussion of private access.

Limited Public Access: Given the guarantees of freedom of public access to the navigable waters of the State embodied in the Northwest Ordinance and contained in Article IX of the State Constitution, limitation of public access opportunity is not a desirable option although such limitation is recognized as being possible in situations where unrestricted public access could impair public health, safety, necessity, welfare, comfort or convenience as provided for in Wisconsin Statutes. This latter provision has been interpreted as including the protection of natural resources as set forth in Section NR 1.90 (1) of the Administrative Code. The protection of breeding colonies of endangered waterfowl and threatened wildlife by limiting public access on Big Muskego Lake-Bass Bay would be consistent with this interpretation as already embodied in Section NR 15.02(4) which provides for seasonal no-entry restrictions covering portions of the waterbody. Exclusion of the 440 acres of open water area falling within this refuge from the calculation of minimum public boating access requirements reduces the open water surface area of the system to 1,654 acres and the amount of car-trailer unit parking by nine units to 33, plus parking for handicapped individuals. Additional area, such as that which includes the Forster's tern colony, could be added to the present refuge area, further reducing the required minimum number of car-trailer unit parking. Nevertheless, while such inclusion is desirable from a natural resource protection perspective, it is in conflict with expressed demand for lake access as evidenced by the use statistics compiled by Furthermore, the special types of use which predominate in the the DNR. waterfowl hunting season should not be as potentially disruptive to the natural areas of the Lakes as would more conventional boating activities. reasons, the limitation of public access by reducing the size of the open water used to calculate the minimum number of parking spaces is not considered appropriate.

Modified Public Access: Recognizing the demand for public access to Big Muskego Lake-Bass Bay, a further option for the provision of public boating access is to provide parking for at least the minimum number of vehicles as determined under Section NR 1.91 (4) of the Code modified for the nature of that demand. In other words, 43 parking spaces including two parking spaces for handicapped individuals would be provided by a mixture of parking for both trailered and non-trailered boats. In terms of this option, approximately 75 percent, or 32, of the spaces should be allocated for parking of trailered boats--especially those spaces contiguous to the launch site--with the remaining 11 spaces being allocated for parking of vehicles with car-top or carry-in boats. The precise proportion of the allocation of parking spaces for trailered and non-trailered watercraft would be determined by the configuration of the access and parking sites and the area available. Given the intensity of usage experienced on Big Muskego Lake-Bass Bay, this option is to be preferred.

Private Access

Access to Big Muskego Lake-Bass Bay has traditionally been by way of the several privately owned and operated access sites along the eastern shore of the lake. In this regard, and on this basis, access to the lake has been considered to be adequate to meet demand. 35 In general, these private providers have charged fees, set forth above, that are consistent with Section NR 1.91 (11) of the Wisconsin Administrative Code. It would therefore appear that continuation of this situation could be encouraged. Under this alternative, the private access operators would become private providers as defined in Section NR 1.91 (7) of the In terms of this Section, private owners who provide a free service or service for which the fee is consistent with Section NR 1.91 (11) and who contract with the State as providers for a minimum period of at least 5 years and whose facilities meet the development standards set forth under Section NR 1.91 (8) of the Code would be considered as providing adequate public access to the Historically, the private providers have been unwilling to make the requisite five-year commitment. Nevertheless, this option should continue to be explored in order to provide reasonable public access to those areas of the lake removed from the Durham Road access sites.

 $^{^{35} {}m SEWRPC}$ Community Assistance Planning Report No. 137, op. cit.

In addition to being the traditional access to Big Muskego Lake-Bass Bay, the private sites provide a more direct access route to those portions of Big Muskego Lake-Bass Bay which are remote from the proposed public launch site. For this reason, and recognizing the difficulties imposed by lack of adequate depth and the abundant growth of aquatic plants on boat traffic traversing the waterbody, the continued demand for, and operation of, these private sites is to be anticipated. Thus, regardless of their status as recognized private providers under Section NR 1.91 (7) of the Code, these operators should and are likely to continue to play a role in the provision of access to Big Muskego Lake-Bass Bay for the foreseeable future.

Supplementary Seasonal Access

A further option designed to cater for the highly seasonal nature of the demand for public access on Big Muskego Lake-Bass Bay is the augmentation of the public access site with launch facilities seasonally allocated for public use by the private providers. This option is not explicitly recognized under Chapter 1.90 of the Wisconsin Administrative Code, and it is likely that seasonal providers would have to meet the same three-fold requirements as private providers recognized under Section NR 1.91 (7) of the Code--namely, that their service is provided free or at a fee consistent with Section NR 1.91 (11); that a five-year contract to provide the service is in place with the State; and that the facilities meet the site development standards set forth under Section NR 1.91 (8). Such access would probably be considered as supplemental to the minimum access standard determined under Section NR 1.91 (4) of the Code. Nevertheless, further consideration might be given to this option should circumstances warrant.

Information and Education

In addition to the alternative access policy options set forth herein, an ongoing campaign of community information should support the management of lake use and the protection of waterways in Big Muskego Lake-Bass Bay. This information program should remind riparian residents of the habitat and other benefits, such as shoreline stabilization, provided by the aquatic flora of the lake, and promote the preservation of an healthy aquatic flora in the lake. In particular, notices regarding the spread of Eurasian water milfoil should be posted at the public and private boat landings.

The information and education program should also support the protection of lake fauna including the threatened and endangered species present in and around the lake.

The District newsletter and annual meeting should be used as a forum for increasing public awareness of the Big Muskego Lake-Bass Bay system. Suitable informational materials, readily available from the University of Wisconsin Extension (UWEX) and the DNR, can be obtained and distributed through such media and at such times.

