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LCC Members - *Richard Coen, Chair • Mark Johnson • Don Schauls • Wilfred Kuhl, FSA Rep.*

June 29, 2001

RE: SENSITIVE AREA SURVEYS

Dear Lake Association Representative:

Enclosed is a copy of two documents that pertain directly to your lake:

- 1) *Sensitive Area Survey Report and Management Guidelines*
- 2) *Guidelines for Protecting, Maintaining, and Understanding Lake Sensitive Areas*

The *Sensitive Area Survey Report* was developed by the Wisconsin Department of Natural Resources as a guide for both citizens and natural resource managers. If you have questions about this report please contact the following people:

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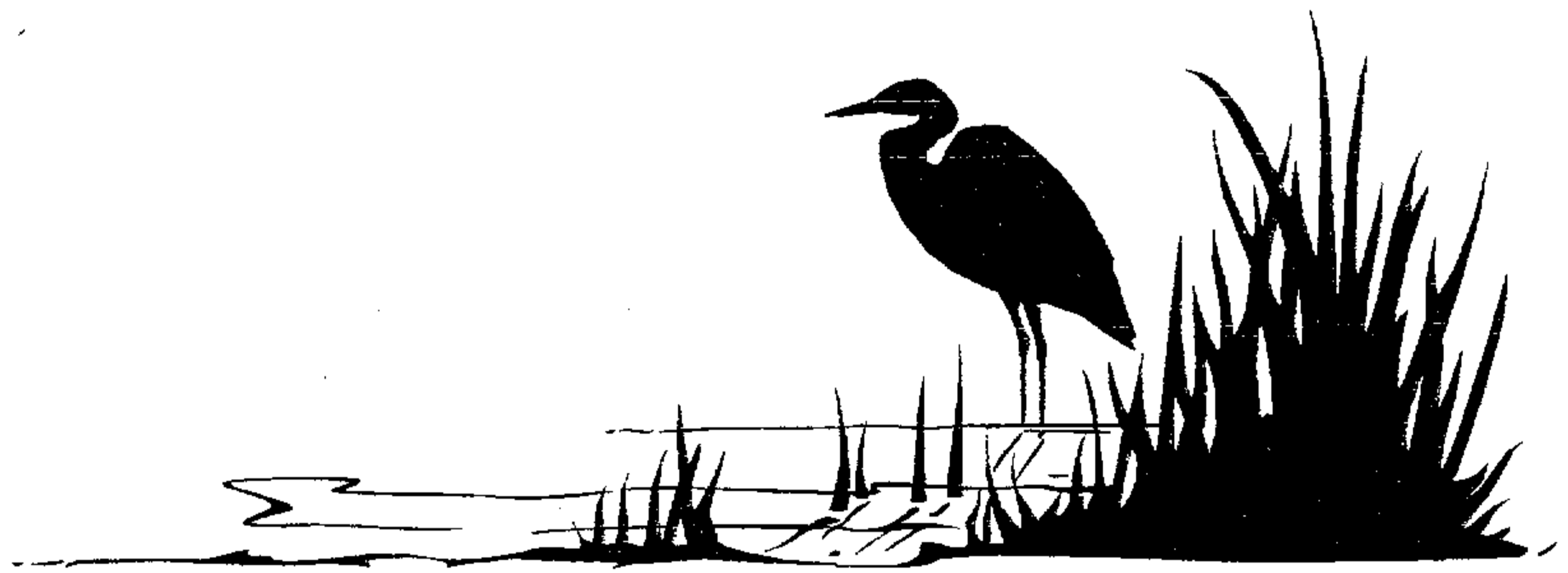
I hope this report is useful to you and your fellow lakeshore owners.

Sincerely,



Brook Waalen

LARGON LAKE SENSITIVE AREA SURVEY REPORT AND MANAGEMENT GUIDELINES



**This document is to be used
with its companion document
"Guidelines for protecting, maintaining,
and understanding lake sensitive areas"**

Largon Lake (Polk Co)

Integrated Sensitive Area Survey Report

Date of Survey: 25 August 1999

Number of Sensitive Areas: 4

Site Evaluators: Rick Cornelius, Fisheries Biologist
Kevin Morgan, Wildlife Biologist
Jim Cahow, Water Resources Biologist
Kurt Roblek, Water Resources Biologist
Gary Lund, Fisheries Technician

Lake Sensitive Area Survey results identified four areas that merit special protection of the aquatic habitat. These areas of aquatic vegetation on Largon Lake offer critical or unique fish and wildlife habitat. This habitat provides the necessary seasonal or life stage requirements of the associated fisheries while offering water quality or erosion control benefits to the body of water.

During this survey there were no documented occurrences of Purple Loosestrife. However, the threat of Purple Loosestrife is always a concern and should be dealt with immediately. Methods for control are to remove the entire plant before it produces seeds or by cutting the flower head and spraying with an approved herbicide. You should contact the Department before any of these methods are implemented.

The reader should consider that any buffer that does not extend back from the waters edge at least 35' is not providing adequate protection for water quality and should be expanded to at least 35'. Local zoning ordinances and lakes classification systems have tried to provide better guidelines pertaining to buffer widths and set backs based on lake type. Landowners are encouraged to go beyond the minimum requirements laid out by zoning and consider extending buffer widths to beyond 35' and integrating other innovative ways to capture and reduce the runoff flowing off from their property while improving critical shoreline habitat. Berms and low head retention areas can greatly increase the effective capture rate from developed portions in addition to that portion captured within the buffer.

Site conditions may dictate that a buffer has to be much wider than 35' to be effective at capturing the sediments and nutrients running off the developed portions of the shoreline. If the shoreline is steeply sloped (>7% slope) greater widths should definitely be used.

No mowing should take place within the buffer area (with the exception of a narrow access trail and small picnic area), and trees and shrubs should not be cut down even when they become old and die; because they provide important woody debris habitat within the buffer zone as well as aquatic habitat when they fall into the lake.

