May 2001 Volume 36 No. 2

THE MICHIGAN RIPARIAN

DEVOTED TO THE MANAGEMENT AND WISE USE OF MICHIGAN'S LAKES AND STREAMS

Published Quarterly – February, May, August and November

taking clarity measurement with secchi disk

taking water sample for chlorophyll a testing

(See pages 13 & 14 for ML&SA Clean Lakes Monitoring Programs)

THE MICHIGAN RIPARIAN

"THE MICHIGAN RIPARIAN (ISSN 0279-2524) is published quarterly for $2.00 per issue by the Michigan Riparian Inc., P.O. Box 249, Three Rivers, Michigan 49093. Periodicals postage paid at Three Rivers, Michigan and additional mailing offices."
POSTMASTER:
Send address changes to:
The Michigan Riparian
P.O. Box 249
Three Rivers, MI 49093

The Michigan RIPARIAN is the only magazine devoted exclusively to protection, preservation and improvement of Michigan waters and to the rights of riparian owners to enjoy their waterfront property.

The Michigan RIPARIAN is published quarterly and is mailed to subscribers during February, May, August and November.

THE MICHIGAN RIPARIAN magazine is owned and published by the Michigan Riparian Inc., a Michigan non-profit corporation.

EDITORIAL and BUSINESS OFFICE: 124½ N. Main Street, P.O. Box 249, Three Rivers, MI 49093.

TELEPHONE: 616-273-8200

FAX: 616-273-2919

ADVERTISING DEADLINE: No later than 10th of the month preceding month of publication.

ADVERTISING RATES: Sent upon request.

SUBSCRIPTION RATES:

Individual Subscription	$8.00
Group Rates: 10 to 49 Subscriptions	$7.00
50 or more, or all members of a Lake Association	$6.00

EDITOR and PUBLISHER: Donald E. Winne

Printed by J.B. Printing, Kalamazoo, MI 49007.

EDITORIAL


Don Winne

OWNERSHIP OF WATERFRONT PROPERTY— A PRIVILEGE AND A RESPONSIBILITY

To own a parcel of land along a lake or stream is a special privilege. The owner has the exclusive right to construct a dock from his shoreline and to moor a boat on his bottomland. He may also use the water for domestic purposes and launch a boat in jig time to enjoy the use of the entire surface of the lake or stream. In addition to the recreational use of the water, just being able to see the lake when being hit by a storm or to look at it when it is as smooth as glass, or waves gently lap the shore, brings extreme pleasure.

With this pleasure comes an awesome responsibility. The water is teeming with billions of microscopic plants and animals both in the shallow littoral zone and the deeper parts of the lake. We must learn how to be caretakers of that water so that the plants and animals can survive and multiply. If what we do on the land and on the water is not conducive to reproduction and growth of native species of fish, then we better change what we do. Solid cement sea walls are probably a no, no. If the excuse is that we are losing too much shoreline from wave action, then we need to discover ways to slow down the wave action.

Donald E. Winne

The Michigan Riparian welcomes letters to the editor, articles for publication, comments, suggestions, and article ideas. If you wish to write an article or just have an idea for one, it would be best to write us a short note or give us a call to discuss it.

—The Editor

In This Issue:

TOWNSHIPS GIVEN BROAD POWERS TO REGULATE LAND AND WATER USE ACTIVITIES

The Michigan legislature has passed enabling legislation during the past 60 years that gives townships broad powers to regulate land and water use activities within their townships. Some of those Acts are identified as follows:

ACT 184, P.A. of 1943, TOWNSHIP RURAL ZONING ACT.
ACT 246, P.A. of 1945, TOWNSHIP ORDINANCE ACT. (Health, Safety & Welfare).
ACT 188, P.A. OF 1954, TOWNSHIP IMPROVEMENT ACT.
ACT 146, P.A. OF 1961, INLAND LAKE LEVEL ACT, Part 307, Act 451, P.A. of 1994.
ACT 345, P.A. OF 1966, INLAND LAKE IMPROVEMENT ACT, Part 309, Act 451, P.A. of 1994.
ACT 127, P.A. OF 1972, MICHIGAN ENVIRONMENTAL PROTECTION ACT, Part 17, Act 451, P.A. of 1994.
ACT 203, P.A. OF 1979, WETLAND PROTECTION ACT, Part 303, Act 451, P.A. of 1994.