RECOMMENDED ALTERNATIVE BOATING ACCESS AND WATERWAY PROTECTION PLAN

The development of a publicly-owned boating access on Big Muskego Lake-Bass Bay is recommended in SEWRPC Community Assistance Planning Report No. 202, A Park and Open Space Plan for the City of Muskego, Waukesha County, Wisconsin, published in January 1992. The foregoing inventory and analysis of possible alternative access and waterway protection measures is consistent with this recommendation.

The foregoing inventory and analysis of possible alternative access and waterway protection measures also clearly demonstrates the rather unique situation of Big Muskego Lake-Bass Bay. This large and diverse system should be managed as a public resource and in such a way as to emphasize its value as an habitat area. This value is presently recognized in part through the creation of a seasonal noentry wildlife refuge, in part through its delineation as primary environmental corridor, and in part through the identification of presently undeveloped shorelands as potential open space areas in this rapidly developing City.

In recognition of both the demand for an high quality recreational experience on and around Big Muskego Lake-Bass Bay and the unique environmental situation of the resource, the recommended alternative access plan consists of four principle components; namely, 1) the development of a publicly-owned access site meeting the minimum standards set forth under NR 1.91 (4) but modified with regard to the number of car-trailer units for which parking space is provided; 2) the promulgation of boating ordinances for the protection wildlife and wildlife habitat; 3) the placement of suitable buoyage and signage; and 4) the conduct of a public information campaign. Adoption of this plan will contribute to the protection of the resource and the maintenance of its public recreation capacity in a manner

consistent with the intent of Chapter NR 1.90 of the Wisconsin Administrative Code.

Provision of Public Access

The acquisition by the City of Muskego of a 7.7-acre site on the northeastern shore of Big Muskego Lake and proposed acquisition of easements from Waukesha County and the WEPCo to permit parking in close proximity to the access site is recommended to proceed as the prelude to the development of a publicly-owned access on Big Muskego Lake-Bass Bay. The combined capacity of these sites should be such as to permit the parking of 43 vehicles, a proportion of which--approximately 75 percent at a minimum--should be capable of accommodating car-trailer units. Two parking spaces accessible to handicapped individuals are also required pursuant to Section NR 1.91 (8) of the Wisconsin Administrative Code. Should the site geometry allow, the access site itself should contain 10 to 20 percent of this capacity, including the mandated car-trailer unit parking space for handicapped individuals. The remainder of the required parking would be provided off-site on the easements presently being acquired from the County and WEPCo.

This recommended plan acknowledges that a significant proportion of the usage of Big Muskego Lake-Bass Bay is by small, shallow draft vessels suited to the shallow depths of the system. It varies from the prescribed standards established under Chapter 1.90 in that a portion of access is provided for carry-in or car-top units rather than the car-trailer units envisaged in Section NR 1.91 (4). Formalization of the demand for carry-in and car-top access places restrictions on the size of the watercraft being encouraged to use Big Muskego Lake-Bass Bay. That these restrictions are themselves the result of a traditional recognition of the extreme shallowness and extensive aquatic plant growth of the Big Muskego-Bass Bay system is an implicit application of the environmental sensitivity criteria set forth in Section NR 1.91 (6) (b) 1. of the Wisconsin Administrative Code, as well as of the social and developmental criteria set forth in Section NR 1.91 (6) (b) 2.

It is further recommended that the development of the off-site parking be implemented in such a way that due recognition is given the seasonal nature of the use of Big Muskego Lake-Bass Bay; to wit, parking surfaces on the lands proposed for acquisition through easement should be porous in nature rather than the more

usual impervious bituminous surfaces provided at the public access site. Construction of a reenforced grass parking area, for example, would be visually less intrusive and permit infiltration of precipitation, thereby delivering some water quality benefit in comparison with a site surfaced with a nonporous pavement, while being able to withstand periodic usage. Provision of the parking space for handicapped individuals at the launch site in this instance will satisfy the accessibility requirement of Section NR 1.91 (8) (d).

Protection of Wildlife and Ecologically Valuable Areas

The protection of wildlife and ecologically valuable areas of Big Muskego Lake-Bass Bay can be implemented through several mechanisms. Such control is effected in part through adoption of the recommended modification of the access standards set forth above. It is also given effect through locally-adopted boating ordinances designed to control the operation of watercraft in portions of the lake basin.

Restrictions on boat size imposed by the recommended modification of the boating access standards set forth above do not and cannot address the issue of boat operations once the watercraft have been launched. Conventional small craft such as are able to operate in the shallow depths prevailing at Big Muskego Lake-Bass Bay are unlikely to be capable of high speed travel due to restricted motor and hull sizes. However, jet-skis, jet boats and similar craft can operate at speed in this environment, creating a potential danger not only to wildlife and habitat areas but also to conventional watercraft with which they could collide. For these reasons, therefore, controls on the in-lake impacts of boating--on both the environmentally valuable areas of Big Muskego Lake-Bass Bay as well as for public safety--through amendment of the boating ordinance adopted by the City of Muskego (and the Big Muskego-Bass Bay Lake Management District) pursuant to Section 30.77 (4), Stats., are recommended.

Presently, a general boating ordinance is in effect within the City of Muskego. This ordinance is set forth in Appendix A. Amendment of this ordinance is recommended to provide for:

1. The recognition of the seasonal no-entry restrictions imposed pursuant to Section NR 15.02 (4) in the wildlife refuge between September 1 and December 31;

- 2. The development of navigational lanes on Big Muskego Lake;
- 3. The establishment of speed restrictions including the designation of specific areas of the lake and shore zone as slow-no-wake, motorboat prohibition or boat excluded areas; and
- 4. The placement of regulatory and informational buoyage to demarcate such lanes and areas pursuant to Section NR 5.09 is recommended. Such ordinance provisions are subject to DNR review. Placement of buoyage is subject to an approved ordinance and DNR permit requirements.

