

Irogami Lake
WIBIC #103900
Sensitive Area Designation Report

Date of survey: 17 July 2003 and 19 August 2003

Number of sensitive areas: 7

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General Lake Information:

Irogami Lake is a 289-acre lake located adjacent to Big Silver Lake near Wautoma, Wisconsin. Maximum depth is 5 feet and the average depth is 2 feet. A water control structure on the northeast end and a weir at the culvert to Big Silver Lake end artificially raises the water level.

The shoreline has varying levels of development with the west shoreline being the least developed on the lake with abundant fallen timber as a result of the 1992 tornado. The undeveloped shorelines have diverse, high value aquatic plants and are buffered by forest and wetlands. There are 97 homes on the lake with the majority being on the north, east and south side. There are other homes not adjacent to the shoreline, but there is considerable use from the residents. All homes are serviced by municipal sewer, which eliminates septic systems as a nutrient source to the lake.

The lake has standard boating restrictions so speeds in excess of no wake are common. Despite the popularity of boating, the lake is also very popular for fishing. Canoeing, swimming and relaxation are other uses found on Irogami Lake. Public access is provided by one boat landing on the north side off of Chicago Avenue and two improved boat landings along the south shore off of Irogami Trail.

A unique characteristic of the lake is that the entire lake is considered to be littoral. The littoral zone is the area of a lake that sunlight can penetrate to sufficient depths that allows aquatic plants to grow. The amount of littoral zone directly affects the productivity of a lake. The more littoral area a lake has to offer, the more a lake can reap the benefits that aquatic plants provide (e.g. nutrient attenuation, water clarity, habitat, etc.). The large littoral area is responsible for the diversity of aquatic plants in the Irogami Lake and one reason the lake is so unique, which led to this SAD. Protecting the native plants in the lake and especially in the sensitive areas will help enhance the benefits aquatic plants provide as well as reduce the risk of unwanted exotic species from becoming established.



Segments of the shoreline are undeveloped and provide very important habitat for wildlife, fish and invertebrates. Large trees, brush and other plants provide diversity in habitat that is well suited for many species. The common occurrence of dead trees provides snags for birds and cavity dwellers as well as aquatic habitat when these snags fall into the water.

Fallen trees should be considered an asset and beneficial to the wildlife and fish community. When snags fall into the water they provide very important functions to the lake such as habitat for fish, wildlife and invertebrates. Species that need to bask in the sun such as painted turtles can use these to rest. Fallen trees also absorb wave energy that would otherwise erode banks and decrease water clarity and quality (see figure 1.). The loss of this woody debris affects many things. Research has found that recent losses of woody debris on developed shorelines could affect those areas for two centuries.

Near shore aquatic vegetation works in concert with fallen trees to add diversity, which improves fish, wildlife and macro-invertebrate production. Almost all living things in a lake ecosystem (94%) depend on shorelines for feeding, shelter or raising their young during all or some of their life. Essential habitat is provided by the undisturbed shorelines around the lake and the large littoral zone. Combining these two factors makes Irogami Lake truly unique.



Figure 1. Fallen trees along the west shoreline. Very diverse shoreline teeming with wildlife and fish.

Irogami Lake is a warm water fishery. Primary game species are largemouth bass and northern pike. The Lake was declared a freeze-out lake in the 70's but has since been removed from that listing. Sport fishing has been a popular year round activity the past few decades. Bluegill and yellow perch are the common panfish; crappie and sunfish are present but not abundant.

A comprehensive fish survey by the Department in 2001 showed a healthy fishery with abundant bluegill and large-mouth bass (see attached summary). Part of the survey consisted of marking bluegill spawning colonies. Location of bluegill colonies during the spring has been ongoing since then and a remarkable correlation to the SAD's occurs. The designation of the SAD's was primarily based on the presence of aquatic vegetation, aesthetics and undeveloped shoreline on the premise that these areas are conducive to good fish and wildlife habitat. Overlaying maps of the bluegill spawning colonies to the SAD's shows a correlation beyond coincidence. The presence of these colonies in the

proposed SAD's underscores the importance of the areas to fishery of the lake and ultimately to other wildlife.

Introduction:

This survey was conducted on 17 July 2003 and 19 August 2003 using the Wisconsin Department of Natural Resources protocol guidelines for conducting and implementing sensitive area designations (SAD). The purpose of the SAD is to identify areas within the lake that have unique characteristics based on the aquatic plant community, fish and wildlife use. This SAD can provide lake organizations, shoreline property owners, county zoning officials, DNR personnel and other users with specific information that can be used for management recommendations and for educational efforts.

The companion document "Guidelines for Protecting, Maintaining, and Understanding Lake Sensitive Area" is attached in Appendix I. This is a generic document designed to be used in conjunction with specific lake sensitive area designation reports to help the user plan for future needs such as zoning changes, specific town ordinances or land purchases for protection.

What is a Sensitive Area Designation?

Sensitive area designations are defined in Wisconsin Administrative Code NR 107.05(3)(i)(1) – *Sensitive Areas are areas of aquatic vegetation identified by the department as offering critical or unique fish and wildlife habitat, including seasonal or life-stage requirements, or offering water quality or erosion control benefits to the body of water.* These areas may consist of valuable aquatic/wetland vegetation, terrestrial vegetation, gravel/rubble substrate, downed woody cover and water quality buffers.

Following is a list of potential ways sensitive area designations could be used:

- To inform and educate the public of potential impacts to the aquatic ecosystem from shoreline alteration
- By managers to guide permitting processes of aquatic plant management, water regulations, fisheries management, wildlife management and local zoning activities
- By local lake organizations to help guide lake use and management activities
- As a foundation for further research or study
- As a complement to local land-use planning activities
- To provide information to potential shoreland buyers and existing shoreland owners
- As baseline data for various resource management decisions
- To provide education to the public about the benefits of protecting and restoring aquatic life habitat.

It is a goal of this SAD to include an educational component as well. A "Lake Water Trail" is also included so an interested party can follow a path through each sensitive area to gain a better understanding of why these areas were selected. We encourage you to explore these sensitive areas and witness the many living things that use these unique areas. Appendix II has a map of the SAD's, a suggested travel route, and a brief narrative to explain some of the uniqueness associated with the area.

The Sensitive Area Designations:

Seven sites on Irogami Lake were designated as sensitive areas because they contain critical or unique habitat (figure 2.). These areas are highly recommended for additional protection. No removal of any rooted vegetation should take place in these areas unless the local Aquatic Plant Management Coordinator has approved the removal. Table 1 below contains the GPS coordinates for the start and end of each SAD.

Table 1. GPS coordinates for the start and end of all SAD's .