The following is a brief summary of the Largon Lake sensitive area sites and the management guidelines. Also, the "Guidelines for Protecting, Maintaining, and Understanding Sensitive Areas" provides management guidelines and considerations for different lake sensitive areas (Attached).

I. Aquatic Plant Sensitive Areas

The following sensitive areas contain aquatic plant communities, which provide important fish and wildlife habitat as well as important shoreline stabilization functional values. Sensitive areas provide important enough habitat for the Largon Lake ecosystem that conservation easements, deed restrictions, or zoning should be used to protect them. Management guidelines for aquatic plant sensitive areas are (unless otherwise specifically stated):

1. Limit aquatic vegetation removal to navigational channels no greater than 25 feet wide where necessary, the narrower the better. These channels should be kept as short in length as possible and it is recommended that people do not completely eliminate aquatic vegetation within the navigation channel; but instead only remove what is necessary to prevent fouling of propellers to provide access to open water areas. Chemical treatments should be discouraged and if a navigational channel must be cleared, pulling by hand is preferable over mechanical harvesters where practical.
2. Prohibit littoral zone alterations covered by Wisconsin Statutes Chapter 30, unless there is clear evidence that such alterations

would benefit the lake's ecosystem. Rock riprap permits should not be approved for areas that already have a healthy native plant community stabilizing the shoreline and property owners should not view riprap as an acceptable alternative in these situations.

3. Leave large woody debris, logs, trees, and stumps, in the littoral zone to provide habitat for fish, wildlife, and other aquatic organisms.
4. Leave an adequate shoreline buffer of un-mowed natural vegetative cover and keep access corridors as narrow as possible (preferable less than 30 feet or 30% of any developed lot which ever is less).
5. Prevent erosion, especially at construction sites. Support the development of effective county erosion control ordinances. The proper use of Best Management Practices (BMP's) will greatly reduce the potential of foreign materials entering the waterway (i.e. silt, nutrients).
6. Strictly enforce zoning ordinances and support development of new zoning regulations where needed.
7. Eliminate nutrient inputs to the lake caused by lawn fertilizers, failing septic systems, and other sources.
8. Control exotic species such as purple loosestrife. Exotic species are marked with a "*".

Resource Value of Site A

Sensitive area A is located at the confluence of Largon Creek and Largon Lake on the Northeastern end of the lake. This area covers approximately 400 feet of shoreline and encompasses the entire bay.

This area provides important habitat for centrarchid (bass and panfish) and esocid (northern pike) spawning and nursery areas. This area also provides important habitat for forage species. Wildlife also are reliant upon this area for habitat. Eagles, loons, herons, waterfowl, songbirds, furbearers, turtles, and amphibians benefit from this valuable habitat.

The emergent, floating and submergent plant community structure of Sensitive area A includes: **Emergents:** creeping spike rush (*Eleocharis*

palustris), pickerel weed (*Pontederia cordata*) and arrowhead (*Sagittaria sp.*). **Floating leafed;** yellow pond lily (*Nuphar advena*) and white water lily (*Nymphaea odorata*). **Submergents;** wild celery (*Vallisneria americana*).

Chemical treatments and mechanical removal efforts should only be allowed for navigation channels in this area. All other removal efforts should be strongly discouraged.

Resource Value of Site B

Sensitive area B encompasses the Northwestern bay of Largon Lake. Most of this length is dominated by a shallow or open water wetland, which have helped protect it from the negative impacts that can be associated with improperly developed shorelines. There are however some developed shorelines with minimal buffers. These shorelines should implement the creation of suitable vegetative buffers (approximately 35').

This area provides important habitat for centrarchid (bass and panfish) and esocid (northern pike) spawning and nursery areas. This area also provides important habitat for forage species. Wildlife are reliant upon this area for habitat. Loons, herons, waterfowl, songbirds, furbearers, turtles, and amphibians also benefit from this valuable habitat.

The emergent, floating and submergent plant community structure of Sensitive area B includes: **Emergents;** creeping rush (*Eleocharis palustris*) **Floating leafed;** yellow pond lily (*Nuphar advena*), white water lily (*Nymphaea odorata*) and water shield (*Brassenia schreberi*). **Submergents;** elodea

Chemical treatments and mechanical removal efforts should only be allowed for 25 foot navigation channels in this area. All other removal efforts should be strongly discouraged.

Resource Value of Site C

Sensitive area C is located off the small point on the western shore of Largon Lake. Most of this length is dominated by a deep marsh and shallow or open water wetland, which have helped protect it from the negative impacts that can be associated with improperly developed shorelines. There are however some developed shorelines with minimal buffers. These shorelines should implement the creation of suitable vegetative buffers (approximately 35 feet).

This area provides important habitat for centrarchid (bass and panfish) spawning and nursery areas. This area also provides important habitat for forage species. Wildlife also are reliant upon this area for habitat. Loons, herons, waterfowl, songbirds, furbearers, turtles, and amphibians also benefit from this valuable habitat.

Sensitive area C has a diverse community structure of emergent, floating and submergent aquatic plants including: **Emergents;** common bur-reed (*Sparganium eurycarpum*), smartweed (*Polygonum sp.*) and jewelweed (*Impatiens capensis*). **Floating leafed;** white water lily (*Nymphaea odorata*) and watershield (*Brasenia schreberi*). **Submergents;** elodea

Chemical treatments and mechanical removal efforts should only be allowed for navigation channels in this area. All other removal efforts should be strongly discouraged.

Resource Value of Site D

Sensitive area D is located along the Southwestern and Southern shoreline of Largon Lake following along Largon Lake Road. This area covers approximately 3,000 feet of shoreline and extends out 100-300 feet. Most of this length is dominated by a deep marsh and shallow or open water wetland. The Western shoreline contains large amounts of logs and woody debris. Portions of the sensitive area and adjoining wetland buffer along Largon Lake Road have been brushed (mowed). Removing this buffer can be

detrimental to the sensitive area and overall ecosystem of Largon Lake. Efforts should be made to discontinue or minimize the brushing activities.