Boat operators should be informed of the approved alternative public boating access and waterway protection plan. A copy of this plan should be kept at the City of Muskego City Hall, and a suitable graphic summary version of the plan should be posted at the access points, both private and proposed public. Boating ordinances enacted in conformity with State law should also be clearly posted at public landings as provided for in Section 30.77 (4), Stats. Operation of watercraft outside of the established navigation lanes should be minimized in the western portions of the lake, and seasonally prohibited in accordance with the established no-entry wildlife refuge, to prevent disturbance of the wetland habitat areas. To this end, operation of watercraft outside of established navigation lanes should be at no more than slow-no-wake speeds, with entry of motorized watercraft restricted in the vicinity of waterfowl nesting sites. Extension of such restrictions to the nesting areas of the Forster's terms should also be considered.

Ordinance review and development, such as that proposed in this recommended plan, is an eligible expense under the Chapter NR 191 Lake Protection Grant Program. This program provides for a 50 percent state cost sharing of the cost of development of lake protection ordinances and for a 50 percent cost sharing of the cost of information and enforcement-related activities during their initial implementation to a maximum state share of \$100,000 per project. 36

³⁶Wisconsin Department of Natural Resources, <u>Guidelines for the Lake Management Protection Grant Program: A Financial Assistance Program Administered Through the Wisconsin Department of Natural Resources</u>, s.d.

Buoyage and Signage

Marker buoys may be used to direct boating operations on the Lake by marking the navigation lanes and areas to be restricted to non-motorized access, slow-no-wake navigation and boating exclusion. Boating operations should be regularly supervised by City staff and enforced by law enforcement personnel. Appropriate signage at the public and private launch sites should also be erected to inform boaters of the restrictions. Such signage is required under Section 30.77 (4), Stats., to be displayed at the public access site. The general location of the areas to be provided with buoyage and signage is shown on Map 9.

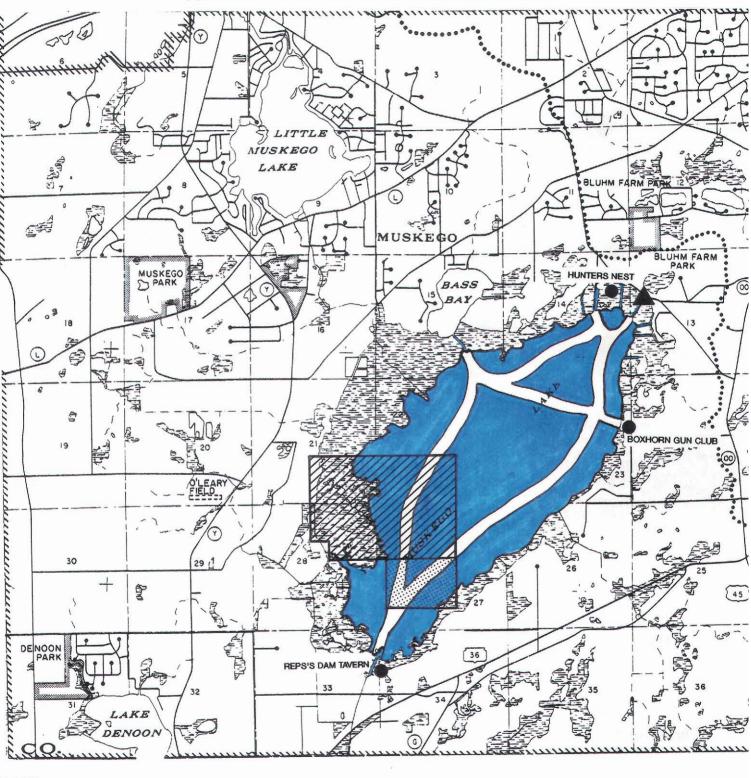
Buoyage can be expensive to obtain, install and maintain. However, buoyage has the advantage of being readily visible to recreational boaters and clearly demarcating the affected areas. Nevertheless, given the extensive usage of Big Muskego Lake-Bass Bay for recreational hunting, consideration should be given to combining the deployment of buoys with an extensive public information effort to minimize collateral damage to the buoys from stray gun shots. To this end, consideration should be given to the development of a fact sheet that can be provided to riparian residents and casual users informing them of the regulations and ordinances in effect on the Big Muskego-Bass Bay system. As noted above, development of educational and informational materials relating to the enforcement of boating ordinances is cost-sharable under the Chapter NR 191 Lake Protection Grant Program. Placement of buoys may be cost-shared through Recreational Boating Facilities Program grants from the Wisconsin Waterways Commission administered by the DNR Bureau of Community Assistance.

Public Information

It is the policy of the City of Muskego and the Big Muskego-Bass Bay Lake Management District to maintain an active dialogue with the community. This dialogue is carried out through the medium of the public press and in public fora through various City Committees, public meetings, and other scheduled hearings. Further, the Big Muskego-Bass Bay Lake Management District holds regular public meetings and sends a newsletter to electors and riparian property owners. Items of interest to electors can be published in this manner. In addition, informational items can be provided to the numerous sporting clubs and organizations that make use of the lakeshore as appropriate, and, where necessary, personal contacts with homeowners can be made by City staff and District Commissioners. Certain costs incurred in the conduct of the recommended public information

Map 9

GENERALIZED RECOMMENDED PUBLIC BOATING ACCESS AND WATERWAY PROTECTION PLAN FOR BIG MUSKEGO LAKE



LEGEND

Public Launching Site--Signage Required

Ecologically Valuable Area--Seasonal Motorized Boat Restriction

Nonpublic Launching Site--Signage Recommended

Navigational Access Area--Buoyage Recommended

☑ Wildlife Refuge--Seasonal No Entry Restriction

Slow-No-Wake Area

Source: SEWRPC.

campaign may be eligible costs under the Chapter NR 191 Lake Protection Grant Program, as noted above.