SAD No.	Start		Finish		Type
	Lat.	Long.	Lat.	Long.	
A	44 03' 48.7"	89 14' 22.0"	44 04' 9.2"	89 14' 15.7"	I
B	44 03' 47.6"	89 14' 9.7"	44 03' 58.6"	89 13' 50.6"	III
C	44 04' 13.7"	89 13' 45.4"	44 04' 12.1"	89 13' 38.9"	I
D	44 03' 44.8"	89 13' 29.8"	44 03' 42.7"	89 13' 29.8"	I
E	44 03' 59.2"	89 14' 29.9"	44 04' 11.0"	89 14' 29.1"	II
F	44 03' 39.5"	89 13' 31.8"	44 03' 29.2"	89 13' 11.1"	II
G	44 03' 47.3"	89 13' 53.1"	44 03' 51.9"	89 13' 40.8"	III

The Field Survey:

Two surveys were conducted in the summer of 2003. The first survey involved DNR personnel Fishery Biologist – Dave Bartz, Wildlife Biologist – Paul Samerdyke, Water Management Specialist – Shawn Eisch, and Water Resources Specialist – Scott Provost. This team surveyed the lake to locate specific areas that provided significant habitat. The second survey consisted of the Water Resources Specialist and Conservation Warden Dave Algrem. The objective was to identify areas of interest law enforcement might have.

All surveys pointed out unique areas that served fish and wildlife functions, provided aesthetic qualities, and/or had unique characteristics that differ from other lakes in the area. Each specialist identified areas that they feel provide the most habitat and protection for the lake. The results were meshed together to develop the sensitive areas delineated on the map.

The SAD's were divided into three types. This was done to have different levels of management and to effectively control exotic species.

Type I: This type of SAD is designed to maximize protection of the most unique and beneficial areas of the lake along the shoreline. Type I sensitive areas were chosen based on the lack of disturbance, lack of exotic species, unique habitat for fish and wildlife and relative importance to maintaining the integrity of the lake. Shoreline disturbance above and below the OHWM should be limited.

Suggested Management Criteria of Type I SAD:

- No native aquatic plant control/removal of native rooted plants.
- Maintain a 75-foot buffer of undisturbed vegetation above OHWM.
- Limit shoreline alteration to correction of only the most degraded cases.
- Discourage all bank armoring with rock or concrete.

Type II: This type of sensitive area focused on the benefits adjacent wetlands provide for wildlife and water quality. Human development or exotics may threaten these areas and so it may be a candidate for limited management strategies. For example, a site may have high quality characteristics but exotics such as, Purple Loosestrife may become established that area. Certain management options may need to be employed.

Suggested Management Criteria of Type II SAD:

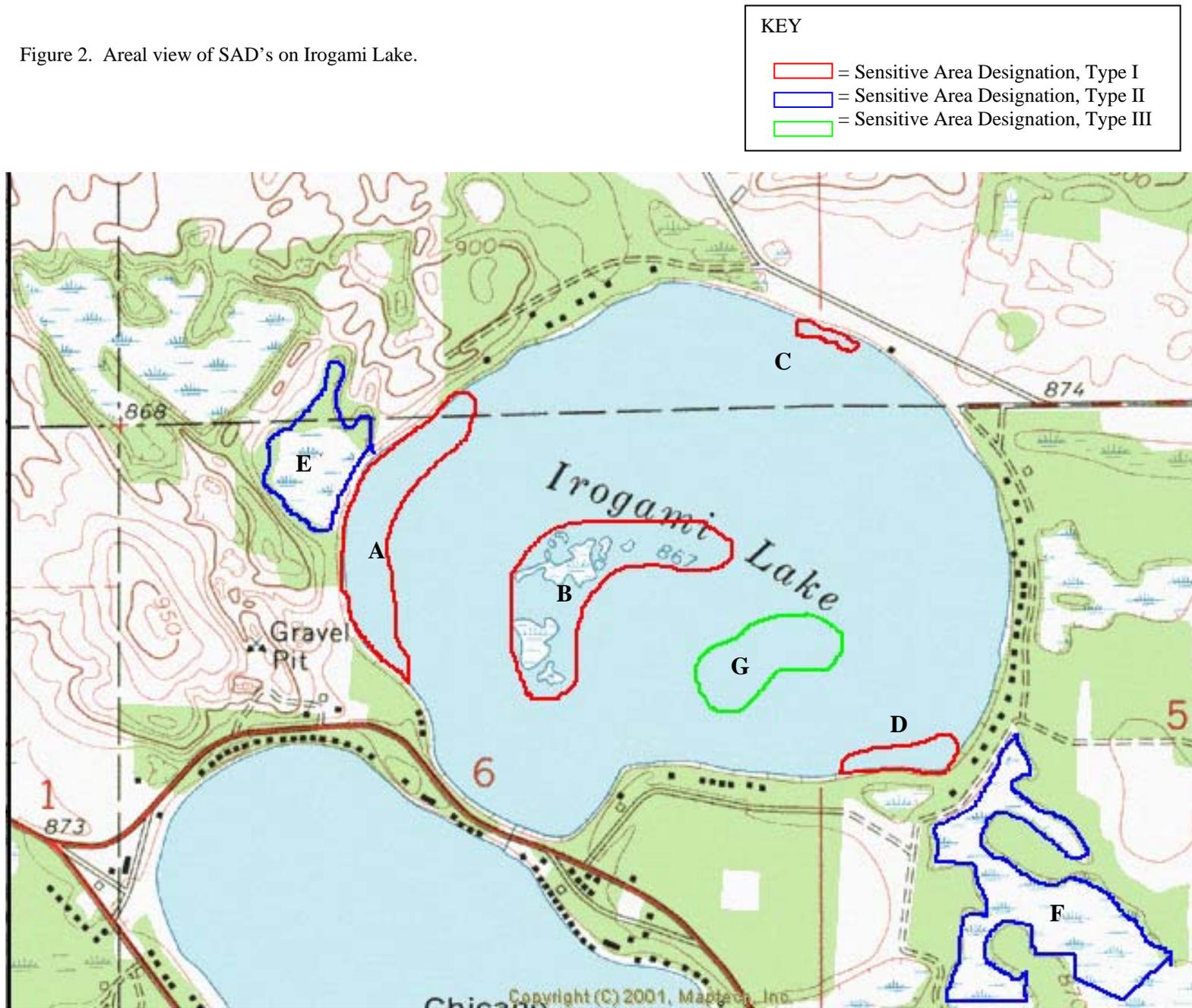
- No native plant control/removal of native rooted plants
- Discuss treatment regimens to control exotic species
- Discourage future structures within 75' of OHWM.
- Limit shoreline alteration to correction of the most degraded cases

Type III: This type of SAD is designed to maximize protection of the most unique and beneficial areas of the lake that are submerged. Type III sensitive areas were chosen based lack of exotic species, unique habitat for fish and wildlife and relative importance to maintaining the integrity of the lake. If exotics are found, treatment regimen must be designed specifically for the control of the exotic specie(s).

