R.A.SMITH
& ASSOCIATES, INC.

John's Lake

Sensitive Area Designation Proposal

Waushara County, Wisconsin

R. A. Smith & Associates, Inc.

September 23, 1994

Project Number: 92803-0-345-345

INTRODUCTION

As part of the John's Lake Planning Grant Study ecologically sensitive areas were identified. This report describes what a sensitive area designation is, how parts of John's Lake qualify for this designation, and specific recommendations for protecting these areas.

SENSITIVE AREA DESIGNATION

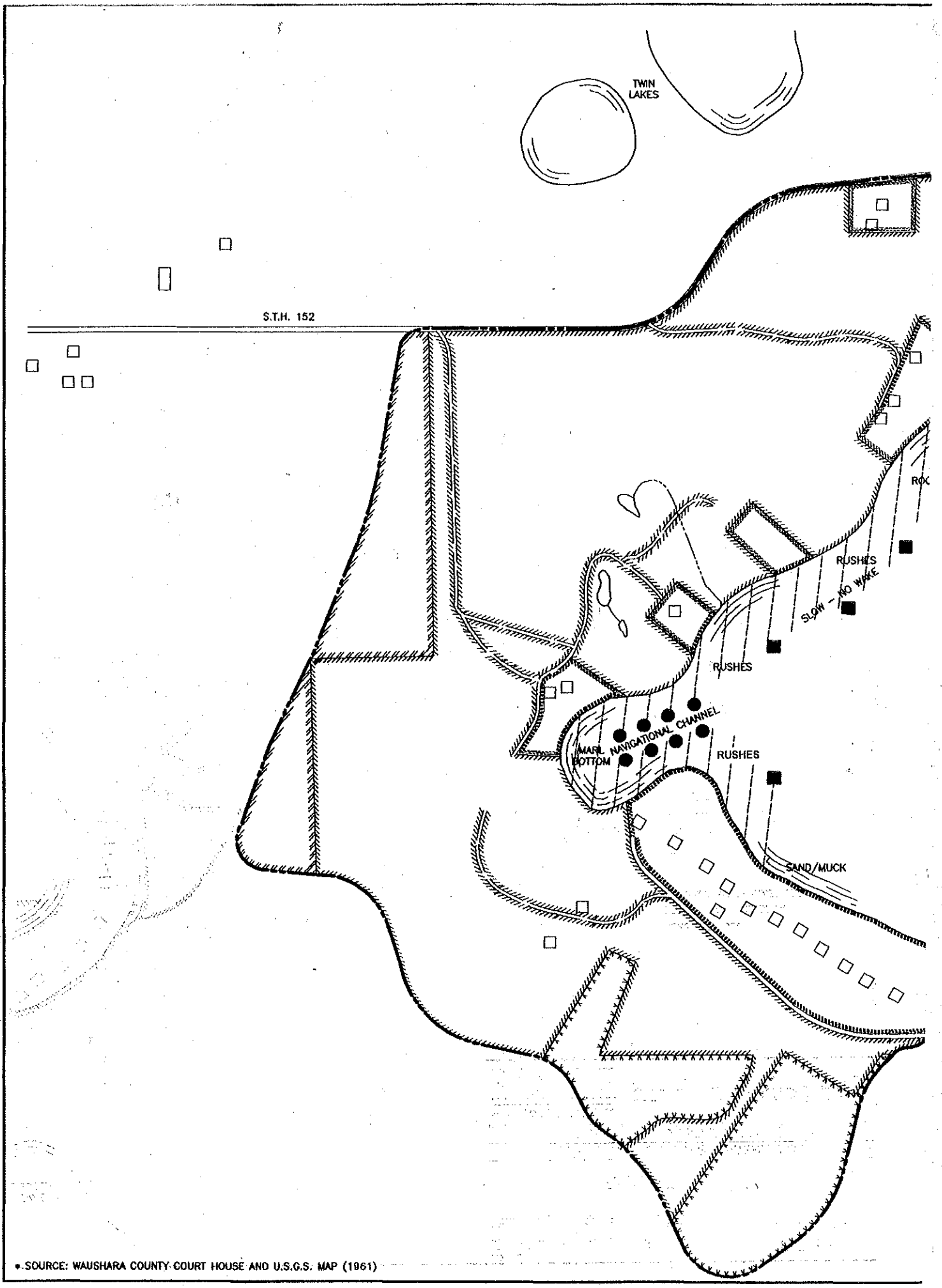
"Sensitive area" designation is described in Chapter NR 107 of the Wisconsin Administrative Code governing aquatic plant management. In Section 107.05(3(i)) it is stated that "Sensitive areas are areas of aquatic vegetation identified by the department as offering critical or unique fish and wildlife habitat, including seasonal or lifestage requirements, or offering water quality or erosion control benefits to the body of water." The "department" refers to the Wisconsin Department of Natural Resources (WDNR). According to this section, the WDNR may deny a permit to chemically treat a lake area to control aquatic plants if it is true that, "The proposed chemical application is in locations identified by the department as sensitive areas, except when the applicant demonstrates to the satisfaction of the department that treatments can be conducted in a manner that will not alter the ecological character or reduce the ecological value of the area." In practice, identification as a sensitive area by the WDNR prohibits the use of broad spectrum herbicides which indiscriminately kill aquatic plants. Designation as a "sensitive area" also has an influence on the placement of piers, marina approvals, dredging, sand bed placement or any other activity on the lake bed which requires WDNR approval. The sensitive area designation can extend beyond just areas with aquatic plants. It can also include areas which are of high importance from an ecological standpoint.