ACCESS NEEDS AND OPERATIONS

Access Needs and Total Costs

Based on the recommended plan set forth above, development of the former Bass Bay Sportsmen's Club site into an accessible publicly-owned boat launch with its attendant parking areas is recommended. As noted, this plan would provide for a formal launch area and a total of 43 parking spaces. Of these, it is proposed that 1 space be provided at the launch site for handicapped access, together with 3 car-trailer unit spaces at the launch site for general use, 7 to 10 car-trailer unit spaces at the proposed remote parking area, and 29 to 32 car parking spaces at the aforementioned remote parking site to accommodate car-top and carry-in watercraft. While the actual cost of site acquisition and development is dependent on the particular parcels involved and the lay-out of the launch and parking facilities, and will be determined in part by the DNR design team responsible for the detailed site design, ³⁷ the following estimates have been made to provide guidance: ³⁸

Site acquisit	io	n:	
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Transfer of Club site to City Easement acquisition: WEPCo site	\$ 3,500 3,250
Easement acquisition: County site Site development: Launch	3,250 \$ 50,000
Parking areas Total	40,000 \$100,000

Portions of these expenses are considered eligible expenses for State cost-share funding under the Recreational Boating Facilities Program administered by the Wisconsin Waterways Commission, particularly those relating to the development of the sites acquired by the City of Muskego and Big Muskego-Bass Bay Lake Management District.

 $^{^{37}\}mathrm{A}$ preliminary site design and cost estimate is set forth in Appendix B.

³⁸See SEWRPC Community Assistance Planning Report No. 202, op. cit., p. 39.

Development of ordinance amendments to control boating activity on Big Muskego Lake-Bass Bay, as proposed in the recommended plan, may require the services of an attorney and require the placement of buoyage and the posting of signage. Additional law enforcement action may also be necessary to ensure compliance with the amended ordinance by lake users. Estimated costs are dependent on the amount of time and the number of possible additional staff needed to develop the necessary ordinance amendment and carry out the law enforcement duties attendant Such actions, including the production of informational materials associated with the amended ordinances, are eligible expenses under the Chapter NR 191 Lake Protection Grant Program which provides for a 50 percent State cost share up to \$100,000. If attorney services and a part-time law enforcement official are required, additional costs will be incurred in the development and implementation of an amended boating ordinance for Big Muskego Lake-Bass Bay. Similarly, the placement of buoyage and signage is an eligible expense under the Recreational Boating Facilities Program which provides for a 50 to 60 percent State cost share--the additional 10 percent accrues to project sponsors conducting a boating safety enforcement and education program.

Maintenance and Related Costs

Maintenance of the access site will be performed by the City of Muskego and the Big Muskego-Bass Bay Lake Management District. Maintenance costs will be borne by the City of Muskego and Big Muskego-Bass Bay Lake Management District. Depending on the nature of the site design and parking surface selected, maintenance costs are expected to be low. A significant portion of these costs could be recouped through the imposition of a boat launching fee as provided under Section NR 1.91 (11), which fee should not exceed that charged a State resident for entry to a State park. In addition to the base fee, Section 1.91 (11) provides for public boating access surcharges to subvent the cost of staff and toilet facilities if these are provided. Launch fees are subject to DNR approval.

In addition to routine maintenance to be performed annually at the launch and parking sites, the conduct of periodic maintenance dredging of the channel linking the launch site to Big Muskego Lake may be required to ensure free passage of watercraft. Maintenance dredging requires a DNR permit issued under Section 30.19 or 30.20, Stats., depending on whether the DNR determines the existing waterway to be artificial or natural, respectively. Costs to conduct such dredging may approach \$10 per cubic yard of material removal--including

disposal costs--and may be an eligible expense under the Recreational Boating Facilities Program. Initially, a total of approximately 1,800 cubic yards of material are estimated as requiring removal in order for the launch site to be accessible to and from the Lake. The initial dredging would be best undertaken at the time of the proposed lake drawdown in 1995-96 and should provide access to the Lake for a period of at least 10 years with limited maintenance dredging required thereafter. The cost of the dredging may be an eligible expense under the Recreational Boating Facilities Program grant.

Insurance Coverage

Insurance coverage on the access site(s) will be incorporated into the policy held by the City of Muskego. Liability insurance will also be borne by the City. The relevant certificates of insurance will be held by the City of Muskego.

Training and Supervision

Day-to-day supervision of the launch site and parking area(s) will be by the City staff, with oversight by Director of Public Works and City Engineer. Periodic inspection may also be conducted by the Commissioners of the Big Muskego-Bass Bay Lake Management District as requested by electors.

EVALUATION AND MONITORING

Record-keeping Relating to the Boating Access Operations

It is the intention of the Big Muskego-Bass Bay Lake Management District, in consultation with the City of Muskego, to undertake a periodic, formal review of the alternative access plan as established for Big Muskego Lake-Bass Bay, a copy of which has been lodged with the DNR's Southeast District Office. To support such periodic review, an attendant would maintain records of public use of the access, recording such data as the type of fee paid--daily or seasonal, trailered or non-trailered watercraft--and the status of the user--resident, State resident or out-of-state resident. Alternatively, such information would be gathered by periodic license plate surveys or through information provided by users on an "honor system" type basis.

³⁹ Muskego-Wind Lakes Priority Watershed Newsletter, op.cit.

