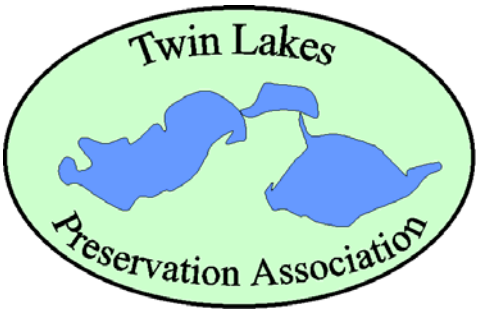


July 24, 2006

Dear Neighbor,

Enclosed you will find your copy of the Twin Lakes Community Handbook of Best Practices, a book of tips on the best ways to enjoy our lakes while keeping them in the best condition. This work is based on three scientific studies of our lakes, carried out with the help of Barr Engineering and other professionals. These studies and this Handbook were funded by grants from the Wisconsin Department of Natural Resources totaling over $30,000, and by individual donations from people who live or have cottages around these three lakes.

The information in this Handbook is consistent with the best science we were able to find; we have based our recommendations on that. Please note that the role of the Twin Lakes Preservation Association is simply to educate by providing information.

We hope this Handbook is helpful. Read it, or parts of it, and keep it around as a reference. And finally, as we state in the Handbook, it is not a substitute for local or state statutes or ordinances. One should always go to the legally constituted government authority for the latest, up-to-date laws and their interpretations.

Enjoy the Handbook, and enjoy our lakes.

Sincerely,

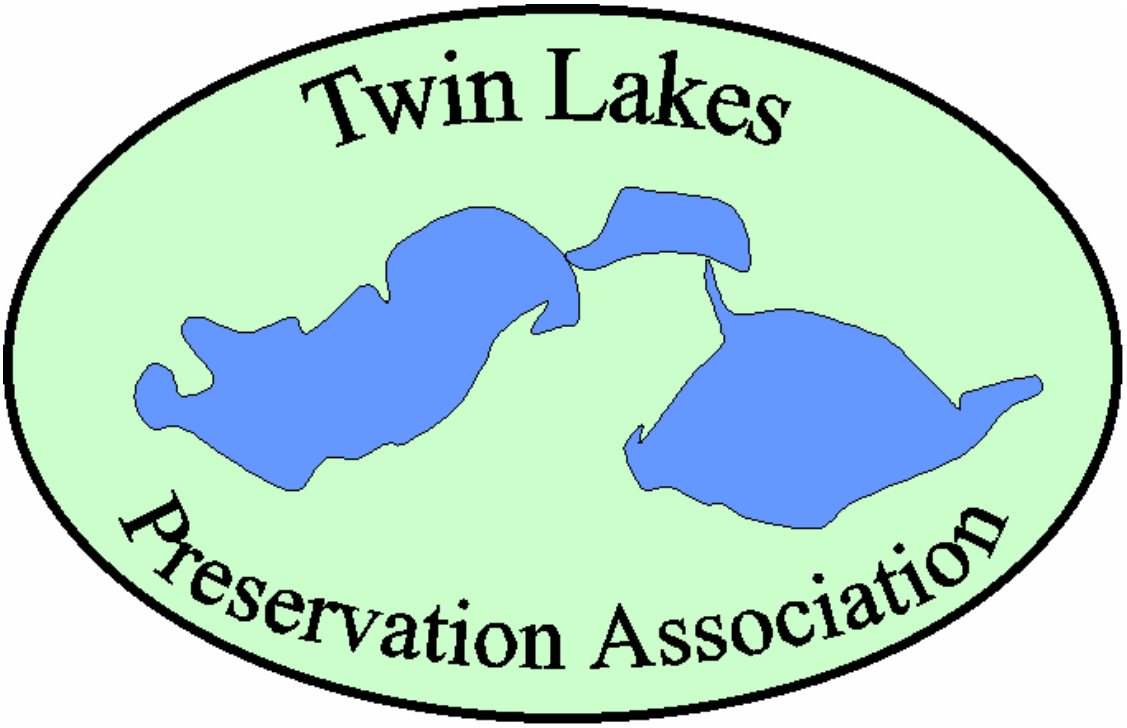
The Twin Lakes Preservation Association

TWIN LAKES: A COMMUNITY

HANDBOOK

OF BEST PRACTICES

Prepared by the Twin Lakes Preservation Association
2006



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A COMMUNITY HANDBOOK OF BEST PRACTICES

TWIN LAKES: A COMMUNITY HANDBOOK OF *BEST PRACTICES*

(Prepared by the Twin Lakes Preservation Association for all Property Owners and Other Users of the Twin Lakes)

I. Mission Statement of the Twin Lakes Preservation Association

"The mission of the Twin Lakes Preservation Association is to maintain, protect, and enhance the quality of the lakes and surrounding area for future generations. We will accomplish this by education and the cooperative efforts of our members and the people of the surrounding area."

II. Introduction and Purpose

This Handbook is the outcome of three scientific studies[1] of the Twin Lakes environment and community. It aims at providing information for lake property owners and users about the best practices for preserving the high quality physical and social environment we now enjoy. The outcome of these studies is summarized in the appendix. Voluntarily following these practices will not only maintain the good life for those of us who live here, and for our children and grandchildren, it will also contribute significantly to maintaining property values. Results of the three studies, undertaken with grants from the State of Wisconsin and private donations, are available for review from the Twin Lakes Preservation Association. This Handbook was compiled by a committee of community members

By 'Best Practices" we mean those ways of using and modifying the natural environment that preserves or enhances it, based on the scientific logic of "IF—THEN" thinking. For example, if a property owner clears his land down to the shore and plants grass, then more nutrients will wash into the lake, contributing to the growth of algae and unwanted weeds. If a large buffer of natural plants is left between yard and lake, fewer nutrients will wash into the lake and more wildlife will find habitat. We also mean those social behaviors that contribute to a cooperative and civil community based on mutual respect.

Carrying out the Best Practices in this handbook is left up to the Twin Lakes community citizens. This Handbook is educational in purpose and we hope that all will see its value.

III. The Three Twin Lakes

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[1]They are: "Phase I: Twin Lakes Data Collection: Lake Water Quality, Macrophyte Survey, Precipitation Data, and Lake Level Data, and "Phase II: Hydrologic and Phosphorus Budgets." These covered the biophysical environment. The study of concerns, issues and values held by Twin Lakes community members was conducted by Ph.D. sociologist, Dr. Patricia Shifferd through two consecutive surveys, the results analyzed and presented for public review at Twin Lakes Preservation Society's annual meetings ("Twin Lakes Day"). Phase III includes the development of a management plan and the production and distribution of this Handbook.

Located geologically on the Northwest Sands of Wisconsin, these three lakes comprise a “chain.” North Twin has a surface area of 113 acres and a maximum depth of 20 feet at the deep hole on the northeast corner. Most of the lake is shallow and the average depth is only 6 feet. Middle Lake, connected at the East end of North by a shallow channel and a culvert, is 30 acres and has a maximum depth of about 5 feet and is connected by a shallow channel to South Twin at its south end. South Twin is 115 acres and has a maximum dept of 29 feet midway down the western shore, and an average depth of 16 feet. North and South are primarily sand bottom and Middle is a muck bottom. These are seepage lakes with some springs and there is a general flow of water from North, through Middle, to South. There appears to be a seepage outlet from South. Water clarity is generally high for lakes in this region and the aquatic community is currently in a good health. The fishery includes northern pike, bass, bluegills, sunfish, crappies and a few walleye.

Two forest types are merged here: the Oak-Pine Barrens and the Northern Pine Forest. Characteristic of the first is the scrub red oak and jack pine. Understory plants typically include bear berry, big leaf aster, blueberry and bergamot. Of the second, northern red pine, white pine, bush honeysuckle, columbine and soloman man seal and service berry. Additionally we see paper birch and aspen and a few balsam firs. Soils are sandy and acidic. Rare but present are moccasin flowers and trailing arbutus.

The Twin Lakes Preservation Association provides lake residents an opportunity to work together to protect the character and quality of the lakes. In 2002 the Association engaged Barr Engineering of Edina, MN, to undertake a comprehensive, scientific study of the biophysical aspects of the lakes and in 2005 engaged a professional sociologist to learn from the lake residents what are their chief values and concerns. The results of these studies are appended to this Handbook. With the help of these studies, the Association has prepared this Handbook of Best Practices.

IV. WHAT IS A LAKE?

A lake isn’t just a bowl of water we play on and in. It is a complex life system, a community of microorganisms, insects, fish and invertebrates, waterfowl, terrestrial animals, birds, vegetation (both aquatic and terrestrial). These are organized into a food pyramid, so that the upper layers (Northern Pike, Eagles, and Humans) depend completely on the health of the lower layers (Bluegills, frogs, even the microscopic plankton which support the whole food chain.

The water itself is a subtle, easily affected balance of chemicals. The most important element affecting overproduction of plant life and algae is phosphorus which is a natural component of healthy ecosystems unless it is present in a high concentration which can then cause algae blooms and reduced water transparency. Most phosphorus enters the lake through runoff from lawns. Oxygen is also a critical component of a healthy lake ecosystem, present from the surface to the bottom. But

in a nutrient-rich lake with unnaturally high amounts of plants and algae, oxygen is consumed in the bottom waters by decomposing organic matter. When oxygen levels become too low, phosphorus trapped in bottom sediments is released, compounding the problem, and fish begin to die. Water clarity is also crucial because without light, plants cannot grow and, through photosynthesis, supply the oxygen required by fish and other aquatic life.

All of these things are interrelated and follow a basic law of nature which states that you can't do just one thing in a system. Every act has many repercussions. For instance, putting in a pier not only provides welcome access for boating and fishing, it also shades out habitat and affects the aquatic life of the lake. Lakes, and especially very small lakes such as ours, are quite fragile and can be quickly aged (becoming "eutrophic") by adverse human impacts. Many lakes in southern Wisconsin are in very poor health and are often referred to as the "green lakes" because high nutrient runoff levels produce major algae blooms. Lakes can tolerate some level of development before they become eutrophic, that is, before the water loses its clarity, the fish population declines, stinking weed masses and algae blooms limit swimming and boating, etc. Different lakes have different tolerance limits. The Wisconsin DNR has developed a 3-fold classification system on which zoning regulations are based. Class 1 lakes (usually large and deep) are the most tolerant. Class 2 lakes such as North and South Twin, are less so, and Class 3 lakes (shallow and small, such as our Middle Lake) can tolerate only a minimum of development before the balance is tipped and they become severely degraded. Both the kind and amount of human activity play a role in whether a lake remains healthy or becomes quickly eutrophic. For example, a pier can be harmless, but 10 piers every 100 feet all the way along the shore will adversely affect the lake's bottom life and have repercussions up the food chain. A lake is also a human community made up of many people who share some values and differ on others. Conflicts over right use are an inevitable part of life at the lake. How these are handled, either with care and civility, or with negativity and hostility, will also determine the quality of life on the lake.

V. WHOSE LAKE IS IT? THE PUBLIC TRUST DOCTRINE IN WISCONSIN

The best answer to this question is, "Yours, Mine, and Ours." In other words, the lakes are public property. Everyone has a right to use and enjoy them and no one has a right to do things which inhibit some else's right. This principle is enshrined in law and in a series of court precedents known as the Public Trust Doctrine.

Before the development of significant water law, Wisconsin's streams and lakes were badly degraded. In the second half of the 19th century, the logging industry used the streams and rivers to float millions of logs to the mills, scouring out stream beds and clogging flow. Without vegetation, and after the great fires, the soils of the cutover eroded into the streams, leaving muddy, ash-laden stagnant pools where trout had once flourished. In addition, municipalities dumped raw sewage

directly into lakes and rivers. A promotional pamphlet for the city of Eau Claire, published in 1880, read: “There is abundant means for the disposal of sewage. With the Chippewa River running through the city from the north to the south, and the Eau Claire passing thru much of the thickly inhabited portion, together with the little Niagara stream, south of the East side, which will in the future be very valuable as a sewage receptacle for that portion of the City, and Half Moon Lake, which can be used at any time when necessary, the complete sanitation of the City is at all times thus assured.” Sawyer Creek in Washburn County was one such example where fifty years ago the pollution levels were severe. Many other creeks including some in Clark County were bottom coated with sewage sludge which used up so much of the dissolved oxygen that, instead of May Flies and other natural foods of fish and frogs, the steams hatched sludge worms, sow bugs, blood worms, and rat-tailed maggots.