In addition to the sensitive area designation, NR 107 also has a provision to protect certain high value aquatic plant species from herbicide applications. It is stated in Section 107.08(4) that, "Treatment of areas containing high value species of aquatic plants shall be done in a manner which will not result in adverse long-term or permanent changes to a plant community in a specific aquatic ecosystem. High value species are individual species of aquatic plants known to offer important values in specific aquatic ecosystems...." This section specifies 12 species which are classified as high value species of which three have been found in John's Lake and are noted below.

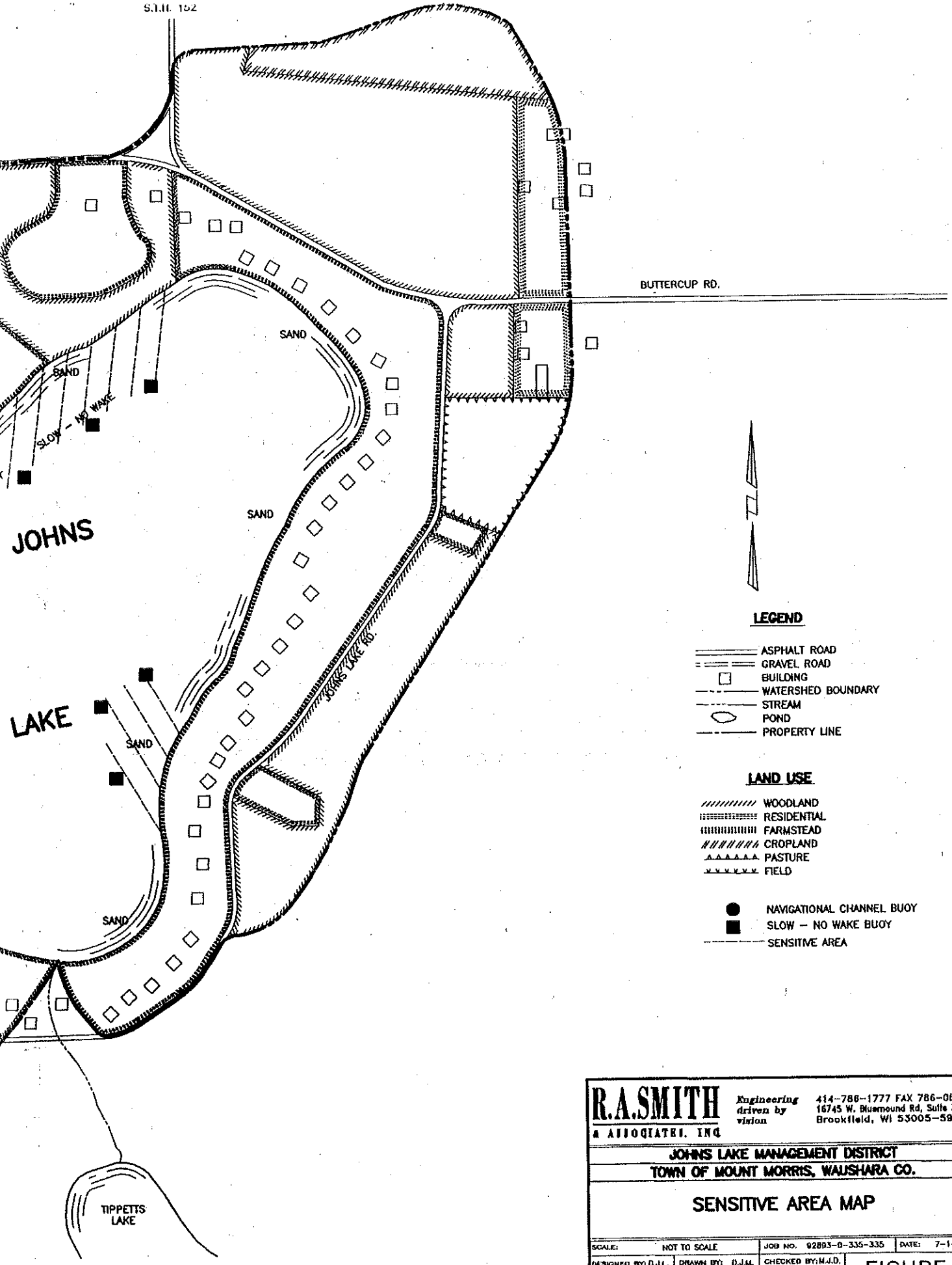
JOHN'S LAKE LITTORAL ZONE DESCRIPTION

John's Lake is a 73 acre sand and marl bottom lake predominantly fed by groundwater. Water clarity is good and aquatic macrophyte densities are low. The fishery is diverse with panfish, large mouth bass, northern pike and brown trout present, however, the fishery is not highly productive. According to the 1970 Surface Water Inventory for Waushara County prepared by the WDNR habitat for reproduction of large mouth bass and