Record-keeping Relating to the Waterway Protection Measures

It is the intention of the Big Muskego-Bass Bay Lake Management District, in consultation with the City of Muskego, to undertake a periodic, formal review of the waterway protection measures implemented on Big Muskego Lake-Bass Bay under this plan, a copy of which has been lodged with the DNR-Southeast District Office. This review would be undertaken in consultation with the DNR Bureaus of Wildlife Management and Water Resources with the objective of ensuring the protection a wildlife habitat and species diversity, particularly among threatened and endangered species using the lake for breeding purposes.

SUMMARY

Pursuant to the provision of Chapter NR 1.90 of the Wisconsin Administrative Code, this plan sets forth a recommended public boating access and waterway protection plan for the Big Muskego Lake-Bass Bay system. Big Muskego Lake-Bass Bay is located in southern Waukesha County within the municipal jurisdiction of the City of Muskego. A Chapter 33 public lake protection and rehabilitation district was created around this lake in 1974. Compilation of this plan was undertaken at the request of the Big Muskego-Bass Bay Lake Management District.

Inventory data collected during this study describe the 2,094 acre Big Muskego Lake-Bass Bay system as being comprised of two diverse waterbodies; namely, a 1,989 acre deep water marsh known as Big Muskego Lake, and an interconnected 105 acre deep water embayment known as Bass Bay. This waterbody therefore provides the opportunity for a variety of recreational pursuits suited to both shallow and deeper waters. Foremost among the recreational activities documented on this system is recreational hunting, with approximately 170 hunters using the lake on opening day of waterfowl season. More consistent, though less intensive, use is made of the lake for boating, fishing and aesthetic enjoyment.

In addition to the human use of the system, wildlife and waterfowl make extensive use of Big Muskego Lake-Bass Bay, including several species which are threatened or endangered, such as Forester's Tern which nest in the southern part of the main lake basin. A State wildlife refuge is located on the western shore of the main lake basin and incorporates a substantial portion--440 acres--of the lake basin within its seasonal no-entry boundaries.

Traditionally, public boating access to this waterbody has been through launching facilities maintained by private owners at several sites along the northern, eastern and southern shores of the lake and on Bass Bay. Of these sites, three private provider remain, providing public boating access for a fee presently consistent with that proposed under Section NR 1.91 (11) of the Wisconsin Administrative Code. However, recognizing the increasing level of public demand for quality water-based recreational opportunities in southeastern Wisconsin and the need to ensure long-term public access to the major lakes of the area, the Regional Planning Commission in the park and open space plan for the City of Muskego recommended acquisition of an additional, publicly-owned access site. 40 Such a site was recently obtained through a donation of land by the Bass Bay Sportsmen's Club to the City of Muskego.

Clearly the development of this site must recognize not only the nature of the traditional public usage of Big Muskego Lake-Bass Bay but also the extreme shallowness of the lake and its unique marsh-like character which create the conditions so amenable to the wildlife that make use of the system. Accommodation of such diverse demands as public boating use and wildlife and waterway protection required the development and promulgation of a DNR approved alternative access plan. The primary features of this plan include:

- 1. The modification of the minimum access standard to accommodate car-top and carry-in watercraft rather than the trailered watercraft as envisaged in the code--to accommodate 43 units, it is proposed that one space be provided at the launch site for handicapped access, three car-trailer unit spaces at the launch site be provided for general use--site geometry permitting, 7 to 10 car-trailer unit spaces be provided at the proposed remote parking area whose acquisition by easement is still under negotiation at the time of writing, and 29 to 32 car parking spaces be provided at the aforementioned remote parking site to accommodate cartop and carry-in watercraft;
- 2. The amendment of existing City boating ordinances to permit the establishment of boat traffic lanes and control of boat traffic, including

 $^{^{40}}$ SEWRPC Community Assistance Planning Report No. 202, op. cit.

establishment of slow-no-wake, motorboat prohibited, and boat exclusion areas to ensure protection of waterfowl and wildlife;

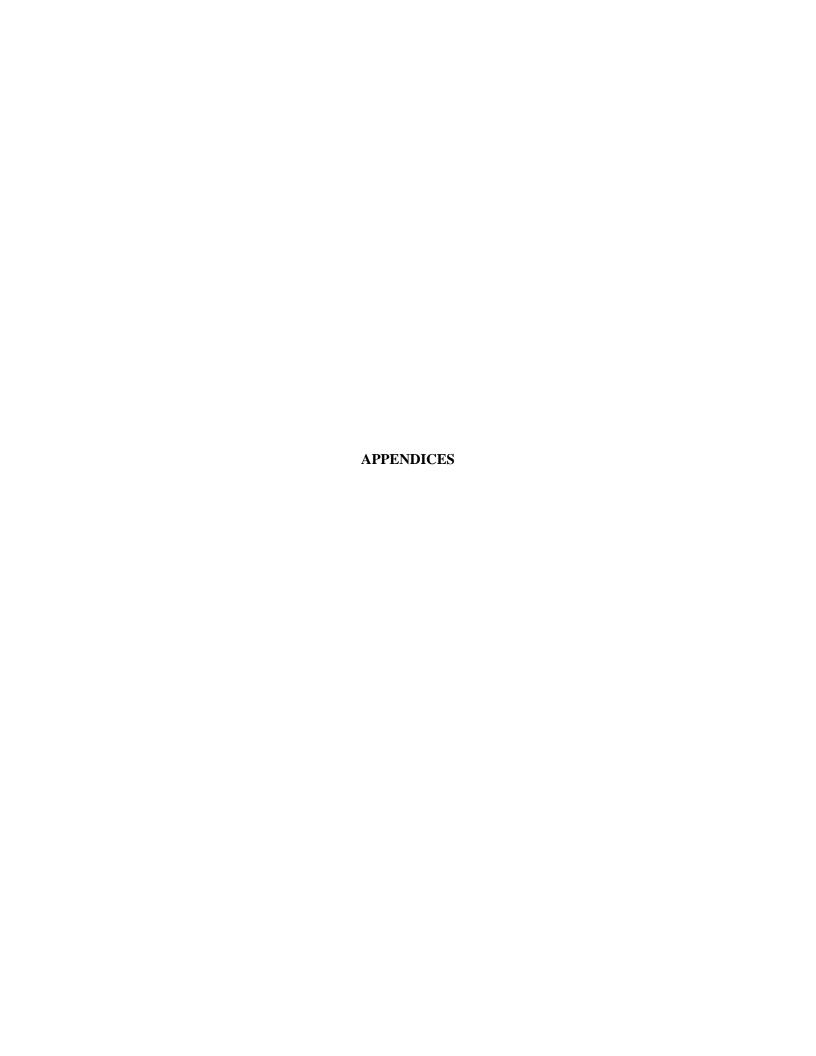
- 3. The placement of buoyage and signage consistent with the amended boating ordinance; and,
- 4. The conduct of a public information campaign to advise lake users of the boating ordinance and features of the alternative access plan.