In the past, wetlands and river beds were dredged and filled. The rivers and wetlands around La Crosse were typical, losing half their area to fill. Industrial pollution also took a serious toll on our rivers and lakes. In 1925, a combination of paper mill waste and a hot summer reduced the oxygen in the Flambeau River below Park Falls and 30 tons of dead fish washed up on the shores. Heavy metals and PCBs contaminated Lake Michigan harbors. At Ashland, a coal gasification plant dumped wastes into Chequamegon Bay in the 1890s. Now, more than a hundred years later, the area is still so severely contaminated that it is a Superfund site, cordoned off to swimmers and boaters. In the 1920s the East River in Brown County was so badly contaminated by stinking sewage that Green Bay’s nearby East High School regularly held classes with the windows closed. One report stated that the only movement in the river was from gas bubbles rising from the bottom, shooting up pieces of raw sewage. So much petroleum was on the surface that touching a match to it resulted in a flame two feet high. Found in the Fox River valley waters were disease carrying sewage, fish packing plant waste, paper company waste, engine oil, appliances and even abandoned cars. In 1935 one report said, “The colored, turbid waters of the Fox River were filled with fibrous materials, sludge deposits and unstable organic wastes. The sight and odor of dead fish along the banks added to the nuisance.” Green Bay’s commercial fisheries were closing due to the loss of the fish population caused by the pollution. But the Fox River Valley wasn’t the only problem area.

By 1950, 1200 dams impeded the natural flow of Wisconsin’s rivers. In more recent times, commercial lake shore development without adequate zoning has resulted in septic tank runoff, destruction of natural shoreline, and the pollution of lakes with lawn fertilizer. Many lakes in the southern half of the state have suffered serious water-quality degradation, the so-called “green lakes” where algae blooms give off malodorous fumes, and clog swimming beaches and boating channels. Natural shorelines have been urbanized and suburbanized with lawns and rip rap, and the carrying capacity of many lakes has been exceeded. The end result is that, as conservationist J. H. Bleucher explained, “The very values that attracted men to the lake in the first place are sacrificed.”

Development of the Public Trust Doctrine and the Legal Protection of Wisconsin Waters

The contamination, over-use and abuse of Wisconsin's waters have been addressed by the Public Trust Doctrine. The idea that waters are a commons belonging to no individual can be traced back to Roman law, the Magna Carta, the U.S. Constitution, the charter of the old Northwest Territories, and the Wisconsin Constitution. The modern Doctrine is the result of many court cases and of legislation, and provides that the waters of the state belong to all the people and not just to riparian property owners. All Wisconsin citizens have the right to boat, fish, hunt, ice skate and swim on navigable waters as well as enjoy the natural scenic beauty and enjoy the quality and quantity of water that supports those uses. The concept underlying a legal trust is the duty to protect something that belongs to someone else. In other words, the waters of Wisconsin are yours, but also mine, and ours. As Professor Dorothy Lagerroos puts it, "As long as you have your feet wet, you're on public water."

Many court cases contributed to the development of the Public Trust Doctrine.

1848: Martin v. Waddell, the U.S. Supreme Court established that the people of each state hold absolute right to all their navigable waters and soils under them for common use.

1901: Illinois v. Bilot, the Wisconsin Supreme Court held that the title to the waters had been held in trust by the federal government and that trust was transferred to the state and "must continue there forever, so far as necessary to the enjoyment thereof by the people."

1969: Reuter v. DNR, confirmed the citizens' rights to clean, unpolluted waters.

1972: Just v. Marinette County, the justice concluded that "An owner of land has no absolute and unlimited right to change the essential natural character of his land so as to use it for a purpose for which it is unsuited in its natural state and which injures the rights of others."

1973: Claffin v. DNR: the Wisconsin Supreme Court upheld a decision ordering removal of a boathouse based on aesthetic impact, stating "the natural beauty of our northern lakes is one of the most precious heritages Wisconsin citizens enjoy."

1983: State v. Bleck, determined that while riparian owners do have rights such as access, piers, reasonable use, that nevertheless when these conflict with the public's interest in navigation, fishing, recreation, hunting and the enjoyment of natural scenic beauty," then "the riparians' interests become secondary to those of the public."

1996: Sterlingworth v. DNR, denied a condo developer the right to increase the number of docks, thus providing support for the concept of cumulative impacts.

1998: Gillen v. the City of Neenah, upheld the citizens' right to have an "independent authority" to decide under the public trust doctrine to challenge violations of the doctrine that may constitute public nuisances."

The Federal Congress and the Wisconsin Legislature have also provided for the protection and recovery of Wisconsin waters. A few representative laws include:

1923: the Legislature granted counties power to zone unincorporated areas subject to Town Board approval.

1935: the Legislature granted counties power to zone shore land including setbacks, size of buildings, commercial activity and to restrict further industrial development.

1961: Wisconsin's Outdoor Recreation Act Program provided $50 million to protect high value lands including shore lands and to buy easements for public access.

1965: Federal Water Quality Control Act required states to adopt water quality criteria for interstate waterways.

1966: Wisconsin's Water Resources Act defined shore land as 1000 feet from the ordinary high water mark of a lake and 300 feet from a river and to establish zoning including minimum setbacks, lot sizes, frontage lengths and limited vegetation removal in a 30 foot riparian zone. It also placed restrictions on dredging, filling, lagooning, ditching and excavating.

1967: The Wisconsin legislature created the Department of Natural Resources.

1968: Local governments required by law to adopt shore land and floodplain zoning.

1997: Legislature created the 3-tiered lake classification system based on a water body's sensitivity to development as determined by size, depth, physical characteristics, fish and wildlife. As the classification goes from 1 to 3, setbacks, etc., increase to protect the more fragile water body.

1999: The State Omnibus Budget provided the legal basis for comprehensive planning by local governments, to be completed by 2010.

These, and many other laws and court decisions, make up the Public Trust Doctrine.

Recovery and Continuing Need for Vigilance

Much progress has been made in cleaning up degraded waters. Sawyer Creek, noted earlier for its sludge beds and worms, is once again a productive trout stream. Legally mandated clean-up has resulted in increased oxygen levels in the Fox and East rivers and many species of fish have returned to the cleaner waters of Green Bay and with them the boaters, fishing enthusiasts and greater public and private investment in waterfront properties. The development of the Public Trust Doctrine, and seeing that the laws which embody it are enforced, has been the work of many public-minded citizens over the last hundred years. But the work is not done, perhaps is never done, because new threats keep cropping up. The northward creep of high density development, including building on nearly all the remaining lakeshore lots, and back lot development, efforts to build condo developments on lakeshores, the multiplication and increase in size of piers, as well as the increased number of users, are putting ever greater pressure on the lakes and rivers.

Development has resulted in property values increasing dramatically (over 400% in some areas) in the last decade. Thirty years ago, many lakeshores consisted of a few seasonal cabins on large lots, a few dirt roads, and lots of forest in between. Many lakes now have 5-10 times the number of shoreline homes that they did in the 1960s. Today many lakes are surrounded by 3-4 bedroom, year-round homes on small lots, with lawns, driveways and two-car garages. Areas once passed over for development are now being snapped up, often by large-scale, commercial developers.

In their natural state, Wisconsin's waters are protected by a thick and diverse vegetation along their shores. As people move in, we change the environment to suit our tastes. Some of those protective elements disappear. As we simplify the environment and remove protective elements, the very things that drew us to the water begin to disappear. And shoreland development is largely permanent. Little by little, over time, we chip away at the natural shoreline and ultimately, at the health of the lake itself.[2]

In short, we are loving them to death, a death by a thousand cuts. In addition, the arrival of invasive species such as Eurasian Milfoil, Zebra Mussels, and Purple Loosestrife threaten to choke our waters and to drive out native species.

Many lake protection advocates around the state are concerned that growing numbers of state legislators appear to be less than supportive of the Public Trust doctrine, and that the fate of Wisconsin's remaining high quality lakes and rivers is again seriously threatened. Once again, as in the past, citizen action to enforce compliance with the Public Trust Doctrine through laws, zoning ordinances, and enforcement will be necessary if we are to preserve our scenic beauty, recreational values and property values. Restoring our southern waters and keeping the north the north, call for vigilance and action. It is for these reasons that we provide this Handbook of Best Practices.

VI. BEST PRACTICES

A. Best Practices To Maintain the Natural Environment of the Twin Lakes

Digging

Before digging consult the Diggers Hotline to locate an underground cables or gas lines. 1 800 242 8511

Yard Care

Remember that it all runs downhill. "Bag it now or swim in it later," is a good motto. Leaves, grass clippings, pine needles all decay and their decay products end up in the lake. If you fertilize, spilled material on sidewalks and

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[2] The foregoing three paragraphs were adapted from "Development Along Wisconsin's Lakeshore", Wisconsin Department of Natural Resources, www.dnr.staste.wi.us/org/water/wm/dfsm/shre/develop.htm

driveways, can wash into the lake. A leaky crankcase or sloppy oil change will also pollute the lake. Washing cars in the drive way will leach soaps—wash the car on the lawn to keep pollutants out of the lake. Never wash a car or RV in the lake. (It's illegal in addition to being polluting.)

Natural Shorelines—the advantages

"Studies have shown that aesthetics is a strong factor when people decide where to build or buy near water. They prefer scenes with more shore line vegetation and less shoreline alteration. People prefer natural shorelines with structures hidden from view." (Life on the Edge…Owning Waterfront Property, p. *8) Boat houses and structures right on the shore are prohibited. (See section on zoning regulations.) *Best Practices: Minimize the size and number of piers and use natural materials and colors; create meandered paths and trails to screen buildings from view, screen satellite dishes, swing sets, grills, fuel tanks and outbuildings from view with vegetation. Avoid erosion. Pathways down to the lake should follow the natural slope of the land using switchbacks. Avoid carving stairways into slopes which concentrate runoff and cause erosion.*

Healthy, long-sustained ecosystems require diversity of plants and animals interacting in subtle ways. The natural lakeshore is a highly diverse habitat where many kinds of plants and animals depend on one another and provide a healthy ecosystem and scenic beauty for our enjoyment. Even dead trees, standing and lying in the water, provide critical habitat for birds, turtles, fish, etc. These natural plant communities also filter the runoff water before it goes into the lake. Natural shorelines provide a barrier against foraging Canada Geese and also act as an avenue for birds and other native animals. Natural shorelines are what give the northern lake country its unique character. Unfortunately, some newcomers think it beneficial to imitate the suburban lot, clear vegetation all the way to the lakeshore and plant a bluegrass lawn. Lawns are not in themselves harmful when properly maintained, except when they eliminate the diverse, natural shoreline vegetation. **When that occurs**, **runoff to the lake increases ten-fold**, and often washes in fertilizers and other lawn chemicals creating excessive growth of algae and polluting the lake ecosystem with toxins that disrupt the development and survival of aquatic organisms. Removing the plants growing in the lake also reduces habitat and impoverishes the diversity of the lake. Fish populations decline, there are fewer birds, frogs, Great blue Herons, etc. In addition, the lawn creates a highly desirable food source for Canada Geese, ducks and muskrats which then leave their feces behind. Bank erosion can also occur and cutting all the trees results in a loss of privacy and increased noise from boating activities.

Along The Shore

Concrete and treated wood seawalls create a barrier for reptiles, amphibians and other species that must travel to and from the water to complete their life cycles, produce barren near-shore areas devoid of plant and insect life that fish and wildlife feed on, and detract from the natural shoreline beauty. (They also require DNR permits.)

Natural Shoreline Restoration

Many property owners chose to restore their shorelines for a several reasons: concern for water quality (a thick vegetative cover slows water flow allowing it to seep into the soil and deeply rooted native plants hold the soil); sharing the land with wildlife from butterflies and hummingbirds to frogs and fish; and enhancing natural beauty with flowering native plants. Assistance with determining what can be done with your shore line and how it is done, as well as funding assistance, is available from state agencies such as University Extension (UWEX) and the Washburn County Land and Water Resources Management agency. Pamphlets may be obtained from UWEX. Web contacts include www.uwex.edu/ces/shoreland and www.dnr.state.wi.us/org/water/fhp/waterfront and a list of plants geared to soils and sunlight conditions can be found at the county website www.co.washburn.wi.us Click on Departments, Planning, Land and Water Resource management, Land and Water Conservation, Native Plants.

How To Restore the Shoreline

It is important to recognize that re-planting of a shore land area is only necessary if native plants have been depleted or bare soils are exposed. If you are developing or building on a lot that has not yet been cleared, consider making the smallest possible 'footprint' on the landscape. This can be done by minimizing the size of the area to be cleared, using 'green building techniques', and by removing only single trees or branches to allow views of the lake. If native plants are missing from your shore land you can begin to restore your shore land, or portions of it, by planting appropriate native species for your particular site.