TOWNSHIP POWERS UNDER ACT 184:

Townships may:

1. Establish zoning districts.
2. Regulate the use of land for various purposes, such as: Agriculture, Forestry, Soil Conservation, Industry, etc.
3. Regulate residential development.

TOWNSHIP ZONING MUST ACCOMPLISH THE FOLLOWING:

1. Promote the health, safety & general welfare.
2. Encourage the use of lands in accordance with their character and adaptability.
3. Limit the improper use of land.
4. Conserve natural resources and energy.
5. Insure that uses of the land shall be situated in appropriate locations and relationships.
6. Avoid overcrowding of population.
7. Provide adequate light and air.
8. Lessen congestion on the public roads and streets.
9. Reduce hazards to life and property.
10. Facilitate adequate provision for a system of transportation, sewage disposal, safe and adequate water supply, education, recreation, and other public requirements.
11. Conserve the expenditure of funds for public improvements and services.
12. Conserve property values and natural resources.

SHORELINE LOT SIZE REGULATED

Some townships have adopted ordinances that set minimum sizes of shoreline parcels for residential and access purposes. The minimum width of residential waterfront lots varies from 50 to 150 feet. The minimum depth of residential lots varies from 200 to 500 feet. Minimum size of waterfront lots vary from 14,000 to 80,000 square feet. Some ordinances do not permit the inclusion of wetlands in meeting the square foot requirement.

SETBACK DISTANCES ESTABLISHED

In order to protect the water quality of lakes, some townships provide for minimum setbacks for dwellings, septic systems, and parking lots. Dwelling setbacks vary from 30 to 100 feet. Setbacks for septic systems vary from 50 to 125 feet.

ACCESS FOR NON-RIPARIAN LOT OWNERS

Some townships prohibit the use of a shoreline lot for access to a lake by non-riparian lot owners. Others provide access to back lots, but establish minimum shoreline distances in feet for each privileged lot. The shoreline width required for providing access for back lots varies from 70 to 300 feet. Shoreline width for each privileged lot varies from 10 to 100 feet.

BOATS, DOCKS AND BOTTOMLAND SETBACKS PROVIDE FOR SAFETY IN USE OF LAKES

In order to provide for safety in use of lakes, townships have provided for the maximum width, length and number of docks per minimum number of feet of shoreline property. Most townships do not provide for the maximum width of docks, but do provide for the maximum length. The length varies from 50 to 150 feet. Others provide that the length shall be determined by distance to floatable water depth and without interfering with the use of the surface waters by other riparians and members of the public. Some ordinances provide for a setback distance from the bottomland lot line to avoid neighbor conflicts. For example, Cannon Township, Kent County, provides, “No dock for boat use shall be located, utilized or placed within seven (7) feet of the side

(Continued on page 10)

lot lines of a lot or parcel as extended to the center of the lake or body of water." The Albert Township, Montmorency County, ordinance provides, "Boat ramps or docks shall not be erected less than 10 feet from any side lot line."

TOWNSHIPS MAY REGULATE WATER USE UNDER THEIR POLICE POWER

Bloomfield Township in Oakland County has adopted Ordinance No. 397 (1987) as authorized by the TOWNSHIP ORDINANCE ACT, Act 246, P.A. of 1945. The intent and purpose of the Ordinance is stated as follows:

"...the Township Board has recognized and concluded that the use of water resources including the inland lakes situated in the township should be considered within a framework of long-term costs and benefits to the township, and that it is desirable to maintain the physical, cultural and aesthetic characteristics of lakes in the township. Moreover, it has been recognized that as the shorelines of lakes become further developed, the cumulative impact of boat usage for each respective property must be regulated in order to protect the rights of riparian owners as well as the Township as a whole. It has further been recognized that the lack of regulation shall result in a nuisance condition and an impairment of these important and irreplaceable natural resources of the Township, and shall further result in the destruction of property values, and threaten the public health, safety and welfare of all persons making use of the lakes within the Township and properties adjacent to lakes in the Township. Accordingly, it is the intent and purpose of the Township Board to adopt reasonable regulations for boat usage in the Township."