Suggested Management Criteria of Type III SAD:

- No native aquatic plant control/removal of native rooted plants
- Minimize disturbance to vegetation from any seasonal structures.
- Monitor these sites on a regular basis for exotic species.
- Monitor these sites for a change in plant species or density.

Figure 2. Areal view of SAD's on Irogami Lake.



Value of Site A:

This site starts along the southwest side of the lake and continues northward along the shoreline to the start of development on the northwest side of the lake. Site A is designated a Type I. The aquatic vegetation is chiefly comprised of White Water Lily (*Nymphaea odorata*), Spatterdock (*Nuphar variegata*) and Sago Pondweed (*Stuckenia pectinata*). Sediment is mainly soft organic matter with some sand near the shore. Other high quality attributes is the large amount of woody debris from the shore to the water. It is about 100-200 feet wide from the shore lakeward to a depth of approximately 3. The shoreline has a large amount of woody canopy. Figure 2. Shows the woody debris and start of SAD #1.

Primary reasons for site selection were fishery values, wildlife values, and water quality protection and aesthetic qualities. This area has a diverse aquatic plant community that can provide important habitat for wildlife and fish. These plants provide important spawning, nursery, and cover area for fish and invertebrates. The aquatic vegetation provides excellent habitat for the production of macroinvertebrates (aquatic insects), which is an essential part of the food chain. The woody debris that is exposed provides roosting and hunting area for birds as well as basking areas for reptiles and amphibians. The site also offers a physical buffer that protects water quality by anchoring and stabilizing sediments and protecting shorelines from wave erosion. During the blooming of the lilies this site is very colorful and adds a great deal of beauty to the lake.

Management Recommendation:

- Protect the woody debris and shoreline buffer
- Exotics should be monitored
- Do not remove native plants by physical, mechanical, or chemical means
- This area should not have any bank armorment such as riprap installed unless erosion is clearly present.

Resource Value of Site B:

This site is located toward the center area of the lake and has been designated a Type III. The stand of bulrushes (*scirpus spp.*) provides excellent and necessary habitat for fish, namely northern pike and yellow perch (see figure 3.). This is prime spawning habitat



Figure 3. Example of a section of the bulrush stand that is gradually thinning.

for these two species. Wildlife will concentrate in this area as well due to the emergent rushes. The rushes provide food and cover for wildlife such as waterfowl and furbearers.

Macroinvertebrates such as dragonflies and damselflies will use the emergent vegetation to crawl out of the water during metamorphosis (as the change to adults). Stands of bulrushes like this were once common in Wisconsin Lakes. Increase development pressure; increase in wave action and artificially raised

water levels, contributed to the decrease of this particular covertime throughout the State. All efforts should be made to protect this area.

Primary reasons for site selection include fishery values, wildlife values and water quality protection. The aquatic plants provide important spawning areas for northern pike and yellow perch. The site is used as a fish nursery and for feeding and cover for other fish and wildlife. Forage species such as minnows also utilize this area. The aquatic vegetation provides excellent habitat for the production of macroinvertebrates. The site also offers a physical buffer that protects water quality by anchoring and stabilizing sediments from wave erosion.

Management Recommendations:

- Protect the aquatic rooted plants.
- Eliminate motorboat activity inside of the bulrush bed.
- Encourage a 100-foot no wake zone along the perimeter.
- Develop contingency plan in the event bulrush density decreases.
- Monitor on a regular basis for the presence of exotics.

Resource Value of Site C:

This site is along the north shore of the lake and is designated a Type I. The site consists of primarily of bulrushes (*scirpus spp.*) and muskgrass (*Chara spp.*). The large amount of muskgrass is important for waterfowl and fish. Thousands of microscopic crustaceans live on this plant, which are an important food source for young fish and waterfowl. Another benefit muskgrass provides is the carpet like appearance and growth pattern of the plant, which is helpful in fending off Eurasian Watermilfoil. The site extends out into the lake to a depth of approximately 3 feet. The shoreline in this area has little or no development.

Primary reasons for site selection include fishery values, wildlife values and water quality protection. The aquatic plants provide vital habitat for fish and wildlife. Bluegills spawn regularly in the spring along this portion of the shore. Vegetation at this site provides a nursery and forage area for both fish and wildlife. Emergent plants also offer a physical buffer that protects water quality by anchoring and stabilizing sediments and shorelines from wave erosion.

Management Recommendation:

- Protect existing aquatic plant growth and increase shoreline buffer.
- Exotics should be monitored.
- Do not remove native plants by physical, mechanical, or chemical means.
- This area should not have any bank armorment such as riprap installed unless erosion is clearly present.

Resource Value of Site D:

This site is located along the southeast shore and adjacent to SAD F. The shore separates this site from SAD F. Bulrushes (*Scirpus spp.*), Smartweed (*Polygonum amphibium*), muskgrass (*Chara spp.*) and variable-leaf pondweed (*Potamogeton gramineus*) are the

primary aquatic plant species found at this site. All of these species provide habitat and food cover for fish and wildlife.

Primary reasons for site selection. Site D was selected due to the undeveloped shoreline and the proximity to the wetlands. The location to the wetlands makes this site ideal for a wide array of fish and animal species. This important transitional area serves as nutrient buffer also. The diversity of plants found in the water and the shore can attenuate nutrients that would otherwise enhance growth of algae, which decreases water clarity. The habitat found on the upland area is currently used by many species of wildlife such as, deer, wood ducks, squirrels and songbirds.

Management Recommendation:

- Protect the upland area and trees to maintain woody habitat
- Maintain a minimum of 75-foot setback from the OHWM on all buffers for future development.
- No riprap should be permitted now or in the future
- Do not remove native rooted aquatic vegetation

Resource Value of Site E and F:

These particular sites are not part of Irogami Lake proper but play a very important role in the protection of water quality and they provide functional habitat (see figure 4.). Sites E and F are designated a Type II. Both wetland complexes have a high affinity for nutrients and other pollutants that would otherwise reach the lake. Irogami Lake has a hydraulic residence time (how long water stays in the lake) of 3.25 years. Nutrients that enter the lake can be utilized for the same time period or even longer. The adjacent wetlands can filter nutrients before reaching the lake. The ability of these wetlands to “filter” water will enhance water quality to Irogami Lake and provide unique habitat as long as they remain intact.



Figure 4. Wetlands adjacent to Irogami Lake. These wetlands have an excellent ability to filter water before flowing into Irogami Lake.

The primary reason for site selection was for water quality protection and wildlife habitat.