Strategies for Restoration: Passive Restoration

The easiest approach to restoring your shore land is the “no-mow” approach. Simply allow the existing plants to grow in a strip along the shore. Seeds of native plants often lie dormant in the soil for years. By not mowing, you allow these seeds to germinate and grow. Removal of undesirable, aggressive plants in this zone will speed the process. A list of non-native invasive species is available in this site. Plants growing in this undisturbed buffer area will trap nutrients and other run-off from the upland and provide wildlife habitat.

Active Restoration

The second strategy for promoting a native shore land buffer strip is to actively plant species that are appropriate to one’s particular shore land site.

It is important to remember that raking leaves is not necessary and is discouraged in a restored area. A leaf layer left in place helps secure soils, acts as compost adding nutrients to the soil and conserves the moisture content of the soil. Under a leaf layer the activity of worms and microorganisms enriches and aerates the soil.

Purchase from local nurseries that sell plants coming from a seed source no farther than 200 miles from your site in order to have a genotype adapted to your area.

Be sure nursery plants are not dug from natural areas. Inquire about their source.

Generic wildflower seed packages usually contain species from distant areas. These species may wither, die out, or become weeds, and are not recommended. Buy seeds from local native plant sources.

(Quoted verbatim from Wisconsin Association of Lakes website)

What You Can and Can't Do In The Water

Aquatic Plants are the underpinnings of a healthy lake: they provide building materials and food for wildlife, homes for loons and other shorebirds, stabilize lake bottoms, provide the best fishing spots, produce oxygen vital to all creatures that live in the water, add natural beauty, and purify the water by absorbing nutrients like nitrates and phosphorus, and can limit the spread of exotics like Eurasian water milfoil. *Best Practices: Do not look on water plants as "weeds." Minimize harvesting or disturbance for swimming and piers.*

Controlling the vegetation of a lake can create unexpected management issues. Manipulating one component of a lake ecosystem has consequences for other components of the lake. For example, population growth of microscopic small green algae and macrophytes (large leafy plants and large plant-like algae) are inversely related. Lakes with abundant algae and poor water clarity generally have fewer submersed macrophytes. However, management efforts that reduce algae often result in increased growth of the remaining macrophytes. Removing the remaining macrophytes increases the effects of wind turbulence and redissolves nutrients in the sediments into the water. This results in an algal bloom, which turns the water green and has the opposite of the desired effect. The trade-off is clear water with abundant submersed macrophytes versus an algae bloom with low water clarity and few macrophytes.

A permit is needed if you intend to:

- Use any type of herbicide or algaecide
- Control any type of emergent vegetation
- Remove vegetation from an area larger than 2500 square feet, or from an area spanning more than 50 feet of shoreline or more than half of the property width
- Control floating leaf-vegetation in an area larger than a 15-foot wide boat channel connecting your lakeshore to open water
- Use an automated plant control device, such as a Crary weed roller

A permit is NOT needed if you intend to:

Remove submerged vegetation from an area less than 2500 square feet; remove the vegetation by hand, with hand tools, or with equipment that doesn't significantly alter the course, flow, or current of the water. The goals of a management plan should be clearly identified in advance. The expectation of a perfectly clear, vegetation- and algae-free lake is unrealistic, and leads to disappointing results. Shorelines with muddy substrates need aquatic vegetation to prevent suspension of the soil into the water.

If you feel you must harvest, then use one of the following methods: *hand removal (pulling plants by hand or sweeping a 3 foot, quarter inch diameter rod back and forth along the bottom; or rake, or use a hand-held cutter. BY LAW, CUT PLANTS MUST BE REMOVED FROM THE WATER because: fragments can re-root, cuttings decompose and add nutrients to the lake and deplete oxygen levels in the water. Cuttings can be used for mulch or compost. CHEMICAL REMOVAL REQUIRES A PERMIT FROM THE DNR. Think of this method as a last resort. Dosage rates must be carefully calculated and properly applied. Currents or outflows can carry the chemicals away from the target area. Plants differ in susceptibility to chemical treatment and no single one works on all plants. Get expert advice.*

Sand blankets

Placing sand or gravel on the shore or in the water to create a swimming beach requires a DNR permit, but even though legal with a permit, they damage the ecosystem of the lake: the added material kills out aquatic plants necessary for a healthy lake environment and often are dispersed to other areas by wave action or currents, damaging vegetation and spawning areas. They also need to be replaced frequently in a never ending cycle.

In general, try to avoid landscapiong and lake alteration practices that result in an ecologically dysfunctional lakeshore and a lot of time spent mowing grass instead of boating, fishing, swimming or watching wildlife.

Best Practices: Landscape for wildlife, water quality and privacy. Create buffer zones along the shore. These are natural strips of vegetation extending onto the land 30 feet or more and into the water 25-50 feet. If such already exists, leave it primarily intact. Clear only a 30 foot wide opening every 100 feet for access and view. Even in the 30 foot areas, some trees can be left that will still allow viewing from the shore but will act as a privacy screen from the lake. Damaged shorelines can be restored by planting native trees, shrubs, grasses and aquatic plants. Help is available from the DNR and University Extension. Avoid putting in stone rip rap or timber walls at the shoreline or sand blankets in the lake itself.. ***Leaving a natural shoreline, or restoring a damaged one to a natural state, is probably the single most effective thing homeowners can do to protect water quality and wildlife habitat.*** *See Landscaping for Wildlife and water Quality. Help is also available from the DNR, University Extension (both with offices in Spooner), and the Washburn County Planning, Land and Water Resource Management (found on the Washburn County Government homepage.)*

Lawn Care

Properly cared for, lawns can have a place at the lake, providing recreation area and aesthetic values. However, note that the runoff into the lake from a lawn is ten times greater than that from a natural forest floor. Large lawns require maintenance time that might be better spent doing the things people come to lake for, such as boating, swimming, fishing, etc. And mowing them contributes to noise pollution.

Best Practices: Bring the lawn to an end at your natural buffer strip. Don't plant lawn on steep slopes as it maximizes runoff and is dangerous to mow. If it is necessary to fertilize, use phosphate free fertilizers (such as 20-0-10) to avoid nutrient loading and the growth of algae at the shore. Do not throw clippings or rakings into the lake or into wetlands. If you need to use herbicide on poison ivy, spot apply it. It is most effective if applied in the fall. Keep lawns small so as to avoid duplicating the suburban look which is in contrast to the natural character of the north woods and mow less often than you would in the city.

Wildlife

Wildlife are not pets. They act according to natural instincts and. "We are not generally included in their life plans…." (Life on the Edge, p. 34) *Best Practices: Protect habitat insofar as possible. Improve habitat by creating brush piles, leave dead trees, and construct nesting boxes and platforms. But, avoid feeding deer as it can increase population above what natural habitat can support and results in over-browsing, disease and die-offs.*

Bears

The Black Bear is a native resident of our lake region and a frequent visitor to our yards in the spring and summer. Generally bears are harmless but under certain conditions they can be dangerous. *Best Practices: Never leave garbage outside—store it in a shed or in the garage. Many people stop feeding birds after the bears come out of hibernation because feeders attract them and they will come right up on your deck to tear the feeders down. Never get between a mother bear and her cubs. During bear season, be watchful, whistle or talk loudly. If you see a bear, move away from it slowly. Do not harass them. If a bear becomes a nuisance, call the DNR which has a policy of relocating problem bears to less populated areas.*

Song Birds

A wide variety of birds visit the Twin Lakes ecosystem. Some winter over (chickadees, crows, nuthatches, etc.) and others come to visit in the summer (indigo buntings, Baltimore orioles, etc.) *Best Practices: Maintain as much natural habitat as possible for nesting sites. Do not let cats roam free, especially around feeders. If you see feral cats, live trap them and take to the local humane shelter.*

Loons

These large waterfowl with their haunting calls are perhaps the signature feature of northern lakes. Because they have difficulty walking on land, they nest

near the water's edge, preferably on an island. Loons need undisturbed shoreline; if too much development occurs lakes can lose their loons. They are easy prey for foxes, loose dogs, cats, and the chicks are in danger from eagles and even large game fish and turtles. Loons do not always nest, and the eggs (usually 2) are easy prey, so to have a successful nesting pair is a great good fortune. In 2005 we had two on our lakes. We are experimenting with an artificial nesting island in the little bay at the north end of South Twin. *Best Practices: Stay well away from nests—100 feet or more, and do not let dogs or cats roam free during nesting season. Never harass loons with a boat or personal watercraft. Stay well away from swimming loons. Maintain a natural shoreline to encourage nesting sites.* [For more information contact the local loon rangers [Elaine Siganos, 466 2822 or] or the Sigurd Olson Environmental Institute, Loon Watch Program, at Northland College, Ashland WI, 54806-3999.]

Other Waterfowl

Canada geese and ducks are common on our lakes and can be enjoyed as long as we keep separate. If we maintain lawns right down to the waters edge, we have created an easy, abundant food supply for them and they will come ashore and leave feces. *Best practices: Maintain a natural shoreline.*

Making Peace with Geese and Ducks

Waterfowl are a common occurrence on lakes, streams and wetlands throughout Wisconsin. Their presence adds to the beauty and charm of our region's water resources. A family of mallards or Canada geese is enjoyable to watch-at a distance. But when they show up in your backyard with several dozen of their friends, the appreciation quickly turns to frustration. The resultant droppings reduce the usefulness of your yard or dock.

Because geese graze primarily on grass, well maintained lawns provide a great food source. Planting trees, shrubs, and groundcovers along the shore line is the best long-term way to discourage geese from coming on your property. This type of greenbelt may take a year or more to establish, so in the meantime, here are some **helpful suggestions:**

1. Do not feed the ducks or geese. This only keeps them interested in your property and may ultimately result in water quality problems.
2. In areas where geese are walking into your yard, border your property boundaries with two strands of string fencing-at five and 14 inches off the ground.
3. Place bright orange flags, 1/2-3 feet in size on your lawn.
4. Place owl or snake decoys on your lawn. They must be moved frequently to be effective.
5. Apply a natural goose/repellant made from grape extract (diluted with water) to your lawn.

Frogs and Other Amphibians

Healthy frog population equal healthy lakes. Frogs are important bioindictors, that is, their status can tell us if good or bad things are happening to the lake

ecosystem since they spend part of their time in the water and part out, they have a permeable skin (which means substances can move relatively freely into their bodies), and they bioconcentrate pollutants. Something mysterious is happening to frogs and other amphibians around the world—their populations are declining rapidly and precipitously. Some species have already gone extinct. Also, badly deformed frogs are showing up in the Midwest. The causes are probably multiple and primarily human in origin. Loss of habitat is crucial. Frogs need wetlands and natural shorelands. Also suspected is the increase in ultra-violet radiation as a result of the destruction of the ozone layer caused by the aerosol propellant, chloroflourocarbons (CFCs). Another culprit may be pesticides, including Methoprene, used to control mosquitoes, ticks and fleas. The introduction of non-native species that out-compete our Wisconsin frogs may also become a problem. Other causes may include parasites and fungus.

Best Practices: Preserve vernal ponds and micro-wetlands. Do not dump grass clippings or pine needles or other yard refuse into them. Preserve or restore natural shorelines. Avoid broadcast spraying of pesticides—it does little good in any case and can cause great harm to frogs, amphibians and many other species. If you need to treat, do limited spot applications with a hand pump sprayer. Do not introduce frogs from other areas as bait when fishing. Keep an eye out for deformed frogs and report any occurrences to the Twin Lakes Preservation Association and the DNR.

Fireworks

Setting off fireworks requires a permit from the Town chairman and is regulated by law. It is not legal to set off fireworks at boat landings.

Fireworks around Independence Day are an American tradition and firing them over the water seems like a no-brainer, yet this can cause serious problems in the categories of pollution, noise, accidents, property damage and litter.

Pollution and Litter

Fireworks contain a number of suspect chemical compounds and heavy metals including: black powder (which contains carcinogenic sulfur-coal compounds); ammonium perchlorate (which can cause thyroid gland problems); white phosphorus (which persists in aquatic animals and has caused die-offs in fish). The blazing reds are created by strontium and lithium, blues by burning copper, boric acid burns green, and the glittering greens are produced by radioactive barium. These ingredients drift on the winds and settle into our water and soils. [During the Stockholm Water Festival in 1996, air pollutant levels of arsenic were found twice as normal, and levels of mercury, cadmium, lead, copper, zinc and chromium were as high as 500 times above normal.] Fireworks also leave cardboard, wood or plastic tubes and structural parts that drift up on shore or settle on the lake bottom endangering fish and wildlife.