LAKES MAY BE IMPROVED UNDER THE INLAND LAKE IMPROVEMENT ACT, Act No. 345, P.A. of 1966

Townships may improve a lake under this Act by establishing a LAKE BOARD. This Act provides that the local governing body of any local government (township, village) may provide for the improvement of a public lake or an adjacent wetland. Lake Boards are made up of: (1) a member of the county commission of the county in which the lake is located (2) the county drain commissioner (3) a representative from the Department of Environmental Quality, and (4) a person who has an interest in the title to a parcel of land that abuts a lake and is a member of a lake association which represents a majority of lakefront property owners. Once the Lake Board has been established, the Township Board shall instruct the Lake Board to proceed. (Part 309, Act No. 451, Public Acts of 1994.)

TOWNSHIPS MAY TAKE ACTION UNDER THE TOWNSHIP IMPROVEMENT ACT, Act 188, Public Acts of 1954

Townships may do any of the following under the authority of the Township Improvement Act:

1. Construct, improve and maintain water systems.
2. Construct, improve and maintain storm or sanitary sewers or combined storm and sanitary sewers.
3. Acquire, improve and maintain public parks.
4. Collect and dispose of garbage and rubbish.
5. Construct, maintain, repair or improve erosion control structures or dikes.
6. Eradication or control of aquatic weeds or plants.
7. Construction, improvement and maintenance of a lake, pond, river, stream, lagoon or other body of water or of an improvement to the body of water.
8. Construction, improvement and maintenance of dams and other structures, which retain the waters of this state for recreational purposes.

ACTION MAY BE TAKEN FOR RELIEF FROM ENVIRONMENTAL POLLUTION

Michigan's Environmental Protection Act, Act No. 127, Public Acts of 1972, as amended, provides:

"The attorney general or any person may maintain an action in the circuit court having jurisdiction where the alleged violation occurred or is likely to occur for declaratory and equitable relief against any person for the protection of the air, water and other natural resources and the public trust in these resources from pollution, impairment or destruction." Part 17, Act 451, Public Acts of 1994, Section 1701.

Attorney Writes

By Clifford H. Bloom
Law, Weathers & Richardson, P.C.
Bridgewater Place
333 Bridge Street, N.W., Suite 800
Grand Rapids, Michigan 49504-5360

PERMIT ME

There are a number of activities and modifications that occur in Michigan inland lakes, as well as the bottomlands and shorelines thereof, which require prior approval and permits from government agencies. Depending upon the type of project involved, the property owner may have to get approvals from the local municipality (city, village or township), county and/or the state of Michigan. This column will discuss applicable permits from the state of Michigan.

While beyond the scope of this article, property owners should not forget that local and county approvals and permits may also be applicable—just because one or more state agencies have approved a particular project and issued the necessary permit or permits, that does not negate the need to comply with all applicable local and county approval and permitting requirements. For example, there may be soil erosion and sedimentation issues and permits which must be obtained from the county (although in some counties, such permits are handled by the local municipality). Additionally, local governments often have ordinances which govern required lake setbacks, docks, shoreline disruption and other lake uses and alterations.

If a property owner desires to alter, dredge, sand or modify a lake shoreline or bottomlands, install a permanent dock, create a marina or similar activities, the activities are regulated by the Michigan Natural Resources and Environmental Protection Act (MCLA 324.101 *et. seq.*) (the "Act"). The Act is a recodification of Michigan's various environmental laws, which was undertaken in 1994 and places all such laws in one supposedly easy to find statutory location. Michigan statutes which are most often applicable to shoreline and bottomland activities (the Inland Lakes & Streams Act, the Inland Lake Level Act and the Wetlands Protection Act) are now found within the Act. Most of the time, a property owner who desires to alter a riparian shoreline or bottomlands will have to deal with the Michigan Department of Environmental Quality ("DEQ"), rather than the Michigan Department of Natural Resources ("DNR").