The wetland complexes provide excellent habitat for furbearers such as, muskrat, mink and otter. These species will take advantage of the proximity of the wetlands to the lake as place to rear young and feed. Taller trees along the fringe can be used by perching raptors such as the Bald

Eagle or Osprey, both species depend on fish for food, their presence always seem to impress the people who utilize the lake. In addition to large birds, songbirds use this area for nesting and cover. Other less known species such as salamanders depends on these types of wetlands to complete their life cycles.

Management Recommendation:

- Protect woody habitat 75-feet from OHWM
- Do not clear woody debris from wetlands
- Monitor for exotic species
- Do not remove/control rooted native plant species

Resource Value of Site G:

This site is located in the water toward the south central part of the lake. It is the only Type III designation. The site is composed of a variety of pondweeds such as large-leaf pondweed (*Potamogeton amplifolius*) and Illinois Pondweed (*Potamogeton illinoensis*). This area provides good habitat for fish. These species of aquatic plants are high value species because they provide a good source of food and cover for small fish and furbearers such as muskrats. Northern Pike, Largemouth Bass and panfish will utilize this area for feeding and some spawning.

The primary reason for site selection was fish habitat and nutrient attenuation. Fish can be found in this area virtually anytime of the day. The tall aquatic plants provide excellent cover from human activity and shading from the sun. These plants are able absorb other nutrients in the water that would otherwise fuel algae blooms, ensuring the water quality of Irogami Lake to remain stable.

Management Recommendation:

- Protect the submerged vegetation that currently exists at this site.
- Do not remove/control any rooted native aquatic vegetation.
- Monitor for, and aggressively manage any exotic species.

Exotic Species:

There is documentation that shows Eurasian Watermilfoil (*Myriophyllum spicatum*); an exotic aquatic plant is present in Lake Irogami. Eurasian water milfoil can be extremely invasive and disrupt natural ecosystems on various levels. Efforts should be made to curb the spread of these exotics.

Exotics are mainly spread by human activities. Therefore, efforts should concentrate on controlling the spread by 1) prevention of new introductions and the spread of the plant, 2) inform and educate the users of the lake to identify and monitor. These exotics are not uncommon in area lakes, but preventing the spread to other lakes by properly cleaning equipment before entering other bodies of water will ultimately help the local ecosystem and break the “circle” of re-infestation. This is required by law, however it will take cooperation from the public to ensure the spread is stopped.

The dedication of SAD's will also help prevent the spread. Exotic plants can easily become established in areas that are disturbed and where native plants have been removed therefor, protection of native plant communities is vital to slow the spread of exotics once they are introduced into the lake. Management efforts should continue to try to control this exotic species as much as possible to preserve the overall integrity of the aquatic plant community.

For additional information on the exotics mentioned above and others now entering Waushara County, please call Scott Provost, Wisconsin Department of Natural Resources at (920) 787-4686 extension 3017.

Threatened, Endangered and Species of Concern:

Currently, there are no registered threatened, endangered or species of concern found in Lake Irogami. However, the Banded Killifish (*Fundulus diaphanus*) is such specie found in Silver Lake that could be found in Irogami also. This fish is attracted to similar habitats that can be found near the shoreline. Moreover, activities on the lake such as raking "weeds" from the lake can directly affect this fish.

Realizing that aquatic plants are the underwater forest, and affect all living things in and around a lake, what we do to the plants will affect other organisms that seem to have no direct connection. This is the case with many threatened and endangered species. Affecting something that seems as insignificant as an aquatic plant affects the life cycles of many organisms, which ultimately affect a threatened, endangered animals or species of special concern. For instance, removing aquatic vegetation may be an insignificant act for you, however the banded killifish needs submergent vegetation to spawn on. If the plant that has viable egg masses on it is removed during their spawning period (78 F), a serious impact to that species has just occurred. Aquatic plants affect many species such as the bald eagle and ospreys – plants provide habitat for the fish they feed on. These all occasionally use Irogami Lake. For more information on Threatened and Endangered species go to www.dnr.state.wi.us/orgland/er or contact the Bureau of Endangered Resources at (608) 264-6057.

Emergent Aquatic Plants:

Several of the sensitive areas designated in Irogami Lake (A, B, C and D) have emergent species of aquatic plants. Emergent aquatic plants are defined as plants that have the majority of their vegetative material above the surface of the water. Examples include cattails, bulrush, blue-flag iris, bottle brush sedge, pickerelweed and arrowhead. Emergent plants can tolerate fluctuating water levels and their dense stands can dampen shoreline waves.

Emergent plants are highly valuable in aquatic communities for several reasons. The standing dead stalks in the early spring are primary spawning habitat for northern pike and perch. These species of fish do not spawn on beds like bass and other panfish but spawn by broadcasting their eggs on standing material such as old stems, aquatic plants or fallen timber. Without this material spawning will not be successful. Another benefit these plants have is due to the leaves having extensive spongy tissue and air spaces. This

makes them great nesting material for ducks shorebirds and muskrats. Nest made of these buoyant leaves float up and down with changing water levels.

Roots of emergent plants spread horizontally creating an interlocking network like a jute-backed carpet. This growth pattern is very important for stabilizing sediment. It also helps these plants withstand wave action and dissipate the force of upland runoff. Flexible reproductive strategies allow emergents to take advantage of variable conditions. When water levels are low, they reproduce from seeds that germinate on exposed lakebed. When water levels are high, they are equally successful at staking out territory with spreading roots and horizontal buried stems, called rhizomes that send up new shoots.

There is an important connection with emergent plants to the shoreline and all aquatic organisms and the creatures that depend on them. Emergents are part of the “Transitional Area” between the aquatic world and the terrestrial (land) world. Fish utilize these areas for cover from predators and to feed on a large array of invertebrates such as insects that uses these plants. Not only do fish use these areas year-round, but also many animals you typically don’t associate with lakes utilize these areas. Raccoon, Whitetail Deer, Red Fox, songbirds and reptiles are just some animals from a long list of organisms that depend on these areas. An interesting fact, 80 percent of all the threatened and endangered species live near the shore. It’s no wonder when you think about the diversity of plant life near the shoreline.

Many lakes in the area were once home too vast and extensive stands of emergent vegetation. These areas are disappearing due to development and human activities near the shore. A recent study found nearly a 66 percent reduction of vegetative cover in developed lots when compared to undeveloped lots. That can be interpreted as 66 percent less habitat for fish and wildlife.

The resource values of emergent vegetation have been pointed out but there are several values to the riparian landowner. A common complaint is the floating mats of dead and decaying vegetation that accumulate along the shoreline. Stands of emergent vegetation prevent these mats from reaching the shoreline, thus preventing the nuisance to the landowner. Emergent vegetation also protects against shoreline erosion, thus reducing the need for bank armorment along the shoreline such as rock riprap or concrete seawalls. These plants can also be very aesthetically pleasing.