Noise

Fireworks also create noise that is not only irksome, but hazardous. At 130 decibels they exceed the safe level of 105 dB, above which exposure for one hour can create hearing damage. The noise can terrify pets and wild animals and seriously annoy neighbors

Accidents and Property Damage

Fireworks can cause burns, loss of fingers and hands, even death. They are extremely hot. Sparklers burn at 1800 degrees. Annually fireworks cause over 30,000 fires nationwide and 9000 injuries requiring hospitalization, 45 % of which are children. In a dry summer, fireworks could cause a major forest fire, leaving our lake shores blackened and barren. At the least, they can cause burns and holes in boat seats and carpeting and in canopy tops.

Best Practices: If you are compelled to set off fireworks, obtain a permit from the Town chairman, be extremely careful of windage (as a fire hazard—do not set them off if the wind speed is above 5 mph), clean up your litter from the beach and lake, take care of children. Please consider the noise pollution and limit fireworks to the July 4th weekend and end your celebration early in the evening. Please consider that it is both safer and cheaper and better for the lake to forego personal displays and attend the community displays in the area. Violations of fireworks laws can be reported to the County Sheriff. [This information was compiled from Lake Tides, a publication of the University of Wisconsin Extension.]

Burning and Burning Rules

Burning permits are required for everything but a campfire anytime the ground is not completely covered by snow. They are free. A campfire is defined by law as a "small fire used for cooking or warming a person." See the Contacts list for fire wardens' numbers.

Burning trash and garbage releases harmful chemicals and noxious odors into the air, which can often be smelled all over the lake and as they fall out of the air, contaminate the water. These include:

- Arsenic
- Benzene and other solvents
- Cadmium
- Chromium
- Dioxin
- Formaldehyde
- Hydrochloric acid
- Lead
- Nitrogen oxide
- Polyarmotic hyudrocarbons
- Sulfuric acid

Burn barrels are especially discouraged. They are an unhealthy method of garbage disposal because they emit serious pollutants. Because they operate at low

temperatures (400-500 degrees), they result in incomplete combustion. They often emit acid vapors, carcinogenic tars, and heavy metals. The ash can contaminate ground water.

It is illegal to burn household garbage, plastics, tires and rubber, treated wood, in a burn barrel, open fire pirt or in an inside wood stove. Also, burning old downed trees and other materials right on the lake shore will contaminate the lake with chemicals and also with nutrients that can encourage the growth of algae. It is never legal or smart to have fires on the ice. *Best Practices*: *Get a permit for any fires other than legally defined campfires. Garbage can be hauled to the Transfer Station in Minong or removed by a contractor*. All f*ires should be as far from the lakeshore as possible.*

Firewood Alert

Because firewood brought into the state, or transferred from another area in the state, can harbor serious pests, buy or cut firewood only from local sources. Do not buy or bring firewood from Michigan where the emerald ash borer has already killed millions of trees. Because of this pest, the DNR has imposed firewood restrictions on state properties. Check the DNR web site at dnr.wi.gov.

Dying and Dead Jackpines

Jackpine budworm is killing many of the trees in this part of Wisconsin. It is a naturally occurring infestation and peaks in 8-9 year cycles and then dies back. Standing dead jackpines can be left in place as long as they do not pose a threat of injury or damage to dwellings, etc. Dropping these trees and burning them does not control for the pest. It is best if they are just left in the woods.

Household Chemicals

Many household chemicals are toxic to fish and wildlife and need to be disposed with great care. *Best Practices: Take all household chemicals to the county household hazardous waste disposal site. Oil and tires may be taken to car repair shops which will recycle them.* **Water Softener "Salt"** Chlorides are a very water soluble solution of chlorine and comes into our lakes from two sources: road salt and water softeners. When discharged to septic systems they enter the groundwater and eventually the lake. A typical home can discharge hundreds of pounds per year. High concentrations may have detrimental effects on plants and wildlife and on water density, which can affect a lake's annual mixing process which can lead to oxygen deprivation problems at the lower levels. *Best Practices: Try to use less "salt" in your water softener and regenerate it less frequently. This will cut down on the discharge. Consider using salt sparingly on decks, walks and drives—limited to those areas where it is really needed for safety.*

Swimmer's Itch

(Adapted from Lake Tides, Vol. 24, No.3, Summer 1999)

An annual nuisance known as "swimmer's itch" is again making its appearance in Wisconsin lakes. Technically known as schistosome dermatitis, swimmer's itch

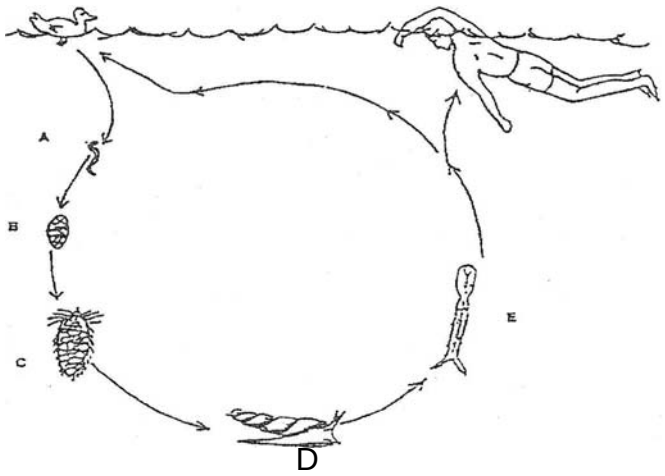
appears as red itching, bite-like welts within several hours of leaving the water. The irritation can last from two days to several weeks, depending on the individual's susceptibility. Preventive measures can be taken, and there are no permanent effects from swimmer's itch.

Swimmer's itch is a widespread occurrence in Wisconsin and has been reported in many other states, in Europe, and elsewhere in the world. There seem to be no special characteristics of lakes having the problem. Some of the finest recreational waters in the state, including Lake Superior, experience swimmer's itch annually, whereas other lakes may have an occasional outbreak or none at all. An outbreak may be severe, but last for only a few days, or can be minor and last much of the season.

The irritation is caused during a life stage of a flatworm parasite (Schistosome) which lives as an adult in suitable mammals and birds, such as mice and ducks. The adult worm sheds its eggs via the host's excretory tract into the water. Here they hatch into a free swimming stage called a "miracidium." The miracidium swim in search of a proper second host animal, a particular type of snail. After a three- or four-week development period, another free-swimming stage called a "cercaria" emerges from the snail in search of the proper primary bird or mammal host.

The cercariae release normally occurs when the water temperatures reach their near maximum summer temperature. This usually occurs in late June or early July in northern Wisconsin, coinciding with peak water recreational activities. It is at this time that the organism can accidentally contact bathers and cause swimmer's itch. In years of warm spring weather, swimmer's itch has occurred as early as May in northwestern Wisconsin.

A swimmer's itch problem may develop with as few as 2% of the snails infected. However, snail populations may be as high as 400 per square meter. One infected snail may release up to 4,000 cercariae per day. At the 2% infection rate, this would mean up to 32,000 cercariae would be produced per square meter per day. On a typical 100' x 100' beach area, this translates into a potential 30 million cercariae released each day. .



Life cycle of swimmer's itch cercariae: (A) blood fluke carried by water bird; (B) egg; (C) miracidia; (D) snail host; (E) cercariae seeking host.

Most cercariae are released during the mid-day hours from noon to 2:00 p.m. With little free-swimming abilities, the cercariae will swim to the surface to optimize their chance of contacting a suitable animal host. Concentrated near the surface, wind and currents may carry the cercariae up to four miles from the release area.

Preventive measures to reduce exposure or to prevent penetration:

Swim rather than play or wade in shallow water to reduce exposure.

If swimmer's itch is present, avoid swimming when winds are likely to carry cercariae into the beach. Swim offshore if possible. Towel vigorously immediately after leaving the water to crush the cercariae before they can penetrate the skin. Some sunscreens and lotions may reduce the infections, however, nothing is known to be completely effective. Once the irritation has developed, various soothing lotions or ointments may be applied to relieve the itching. For severe cases, prescription antihistamines and topical steroid creams may be prescribed by a physician.

There is no effective way for people to eliminate swimmer's itch on their beach. Any attempts to control swimmer's itch by treatment to kill either the cercariae or their snail hosts are ineffective because cercariae are capable of swimming or drifting long distances from non-treated areas. It makes no difference if your beach area is sandy, rocky or weedy. Host snails will live on all sites and one species which commonly harbors swimmer's itch actually prefers sandy bottom areas.

The cercariae may not penetrate the skin until after the bather leaves the water, at which time the person may feel a slight tingling sensation. The cercariae are soon killed by the body's natural defense mechanism, but will continue to cause irritation. Studies have shown that 30-40% of individuals contacting the parasites are sensitive and experience irritation. Small children playing in shallow water are most susceptible because of the alternate wetting and drying with the arms, legs and waist

area most prone to infection.

Feeding of ducks should be discouraged if swimmer's itch is known to be a problem on the lake, since waterfowl are an important adult host to the parasite. New occurrences of swimmer's itch seem to be strongly associated with people feeding and attracting ducks. In recent years, there have been experimental attempts at. treating the host birds with veterinary medicines. The theory is to rid the birds of the adult parasite before they can infect the snail population with miracidia. Depending on the different kinds and numbers of adult hosts, success at this method will be limited to very specific situations. Thus far, the procedure is considered impractical on a lake wide scale in Wisconsin.

Modern pesticide laws prohibit treatments as they were historically attempted. Treatments to kill snails are very harsh and kill many non-target plants and animals and may also lead to contaminated sediments. Some high-use public beaches on specific sites where incoming drift of cercariae is unlikely have been issued permits for a highly reduced treatment, but the result is very temporary and questionable. Anyone proposing any kind of pesticide or chemical treatment for any purpose must obtain a permit from the Department of Natural Resources. It causes no lasting health problems.

Best Practices: Here in Wisconsin, it's best to regard swimmer's itch in the same manner as mosquitoes, wood ticks and deer flies; there really is nothing that can be done to eliminate them, and our best practiceis to learn how to reduce exposure. Often these creatures we consider pests are signs of a healthy and diverse outdoor environment. Overall they shouldn't discourage us from enjoying the many outdoor activities we can experience when we venture into their outdoor habitat.

Exotic Invasive Species

These are organisms introduced into habitats where they are not native and, lacking competitors or predators, their populations explode, altering, degrading the environment and crowding out native species. They cause a loss of biological diversity and are considered a biological pollutant. Once established, they can be controlled but rarely eliminated. The most threatening to Twin Lakes include:

Curly-leaf pondweed, which forms dense surface mats that interfere with recreation. These usually drop to the bottom by mid early July.

Eurasian Watermilfoil, spread by boats and water birds, in nutrient rich lakes. It forms vast underwater stands of tangled stems and surface mats interfering with swimming, fishing, and boating, and it shades out native plants. Often confused with native northern milfoil which has 5 -9 pairs of leaflets, this exotic has 12-21 pairs. It can reproduce a colony from a single fragment and through underground runners. It is introduced via boat trailers, boats, bait buckets and any apparatus that moves

through the water. It is already found in Lake Nancy. Free pamphlets with photos and drawings are available from the DNR office in Spooner and may be seen on the DNR website.

Eurasian water milfoil (invasive)

Northern water milfoil (native)

Best Practices: *for both Eurasian Water milfoil and Curly-leaf pondweed:*

1. *Inspect all boats and trailers, etc. coming into the lake and if found, wash off or pick off every fragment and place in trash*
2. *Do not remove native vegetation as doing so creates a perfect habitat for these exotics*
3. *Maintain healthy water quality which will maintain a diverse, healthy plant community making it harder for the exotics to thrive.*
4. *Monitor boats landings for nascent colonies. Notify DNR if found.*

Purple Loosestrife: a tall (2-7 ft.) ornamental with a purple spike flower that invades wetlands and lakeshores, replacing cattails and other wetland plants, forming dense,

impenetrable stands which are unsuitable as cover, food, or nesting sites, crowding out many desirable native plant species. 1 plant can disperse 2 million seeds annually and this species re-sprouts from roots and broken stems.

Purple Loosetrife
(exotic invasive)

Swamp Loosetrife
(native)

Best Practice: Distinguish from Swamp Loosestrife. Do not plant in gardens around lakes. If colonies are already established, contact the DNR for control methods. In some cases, physical removal at the right season is effective. Also, a species of beetle that attacks it can be introduced.

Coontail (exotic invasive)

<u>Zebra Mussels</u>, a small, fingernail sized mussel which clogs cooling systems of boat engines, and attaches itself to piers, pipes and any firm surface. They will cover rock, gravel, metal, rubber, wood, crayfish, native mussels and each other. Can produce as many as 1 million eggs per year and discharge “pseudofeces” which can harm the plankton food chain. They are introduced in bait buckets, live wells and can ride in on boats and trailers. Diving ducks will eat them but do not significantly control them.