panfish is rated as good and spawning habitat for northern pike is rated as poor. A 1992 WDNR night boomshocker survey captured 132 panfish, 65 large mouth bass, 8 brown trout and 10 northern pike in 1.5 hours.

The majority of the shoreline is developed with homes and cottages. Development is concentrated on the north, east and south sides of the lake with the only significant undeveloped area along the west shore (Figure 1).



*SOURCE: WAUSHARA COUNTY COURT HOUSE AND U.S.G.S. MAP (1961)



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JOHNS LAKE MANAGEMENT DISTRICT
TOWN OF MOUNT MORRIS, WAUSHARA CO.

SENSITIVE AREA MAP

SCALE: NOT TO SCALE		JOB NO. 92893-0-335-335	DATE: 7-1-92
DESIGNED BY: D.J.L.	DRAWN BY: D.J.M.	CHECKED BY: M.J.D.	FIGURE 1
REVISED:			

A survey of John's Lake aquatic macrophytes was conducted on June 28, 1994 by R. A. Smith Associates, Inc. Lake bottom substrate was noted as well. The most common near-shore substrate is sand. In some areas there is a gradation to mucky sand or marly sand with increase in depth. The most common aquatic macrophyte is *chara vulgaris* or muskgrass, which is found along most of the shoreline in varying densities.