This area provides important habitat for centrarchid (bass and panfish) and esocid (northern pike) spawning and nursery areas. This area also provides important habitat for forage species. Loons, herons, waterfowl, songbirds, furbearers, turtles, and amphibians also benefit from this valuable habitat.

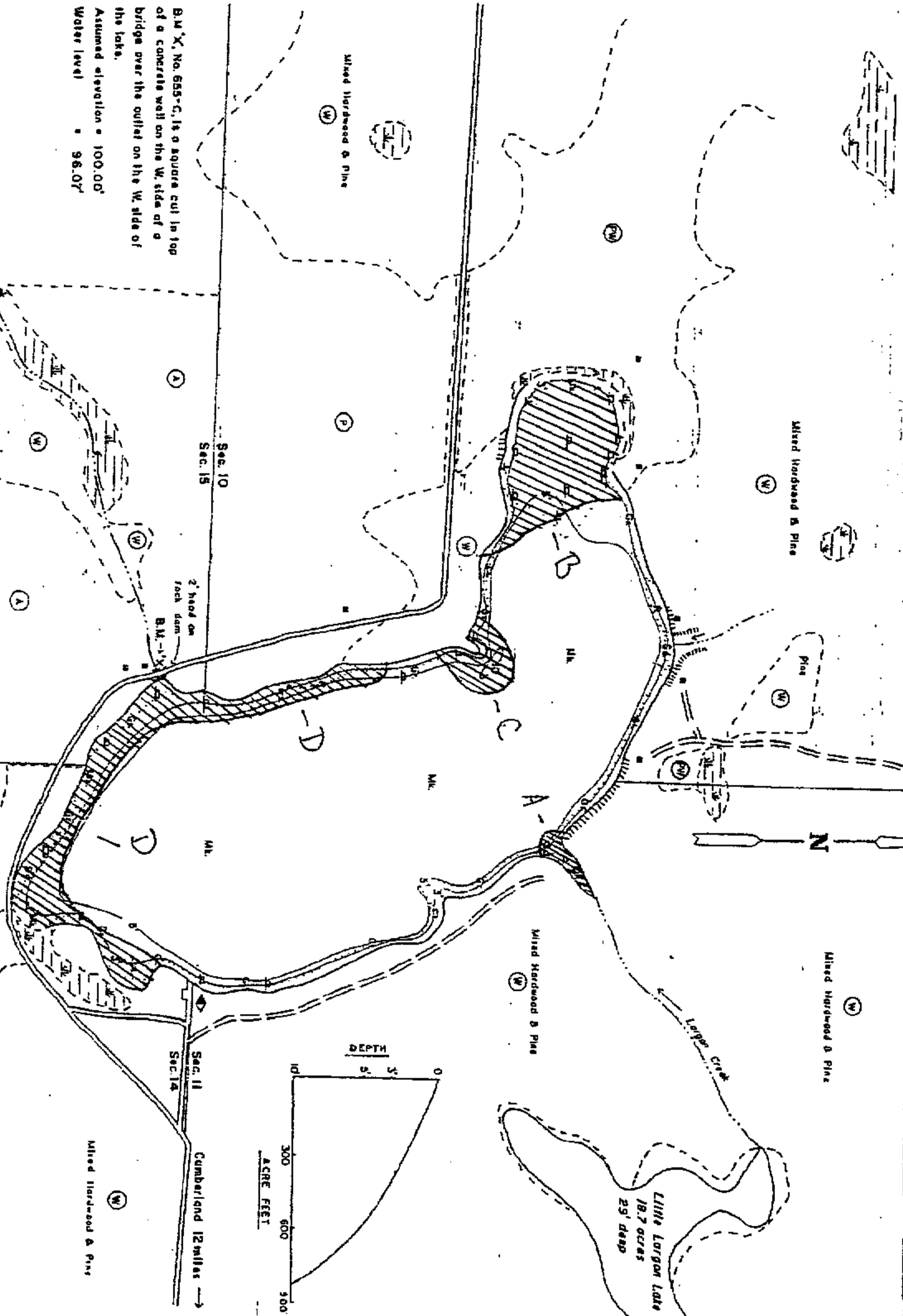
Sensitive area D has a diverse community structure of emergent, floating and submergent aquatic plants including: **Emergents:** common bur-reed (*Sparganium eurycarpum*) creeping spike rush (*Eleocharis palustris*), smartweed (*Polygonum sp.*), pickerel weed (*Pontederia cordata*) and arrowhead (*Sagittaria sp.*). **Floating leafed:** white water lily (*Nymphaea odorata*), yellow pond lily (*Nuphar advena*) and watershield (*Brasenia schreberi*). **Submergents:** elodea

Chemical treatments and mechanical removal efforts should only be allowed for navigation channels in this area. All other removal efforts should be strongly discouraged.