Best Practice: Never bring bait or water from one lake to another. Never dump live fish from one lake into another. Tackle and trailer with hot water when you get home. Flush water through your motor’s cooling system. Let everything dry for three days before taking your boat to another lake or river. Report sightings to the DNR.

See “A Field Guide to Aquatic Exotic Plants and Animals, available at the DNR office in Spooner or from the WI DNR (PO Box 7921, Madison, WI 53707

Personal Watercraft(Questions and Answers From the WAL website verbatim by Blue Water Network)

Don't conventional motorboats powered by two-stroke engines pollute the air and water just as much as do personal watercraft?

No. Personal watercraft have been proven to discharge more air and water pollutants than do outboard motorboats powered by similar two-stroke engines. The reasons for this are threefold: personal watercraft operate at higher average horsepower than do conventional motorboats; personal watercraft operate at higher average throttle settings; and, personal watercraft have higher annual usage rates than do conventional motorboats. In fact, the National Marine Manufacturers' Association explained this phenomenon on their website. . . .

First, we need to recognize that personal watercraft engines are physically smaller than outboard engines of the same horsepower. This requires the engine to operate at higher speeds resulting in higher emissions. The second reason for higher emissions from personal watercraft is that they generally are operated closer to full throttle, resulting in a greater amount of exhaust emissions. (National Marine Manufacturers' Association, Frequently Asked Questions About Recreational Boating and Water Quality, October 30, 1998)

Will new direct-injection two-stroke and four-stroke personal watercraft solve all the problems associate with the craft?

No. Though direct-injected (DI) two-stroke engines are cleaner than carbureted two-strokes, on average they are dirtier than four-stroke engines. For example, DI engines emit approximately seven times more total hydrocarbons (THC) than do four-stroke engines. THC is a key component in the formation of smog. In the case of formaldehyde, a possible human carcinogen, DI engines emitted more than both the carbureted two-strokes and four-stroke engines. While four-strokes are substantially better in terms of discharging less of some of the most important pollutants, they do not solve all problems. In the case of nitrogen oxides and carbon monoxide, four-stroke engines emit more than DI engines.

The industry has shown no data to prove that new personal watercraft are any quieter than the older versions. Moreover, new personal watercraft show no improvements in addressing safety concerns. For example, the new machines still lack off-throttle steering.

Septic Systems

Septic systems process human waste that is high in nutrients by breaking it down through bacterial action in the tank and then dispersing the cleaner effluent slowly into the soil via a drain field. If left un-pumped, the tank will build up with solids which will be released into the drain field, clogging it and releasing pollutants into the environment. Failed systems will end up putting that waste in the ground water or into the lake. Evidence of a failed system includes ponded water or wet areas over the drain field, bright green grass over the drain field, a dense stand of aquatic plants only on your shoreline, slow draining drains or toilets sewage odors. A biodegradable dye can be flushed through your system and if it shows up in the lake, the system is faulty. (Also see "Water Softener Salt" above.)

Best Practices: Maintain effectiveness by having the system inspected annually or every other year to see if it needs pumping and if it does, have it pumped by a professional contractor. Do not use additives labeled as being for septic systems as they can actually be harmful. Do not dump any household chemicals down the sink or toilet as they may kill the beneficial bacteria that break down the organic solids. Do not put grease, coffee grounds, cigarettes, paper toweling, tampons, or disposable diapers down the drains. Use septic approved toilet paper only, such as Campers T-paper, or paper that starts disintegrating after 5 seconds in water. Have your septic system inspected professionally to see if it is functioning properly. Information is available from the DNR.

B. Best Practices to Maintain the Community Environment of the Twin Lakes

Boating Regulations

All citizens are guaranteed the right to boat on our lakes. However, boating is subject to legal restrictions. According to state law, townships may regulate boating including restrictions on speed, on certain types of boating activities in specified parts of the lake, and during specified hours of the day or week. The County Sheriff is responsible for enforcement although he may delegate that power to other agencies. DNR wardens may also enforce boating regulations. Local boat patrols or constables must consist of law enforcement officers duly trained and authorized. Citizens may, however, politely provide information regarding the regulations to those they see violating them and they are encouraged to report persistent violators.

The lakes are a kind of playing field where fast power boats and personal watercraft, slow moving sail boats and fishing boats, and swimmers must all play in close proximity, making attention to safety a high priority. Where, when and how fast a watercraft may be operated is regulated by state and local law, and, one would hope, common sense.

Best Practices: Some of the regulations are:

1. *It is illegal to operate a watercraft if one is legally intoxicated.*
2. *On all Wisconsin Lakes, there is **no wake** within 100 feet of shore for powerboats and within 200 feet of shore for personal watercraft. No wake is*

defined as going the SLOWEST POSSIBLE SPEED AT WHICH YOU CAN STILL STEER YOUR BOAT. This applies to North and South Twin.

3. *No wake also applies within 100 feet of any other boat, any swimmer, or any swim raft.*
4. ***NO WAKE at any time on Middle Lake (by state law).***
5. ***ON SOUTH AND NORTH TWIN LAKES, there is NO WAKE before 10 AM and after 5 PM.***
6. *When skiing or towing tubes, all boats should travel counter-clockwise around the lake to avoid head-on confrontations and must have a second person or spotter watching the tow.*
7. *Each boat must have a PFC (personal flotation device) for each person in the boat*
8. *Leave nothing behind but your ripples: do not throw cigarette butts, bottles, cans, or any other litter in the lake.*
9. *It is illegal to harass loons any wildlife with a boat or personal watercraft.*

What to do if you see a boating infraction

First, politely inform the offenders of the rules—many visitors do not know them. If that fails, or if there are repeated abuses, call the DNR game warden or the Sheriff. The nearest DNR Warden is Dave Swanson, 466 2022 (DNR Field Office in Minong) or 466 5358(home). The other warden for the county is Brian Knepper, 635 4099. Washburn County Sheriff Dispatch Office is 468 2720, or Business Office, 468 4700. **Or you may contact the DNR Hotline**

DNR Violation Hotline

Wisconsin's Department of Natural Resources' Violation Hotline program provides Wisconsin citizens with the opportunity to confidentially report suspected wildlife, recreational, and environmental violations using a toll free number:

1-800-TIP-WDNR (1-800-847-9367);
#367 by cellular (free for U.S. Cellular customers)

or by

LE.Hotline@dnr.state.wi.us

These violations may include fishing or hunting out of season, night hunting, exceeding bag limits, illegal sale of fish and wildlife, deposit of harmful substances in lakes or rivers, or illegal storage or disposal of hazardous waste. All these violations seriously affect our state's natural resources.

The hotline number is in operation 24 hours a day, 7 days a week. Trained staff relay reported information to our Conservation Wardens. Anyone who calls the hotline or provides information can remain anonymous.

Helpful Information when Reporting a Violation

- What was the violation?
- When and where did it occur? (county, township, road/highway)
- What weapons or equipment were used?
- What vehicles or crafts were used (registration numbers are important)?
- How many people were involved? (Do you know the people, their names, addresses?)
- Describe the people, including their physical description and clothing (backtag?).
- What evidence is still at the scene?
- Did the violator(s) take evidence of the crime with them?
- Which way or where did they go and how?

Motors and Pollution

“Two Strokes and You're Out” *by Russell Long, Blue Water Network*

Boaters should be encouraged to use only four-stroke motors for their outboards and jet skis. These motors, primarily manufactured by Honda, are 95 percent cleaner than the existing, unregulated two-strokes used on most craft today.

The two-strokes discharge large quantities of carcinogenic and otherwise harmful chemicals (including benzene and toluene) into lakes, rivers and reservoirs used for drinking water.

While the effects of hydrocarbon pollution are largely invisible, the spent oil from pleasure boats floats on the surface micro layer of bays, lakes, rivers and seas - all important sites for fish reproduction and home to the algae, zooplankton and larvae so essential to the food web.

Chromosomal damage, malformations, reduced growth and high mortality rates of fish larvae occur even at extremely low levels of surface layer hydrocarbon pollution. Scientists at the University of Stockholm have observed similar genetic effects in fish exposed to outboard exhausts. They conclude that "the biological effect of exhaust from two-stroke outboard engines is a serious threat to the environment."

Using EPA data, Bluewater Network was able to show that these two-cycle `engines dump as much fuel into U.S. waters each year as 15 Exxon Valdez-sized tankers, or one billion pounds of cancer-causing petroleum hydrocarbons. The report alleged that driving a jet ski for 7 hours produces as many hydrocarbons as driving a car for 100,000 miles. Russell Long, a former race car driver and founder of Bluewater Network, ran a two-stroke engine in a tank of water for half an hour and

then proposed to dump the water from the tank into San Francisco Bay. State and federal officials threatened him with $25,000.00 in fines for polluting the bay if he did so. It is also a problem if motors of any kind are operated at high speeds in shallow waters because they stir up bottom sediments and release phosphorus, a nutrient that speeds the growth of algae.

Best Practices:

1. *Before purchasing a new motor or personal watercraft, investigate the emissions information. If at all possible, purchase the least polluting type of motor.*
2. *In less than six feet of water, however far from shore, operate watercraft at slow speeds.*

How to Increase the Size of a Small Lake

Our lakes are, by any standards, small. North and South are a little over a hundred acres and Middle is just thirty-nine. Hardly Lake Superior, but even tiny when compared to some of the other lakes and flowages around here. A high-speed motorboat can go from one end of South Lake to the other in about a minute. Not much lake there. But a fishing boat or pontoon at trolling speed, or better yet, a canoe or rowing boat, takes about twenty times as long, prolonging the experience of being on the lake. Going slow makes it seem like a much bigger lake, and you can enjoy the shoreline and wildlife. So do we need 150 horsepower motors on these little lakes? Each person will have to answer that question for himself or herself, but before answering "yes," take a slow tour of the lake and see how big it really is.

Building or remodeling—zoning restrictions

Disclaimer: The information provided in this section is accurate to the best of our ability but in no way takes the place of the ordinances or information provided by the County Zoning Department. Always consult the Department before construction or before buying property.

The County and the Townships are zoned in order to protect property values and the natural landscapes that give the North Country its unique character. State regulations also apply. The official guide is *Zoning Regulations: Guidelines for Buyers and Builders in Washburn County,* and is available at the Court House—PO Box 506, 10 Fourth Avenue, Shell Lake, 54871, tel. 715 468 4640. In addition, any new construction or additions that are greater than 25% of the existing area of a house require a State issued Uniform Building Code permit.

Nearly all building projects, landscaping near shore, etc., require a permit from either the County Zoning office, the DNR, or the township (via the Uniform Building Code Inspector.) Be sure to contact these agencies IN ADVANCE OF ALTERING OR BUILDING. (Failure to do so could result in dismantling your project and /or in heavy fines.) The following partial information is not meant to take the place of information you will obtain at these government agencies and is for your information

only. Contact points for these agencies are at the end of this section. Various restrictions apply including lot size, setback from the ordinary high water line and from nearby roads, height requirements, sanitary facilities, and use regulations for houses, garages and outbuildings, trailers and campers and other structures. Failure to obtain necessary permits can result in large fines and even in the dismantling of the structure. Existing uses may be grandfathered. New subdivisions must conform to the new State of Wisconsin lake classification system. The state has placed every lake into one of three classes. The Twin Lakes are Class II and Class III lakes.

South and North Twin are class II Lakes.

Zoning requirements include Waterfront lot width per single family unit of 200 feet, minimum Lot area of 30,000 sq. feet, shoreline setback of 75 feet, vegetation removal only within a 30 foot corridor within 50 feet of ordinary high water mark, side setack of 20 feet one side and 60 feet total both sides, and other requirements as listed in the official guide.

Middle Twin is a class III Lake.

Zoning requirements include: 300 feet of frontage, 3 acres minimum lot area, 100 foot setback from ordinary high water mark, 30 foot limited removal corridor within 75 feet of ordinary high water mark, and side setbacks of 30 feet one side and 90 feet total both sides.

Best Practices: Do not sell or build or construct without consulting the zoning requirements and obtaining the necessary permits from the County and the Uniform Building Code Inspector (name and contact information available from the Town Board).

Wetlands:

any area where the water level is at or near the ground surface long enough during the year to determine the types of plants that grow and influence the soils there. Wetlands are protected. *Best Practice: It is illegal to fill a wetland or to dump refuse or yard waste into it. Before altering any wetland, contact the DNR to determine which uses are permitted. Any alteration will require a permit.*

"**Nonconforming" uses**

or structures applies to uses and structures that predate an ordinance even 'though they do not comply with current regulations. Such sues or structures have a protected status and are referred to as "grandfathered." Replacement and additions to nonconforming structures are often limited by local ordinances in order to eventually eliminate them.