There is a small, artificial bay in the southwest corner of the lake which was created when this area was dredged out for its marl. In this bay, the marl bottom is exposed and provides a diverse substrate for both fish and aquatic plants. The aquatic macrophytes found in this bay include *Potamogeton illinoensis* (Illinois pondweed), *Ceratophyllum demersum* (coontail), *Elodea canadensis* (elodea), *Valisneria americana* (wild celery), *Scirpus spp.* (bulrushes), *Myriophyllum sibericum* (northern water milfoil) and *Typha latifolia* (broad leafed cattail). Both the emergent and submergent aquatic plants create a favorable spawning and refuge area for fish, northern pike in particular. The plants also provide habitat for aquatic insects and zooplankton which are important forage for panfish. Some of the aquatic plants such as wild celery also provide important forage for waterfowl. It was also noted that there were areas of the lake bottom in this bay which were heavily disturbed by the churning action of power boats.

The western shore of the lake from the southwest bay to the north shore is relatively undisturbed by development. Stands of bulrushes remain along this shore. The bulrushes are most dense near the southwest bay and thin out as you go north along the shore. Bulrushes provide important spawning areas for northern pike and cover for other fish. It also provides food for ducks and geese. The sand and gravel substrate here is relatively undisturbed.

There is another important littoral zone area of the lake. On the eastern shoreline of the lake there is a sand and gravel bar which juts out into the lake approximately 200 feet. While this bar does not contain many aquatic macrophytes, it has been observed to be a spawning area for bluegills and sunfish.

A summary of the aquatic macrophytes found in John's Lake is presented in Table 1. "High value species" as defined in the preceding section are noted in the table. Assessments for habitat value were found in the Guide to Wisconsin Aquatic Plants published by the WDNR in 1988.

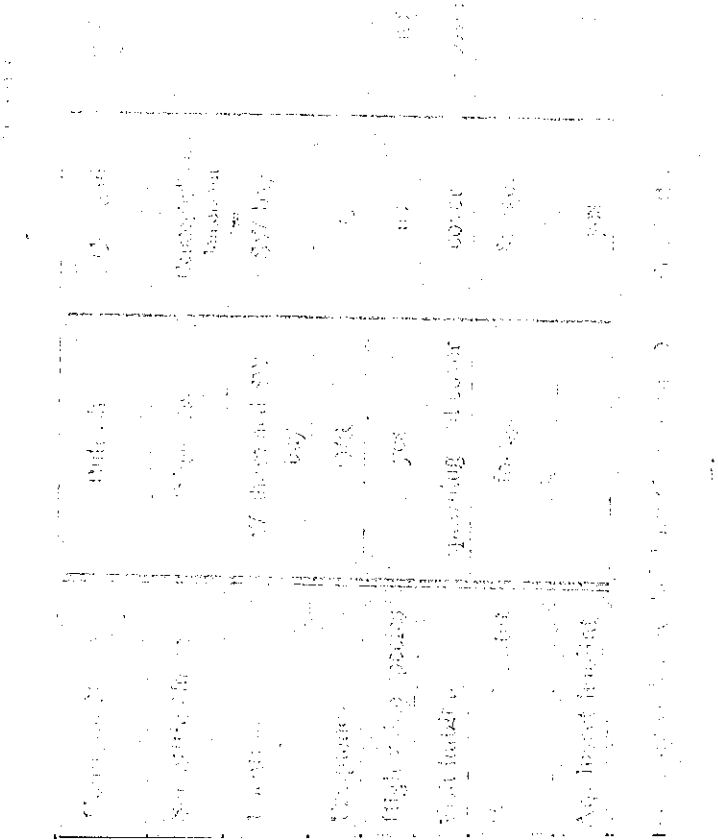

TABLE 1

Aquatic Macrophyte Species List for John's Lake

Common Name	Bulrush	Coontail	Elodea	Illinois Pondweed	Muskgrass	Northern Water milfoil	Wild Celery	Broad-leaved Cattail
Scientific Name	Scirpus spp.	Ceratophyllum demersum	Elodea canadensis	Potamogeton illinoiensis	Chara vulgaris	Myriophyllum sibericum	Vallisneria americana	Typha latifolia
Location	W shore and SW bay	SW bay	SW bay	SW bay	lake wide	SW bay	SW bay	SW bay
Frequency	O/R	C	C	C	A	C	O	O
High value species	yes	no	no	yes	no	no	yes	no
Fish habitat	spawning and cover	cover	cover	nesting and cover	cover	cover	cover	spawning
Waterfowl habitat	forage	forage			forage	occasional forage	forage	cover
Aq. insect habitat		yes	yes	yes	yes	yes		

requency codes: A-abundant; C-common; O-occasional; R-rare.