Shoreland Management:

Wisconsin’s Shoreland Management Program, a partnership between state and local government, works to protect clean water, habitat for fish and wildlife, and natural scenic beauty. The program establishes minimum standards for lot sizes, structural setbacks, shoreland buffers, vegetation removal and other activities within the shoreland zone. The shoreland zone includes land within 1,000 feet of lakes and 300 feet of rivers and floodplains.

A critical part of protecting our water resources is the establishment and protection of an adequate buffer. A shoreland buffer should extend from the water onto the land at least 35 to 50 feet. Recent studies have shown that many species of wildlife may require up to 500 feet of buffer for habitat. Buffers of 50 feet and more help filter pollutants from runoff associated with impervious surfaces such as driveways, rooftops, roads and fertilized lawns.

Water gardens have been an increasing trend in the United States the last decade. By using native shoreline plants a riparian owner may have a very exquisite water garden with very little effort. Many of these species are visually attractive. By leaving these plants undisturbed, one can add a water garden to your property that would benefit everything on the lake. Incorporating aquatic plants with other natural features and very relaxing space can be developed that would still allow room for watercraft.

Shoreland restorations should focus on native plant communities and should include aquatic vegetation as well as the canopy, herbaceous, shrub and tree layers. Please contact your local DNR Lake Management Coordinator, Mark Sesing (920) 485-3023 to learn more about shoreland restoration and associated grant programs.

There are also programs through the Waushara County Land Conservation Department that can offer grants to qualifying applicants to help pay up to 70 percent of the cost of shoreline restoration. Please contact the Waushara County Land Conservation Department at (920) 787-0443.

Whole Lake Management Recommendations:

Resource managers made several recommendations on a whole lake basis.

1. Maintain as much of naturally felled woody debris as possible.
2. Restore shoreland buffers and discourage sea walls and riprap on developed sites.
3. Complete an updated Aquatic Plant Management Plan or Comprehensive Lake Plan.
4. Educate landowners about the importance of a healthy lakeshore buffer.
5. Protect terrestrial vegetation within 75 feet of the shore.
6. Manage and prevent the spread of Eurasian Watermilfoil.
7. Reduce entire tree removal for viewing purposes; try to trim choice limbs.
8. Protect adjacent wetlands and spring areas from development pressures.
9. Encourage periodic water level manipulation.
10. Minimize lawn fertilization to prevent excess nutrient loading to the lake.
11. Create no-wake in the central bulrush stand and a buffer zone.
12. Obey the slow no-wake rules within 100 feet of shore.
13. Restrict manual raking to floating mats of vegetation and leave rooted plants in place.

Conclusions:

Irogami Lake is a beautiful lake that deserves special attention. It is truly a unique setting in Central Wisconsin due in part, to the tracts of undeveloped shoreline, bulrush stand and adjacent wetlands. Seven sensitive areas were designated on the lake because they contribute to the uniqueness of the lake as a whole. These areas also provide essential functions that make the lake what it is. Special care should be taken to protect these areas

and other areas on the lake from further disturbance. Restoring disturbed shorelines and shoreland buffers to a more natural state would be even more desirable to aquatic life and wildlife. The large amount of woody debris along the west shore provides exceptional habitat for fish and wildlife. The slow no-wake speed restriction within 100 feet of shore, combined with an expanded zone around the bulrushes and restoration of near shore areas will dramatically decrease, or eliminate, shoreline erosion and therefore there will be little need for bank armorment. Lakes are one of the state's most valuable resources and without proper protection, the water quality will quickly deteriorate resulting in degradation of fish and wildlife habitat. All lake ecosystems are sensitive to change and human impacts. It is critical that we protect and restore these valuable resources.

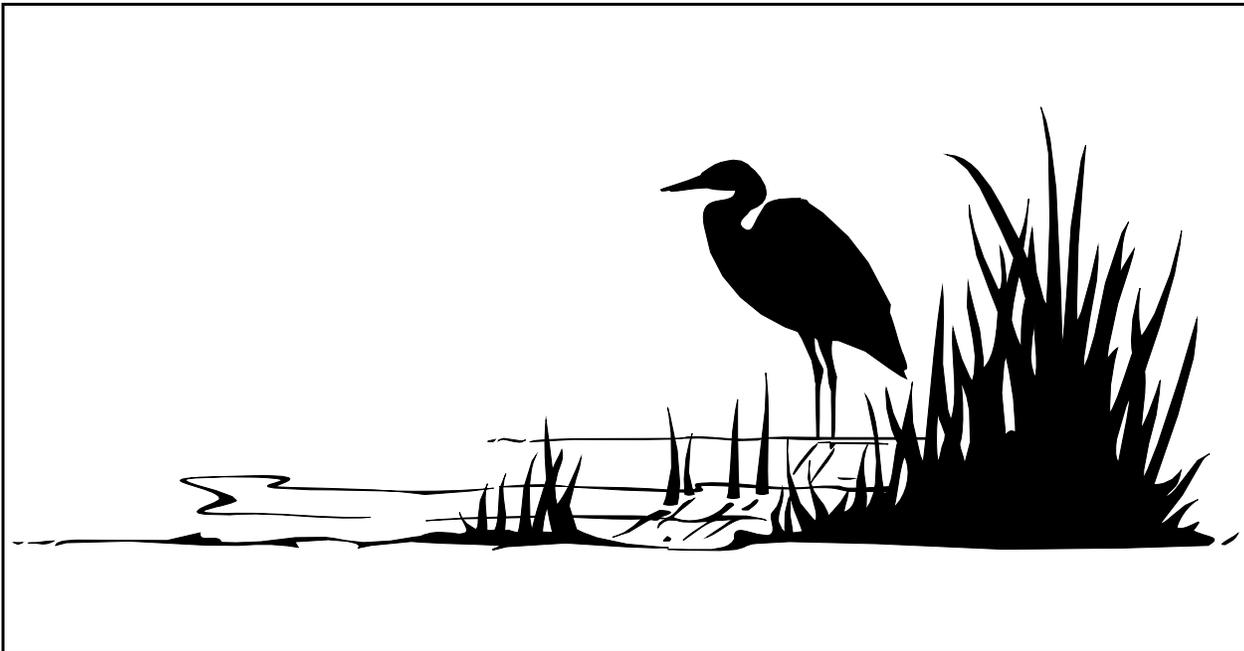
MILESTONE

Complete review of draft from residents.....	May 1, 2004
Revise and Final Draft.....	June 15, 2004
Present at Lake Meeting.....	TBA
Resolution with Township.....	January 2005
Develop applicable shoreline ordinances.....	2005-2006
Pursue funding to purchase property.....	ongoing

Appendix I

Guidelines for Protecting, Maintaining, and Understanding Lake Sensitive Area

GUIDELINES FOR PROTECTING, MAINTAINING, AND UNDERSTANDING LAKE SENSITIVE AREAS AND CRITICAL HABITAT



**A companion document to better help
understand lakes sensitive area reports**

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GUIDELINES FOR PROTECTING, MAINTAINING,	

AND UNDERSTANDING LAKE SENSITIVE AREAS AND CRITICAL HABITAT

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 affect water quality and lake ecosystem health.** 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 should be recognized that lakes may have problems that occur in these outlying areas of their watershed resulting in significant nutrient and sediments additions that threaten the overall health of the lake ecosystem and should be dealt with through land acquisition and subsequent deed restrictions and implementation of non-point source control best management practices.