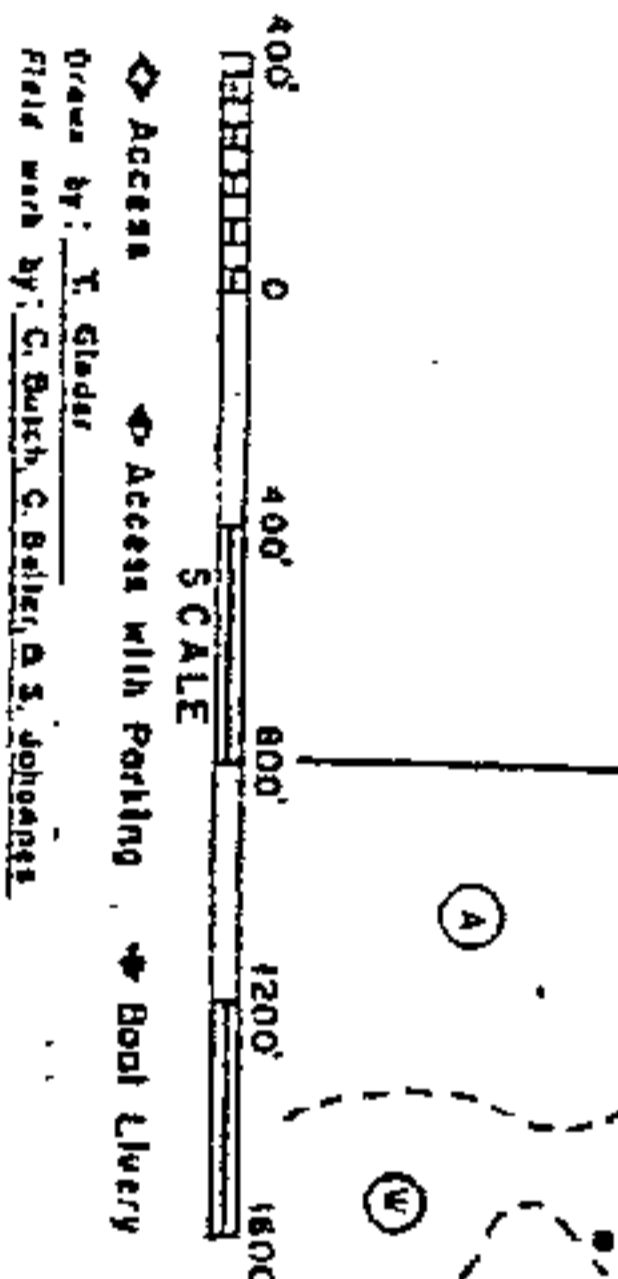
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LAKE SURVEY MAP

LARGON LAKE
POLK COUNTY
SEC. 10, 11, 14, 15 T. 36 N. R. 15 E. W.



- EQUIPMENT RECORDING SONAR MAPPED
- TOPOGRAPHIC SYMBOLS
 (1) Brush
 (2) Partially wooded
 (3) Wooded
 (4) Cleared
 (5) Pastured
 (6) Agricultural
 (7) B.M. Bench Mark
 (8) Dwellings
 (9) Resort
 (10) Camp
- SONAR MAPPED
 (A) Steep slope
 (B) Indistinct shoreline
 (C) Marsh
 (D) Sprinkle
 (E) Intermittent stream
 (F) Permanent inlet
 (G) Permanent outlet
 (H) Dam
 (I) D.I.M.T. State owned land
- 1989 YEAR
 JULY MONTH
 LAKE BOTTOM SYMBOLS
 P. Peat
 Mh. Mud
 C. Clay
 M. Mort
 Sd. Sand
 Sl. Silt
 Gr. Gravel
 R. Rubble
 Bt. Bedrock
- 1989 YEAR
 (1) Boulder
 (2) Stump & Snags
 (3) Rock exposed to navigation
 (4) Submerged vegetation
 (5) Emergent vegetation
 (6) Floating vegetation
 (7) Dam shutters