Costs associated with these plan elements may be eligible expenses under the Recreational Boating Facilities Program administered by the Wisconsin Waterways Commission and the Chapter NR 191 Lake Protection Program administered by the DNR:

- 1. The estimated cost of establishing the public access and acquiring easements to permit off-site parking to accommodate peak usage, and dredging an access channel to the main basin of the Lake, is \$100,000 for the launch ramp and parking areas and \$18,000 for the dredging;
- 2. The estimated cost of obtaining and placing buoyage and signage is about \$5,000; and,
- 3. Additional costs may be incurred for annual maintenance of the launch site, periodic maintenance dredging of the channel linking the launch to the main body of the lake, insurance and record-keeping.

The Wisconsin Department of Natural Resources permitting and/or review of boating ordinances, signage and buoyage, and maintenance dredging activities is required to meet statutory requirements under Chapter 30, Stats., and attendant Administrative Codes.

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Appendix A

BOATING ORDINANCE APPLICABLE TO BIG MUSKEGO LAKE-BASS BAY

20.01 STATE STATUTES ADOPTED

The statutory provisions describing and defining regulations with respect to boats and boating, and particularly Section 30.50 to 30.71, Wisconsin Statutes and any amendments thereto, exclusive of any provisions therein relating to the penalties to be imposed or the punishment for violation thereof, are hereby adopted. Any act required to be parformed or prohibited by any such statute, which are incorporated herein by reference is required or prohibited by this section. (Ord. $\frac{1}{2}$ 725 - 5-12-92)

20.02 ADDITIONAL REGULATIONS - Motorboats. (Ord. \$462 - 9-13-83)

- (1) (2) and (4) are deleted. (Ord. \$462 9-13-83)
- (3) Except for ingress and egress for docking purposes or for purposes of bona fide straight line (point to point) navigation, no person shall operate any boat, motor or otherwise, closer than 150 feet to any pier, swimming beach or other area so designated.
- (5) Excessive Motor Noise. Motorboats shall not be continuously operated without the motor cover firmly secured.
- (6) Mufflers. The engine of every motorboat propelled by an internal combustion engine shall be equipped with a muffler which is so constructed and kept in constant operation that it prevents excessive or unusual noise at all times while the engine is in operation. (Ord. #443 11-23-82)

20.025 LITTLE MUSKEGO LAKE - SPEED RESTRICTIONS. (Ord. #502 - 10-9-84)

No one shall operate a motorboat upon Little Muskeço Lake between the hours of 8:30 P.M. and 8:00 A.M. at a speed in excess of slow-no-wake.

20.03 ADDITIONAL REGULATIONS - WATER SKIING (CR. \$167)

- (1) Whenever a boat is used for towing purposes, for water sports or otherwise, there shall be no less than 2 persons in the towing boat, one to operate the boat and one to be in charge of the tow line.
- (2) When pulling a skier or another boat the tow rope shall not exceed 75 feet in length.

20.04 EMERGENCY ASSISTANCE (Cr. \$167)

When the operator of a boat observes the display on a boat or by a person with an orange flag approximately 18 by 30 inches, he shall render to the boat or person displaying the flag, such assistance as may be necessary to save the boat or persons, or to minimize the damages to them, in so far as is possible to do so without serious danger to his own boat or the persons on board. No person shall display such a flag unless he is in need of assistance to prevent bodily injury or destruction of property.

20.05 WATER SKI JUMPS (Ord. \$413 - 06-09-81)

- (1) Permit Required. No person shall place or maintain or permit to be placed or maintained any so called "water ski jump" on any lake in the City without a permit from the Council. Such permit shall be for a period of not more than (months and shall state the limitations of use.
- (2) Application. An application for a permit hereunder shall set forth the following:
 - (a) Name and address of the owner of the structure.
 - (h) A scale map of the location of the structure, drawn to a scale of not less than one inch to 200 feet.
 - (c) Proposed method of securing the structure.
 - (d) A description of the life and warning devices to be used which shall conform to the rules of the Wisconsin Department of Natural Resources and the U.S. Coast Guard.
 - (e) Length of time for which the permit is requested.
 - (f) A copy of a policy of public liability insurance applicable to the structure and its use in an amount of not less than \$100,000.00.
 - (g) A proposed plan for safequarding the area during jumps from 150 feet before the take off to 100 feet after the landing.
 - (h) The daylight hours during which the jump will be used.
- (3) No person shall tow another person on water skis for the purpose of using a water ski jump which is in violation of this section.
- (4) In granting such a license, the City expressly reserves the right to revoke any such license for any reason if it is falt by the City that said license is no longer in the best interest of the public.
- (5) A permit fee of \$10.00 shall be paid at the time of application. (Ord. \$599 03-17-68)