UNDERSTANDING AQUATIC PLANT SENSITIVE AREAS

The importance of aquatic plant communities are frequently under appreciated and their importance to a lake's ecosystem health misunderstood. This is often evident by the way people refer to aquatic plant habitat 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 native aquatic plants grow where they should be growing based on available light (water clarity & light penetration), water depth, and bottom substrate or soils and 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. Aquatic plants (macrophytes & algae) are the primary energy source upon which the rest of the lake food chain is based and dependent upon. Fisheries are dependent upon them for cover, spawning habitat, important habitat and cover for fingerlings and young of the year, critical habitat for aquatic insects and other important food or forage species (minnows). They also serve an important function in reducing the shoreline erosion associated with

wave action while stabilizing sediments in place, and aquatic plants lock up available phosphorus which would otherwise be available to drive undesirable algae blooms.

Aquatic plants also provide many important functional values for wildlife: Loons require aquatic vegetation for their nests, and waterfowl and furbearers require aquatic vegetation 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.

Use of Aquatic Herbicides

Because the potential ecological risks associated with aquatic herbicide applications are so high, most aquatic herbicide applications must be approved through the DNR permitting system and the application must be completed by a DATCP certified aquatic herbicide applicator. Those herbicides that don't require a DNR permit are often inappropriate for the existing site conditions or species present resulting in potential impacts without real nuisance relief.

The herbicides that don't require a permit are restricted to granular or pelletized forms and usually will only work in a narrow set of environmental conditions. If the site conditions include much of any fine flocculent sediments effectiveness can be dramatically reduced or eliminated. Many of these herbicides will work on only a limited number of species which may not even occur on the site increasing the importance of having a qualified applicator capable of identifying the species present and the site conditions which can limit herbicide effectiveness. In the long run most people would be far better off trying to limit vegetation by hand pulling or raking and if these are not feasible contacting a DATCP certified aquatic herbicide applicator to have them assess the different control methods suitable for the site.

In most cases aquatic herbicide applications should be discouraged because:

- I. Less invasive or less destructive methods of control are feasible for the site and may include one or more of the following: mechanical harvesting, hand pulling, hand raking, hand cutting, and nutrient controls within the watershed. All too often herbicide treatments are conducted adjacent to private docks in situations where hand pulling

or raking were easily a viable option and should have been the only allowable practice.

Before taking action a careful assessment of existing conditions should be conducted and should include: importance of existing habitat areas, actual needs for clearing of aquatic plant habitat (navigational access does not require removal of all vegetation; only a reduction in density), and consideration of the cumulative impacts of removing aquatic plant habitat or treating it and the organisms living in it or around it with herbicides.

- II. Can result in an overall reduction or fragmentation of important native aquatic plant habitat.
- III. Creates openings in areas that should be colonized by native aquatic plant species. These openings provide increased opportunities for exotic species to become established in the lake and once established provide opportunities for their expansion.
- IV. Results in direct and indirect mortality of sensitive or intolerant immobile species such mussels and other invertebrates. Some treatments can also result in the gradual build up of copper in the lake bed sediments to the point of being toxic to aquatic organisms. Several lakes in Northwestern Wisconsin have already reached or are approaching copper concentrations or levels that would be toxic or considered a lethal dose to 50% (LD50) of selected aquatic organisms exposed to similar concentrations under laboratory conditions. A serious problem that needs to be carefully considered is that copper does not break down, and it continues to build in concentration in the lake bed sediments with each subsequent treatment containing copper.

If people are going to treat aquatic plants they must understand that the available phosphorus will be expressed in larger plants or algae. Any attempts to suppress the expression of the available phosphorus will usually be very short term (7 days). It is difficult to justify adding toxic chemicals which do not break down and continue to build up towards toxic levels with each subsequent treatment. For this reason aquatic herbicide treatments containing copper should be restricted to exceptional circumstances and not used on a regularly reoccurring basis.

- V. If the average landowner width is 100' or less and the minimum effective herbicide treatment width of 30' is applied by most shoreline property owners around a lake, the cumulative impacts of the treatment could eliminate or seriously impact greater than 30% of the available habitat. This reduction in available habitat can result in an even greater percentage reduction in the overall fish populations for the lake. Elimination of habitat in even a small percentage of a lake, especially in critical habitat areas, can cause the collapse of a fishery.
- VI. Aquatic plants lock up available phosphorus which would otherwise be available to drive undesirable algae blooms.
- VII. Aquatic plants serve an important function in reducing the shoreline erosion associated with wave action while stabilizing sediments in place.
- VIII. Aquatic plant management staff routinely hear complaints from shoreline property owners who expected their contracted aquatic herbicide application to eliminate all of the vegetation from the treatment area for a significant portion of the summer period. Most aquatic herbicides are effective on only a portion of the total aquatic plant community at a given site (species selective).

Free-floating species such as coon tail (*Ceratophyllum* sp.) and duckweed (*Lemna* sp.) also often drift back into treated areas with the next pervasive wind, eliminating the benefits they had expected from the chemical treatment. Other species such as Elodea, curly-leaf pondweed, milfoil, and other species easily fragment at times of the year and also drift into treatment areas eliminating or reducing the benefits of the previous treatment.

Hand raking or pulling near docks and in front of private developed properties eliminates the guess work out of what will be removed or eliminated when compared to expensive herbicide treatments with health concerns, use restrictions, and limited effectiveness.

Recent changes affecting mechanical removal and hand pulling of aquatic vegetation

Prior to the passing of Senate Bill 55 in September 2001, mechanical removal of aquatic plants were unregulated provided the following: the lake bottom was not disturbed, cut plants were removed from the lake and not allowed to drift free, the plants were not wild rice or plants were not part of a floating bog mat.

As exotic species, such as Eurasian Water Milfoil, expand their distribution within the state, more opportunities for spreading these exotics will occur. The risk of an exotic becoming established in a new lake is dramatically increased if the native species of aquatic plants that normally occupy a specific habitat type have been eliminated or reduced. When exotics are introduced into an area they have to find a suitable location to become established. If all the suitable growing sites are occupied by native species the exotic will have a much more difficult time establishing a reproducing population.