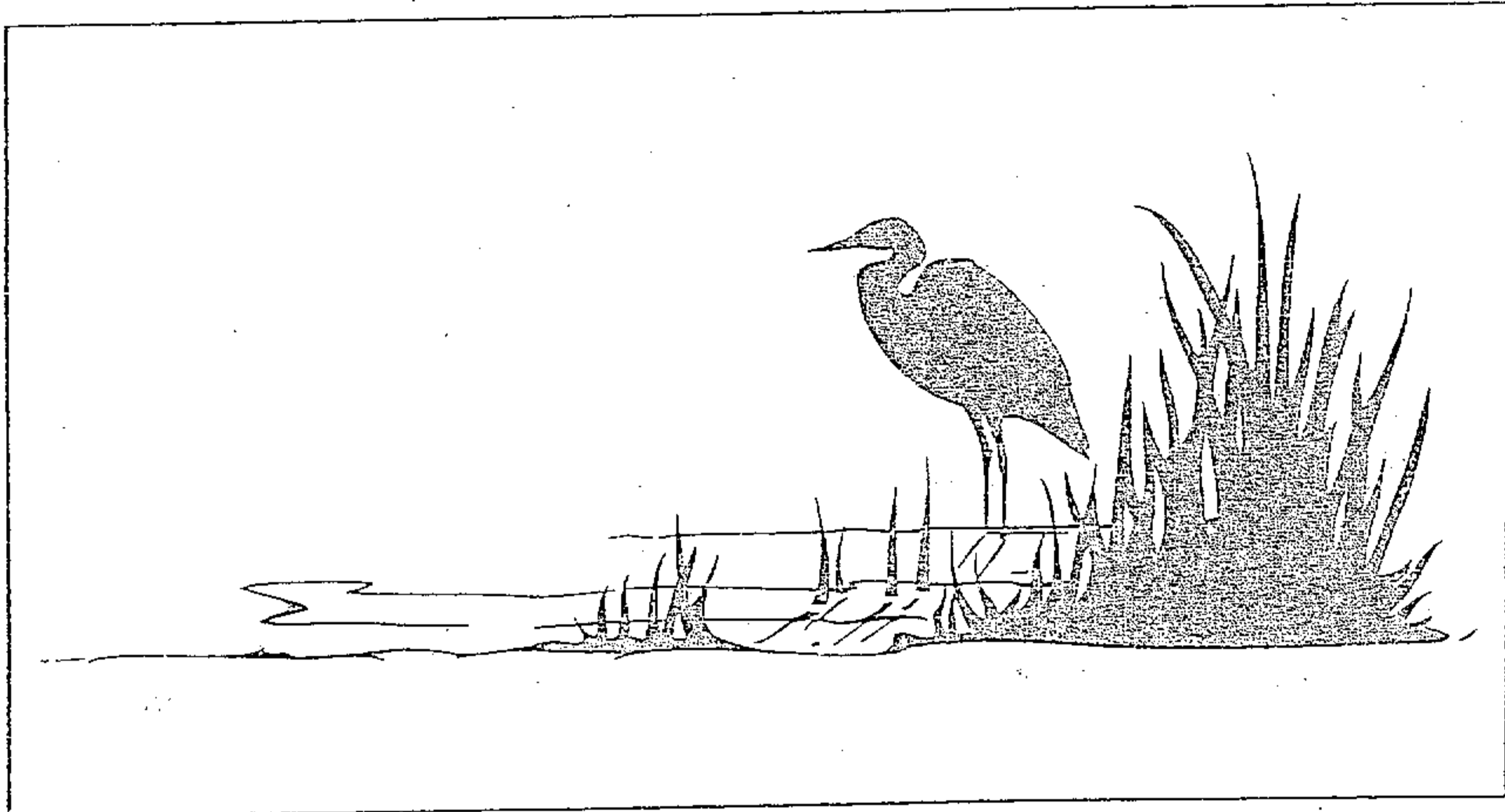
SPECIES OF FISH

FISH	1989	1988	1987	1986	1985	1984	1983	1982	1981	1980
Bluegill	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Crappie	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Kribia	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Rock Bass	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
White Bass	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Striped Bass	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Smallmouth Bass	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Brook Trout	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Parula	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Tit	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

WATER AREA 129.2 ACRES
 UNDER 3 FT. 9.5 %
 OVER 20 FT. 0 %
 MAX. DEPTH 10 FEET
 TOTAL ALK. 13 PPM
 VOLUME 826.5 ACRE FT.
 SHORELINE 2.34 MILES

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GUIDELINES FOR PROTECTING, MAINTAINING, AND UNDERSTANDING LAKE SENSITIVE AREAS



A companion document to better help
understand lakes sensitive area reports

GUIDELINES FOR PROTECTING, MAINTAINING, AND UNDERSTANDING LAKE SENSITIVE AREAS

A companion document to better help
understand lakes sensitive area reports

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CONTENTS

	Page
Introduction.....	1
Aquatic plants.....	1
Shoreline landuse and lakeshore buffers.....	4
Gravel and rock rubble habitat.....	6
Large woody debris.....	7
Zoning and regulations.....	8
Erosion control.....	9
Fertilizer use.....	10
Septic systems.....	11

GUIDELINES FOR PROTECTING, MAINTAINING, AND UNDERSTANDING LAKE SENSITIVE AREAS

This document was originally designed to be used in conjunction with specific lake sensitive area survey reports; but it can also be useful to other parties interested in protecting lakes by helping them understand important factors which determine water quality and the health of lake ecosystems. This document will concentrate on several main areas within the lake and its' shoreline areas that can be protected or restored to maintain water quality and lake ecosystem health. These main areas include aquatic plant sensitive areas, shoreline land use and lakeshore buffers, gravel and coarse rock rubble habitat, large woody debris, and various water regulations and zoning concerns. This document will not attempt to deal with land use problems that do not fall within the immediate shoreline areas; although it is recognized that lakes may have problems that occur in these outlying areas of their watershed resulting in significant nutrient and sediments.

UNDERSTANDING AQUATIC PLANT SENSITIVE AREAS

The importance of aquatic plant communities are frequently under appreciated and their importance to a lakes ecosystem health misunderstood. This is often evident by the way people refer to aquatic plants as problem weeds or weed beds. A weed by definition is a plant that is out of place or a plant of no value. The vast majority of aquatic plants are not out of place and as previously stated are extremely important for the proper functioning of a healthy lake ecosystem and are an integral part of the biotic integrity. Fisheries are dependent upon them for cover, spawning habitat, important habitat and cover for fingerlings and young of the year, habitat for aquatic insects and other important food or forage species (minnows), and they also serve an important function in reducing the shoreline erosion associated with wave action while stabilizing sediments in place.

Aquatic plants also provide many important functional values for wildlife: Loons require aquatic vegetation for their nests, waterfowl for food and cover, furbearers for food and cover, songbirds, shoreline waterbirds, frogs and other amphibians, reptiles, and a host of other wildlife require aquatic vegetation for some critical need throughout different life cycles.

In most cases chemical treatments for the removal of aquatic vegetation should be discouraged because they result in a loss or fragmentation of important habitat while also directly killing or impacting immobile species such as mussels and other invertebrates. Leading plant experts agree that chemical treatment often does not result in the desired effects with many species not affected by the chemical or free-floating species such as coon tail (*Ceratophyllum* sp.) and duckweed (*Lemna* sp.) quickly drifting back into treated areas with the next pervasive wind eliminating any benefit to chemical treatment while the introduced chemicals and their breakdown components continue to persist in the lake ecosystem. Mechanical removal of aquatic vegetation should also be discouraged or at least limited to narrow navigational channels (<20' wide) and small areas next to docks when needed.

Many lakes have limited aquatic vegetation restricted to shallow bays. Property owners in shallow bays may think they are cleaning up their bay but in actuality they are further reducing important habitat that may already be in short supply and may be the limiting factor suppressing game fish numbers for the rest of the lake. In these circumstances we need to especially consider the impacts of having clearly defined navigational channels through already scarce aquatic plant communities. We need to think of the cumulative impacts of our actions. If everyone removed the aquatic vegetation from in front of their property the health of the lake ecosystem would be severely impacted, limiting the fishery and water quality. Aquatic plants lock up available phosphorus which would otherwise drive undesirable algae blooms. Lake districts should carefully consider the value of purchasing shallow water bays with extensive aquatic plant communities to insure that future development does not result in an impact or a loss of this valuable habitat.

While current water regulations allow for the mechanical removal of aquatic plants provided the lake bottom is not disturbed and the cut plants are removed from the lake and not allowed to drift free it is hoped that property owners will carefully consider the cumulative impacts of the decisions they make for their property under the insight of this and other documents. Chemical treatment of aquatic plant communities requires a permit review and approval process, but adequate staff are not available to educate individual landowners about the full ramifications of chemical treatment and it is difficult to deny permits without adequate time to carefully research each individual application. Impacts to the native aquatic plant community also increase opportunities for exotic species to

become established.