20.06 RACES ON ICE

- (1) License Required. No person shall sponsor, promote, participate or engage in any automobile or motorcycle race or other contest on the ice of any lake or other public waters located in the City of Muskego, unless said race or contest has first been specially licensed by the Council and the permit fee therefore as hereinafter provided, has been paid to the City of Muskego.
- (2) Application. Application for such a license shall be made to the Council at least 20 days prior to the date on which said race or other contest is to be held. The application for such license shall state:
 - (a) The name of the person or organization promoting said race or contest;
 - (b) The type of race or contest and the number of vehicles to be involved;
 - (c) The names and addresses of the persons who will participate therein;
 - (d) The time and place of said race or contest;
 - (e) The number of persons who it is anticipated will attend said race of contest;
 - (f) The time at which said race or contest will conclude.
- (3) License Fee. Each application for such permit shall be accompanied by cash or a certified check in the amount of \$200.00, and if a license is granted, the

- minimum sum of \$25 shall be retained as and for the license fee and such an additional sums shall be retained as is necessary for the purposes stated in (4) (Ord. #523 04-09-85)
- (4) Purposes of Section. The purpose of this section is to promote and protect the safety, health and welfare of the citizens of the City and persons attending such contest, and amount of license fee theretofore, provided is to be a reasonable sum for making an investigation as to the circumstances of the application to provide for necessary additional police protection and to clear up the area after the event. (Ord. #523 04-09-85)

20.07 OPERATION OF MOTOR VEHICLES ON ICE

- (1) Operation prohibited on Base Bay. We person shall use or operate any automobile or other motor driven vehicle in excess of 750 pounds gross vehicle weight upon the ice surface of that part of Big Muskego Lake known as Bass Bay, which is the Bay located at the Northwest end of said Big Muskego Lake.
- (2) Operations Regulated. No person shall use or operate any automobile or other motor driven vehicle upon the ice surface of any lake or part thereof located in the City:
 - (a) In any manner so as to endanger persons engaged in skating or in any other winter sport or recreational activity being engaged in upon the ice.
 - (b) At a speed in excess of 10 miles per hour
 - (c) When more than 4 persons occupy said vehicle.
 - (d) To tow, pull or push any person or persons on sleds, skis, skates, toboggan or device or thing of any kind.
 - (e) Between the hours of 9:30 p.m. and 5:30 a.m. (Am #94)
 - (f) Unless the operator of the motor vehicle has a valid operator's license, if the motor vehicle is an automobile, truck, motorcycle or moped. (Ord. \$597 03-03-88)
- (3) Propeller driven vehicles prohibited. No person shall operate any propeller driven vehicle, device or thing, whether or not designed for the transporting of a person or persons upon the ice surface of any lake or part thereof located in the City.

(4) Definitions:

- (a) The "automobile" as used in this section shall mean all motor vehicles of the type and kind permitted to be operated on the highways in the State of Wisconsin.
- (b) "Motor Driven Vehicle", as used in this section, shall mean any kind of device or thing designed or utilized for propulsion or movement upon the ice using a motor, whether of internal combustion design or not.
- (5) No City liability. All traffic on the ice-bound waters lying within the City shall be at the risk of the traveler as set forth in sec. 30.81(3), Wis. Stats., and nothing in this section shall be construed as rendering the enacting authority liable for any accident to those engaged in permitted traffic while this Code is in effect.

(6) Exceptions. Use of snowmobiles and all-terrain vehicles as defined by statutes of the State of Wisconsin, shall not be governed by this section. (Ord. #638 - 04-06-89)

20.08 SKIN DIVING (Ord. \$417 - 01-26-62)

- No person may engage in underwater diving or swimming with the use of swimming (1) fine or skin diving in waters other than marked swimming areas or within 150 feet of shoreline, and no person may engage in underwater diving or swimming with the use of self-contained underwater breathing apparatus in waters other than marked swimming areas, unless the location of such diving or swimming is distinctly marked by driver's flag, not less than 12 inches high and 15 inches long, displaying one diagonal white stripe 3 inches wide on a red background, and of height above the water so as to be clearly apparent at a distance of 100 yeards under normal conditions, and so designed and displayed as to be visible from any point on the horizon. Except in case of emergency, anyone engaging in such diving or swimming shall not rise to the surface outside of a radius of 50 feet from such flag. No person engaged in such diving or swimming in established traffic lanes; nor shall any such person alone or with another, intentionally or unintentionally, block or obstruct any boat in any manner from proceeding to its destination where a reasonable alternative is unavailable. A reasonable alternative route is available when the otherwise unobstructed boat can proceed to its destination without reducing its lawful speed, by passing to the right or to the left of a marked diving operation.
- (2) Swimming. When swimming without the use of self-contained underwater breathing apparatus, a suitable boat (motor or otherwise) shall accompany any person or persons swimming more than 150 feet from the shoreline or 75 feet from any anchored swimming raft on any waters within the City of Muskego, and upon adoption of an identical ordinance by the Town of Norwey.