The Department has recently developed the necessary administrative rules within NR 109 to comply with the legislative mandates of SB 55. These focus on protecting native aquatic plant habitat to reduce the risk of exotic species invasions, while also recognizing the importance of protecting and maintaining the native aquatic plant habitat and the functions it performs in maintaining overall lake health. These rules limit shoreline removals of aquatic plant habitat without a permit to less than a 30' width; with the restrictions that this 30' width also include docks and other human activity areas that result in the loss or degradation of aquatic plant habitat.

If individual shoreline owners would like to consider removing vegetation by hand pulling or raking in widths greater than 30' they must apply for an aquatic plant management permit with their local DNR aquatic plant management specialist. It is unlikely that the Department will approve many alterations beyond the standard 30' width because of the concerns related to: creating more areas devoid of native vegetation which increases opportunities for possible colonization sites for exotics, cumulative losses of overall habitat, and the fragmentation and degradation that impairs the remaining habitat.

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 that will work to clear necessary navigational access channels identified in a Department approved management plan (post 2000)
 - 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 Department approved NR 109 permitted navigational channels 20'-30' wide. If small areas adjacent to docks are to be cleared of vegetation hand raking or pulling should be used if at all possible. 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 and importance of native aquatic plant habitats. Lake districts and associations should try to educate new property owners as soon as possible about the value of critical habitat and the laws associated with protecting lakes and lake front property.
4. Apply aggressive erosion control measures to all bare soil areas
5. **Protect** existing natural plant cover in upland areas within at least 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 and provides critical habitat for our shoreline species of wildlife. Lake districts and

associations should try to educate new property owners as soon as possible about the value of **shoreline buffers** and the laws associated with protecting lakes and lake front property.

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.
10. 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.

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 and mowing to no more than a 30' width of the 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. The natural spongy layer of decaying leaves and plant matter is also removed further reducing infiltration and increasing runoff. Soil porosity is also decreased, decreasing infiltration and increasing runoff. As we lose or simplify the layers present (trees, shrubs, and unmowed 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 ground's surface thereby reducing what is available for the mobilization and transport of sediments and nutrients from the ground's 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.

Shoreline buffers also increase the build up of leaf litter forming a spongy layer to absorb more precipitation and runoff reducing the amount of sediment and nutrients reaching the lake and negatively impacting water quality and habitat. The denser unmowed vegetation also filters sediments and nutrients from runoff.

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 lose 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.
6. Utilize only the native indigenous species for shoreline buffer restoration efforts and carefully consider site limitations (soil type, soil moisture regime, and shade preferences of plantings) when selecting appropriate species. Restoration efforts should follow a least disturbance scenario; by first halting mowing within at least the shoreline buffer zone (35' back from the waters edge and with no more than 30' width of the shoreline cleared for access purposes; landowners that care about the health of their lake ecosystem are encouraged to go beyond the minimum requirements of the law and increase buffer width and decrease the length of shoreline cleared of vegetation for access). It is important to remember that any ground breaking activities increases the opportunity for transport of sediments

and nutrients into the lake; especially within the lakeshore buffer zone.

Landowners should expect that initial recovery of the natural vegetation within the ground cover layer may take one or two full growing seasons, after halting mowing activities. Vegetation can usually re-establish itself from the natural seed bank available within the existing soils and from the seeds and rootstalks of adjacent plant communities. Plug plantings of the native herbaceous groundcover species can be used to achieve adequate density and diversity if recovery appears to be sparse in successive years. Supplemental plantings to establish adequate densities for the tree and shrub layer will have to be used in most situations.

The native species that should be used to restore the lakeshore buffer in order to provide the proper habitat and water quality protection functions necessary to insure a healthy Northern Wisconsin lake ecosystem are available through County Land and Water Resources District Conservation staff, please refer to the list of contact names and numbers at the end of this document.

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 which can not be handled with just restoration of the native vegetation. If questions arise or problem areas exist lakeshore property owners should call their local DNR water regs staff for assistance or to report a problem area which may be negatively impacting lake water quality or habitat. A list of locally available technical assistance contact names and phone numbers is provided at the end of this document for easy reference.

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. Most of the counties in northwestern Wisconsin now have lakes classifications which require or prescribe certain setbacks for all structures and the maintenance or re-establishment of shoreline buffers to protect water quality and habitat needs. Most of them **as a minimum** allow for reasonable use of shoreline areas by allowing a 30' wide access/viewing corridor through the buffer. The remainder of the lot from the waters edge back 35' should be restored to a natural condition with trees, shrubs, and unmowed herbaceous ground cover including various grasses, sedges, forbs, and wildflowers. On more sensitive lakes county classifications may require or prescribe a wider buffer width and lakeshore property owners are encouraged to contact their **local county conservatoinist** and determine what the specific requirements are for shoreline buffers on their lake. A list of locally available technical assistance contact names and phone numbers is provided at the end of this document for easy reference.

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 landowners are encouraged to reestablish a buffer zone composed of the natural plant communities that belong there. For technical assistance in restoring your shoreline buffer please contact your local county conservatoinist or county shoreline BPM technician using the names and numbers provided at the end of this document. This ensures that you not only get water quality protection, but you also get the important functional values that the native plants provide 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 constructions site erosion control

1. Minimize disturbance of natural plant communities within shoreline areas (50'-60' from waters 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.
2. 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 none 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).

3. Report serious erosion control problems that aren't being dealt with in a timely manner; before, they can result in significant impacts to water quality and habitat.

PROTECTION OF GRAVEL AND COARSE ROCK RUBBLE HABITAT

Gravel and coarse rock rubble free of silt and sediments are critical to the successful reproduction of some walleye stocks. Gravel and coarse rock rubble free of silt and sediments are 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 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 the any lake's ecosystem health and should be discouraged. The way we look at large woody debris should be 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

1. 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.

2. 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.

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 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

1. Apply fertilizers only if a soils test has determined that it is nutrient deficient and add less than the maximum recommendation.
2. The use of a low phosphorus content fertilizers or no-phosphorus fertilizers is strongly recommended if the fertilizer is to be applied on lakeshore property.

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 symptoms 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.