Summary of management recommendations for the protection and restoration of aquatic plant communities

The following management recommendations provide some basic concepts that can be used or implemented to insure the long term health of aquatic plant communities and the overall health of lakes ecosystems.

1. Prohibit chemical treatment of aquatic plants except under extenuating circumstances such as:
 - A. The habitat to be treated is a dominant feature in the lake and the cumulative treatment of small areas will not reduce the overall percentage of coverage from historic coverages.
 - B. There is no other management alternative
 - C. Treatment will not result in a loss of critical habitat
 - D. It can be shown that chemical treatment will result in an improvement to the overall health of the ecosystem.
 - E. a serious use problem clearly exists
2. Discourage mechanical harvesting of aquatic plants in most circumstances. Clear only navigational channels <20' wide and small areas adjacent to docks, please consider the cumulative impacts if everyone was to duplicate the actions you take on your property around the rest of the lake.
3. Educate lake users about the value of aquatic plants
4. Apply aggressive erosion control measures to all bare soil areas
5. Protect existing natural plant cover in upland areas within a 50'-60' corridor of the waters edge and reestablish an effective buffer of natural plant cover where it has been eliminated. This corridor or buffer is an important component in protecting water quality and habitat against eutrophication and sedimentation.
6. Encourage the strict enforcement of existing zoning regulations and encourage their strengthening and uniform enforcement.
7. Provide follow through and feed back with public officials when it comes to waivers and variances of existing zoning regulations and building codes
8. Encourage the requirement of mandatory erosion control

- plans for all building permits that require ground breaking
9. Filling, dredging, or other shoreline or littoral zone alterations covered by chapter 30, Wisconsin Statutes, should be prohibited unless there is clear evidence that such an alteration would benefit the lake's ecosystem.

SHORELINE LANDUSE AND LAKESHORE BUFFERS

The impacts that can result from shoreline development can be greatly reduced if done carefully with respect to the many important functional values that must exist to maintain a healthy lakes ecosystem. Natural shoreline vegetation provides important protection for lake water quality as well as ecosystem health and should be maintained for at least a 50-60' buffer strip adjacent to any waterbody. If shorelines have a steeper gradient than 10-15% the buffer strip width should be increased. Access corridors through this buffer zone are restricted by most county zoning regulations. Restrictions usually prevent the clearing of woody vegetation to no more than 30' out of every 100' of shoreline. Property owners that care about the health of their lake's ecosystem can go a step further by reducing the clearing of vegetation to a narrow foot path. The best design for a foot path is an irregular trail that does not go in a direct line to the lake but has irregular meanders much like a stream with small berms and humps to prevent runoff from flowing directly down the path and preventing the path from become an area of concentrated flow for the direct delivery of sediments and nutrients.

The importance of maintaining the zone of no disturbance of the natural vegetation along the lake shoreline is important for several reasons. As land is cleared and developed, irregular surface areas are lost, leveled, and filled in by earth moving equipment, reducing infiltration and increasing runoff. Soil porosity is also decreased, decreasing infiltration and increasing runoff. As we loose or simplify the layers present (trees, shrubs, and herbaceous ground cover) in the shoreline areas we decrease the layers present for the interception of rainfall; each layer present reduces the energy and volume of rainfall striking the grounds surface thereby reducing what is available for the mobilization and transport of sediments and nutrients from the grounds surface to the lake. The greater the volume of runoff the more energy available for the transport of nutrients and sediments from surrounding land uses into the lake to drive algae blooms and bury important shoreline habitats.

Each of these three layers (trees, shrubs, and herbaceous ground cover) provide different important habitat components for different life cycle requirements of various wildlife. If any one layer is missing the ability of certain wildlife species to survive may be compromised. Leaving wider areas of uncut vegetation (Buffer Zones) increases the likelihood that adequate habitat will exist for many species of songbirds, who are at risk from the loss of this valuable lake shoreline habitat. Furbearers, raptors, frogs, deer, and other wildlife also benefit from these wider natural areas.

The aesthetic perspective also needs to be evaluated. Everyone likes to look out and see the lake, but very few people like to look at an intensively developed shoreline that reminds them of the urban yards and hectic pace they were trying to get away from. Maintaining the natural wild character of a lake should be the highest priority guiding any development activities. Both man and wildlife will loose if the natural character is allowed to be manipulated to the point our lakeshores begin to resemble urban yards and lawns. This emphasizes the importance of insuring that development is done carefully to maintain as many of the important functional values that the natural undeveloped shoreline had.

The restoration of a naturally vegetated buffer for at least 50'-60' from waters edge should be a very high priority for properties that have been cleared or converted. As previously stated a healthy buffer includes the native trees, shrubs, and herbaceous ground cover that would naturally have existed on a given site or location. The native species can usually be identified by looking at undeveloped shoreline areas.

Summary of management recommendations for the protection and restoration of natural vegetative shoreline buffers

1. Educate landowners about the importance of a healthy lakeshore buffer
2. Encourage the strict enforcement of existing zoning regulations and encourage their strengthening and uniform enforcement.
3. Provide follow through and feed back with public officials when it comes to waivers and variances of existing zoning regulations and building codes
4. Encourage the requirement of mandatory erosion control

- plans for all building permits that require ground breaking
5. Provide direct oversight of all building crews and insure that as little as possible of the natural plant cover is disturbed during the construction phases.