RECOMMENDATIONS

It is recommended that the John's Lake Management District request that the areas described above and shown in Figure 1 be designated "sensitive areas" as defined by Chapter NR 107 of the Wisconsin Administrative Code. Since there are so few aquatic macrophyte beds in the lake, the southwest bay and west shoreline provide crucial spawning and feeding grounds for the lake's fishery. The sand and gravel bar on the east shore also provides an important panfish nesting area. It is very important that these areas be protected. They are unique and valuable areas in terms of the aquatic ecology of John's Lake. The WDNR has the authority to designate an area a "sensitive area." The local WDNR lakes manager should be approached with this proposal in order to start the process.

Sensitive area designation provides protection from aquatic herbicide application. In addition it would influence the placement of piers, marinas, sand beds, dredging and any other activity on the lake bed which would require WDNR approval. While herbicide use is not much of a factor on John's Lake, "sensitive area" status could have a major impact on how the remaining undeveloped areas on the west shore are developed, if that occurs.

In addition to protecting the proposed "sensitive area" from herbicide use and the lake bed disturbances listed above, it is also important to protect them from the churning action and waves caused by power watercraft. There are certain aquatic macrophytes which are susceptible to damage caused by power watercraft. According to Sandy Engel, Aquatic Biologist for the WDNR, these plants tend to have brittle stems, weak or buoyant root systems or broad underwater leaves.

Of the species found in John's Lake, three of them can be damaged significantly by power boating. Bulrushes often disappear under heavy boating pressure since their brittle stems tend to break from the shear stress from boat waves. Broad leaved pondweeds such as Illinois pondweed will also disappear since their leaves provide high hydrodynamic resistance and the plants get ripped out by waves. Wild celery is flexible and able to withstand waves, but cannot withstand the direct churning action from a power boat. These three plant species are considered high value plant species. Four plant species in John's Lake, coontail, elodea, northern water milfoil, and cattail are resistant to power boating pressure but these plants are not considered to be as desirable from a fishery and wildlife standpoint as the more susceptible plants. Under heavy boating pressure, aquatic plant species diversity will decrease and species composition will shift to the boating resistant plants.

Panfish nesting beds in shallow sand and gravel bars such as found on the east shore of John's Lake can be damaged by the churning action of power boats passing overhead.

It is recommended that a new boating ordinance be instituted which would create no wake zones. The Town of Mount Morris has jurisdiction over local boating regulations. To institute a new boating ordinance, the lake district would have to request that the Town draw up and approve it and then the WDNR Bureau of Law Enforcement would have to approve it. According to state law, the creation of no wake zones can be created to protect public health, safety or welfare. This is slowly being expanded to include creating no wake zones for ecological reasons. There is precedent in the state for the creation of no wake zones to protect important aquatic plant beds which have been demonstrated to be adversely affected by fast moving power boats. It is suggested that the above proposed "sensitive areas" in John's Lake constitute important and unique ecological areas in John's Lake and that the high value aquatic plant species and panfish nesting beds are being adversely affected by fast moving power watercraft. For this reason it is suggested that a no wake zone be created which would extend 100 feet out from the shoreline around the proposed sensitive areas.

In addition to the creation of a no wake zone, it is recommended that the lake district acquire permits for, and place "Slow-No Wake" buoys along all of the "sensitive areas" as shown in Figure 1, which include the east shore sand and gravel bar. The buoys should be placed approximately 100 feet from shore or 100 feet lakeward from the longest pier. Also, a 50 foot wide navigational channel should be marked with buoys at the inlet to the southwest bay. The navigational channel would have no force of law but would encourage boaters to use an area which is already disturbed and protect the remaining aquatic macrophyte beds from further damage.

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