Appeals:

If a property owner disagrees with the zoning administrator he may appeal to the local Board of Adjustment for a variance. To qualify, the landowner must show that strict application of the ordinance will cause unnecessary hardship (i.e., in the absence of a variance, no reasonable use can be made of the property); that the

hardship is caused by unique physical limitations of the property (steep slopes, wetlands, etc., rather than resulting from the circumstances of the property owner, and that granting the variance will not harm any public interests listed as objectives for the ordinance. Economic hardship is not considered a compelling reason for granting a variance.

Piers, Docks, Decks, Boathouses, etc.

Only riparian (shore line) property owners may build structures. They may not convey this right to non-property owners beyond the right to cross the land to get to the lake. Non-owners may not erect any structures or place any materials in the water.

These structures are all regulated with regard to the shoreline. Currently the regulations are undergoing some complex changes based on political battles in the state legislature. Generally speaking, any over the water structure such as a pier, shades out aquatic plants and limits wildlife production. Therefore their numbers and size have been regulated. Swim rafts are allowed within 200 feet of shore as long as they do not interfere with navigation. Boathouses over water are not allowed unless built before 1979. Boat shelters (no roof or sides) are allowed. *Best Practices: In the current situation, it is safest to check with the DNR before making any alterations or erecting any structures.*

Noise

One of the most important concerns listed by the respondents to our survey was noise. People come to the lake to be free of the constant noise of the city. Of course, some appropriate lake activities do involve noise, such as power boating and water skiing, but these are confined to the daytime hours between 10 AM and 5 PM, and are to be expected. Kids playing and yelling is another happy sound at the lake, but there are other noises that are objectionable, especially before 10 and after 5. These include loud radios and CD Players. Sound carries easily over water, and a radio on at even normal volume, can be heard all over the lake. Especially annoying is playing a radio or boom box on a boat while cruising around the lake. Remember, there are many kinds of music, and most people probably do not like the kind you do. Another source of loud and objectionable noise is the shooting off of fire crackers. The natural sounds of the lake environment, such as the call of the loons, the cry of the eagles, coyotes on full moon nights, frogs singing in the spring, even the croak of the Great Blue Heron, are a special part of what makes northern lakes unique.

Best *Practices: Avoid playing radios and CD players at high volume and especially do not take them on the boat. Don't play music out of doors while raking leaves or any other activity. Leave your music inside. Of course, earphones are a perfect solution—you can enjoy your music and not annoy others. Firecrackers are especially loud—good neighbors don't shoot them off after dark. Also, check the section on firecrackers for the law that governs their use.*

Lighting (Adapted from a University Extension pamphlet)

Perhaps the most visible and valued difference between the city and being up at the lake is that you can see the stars splayed out over the night sky. In f act, there are fewer and fewer places on planet earth where the night sky is visible.

Many children now see the night sky only in pictures or at planetariums. We are losing this precious part of our up north heritage. Unfortunately, light pollution has become a significant fact of life over much of the earth. Dusk to dawn lights obscure our view of constellations, meteor showers, planets, and the landscape lit by the moon.

Naturally we want safety and security from our lights, but most outdoor lighting provides neither. Most of the light is wasted upward because our lights are poorly designed and inefficient and it is these lights that create the three problems of poor lighting: glare, light trespass, and sky glow.

Glare:

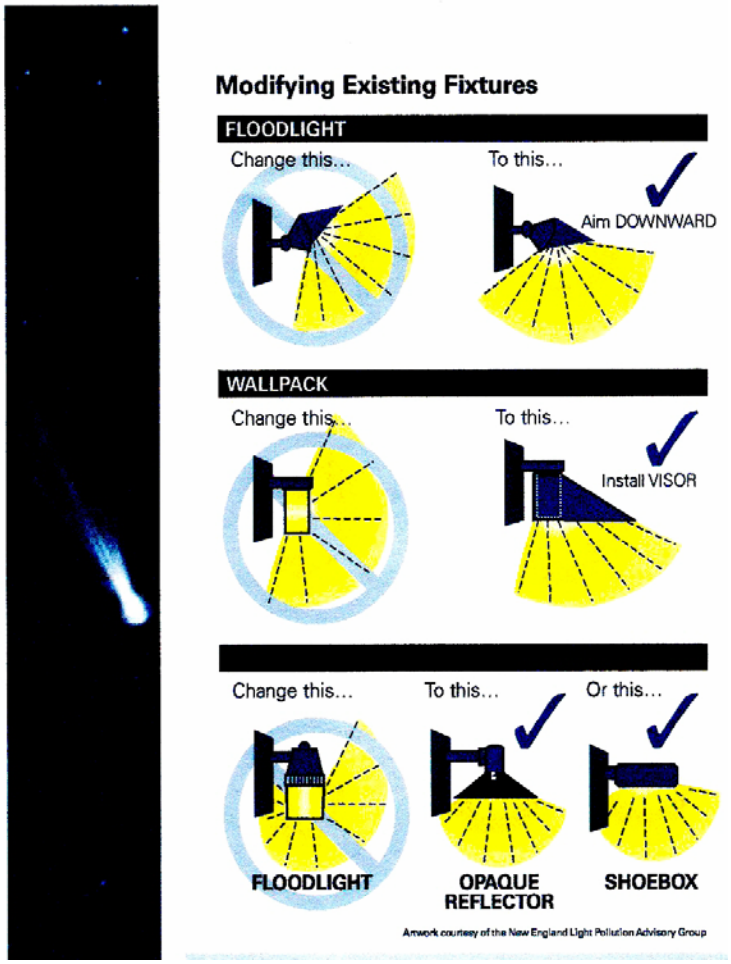
The first principle of good lighting is to illuminate only what we wish to see. When we see a light across the lake we are seeing light from the fixture itself, rather than what the fixture is meant to illuminate. Light Trespass: Glare is also the most common cause of light trespass, i.e., a fixture on one property that illuminates an adjacent or nearby property. At the lake, water reflects glare over long distances to trespass on distant properties.

Sky Glow:

Much of our existing lighting shines upward, is wasted, and creating sky glow that obstructs the view of the stars. Ineffective lighting that produces glare and sky glow also makes it difficult to see unwanted persons or activities because so much of the light is wasted and the glare can dazzle the eye and reduce our ability to see into shadow. However, there are ways to achieve greater security from your outdoor lights while cutting down on light trespass, glare, and sky glow.

While we have often been annoyed by the glare from an unshielded garage light from across the lake, seldom do we travel across the lake to see what may be emanating from our own property. Let’s start by making our own lighting sensible and then help our neighbors “see the light.”

Overpage is an illustration showing kinds of lighting that offend and what kinds of adjustments you can make to continue to have the safety of outdoor lighting without offending your neighbors.



Best practices: Provide adequate light for the task but don't over light. The full moon can make an areas seem quite bright, but some modern lights by comparison are a 100 times brighter. Don't illuminate the neighborhood. Glare can be eliminated by shielding light fixtures so the direct rays of light cannot reach our neighbor's eye. Aim lighting fixtures away from the water and neighboring property. Use full cutoff lighting fixtures, those that emit no light above the horizontal. Retrofit existing lights with shields. Aim flood lights downward. Change over to motion or heat sensitive lights. Consider turning outside lights off at night including outdoor Christmas lights.

Pets and Wild Animals

Washburn County requires all animals to be restrained from running at large. Dogs over 5 months old must be licensed. The license year is from Jan. 1 to Dec. 31 and licenses cost $3 if the dogs are sterile and $8 if not. Fees are paid to the

township treasurer. Note that cats are extremely destructive to birds and other wild life when they are allowed to roam freely. Injured wild animals may be reported the DNR (635 2101) or the sheriff's office (468 4720). Abused animals can be reported to the Humane Society (635 4720) or local law enforcement. Information on controlling wild nuisance animals is available by calling the Wildlife Services at 1 800 228 1368 or the DNR (635 2101).

The Twin Lakes Preservation Association

The Twin Lakes Preservation Association (TLPA) was formed in 1994 by a group of local property owners working to maintain or enhance the quality of the water, wildlife, and recreation. It is a lake association, which means that it differs from a lake district in not having legislative powers. TLPA serves only to educate and inform all who use these lakes. TLPA is governed by a board of directors elected at the annual meeting (generally in August) and membership is open to all persons who live or own land within one mile of the lakes. TLPA publishes a newsletter several times a year. All persons are strongly encouraged to join in these efforts to preserve our unique and high quality lakes.

Twin Lakes Lake Study Grants

Since the year 2000, TLPA has received three lake study grants from the DNR. The first two were biophysical studies that concluded that the lakes were, at the time of the studies, in very good condition. These studies provided benchmark data from which to measure changes. **Lake Monitoring** North and South Lake are continually monitored by volunteers as a part of the DNR's Self Help program, checking for water clarity, temperatures, phosphorus, and chlorophyll. Samples are taken and sent to the State Water Quality Lab for analysis.

VII. A Plan for Protecting and Preserving the High Quality Twin Lakes Environment.

1. The Twin Lakes Preservation Association will continue to provide helpful information to all residents and users, by means of:
   a. Making this Handbook available to everyone
   b. Updating this Handbook as necessary
   c. Providing 3-4 newsletters per year to the residents
   d. Holding informational seminars at the Annual Meeting and at other times
   e. Providing Welcoming brochures to all newcomers and nonmembers

2. The Association will encourage the further development of a concerned community by:
   a. Advertising more widely the annual Social/Picnic Event and encouraging attendance more actively.
   b. More actively encouraging membership in the organization

c. Working with county and state level organizations such as the Washburn Country Lakes and Rivers Association and the Wisconsin Association of Lakes
d. Holding other community building events such as gatherings to discuss how to move forward in a proactive way toward the preservation of the quality of life we enjoy in the Twin Lakes watershed
e. Provide volunteer monitoring of boating abuses and abuses of wildlife.
f. Create a collaborative relationship with local and county government and University Extension for making and preserving effective policies that maintain a high quality lake community.

3. The Association will continue to monitor the quality of the biological community by,

a. Participating in the Self-help Lake Monitoring Program
b. Conducting informational inspections for exotic invasives at the landings on weekends
c. Seeking assistance from the DNR in managing exotic invasive species
d. Developing a Loon monitoring and protection collaboration on the lakes.

APPENDIX A
Summary of the Lake Studies
TWIN LAKES BENCHMARK DATA

Based on scientific studies funded by the Wisconsin Department of Natural Resources and carried out by Barr Engineering in 2000 and 2001, these three lakes lakes are "healthy and in good condition. There are no problems evident in the lakes' current water quality." (Twin Lakes Management Plan: Phase I, Executive Summary) The studies examined water chemistry, plant and animal life in the lakes (lake ecology), runoff from the watershed, and comparative population density. This data provides a benchmark from which we can measure change and upon which we can draft a plan for the protection of the lakes and the continuation of their near pristine quality.

Lake Morphology

North Twin	113 acres, mean depth—6 ft, maximum depth—20 ft, volume 678 acre-ft
South Twin	115 acres, mean depth—16 ft., maximum depth—29 ft, Volume 1,848 acre ft.
Middle Twin	30 acres, maximum depth—6 ft.

Water Quality

1) The lakes are oligotrophic to mesotrophic, that is, pure enough to support healthy plant and animal communities and provide clean and healthy recreation. (A eutrophic or degrading lake becomes choked with weeds and algae blooms. While some eutrophication is natural, it can be rapidly accelerated by nutrient and sediment loading from septic tanks, runoff from lawns.) The Nitrogen to Phosphorus ratio in our lakes is above 40 on average (a ratio of 12 or below results in deteriorating conditions) (Ref. p. 13, Phase I)
2) Chlorophyll-a, too much of which is a sign of a eutrophic lake, is at 1.1 to 1.2 ug/K, a level that indicates excellent water clarity conducive to swimming and boating (Ref. p. 18, Phase I)
3) Secchi disk readings averaged 4.2M (North Twin), 5M (South Twin), and Clear to bottom in Middle Twin.
4) Dissolved 0xygen levels at lake bottom average 1mg/L, minimizing the recycling of phosphorus from bottom sediments which, if it became abundant, would cause algae blooms. (Ref. p. 23, Phase I)
5) Conductance profiles indicate low concentrations of dissolved solids and indicate the lakes' water quality is excellent (Ref. p. 23, Phase I)

Lake Ecology

1) Phytoplankton (microscopic plants which are the base of the food chain leading all the way up to eagles and ospreys): a diverse community of phytoplankton exists in the lakes, with a low percentage of blue green algae (which is the substance of algae blooms). (Ref. p. 24, Phase I)

2) Zooplankton (microscopic and tiny animals which feed on the phytoplankton and in turn provide food for fish); the community is diverse and healthy. (Ref. p. 28, Phase I)
3) Macrophyte or plant community (all too often called "weeds"); showed a diverse and healthy community with no population of exotics such as Eurasian Milfoil. The distribution of plants is good (Ref. to color maps pp. 33-35 of the full-length reports), providing habitat and food for the fish population. [Note: while not mentioned in the reports, an exception does occur in the north bay of North Lake where weed choking and sedimentation are a significant problem for property owners; and Middle Lake may be on the verge of experiencing overabundant weed growth. These areas require further study.] (Ref. p. 32, Phase I)
4) Fish and amphibians: The Barr study did not survey these populations: anecdotal observances seem to indicate a variety of fish with an overpopulation of stunted Bluegills and a few stunted Perch; Crappies appear to be small on average. Northerns, Bass and some Walleyes are also present. Several species of frogs are also present. These populations require further study.
5) Shell fish: A large population of snails bears further study. To date there is no observance of Zebra Mussels.
6) Other animals: the Barr study did not include a survey of these but simple observation shows a wide variety of birds including orioles, scarlet tanagers, waterfowl (ducks, geese, herons, loons, etc) and topped by eagles and ospreys; mice and voles, rabbits, squirrels, fox, badgers, deer, frogs, porcupines, turtles and black bear. This population appears quite healthy.