PROTECTION OF GRAVEL AND COARSE ROCK RUBBLE HABITAT

Gravel and coarse rock rubble free of silt and sediments is critical to the successful reproduction of some walleye stocks. Gravel and coarse rock rubble free of silt and sediments is also critical to the survival of different components of the aquatic food chain that supports a healthy lake ecosystem, including aquatic insects, crayfish, and other forage or food species. The greatest threat to these critical habitats is shoreline development that is not accomplished in a manner that maintains an adequate buffer of undisturbed land and does not implement and maintain proper erosion control measures. This buffer is particularly important during ground breaking and construction of lake shoreline areas, because it traps sediments and nutrients within the vegetation and irregular surface areas and small depressions preventing them from reaching the lake and driving algae blooms or burying important habitat.

Summary of management recommendations for the protection of rock rubble walleye spawning habitat

1. Educate landowners about the importance of a healthy lakeshore buffer (filter out sediments)
2. Encourage the strict enforcement of existing zoning regulations and encourage their strengthening and uniform enforcement.
3. Provide follow through and feed back with public officials when it comes to waivers and variances of existing zoning regulations and building codes
4. Encourage the requirement of a mandatory erosion control plan for all building permits that require ground breaking
5. Provide direct oversight of all building crews and insure that as little as possible of the natural plant cover is disturbed during the construction phases.
6. Do not use sand blankets to convert natural bottom types to sterile beach sand.

7. Filling, dredging, or other shoreline or littoral zone alterations covered by chapter 30, Wisconsin Statutes, should be prohibited unless there is clear evidence that such an alteration would benefit the lake's ecosystem.

MAINTENANCE OF LARGE WOODY DEBRIS

Large woody debris or trees should be left in the lake as they naturally collapse and fall into the lake. Large Woody debris is often overlooked for its importance in providing critical fish habitat. Species such as largemouth bass require some sort of cover to successfully nest and rear offspring. Bluegills and other species also benefit from the presence of large woody debris. The conversion or removal of natural plant cover within a 50'-60' corridor of the lake reduces or eliminates completely the opportunity for the replacement of large woody debris as well as other important functional areas important to any lakes ecosystem health and should be discouraged. The way we look at large woody debris should in the context of its importance to the health of the lake ecosystem. Preformulated perceptions drawn from urban experiences or practices used in urban areas can be very destructive to the way natural environments function in a complex interconnected fashion. A shoreline ringed with fallen trees should not be looked at as untidy or unkempt but one that is providing important habitat for fish and wildlife. Fishermen have recognized for decades that fallen trees are often some of the best habitat to fish for bass and panfish. This emphasizes the need to re-assess our value system and begin leaving them for important habitat. Fisheries managers in recent years have begun to increase their educational efforts in this particular area but still have a majority of the public to reach with this important message.

Management recommendations for woody debris

- I. Educate lake shore owners about the value of allowing trees to fall into the lake naturally in order to provide valuable habitat for fish and wildlife.
- II. Encourage lake shore property owners to become involved in the long term planning for woody debris on their property. Plant young trees for the replacement of older trees.

ZONING AND REGULATION CONSIDERATIONS FOR LAKE PROTECTION

Filling, dredging, or other shoreline or littoral zone alterations covered by chapter 30, Wisconsin Statutes, should be prohibited unless there is clear evidence that such an alteration would benefit the lake's ecosystem. Sea-walls should not be used and sand blankets should not be allowed in almost all situations. Rock rip-rap should be used only when anchoring difficult shorelines with problematic erosion.

County shoreland and wetland zoning regulations apply to the areas within 1000 feet of lakes, ponds, and flowages and within 300 feet of rivers, streams, and creeks. The intent of zoning regulations is to promote wise land use planning while allowing careful development around our precious surface water resources.

In all cases during development, the maintenance of a naturally vegetated buffer zone is critical to preserve a healthy lake ecosystem. In situations where the vegetation has been removed or altered it is encouraged to reestablish a buffer zone composed of the natural plant communities that belong there. This can usually be easily identified by looking at undeveloped shoreline areas and utilizing the same plant species. This ensures that you not only get water quality protection, but you also get the important functional values that the native plants were providing for food and cover for shoreline species of wildlife dependent upon them.

Erosion control during lot development

This is one area that can have a dramatic effect on water quality and habitat if it is not done correctly. The volume of sediments and nutrients that can be transported to a lake during the construction phase can equal the amount that would normally have only come off from the same parcel of land over a period of hundreds of years. The compounding effect of this nutrient load can have a dramatic effect on long term lake water quality. By following some basic rules during the construction phase we can keep most of these sediments and nutrients in place and prevent them from becoming a part of the lakes internal nutrient cycle that could cause a shift from a clear lake to one that has ample nutrients to drive extensive algae blooms each year.

Adequate soil erosion control measures and their proper maintenance during construction are very important and should become a very high priority for individual property owners. Lake association members could play an active part in reaching property owners before the damage is done or minimizing impacts by identifying active sites that need erosion control measures and contacting property owners to encourage proper implementation of erosion control measures. County zoning staff and officials need public support to get more effective zoning regulations on the books. Public support needs to be expressed if adequate county staff are to be hired to meet the increasing demands that are being placed on them by expanding development. As is most counties suffer from inadequate staff to deal with existing work demands. Mandatory erosion control plans should be a requirement for all building permits that will involve ground breaking. This needs to be coupled with adequate staff to insure that erosion control plans are being followed and properly implemented and that erosion control measures are properly maintained. More recently county governments have begun to deal with these difficult issues.

Until county wide erosion control ordinances can be established it is strongly recommended that individuals require contractors to develop erosion control plans prior to the initiation of any construction, then the landowner should ensure that it is adequate. Aggressive follow through after construction has begun is also important to insure erosion control practices are properly implemented and maintained.

By giving erosion control careful consideration prior to construction serious impacts to our lakes and streams can be minimized or avoided entirely. Yards can be designed with subtle burms to divert runoff into internally drained areas or into constructed depressions to allow sediments and nutrients to settle out and be trapped before reaching our streams and lakes. Silt screen fences, properly installed during construction can protect against "sheet" runoff. Other erosion control methods are required on steep slopes or difficult sites. Your county land conservation staff or DNR technical support can provide expert advice about erosion control.