Lakes Technical Assistance Contact Information List

Waushara County:

Land Conservation Department: Mark Schumacher – 920/ 787-7819

DNR Water Regulations: Shawn Eisch – 920/ 787-4686 ext. #3016

DNR Water Resources Biologist: Scott Provost – 920/ 787-4686 ext. #3017

DNR Dam Safety and Flood Plain Engineer and Sub-basin Leader:

Linda Hyatt – 920/ 787-4686 ext. #3010

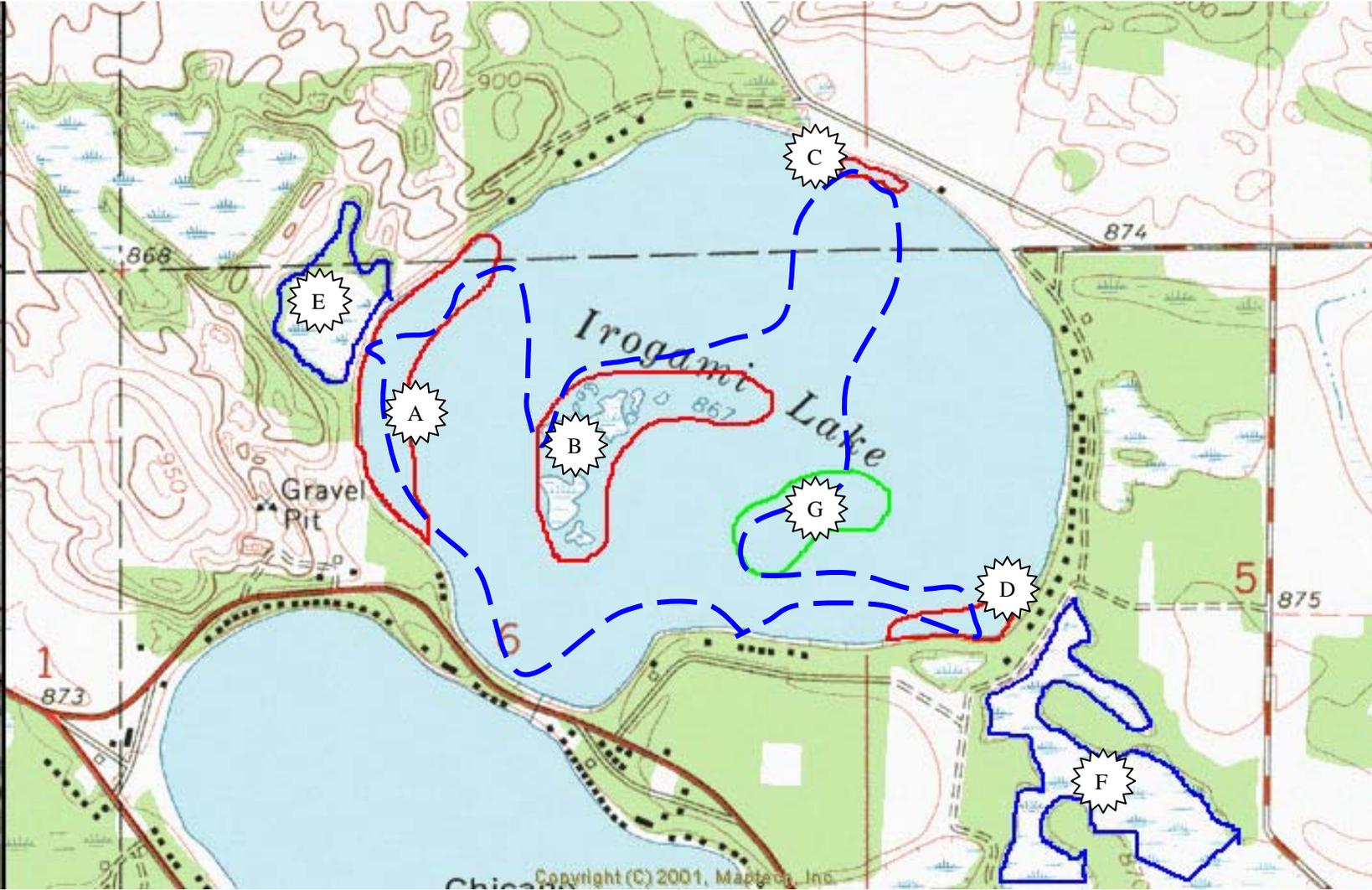
DNR Conservation Warden: Dave Algrem – 920/ 787-4686 ext. #3027

DNR Fishery Biologist: Dave Bartz – 608/ 297-7058

DNR Wildlife Biologist: Paul Samerdyke – 920/ 787-4686 ext. #3012

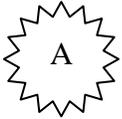
Appendix II
Irogami Lake Water Trail

Irogami Lake Water Trail



The Irogami Lake Water Trail

Use the SAD descriptions with this or
just follow the Water Trail.



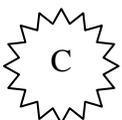
Your first stop will be near Sensitive Area Designation (SAD) A. Observe the shoreline and notice the fallen trees and lily pads. If you approach the timber slowly you should notice numerous painted turtles, dragonflies, damselflies and fish. Move slowly along the trail and you may see birds bathing or a kingfisher, fishing for food. Along the way to SAD B, watch the shoreline for minnows and fish feeding, where do you see them?



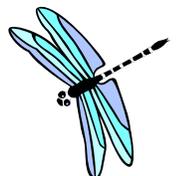
Quietly reach for a view of the wetland. You may see various furbearers, birds and possibly a family ducks. During a spring evening, you may find a salamander or two in this area and listen to concert of spring peepers and other frogs. Watch for turtles basking on logs or frogs on the white water lilies. The wetlands provide habitat all year and filter water to the lake!



Now cut across to SAD B. Enjoy the lily pads as you travel and keep an eye open for the fish that will utilize this area. As you approach the bulrush beds watch for fish fleeing from you and note where they are. Get a bug's eye view of the bulrush and you may gain a better appreciation of this locally scarce stand. Notice the "slime" on the stems. Many microscopic organisms use these plants as a substrate their entire life. You may also notice "fuzzy" matter. If that plant wasn't there, that fuzz would be floating around the lake decreasing the water clarity.



Take a stroll to SAD C. As you travel across the lake watch the bottom. It will change and notice where you see fish. You should see carpets of muskgrass (*chara* spp.). This plant will help fight the spread of Eurasian watermilfoil and provide an enormous amount of habitat for fish, insects and waterfowl. Along the shore near SAD C, watch for fish in the rushes. In the spring you may see many large



male bluegills guarding their nests. Keep watching and listening for songbirds.



Now, take your time and cross the lake to SAD G. Look down and you will start seeing large leaf aquatic plants. What is that? From June until September you should see Large-leaf Pondweed (aka Musky Weed, Bass Weed, Cabbage) and Illinois Pondweed. The nicknames should give you a clue to their importance. Fish love this stuff. Got a big pike in mind, try here. Lose yourself in wonder what is lurking under the leaves of these plants.



You're moving slowly to SAD D, look up and then down, what do you see? Possibly an eagle or an osprey taking a break from catching fish. This is a good area to notice the transition from the aquatic world to the terrestrial world. Look for little trails where mink or muskrats travel back and forth from the lake to the wetland complex.

As you travel the Water Trail, take note on what you see. Notice where the most fish and wildlife is found. Think what you might be able to do to enhance what makes Irogami Lake so unique.



Thank you for touring the Irogami Lake. Like the seasons changing, so does the shoreline from season to season. Try it different times of the year and different times of the day and you should see something different every time. Enjoy.