Impact of Land Use: the Hydrologic and Phosphorus Budget of the Watershed

The outlines of the watershed are depicted in two maps in the Appendix to Phase II.

This study determined the runoff into the lakes of water and the phosphorus it carries and evaluated population density around the shoreline.

The Executive Summary (Ref. p. I, Phase II)

1) Approximately 65% of the water inflow comes from precipitation and the rest from surface and subsurface runoff, with the heaviest concentrations of inflow of the latter in April, due probably to snow melt.
2) The groundwater table is near the surface and groundwater moves from SE to NW.
3) 50% of the phosphorus loading comes from septic systems which may not indicate malfunctioning systems but only that the total loading is quite small at this point. Because the soils are sandy, they retain less phosphorus than other soils, and hence more

makes it to the lake. (Note: If the number of homes in the watershed increase, or the number of days spent at the lake increases, especially as summer visitors retire to become full time residents, the overall loading from septic systems will increase.
Also, as new residences are built and, in some cases, as forest cover is replaced by lawns; more phosphorus will run off into the lakes. If nitrogen based fertilizers are used, nitrogen loading will also increase.)

4) Annual phosphorus loading:
   North Twin 107.5 pounds
   South Twin 126 pounds
   Middle Twin 23.4 pounds
5) Conclusion and Warning: ". . .it was demonstrated that a small increase in total phosphorus in the water column of the Twin Lakes can result in a relatively large loss of lake clarity." (Ref. p. 10, and Fig. 7, Phase II
   Also note: Since over half of the phosphorus loading in our lakes comes from septic systems, an undetermined increase in the number of these, failures, could alter the balance and result in loss of water clarity.
6) Density of development figured as structures per mile of shoreline
   Middle Twin 11
   North Twin 16
   South Twin 22 and for comparison: Nancy Lake 11
   Gilmore Lake 20
   Shell Lake 37

While the above data prompted Dr. Meg Rattey, the biologist who was chief researcher for these studies, to describe these water bodies as "dream lakes" they can easily be tipped into degrading lakes by more development of the wrong kind. With regard to the phosphorus, we are on the edge of the downward curve toward negative consequences. (Ref. fig. 11, Phase II)

APPENDIX B
Lake Property Owners Survey, Summer, 2005
Results and Discussion

In the summer of 2005, a survey of the property owners around the Twin Lakes was carried out in order to assess opinions about a variety of lake issues. The survey is attached. It was sent to all property owners along with a postage-paid return envelope. Of the 130 current property owners for whom correct mailing information was available, 70 returned the questionnaire in time to compile the answers, a 54% response rate.

Only limited demographic data was collected, but the available information suggests that the responses were probably fairly representative of the entire group of property owners. Of those who are not year-round residents, 37% are from Minnesota and the remaining 63% live in other states. A substantial proportion, 42% indicated they are retired compared to 58% who are still employed. Finally, the respondents have, on average, been coming to the lakes for a substantial length of time. Of those who indicated an exact number of years, the range is from 4 to 40 years, with an average of 17.5 years of lake ownership.

The graphs which follow this discussion show the way in which people responded to most of the items on the questionnaire. The survey instrument also follows.

Summary of and commentary on open-ended items:

In addition to questions which provided a number of response choices, the survey also encouraged people to respond openly to several items. This was done to not predispose the kinds of answers by providing limited options. These answers were rich, thoughtful, and interesting; reducing them to a graph would be a disservice to the effort people freely gave to express their views. The following is an attempt to capture the flavor of these responses and to indicate the most common views.

Shoreline Aesthetics:

Questions 7 and 8 asked people to describe the general attractiveness of the shoreline around the lakes. Less than 5% described the shore as unattractive and over 40% view it as “very attractive” with the rest in between. The large majority indicated that the naturalness of the shoreline in most places is what is important. Typical comments were: “Natural shoreline prevails, not many residences visible from the lake,” and “natural shoreline, variety of bays and vegetation types, lots of animals and bird habitat, frogs.” A few noted that this naturalness is not complete and that creates an aesthetic negative. One respondent noted that “the shoreline looks like an aluminum junkyard” and another said “too much development; lawns and cabins too close to the lake.”

Changing conditions, disturbance:

Questions 10 and 11 asked people to assess change in lake conditions over time. Two-thirds indicated that conditions have changed since they have been using their

property. When asked "How?" the responses overwhelmingly indicated changes for the worse. These concerns were generally of one or more of three themes:

- Noise and crowding: the lake itself is more crowded with watercraft, like jet skis and large horsepower boats. Fireworks, lights, and loud music were also noted.
- Building: there are more and bigger houses, filling up the shore.
- Ecosystem deterioration: there are fewer fish, more weeds, snails, and lower water quality.

This issue was continued with questions 12 and 13 which asked how often use of the lake is disturbed and by what sorts of things. Forty-two percent (42%) indicated that they are disturbed "frequently" or "sometimes." The rest (58%) responded that they are disturbed "only occasionally" or "almost never." The concerns of this substantial minority are almost exclusively centered around the first theme above: noise produced by jet skis, music, ATV's, big boats, fireworks, etc. A few mentioned that some boaters are not respectful of wildlife, especially the loons. One respondent provided a detailed list: "music blaring from resort and/or neighbors, ATV's racing down roads and over the center line—especially at curves making for near misses. Boaters speeding after 5 p.m. and before 10 a.m. Fireworks on days other tha July 4th. Guns being fired at any old hour. Loud noises after 10 p.m., whether it be music, talking or shouting. Large floating toys left buoyed on the lake. Diving docks out into the lake too far."

The lakes as a source of meaning and connection:

Questions 14 and 15 asked people to explain the level of connection they feel to the Twin Lakes area; this theme was continued in Question 21 which asked people to express "what do the Twin Lakes mean to you?"

The overwhelming majority (84%) feel strongly or very strongly connected to the area. The reasons for this are expressed by three themes:

- The natural beauty of the surroundings and the peacefulness this provided for rest and relaxation
- Association with friends and family. A source of congeniality, both past and present.
- The large investment of time, in some cases many years, and of money in creating and maintaining a lake refuge.

Some typical responses:
"I feel the things I like most about myself have their root at being at the lake."

"We feel very relaxed and at peace while we are at the lake."

"Growing up there, spending summer vacations and week-ends, happy family times, etc."

"Family has been coming to the area for about 50 years and three generations."

"Tradition, longevity, memories, friends, family, acquaintances."

“It is my retreat and sanctuary—a de-stress zone. I like it best in the spring and fall when there are fewer people and it is quieter.”

These themes were continued in the responses to Question 21“what do the Twin Lakes mean to you?”

Some typical responses:
“Our refuge from the insane world.”

“Retreat, solitude, back to nature.”

“Peace, family, past and future. A beautiful lake and wonderful woodlands. A place I grew up, my children have grown up, and hopefully future generations will be able to enjoy.”

“A place to be alone, or with family, or to entertain friends in a peaceful harmonic atmosphere—where fishing, walking, sitting, reading, canoeing, etc. can take place.”

“Our life away from the headaches of working: bills, clock watching, to visit, unwind, stop to ‘smell the roses’”

“This is my retreat and that of my husband. The beauty of a lake sunrise and sunset, seeing loons, otters, and other wildlife at close quarters is indescribable.”

Development issues:

The majority (53%) of respondents believe that there is already too much development on Twin Lakes. Eight percent would like to see more development, and the remainder is satisfied with things as they are. People who see the level of development negatively are concerned about the fact that the lakes have “filled up,” that there are few or no vacant lots. In addition, some see the larger homes as a loss of the lake cabin idea. Finally, there is concern about back lot development and the possibility of “key-holing.” Some express concern about the expansion of the resort on South Twin. A few mention the belief that zoning laws about lot size and setbacks are not being adhered to.

Related to the question of development is the response to Question 18, which asked if people could foresee their lake experience being spoiled, so that they would want to sell. While many believe that the level of property taxes might force them out, as many or more mentioned similar issues to the questions on development: deterioration of the quality of the lake experience through ecological deterioration, noise and crowding from continued increase in the number of lake users, or overdevelopment from condominiums and back lots.

Personal Practices:

There is a generally high awareness of the fragility of the lake ecosystem. Many people say they either have never used fertilizer on their property or attempt to maintain the land in as natural a state as possible through little mowing, shoreline restoration, etc.

Conclusion:

There is substantial consensus among the residents of Twin Lakes about the importance of maintaining a sound ecosystem here so that the commitment people have to the lake lifestyle can be preserved. There is also a significant level of concern that the lakes are close to or have reached some sort of negative tipping point which will lead to a deterioration of the quality of life.

While there is recognition of the fragility of the lake ecosystem, the main concern people have is the level of human activity: the noise, crowding, watercraft, etc. Whether or not these activities are having a measurable impact on the lake itself—on water quality or fish population, for example, the degree of activity is already having an impact on the quality of people's lake experience.

This presents a difficult dilemma. The lake is a public good which all people have a right to enjoy. But too many people lowers the quality of the experience for everyone. Regulations like no wake and quiet hours go a long way to limit the activity level to a tolerable level. Zoning laws regarding frontage and set-backs, similarly, limit unattractive development to some degree. And there is clearly a continuing need to educate people about the former and enforce the latter.

The question is what, if any, additional steps might be taken to assure that we do not destroy that which is loved by so many—the beauty and peacefulness of the Twin Lakes.

Preliminary Survey Results

Lake Users Survery

Summer, 2005

N = 70 of 130; response rate = 54%

(1) Why do you own property on or around Twin Lakes? Please check all that apply			
	Counts	Percents	Percents 0 100
As a gathering place for family and friends	52	74.3%	
As an investment	32	45.7%	
For fishing	45	64.3%	
To observe wildlife	48	68.6%	
For swimming/scuba/etc.	46	65.7%	
To water ski or jet ski	20	28.6%	
To go boating	45	64.3%	
To preserve family tradition	32	45.7%	
For an escape, a retreat	64	91.4%	
Other	5	7.1%	
Totals	70	n/a	

(3) How often do you come to the lake?			
	Counts	Percents	Percents 0 100
Intermittent in summer	15	21.7%	
Intermittent thoughout the year	39	56.5%	
Summer resident	4	5.8%	
Year-round resident	10	14.5%	
Other	1	1.4%	
Totals	69	100.0%	

(5) When you are here, what activities are you most likely to do? Please check all that apply.			
	Counts	Percents	Percents 0 100
Entertaining friends and relatives	48	68.6%	
Fishing	41	58.6%	
Observing wildlife	59	84.3%	
Water sports (swimming, water or jet skiing, etc.)	38	54.3%	
Enjoying the view, peace & tranquillity, resting	66	94.3%	
Boating	41	58.6%	
Working to maintain/improve the property	56	80.0%	
Other	8	11.4%	
Totals	70	n/a	

(6) Which of these activities are most important to you?			
	Counts	Percents	Percents 0 100
Entertaining friends and relatives	30	43.5%	
Fishing	25	36.2%	
Observing wildlife	33	47.8%	
Water sports (swimming, water or jet skiing, etc.)	21	30.4%	
Enjoying the view, peace & tranquillity, resting	63	91.3%	
Boating	19	27.5%	
Working to maintain/improve the property	22	31.9%	
Other	2	2.9%	
Totals	69	n/a	

(7) How would you describe the general attractiveness of the shoreline around Twin Lakes?			
	Counts	Percents	Percents 0 100
Very attractive	28	41.2%	
Fairly attractive	37	54.4%	
Unattractive	3	4.4%	
Totals	68	100.0%	