Protect all top soil piles by properly locating them away from drainage ways and as far away from the lake as possible. Surround them with a ring of silt screen fence while also seeding them down with an annual rye grass to provide additional stabilization until they are needed.

Never divert rainfall runoff from driveways, roofs, or access roads directly to the lake through drain tiles, culverts, or waterways. Instead, divert runoff into internally drained areas, constructed depressions to allow for settling of sediments and nutrients, or at least into a thickly vegetated site that will provide some degree of filtration and infiltration of runoff.

Management recommendations for construction site erosion control

- I. Minimize disturbance of natural plant communities within shoreline areas (50'-60' from water's edge) so they can continue to act as a buffer protecting lake water quality by filtering runoff and providing for infiltration before it reaches the lake.

- II. Provide direct oversight of the construction crew during development. Insure that clearing of vegetation is kept to the minimum needed to accomplish the desired construction and avoid any disturbances within at least 50'-60' of any shoreline
 - A. Insure that silt screen fences are installed and maintained.
 - B. Apply mulch to all bare soil areas that may be exposed to precipitation during non-work hours, and especially make sure mulch is applied before weekends. Purchase and use excelsior erosion control mats and other products where necessary.
 - C. Provide coarse gravel and crushed rock cover for all areas that have regular heavy equipment traffic, i.e. driveways. Keep all vehicle traffic confined to these protected road surfaces.
 - D. Include landscape designs for the protection of water quality i.e., such as holding ponds and depressions which provide for the opportunity to capture and hold runoff while maximizing infiltration and allowing sediments and nutrients to settle out.
 - E. Try to eliminate or minimize areas of concentrated flow by reducing the surface area draining through a single path or channel and encouraging flow over multiple paths into depressional areas through the use of berms and other best management practices (BMPs).

VI. Use of fertilizers on lake side lawns

From a water quality standpoint lawn fertilizers are a recognizable source of nutrients that property owners can eliminate or control through proper application, more is not better. Landowners are also encouraged to strongly consider the consequences of having a large lawn that extends into the recommended buffer area (within 50'- 60' of the lakeshore). By reducing your lawn size you not only reduce the amount of sediments and nutrients entering the lake you also provide important habitat necessary to support Wisconsin's wildlife species dependent upon this important shoreline habitat that is quickly disappearing in the face of increasing development pressures. Another benefit to decreasing lawn size is the reduction in work load necessary to maintain it; hence you can spend more time relaxing and enjoying your property.

If you feel the need to fertilize your lawn have your soil tested for phosphorus and potassium levels. When applying fertilizers consider the need to have soil phosphorus levels at the maximum recommended level. By applying fertilizers at a lesser rate you can still enhance your lawn without the increased risk of having excess drain into the lake to drive undesirable algae blooms. Remember that fertilizer suppliers are in the business to sell chemicals. The recommended bag application rates are often too high. Get advice from your county or university extension offices and remind them that you are applying the fertilizers to a lakeshore lawn and do not want to over apply.

Never burn brush or leaves, especially along the lakeshore, in road ditches, or in drainage ways that drain into the lake. The ashes are very high in phosphorus and nitrogen and are soluble in rainwater. The best way to deal with leaves is to compost them. Spreading them in a wooded area that does not drain to the lake is also a good way to deal with leaf disposal. If neither of these is an option bag your leaves and take them to a yard waste collection site for proper disposal.

Do not remove grass clippings from lawns. They contain all the nitrogen and phosphorus your lawn needs which you will not have to replace with annual fertilizer applications. Use a mulching lawnmower it recycles the clippings into your lawn more efficiently. Never spread wood stove ashes in areas draining to the lake; instead dispose of them with your household garbage during normal refuse pickup times.

Management recommendations for fertilizer use

- I. Apply fertilizers only if a soils test has determined that it is nutrient deficient and add less than the maximum recommended.
- II. The use of a low phosphorus content fertilizer is strongly recommended if the fertilizer is to be applied on lakeshore property.

VII. Septic system maintenance and necessary replacement of old failing systems

Failing septic systems can pose a significant threat to water quality, especially when large portions of shoreline are developed and when the overall percentage of a lakes watershed is dominated by lakeshore properties. Septic systems that are older than 20 years should be looked at to insure that the filtration field is properly functioning and that waste is not perching above the drain field and entering the lake directly without adequate filtration of nutrients and other components. There is no specific rule that septic systems have to be evaluated to determine if they are functioning properly, unless there is a complaint filed.

It is generally recommended that you have your septic system pumped of the normal sludge buildup every two to three years. This sludge removal is essential for maintaining the absorptive capacity of your drainfield.

Inspect your system regularly for surfacing effluent around the drainfield. Are there wet areas or strong odors? Do the drains in your home seem to work properly or are they sluggish? Do they make noisy gurgling sounds? If your septic system has any of these systems you should have it inspected by a licensed installer.

Never make any changes to your sanitary system or wastewater piping. This work must be done by a licensed installer. It is not only dangerous to health and human safety, as well as water quality, it is also illegal and can result in fines or penalties.

Avoid using a garbage disposal with private septic systems. Put kitchen scraps in a compost pile if at all possible; otherwise, as a last resort put them in with your household garbage. Limit the use washing machines, if possible. Laundry washwater is high in lint, synthetic fibers, and pet hair all of which can cause premature failure of your drainfield. Use a commercial laundry if possible or if

you are a weekend resident with a lakeshore septic system wait until you return to your midweek residence with public water and sewer.

A septic system is only intended to break down organic wastes. Never put solvents, furniture stripping solutions, degreasers, petroleum compounds, oil based paints and stains, or other chemicals into your sanitary system.

Diverting sink and shower drains (so called gray water) to lawns and other properties adjacent to the lake will not only impact lake water quality it is also illegal. Gray water must be run through your septic system to allow for the proper filtration of pollutants. There are no exceptions to this without first obtaining necessary permits.