20.09 PERMITS REQUIRED FOR SWIMMING BEACHES.

- (1) No person shall maintain a swimming beach which is open to the public upon payment of an entrance fee in the City without having first obtained a permit in writing therefore from the Council. Such permit, if issued, shall be for a period of not to exceed one year, and shall not be transferable or assignable.
- (2) Before a permit will be issued, an application in writing must be filed with the City Clerk. Such application shall set forth in detail:
 - (a) The name and address of the owner of the property on which the commercial beach is to be operated.
 - (b) Length of time for which the permit is requested.
 - (c) The proposed plan for safeguarding the area during the hours of operation.
 - (d) The hours during which the commercial venture will be operated.
- (3) No person shall operate a commercial beach unless the swimming area is distinctly and clearly marked off by buoys, and it is further required that during the hours that the beach is used by swimmers there shall be a lifequard on duty who shall possess a Red Cross Life Saving Certificate or its

equivalent and who shall be capable of rendering immediate assistance to persons in distress in the water. (Am. #167)

20.10 UNIFORM AIDS TO NAVIGATION: WATERWAY MARKERS. (Cr. \$111)

- (1) Definitions. A waterway marker is any device designed to be placed in, on or near any navigable water within the City, to convey an official message to a boat operator on matters which may affect health, safety or well-being. Aids to navigation refer to buoys, beacons and other fixed objects in the water which are used to mark obstructions to navigation or to direct navigation through safe channels.
- (2) Waterway Markers Used On Waters Within The City. No waterway markers shall be placed in, on or near any navigable waters within the City, except such buoys or other markers as have been established by the Department of Natural Resources and the United States Coast Guard as uniform navigational aids. The rules and regulations of the Department of Natural Resources and the United States Coast Guard with respect to specifications, color schemes, lettering and marking requirements of waterway markers and aids to navigation shall be kept on file in the Office of the City Clerk. (Reference Wisconsin Administrative Code, Chapter WCD5, Boat Regulations and Registration)
- (3) Display of Waterway Markers. No waterway marker shall be displayed, except in conformity with the requirements of the Department of Natural Resources. (Reference Wisconsin Administrative Code as per Section 2). The following areas in Little Muskego Lake shall be marked with regulatory markers requiring slow, no-wake speed: (Ord. #643; 5-4-89.)
 - 1. One marker on each side of Otto's Island.
 - 2. One marker at entrance to Schubring Bay approximately 200' from shore in middle of channel.
 - 3. One marker at entrance to Circle Bay approximately 200' from shore.
 - 4. One marker at entrance to Kingston Bay approximately 200' from shore.
 - 5. One marker at Idle Isle approximately 30' from shore.
 - 6. One marker at entrance to Jewel Creek.
 - 7. Three markers in west side of Idle Isle Bay extending from the small island to city-owned parcel at the end of Emerald Drive, approximately 150' from shore.
- (4) Authority To Place Markers: Permit Required.
 - (a) No person shall place any waterway marker or aid to navigation in any navigable waters within the City without a permit to do so issued by the Common Council. Application for a permit shall be made in duplicate on forms provided by the City and filed with the City Clerk. The application shall be set forth in detail:
 - 1. The name and address of applicant.

- 2. Description of real estate of owner or occupant.
- 3. Type of marker requested.
- 4. A sketch showing proposed location of the markers.
- (b) The application shall be accompanied by a permit fee as determined from time to time by the Common Council. The permit when authorized shall be issued by the City Clerk, and it shall not be transferable or assignable. The permit shall remain in effect unless surrendered by the applicant, or cancelled or revoked by the Common Council for one year.
- (5) Maintenance of Waterway Markers. Waterway markers shall be maintained in proper condition or be replaced or removed.
- (6) Exemptions. The temporary placement of mooring buoys, race course markers and water ski course markers for special events, which markers do not conform to the size, shape and color requirements of this section, may be authorized by the Common Council for a period not to exceed 14 days.

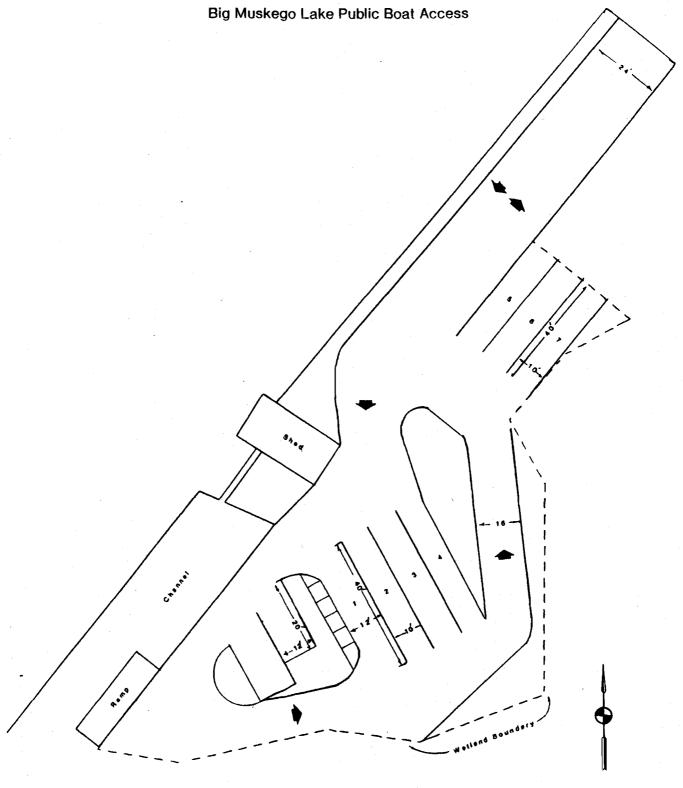
20.11 ADDITIONAL REGULATIONS

The Common Council may from time to time adopt local regulations not contrary to or inconsistent with state statute relative to the equipment, use, or operation of boats, pursuant to Section 30.77(3) and (4) Statutes. Any regulations so adopted shall be promptly posted at all public access points within the jurisdiction of the City of Muskego and a copy thereof shall also be filed with the Department of Natural Resources. (Ord. #313; 6-8-76.)

20.12 PENALTIES

Penalty for violation of any provision of this ordinance shall be as provided in Chapter 25 of the Municipal Code, unless a specific penalty for a specific ordinance or regulation contained in Chapter 20 or adopted pursuant thereto is adopted. (Ord. #313, 6-8-76)

Appendix B PRELIMINARY PUBLIC BOATING ACCESS SITE PLAN



Source: Wisconsin Department of Natural Resources

Scale 1"=30'