(9) How would you evaluate the quality of Twin Lakes' water?			
	Counts	Percents	Percents 0 100
Pure	18	26.1%	
Pretty clean	50	72.5%	
Other	1	1.4%	
Totals	69	100.0%	

(10) Since you have been using your property, have conditions changed?			
	Counts	Percents	Percents 0 100
Yes	45	66.2%	
No	23	33.8%	
Totals	68	100.0%	

(12) We are interested in your opinion about the level of activity overall here at the lake. How often is your use of the lake disturbed?			
	Counts	Percents	Percents 0 100
Frequently	9	13.0%	
Sometimes	20	29.0%	
Only occasionally	25	36.2%	
Almost never	15	21.7%	
Totals	69	100.0%	

(14) How strong a connection do you feel to the Twin Lakes area?			
	Counts	Percents	Percents 0 100
Very strong	40	59.7%	
Strong	16	23.9%	
Average	10	14.9%	
Other	1	1.5%	
Totals	67	100.0%	

(16) What is your opinion about the level of development on or around Twin Lakes?			
	Counts	Percents	Percents 0 100
Too much	35	53.0%	
About right	24	36.4%	
Too little	2	3.0%	
No opinion	5	7.6%	
Totals	66	100.0%	

(20) The Town of Chicog has an ordinance that boats may make no wake on township lakes between 5 p.m. and 10 a.m. the next day. Presumably this is to restrict noisier activities to the daylight hours. In y			
	Counts	Percents	Percents 0 100
A good balance for all users	55	83.3%	
Not restrictive enough	10	15.2%	
Too restrictive	1	1.5%	
Totals	66	100.0%	

(23) Do you think zoning ordinances here are:			
	Counts	Percents	Percents 0 100
Too restricitve	4	6.3%	
About right	33	52.4%	
Not restrictive enough	14	22.2%	
No opinion	12	19.0%	
Totals	63	100.0%	

Lake Users Survey

Lately there has been discussion at many levels--state, county, township--about how best to protect Wisconsin's lakes while ensuring that people can enjoy them.

The Twin Lakes Preservation Association has received a grant from the DNR to ask the opinions of property owners on and around Twin Lakes about how the lake is viewed, what activities people most wish to engage in, and what, if anything, should be done to assure that the lakes remain healthy.

This is the third year of study of our lakes. In the previous 2 years, scientific information about the general health of the lakes was collected. Now, we ask **you**, the people most appropriately concerned, to let us know how you see the lakes and what concerns you might have about their health.

Please complete the questionaire and return it in the enclosed postage paid envelope. The results will be used to assure that any educational efforts and actions represent a concensus of opinion. Your responses will be completely confidential and will be put together with those of other property owners in summary form.

Please return the questionnaire by July 15th. And thank you for participating. Your opinions are greatly valued.

---

(1) Why do you own property on or around Twin Lakes? Please check all that apply.

- ❑ As a gathering place for family and friends
- ❑ As an investment
- ❑ For fishing
- ❑ To observe wildlife
- ❑ For swimming/scuba/etc.
- ❑ To water ski or jet ski
- ❑ To go boating
- ❑ To preserve family tradition
- ❑ For an escape, a retreat
- ❑ Other: _____

(2) How many years have you or your family owned your property here? _____

(3) How often do you come to the lake?

- ❑ Intermittent in summer
- ❑ Intermittent throughout the year
- ❑ Vacations or holidays
- ❑ Summer resident
- ❑ Year-round resident

(4) If you do not live here year-round, where is your main residence, the place you consider home?

_____

(5) When you are here, what activities are you most likely to do? Please check all that apply.

- ❑ Entertaining friends and relatives
- ❑ Fishing
- ❑ Observing wildlife
- ❑ Water sports (swimming, water or jet skiing, etc.)
- ❑ Enjoying the view, peace & tranquillity, resting
- ❑ Boating
- ❑ Working to maintain/improve the property.
- ❑ Other: _____

(6) Which of these activities are most important to you?

- ❑ Entertaining friends and relatives
- ❑ Fishing
- ❑ Observing wildlife
- ❑ Other: _____
- ❑ Water sports (swimming, water or jet skiing, etc.)
- ❑ Enjoying the view, peace & tranquillity, resting
- ❑ Boating
- ❑ Working to maintain/improve the property.

(7) How would you describe the general attractiveness of the shoreline around Twin Lakes?

❑ Very attractive ❑ Fairly attractive ❑ Unattractive

(8) what makes it that way?

_____

_____

(9) How would you evaluate the quality of Twin Lakes' water? . . . ❑ Pure ❑ Pretty clean ❑ Not too clean ❑ Polluted

(10) Since you have been using your property, have conditions changed? . . ❑ Yes ❑ No

(11) If you perceive that conditions have changed, how have things changed?

_____

_____

_____

(12) We are interested in your opinion about the level of activity overall here at the lake. How often is your use of the lake disturbed?

❑ Frequently ❑ Sometimes ❑ Only occasionally ❑ Almost never

(13) If you are disturbed, what sorts of things do you find disturbing?

_____

_____

(14) How strong a connection do you feel to the Twin Lakes area?

❑ Very strong ❑ Strong ❑ Average ❑ Weak ❑ Very weak

(15) What makes you say that?

_____

_____

_____

(16) What is your opinion about the level of development on or around Twin Lakes?

❑ Too much ❑ About right ❑ Too little ❑ No opinion

(17) What specifically is it about the current level of development on or around Twin Lakes that you like or dislike?

_____

_____

_____

(18) Is there anything that would spoil things for you so that you would want to sell your property here on Twin Lakes? . . . . . ❑ Yes ❑ No

(19) What would have to happen for you to no long remain here on Twin Lakes?

_____

_____

_____

(20) The Town of Chicog has an ordinance that boats may make no wake on township lakes between 5 p.m. and 10 a.m. the next day. Presumably this is to restrict noisier activities to the daylight hours. In your opinion, is this rule:

❑ Too restrictive ❑ A good balance for all users ❑ Not restrictive enough ❑ No opinion

(21) What do the Twi Lakes mean to you?

_____

_____

_____

(22) How would you evaluate the services you receive from Washburn County and the Town of Chicog/Minong?				
Road maintainance	❑	❑	❑	❑
Snow removal	❑	❑	❑	❑
Police and fire protection	❑	❑	❑	❑
Conservation practices	❑	❑	❑	❑
Enforcement of zoning ordinances	❑	❑	❑	❑
General responsiveness of officials to your needs and concerns	❑	❑	❑	❑

(23) Do you think zoning ordinances here are?

❑ Too restrictive ❑ About right ❑ Not restrictive enough ❑ No opinion

(24) In the time you have been coming to the lake, have your habits regarding the use of your land changed? For example, do you use more or less fertilizer, mow more or less frequently, etc.?

_____

_____

_____

(25) what about the level of property taxes you pay? Given the services and benefits you receive, are your taxes

❑ Excessive ❑ High, but tolerable ❑ Reasonable

While many actions are possible to protect lakes, all may not be necessary on Twin Lakes			
Thinking of Twin Lakes, is there a need to do a better job of:			
Improving lake habitat	❑	❑	❑
Stocking fish	❑	❑	❑
Managing aquatic plants	❑	❑	❑
Enforcing zoning codes	❑	❑	❑
Improving water quality	❑	❑	❑
Encouraging development	❑	❑	❑
Restricting development	❑	❑	❑
Managing land habitat for deer hunting	❑	❑	❑
Managing land for a diversity of species	❑	❑	❑
Restoring shoreline vegetation	❑	❑	❑
Managing/limiting boating (e.g., horsepower, size, numbers)	❑	❑	❑
Enforcing existing lake usage regulations	❑	❑	❑
Educating owners and users about lake protection	❑	❑	❑

(26) Are there other actions you feel should be considered to protect Twin Lakes for all its users?

_____

_____

(27) The goals of the Twin Lakes Preservation Association are to educate users of the lakes about safe and healthy ways to enjoy the lakes and to represent the interests of the lake and its people when decisions are being made by government which would impact our life here. In your opinion, how effective is this group?

❑ Extremely effective ❑ Very effective ❑ Fairly effective ❑ Not effective ❑ Don't know

(28) How might the Twin Lakes Preservation Association be more effective, in your opinion?

_____

_____

(29) What is your age? . . _____ (30) Are you retired? . . . . ❑ Yes ❑ No

(31) Is your property. . .

❑ On the lake ❑ Off the lake ❑ Both
❑ Other: _____

Thank you very much for taking the time to express your opinions. Your imput is very important and we hope it can be used along with others to contribute positively to conditions on Twin Lakes

APPENDIX C
More Useful Information

- **Contact Information**
- The most comprehensive Directory of local contacts for government, business, social services, etc., is The Source, available from the Spooner Advocate, 509 Front St., Spooner, WI 54801, tel. 635 2181

- **EMERGENCY NUMBERS 911 for all emergencies (injury, fire, theft in progress, acute illness)**
  - **POLICE**
    - **Wisconsin State Patrol** 715 635 2141
    - **Washburn County Sheriff 911** or 4682720
    - **Douglas County Sheriff 911** or
  - **FIRE**
    - **Chicog Volunteer Fire Department** Fire Chief, Gary Vande Vrede, 466 5992 or **911**
    - **Minong Area Fire Department** Fire Chief Harold Smith, 466 2060 or **911**
  - **POISON CONTROL** 1 800 815 8855
  - **BATTERED WOMEN'S SHELTER CRISIS LINE** 715 532 7089

- **TLPA Board** See names of officers and directors in the current newsletter)

  - **Washburn County govt. homepage**
    h*ttp.www.co.washburn.wi.us.index*

  - **Fire wardens: Town of Chicog**: Irene Thompson, N10842 WIs. Dr. (466 2685), Kelly Grimes, Mack Lake Tavern, 466 5348. **Town of Minong**: Jim Clark, W6995 Old Bass Lake Rd. (4664298), Bob Gruzlewski, Buck and Wing Resort, Nancy Lake Rd., (4664301), Ron at Pappy's Leatherneck Bar (466 2568)
  - **Town Boards** (Membership changes by election. Check The Source, under "Leaders and Lawmakers" for current names and numbers.)

- **Wisconsin Department of Natural Resources (DNR)** District Office located in Spooner on Highway 70 just west of Highway 63, tel. 635 2101. Minong Field Office, located at the east edge of Minong on Hwy 77, 4662022. **DNR Wardens** The nearest DNR Warden is Dave Swanson, 466 2022 (DNR Field Office in Minong) or 466 5358(home). The other warden for the county is Brian Knepper, 635 4099. Washburn County Sheriff Dispatch Office is 468 2720, or Business Office, 468 4700.

- **University of Wisconsin Extension (UWEX)** Extension agent, Beverly Stencil: 635 4444, 850 Beaverbrook Ave., Spooner, WI 54801 www.uwex.edu /ces/cty/washburn

- **Washburn County Board** (See The Source: The Answer Book for Washburn County, available from the Spooner Advocate, or
  - **Zoning Committee** (See The Source, the Washburn County homepage, or call the County Clerk, 715 468 4600 for more information)
- **Lake Classifications, Zoning Regulations and Permits** 715 468 4690

More Reading Material

Books, Guides, Pamphlets

- A Field Guide to Aquatic Exotic Plants and Animals, and other pamphlets available from Wisconsin DNR, 101 S. Webster St. P.O. Box 7921, Madison Wi, 53707
- Checklist of Wisconsin Birds, Wisconsin DNR, PO Box 7921, Madison, WI, 53707
- Guide to Wisconsin Aquatic Plants, Wisconsin DNR, Box 7921, Madison, WI 53707
- Lakescaping for Wildlife and Water Quality, Minnesota DNR, 500 Lafayette Ave, St Paul, MN 55155
- Life on the Edge. . .Owning Waterfront Property, UWEX-Lakes Partnership, College of natural Resources, University of Wisconsin, Stevens Point, WI 54481 and available from the Country UW Extension Office in Spooner.
- Loon Ranger Materials, LoonWatch, Sigurd Olson Environmental Institute, Northland College, Ashland, WI 54806

Newsletters

- The Lake Connection, published by the Wisconsin Association of Lakes, a nonprofit group of citizens, organizations and businesses working for clean, safe, healthy lakes. Available from WAL, One Point Place, Madison, WI 53719. Their website is www.wisconsinlakes.org
- Laketides: The Newsletter for People Interested In Wisconsin Lakes, published by the Lakes Partnership, UW Extension, 800 Reserve St. Stevens Point, WI 54481 www.uwsp.edu/cnr/uwexlakes Laketides is free.