Sanding

As we all know, it is very common for riparian property owners to place sand on the beach and along shoreline areas on inland lakes. Some have attempted to do so on the bottomlands of the lake, which is generally illegal without a prior DEQ permit. Apart from the legal issues involved, placing sand along the shoreline or on the bottomlands of a lake is a losing proposition—inevitably, it will be washed away and the property owner will have to replace it later.

The key to whether or not prior approval and a permit must be obtained from the DEQ for sanding is the "existing water's edge," and whether the sanding is "reasonable." The Act does not define the existing water's edge. To be safe, a property owner should be conservative and use the ordinary high water mark as the limit. In most cases, if sand is placed upland of the normal high water mark, a permit is not needed while a prior permit is required if sand is placed below the ordinary high water mark.

There are exceptions to this general rule, however, and the property owner should check with the local DEQ official in a given case to make sure whether or not a permit is required. For example, if a wetland is involved, sanding cannot occur without a permit under the Wetland Protections Act, even if it is upland from a lake. Similarly, if a property owner attempts to place sand in a pile, on a slope or other fashion so that it is reasonably foreseeable that the sand will end up in the water, a permit may be required.

Dredging, Filling, Creating a Canal, etc.

Any activity such as dredging, filling, removal of bottomlands, significant alteration of bottomlands, creating a canal, etc., which occurs on a lake or the lakeside of the high-water mark of a lake or enlarges, diminishes or ties into a lake requires prior approval and a permit from the DEQ under the Inland Lakes & Streams Act.

Seawalls and Lake Retaining Walls

Installing a seawall, retaining wall or similar structure at or lakeside of the high-water mark of a lake, as well as any backfill or fill related thereto, requires prior approval and a permit from the DEQ under the Inland Lakes & Streams Act. A permit may also be required to replace, extend or modify an existing seawall, retaining wall or similar structure.

Permanent Docks or Piers

Seasonal docks or piers (*i.e.*, mooring structures which are taken out during the off season and do not involve pilings significantly attached to the bottomlands of a lake and for use by one family) normally do not require a state permit. However, the following types of docks, piers or mooring devices normally require DEQ approval and a permit prior to installation and usage:

- Permanent structures
- Structures used by more than one family
- Structures used for commercial, business or industrial use

Altering Wetlands

A property owner generally cannot alter, fill or destroy a wetland or any portion of it without obtaining a prior approval and permit from the DEQ under the Wetland Protection Act. This statute only applies, however, if a portion of the property involved constitutes a wetland under the statute. Determining whether or not a given area is a wetland is not always easy and the definitions of wetland contained in the statute are complex and confusing. Nevertheless, if a wet area is located along the shoreline of the lake or is near or tied into the lake, it is highly likely that it will turn out to be a regulated wetland.

It should be kept in mind that the activities mentioned above are not totally

(continued on page 20)

ML&SA NEWS

MICHIGAN LAKE & STREAM ASSOCIATIONS, INC.

P.O. Box 249, 124 1/2 N. Main Street, Three Rivers, Michigan 49093
Phone: (616) 273-8200 Fax: (616) 273-2919
E-mail: info@mlswa.org dwinne@mlswa.org
Web sites: www.mlswa.org. www.mi-water-cmp.org.
Donald E. Winne, Executive Director

WE WELCOME OUR NEW ASSOCIATION AND CORPORATION MEMBERS

Wixom Lake Association, Gladwin/Midland Counties
Gene Kruger, President

Hopkins East Lake Improvement Association, Allegan County
Jack VanderBaan, President

Sutherland Lake Improvement Association, Clare County
Kenneth Wymer, President

CORPORATION MEMBERS:

Aquamarine, Waukesha, WI

Cygnet Enterprises, Flint, MI

Enviroscience, Stow, OH

Professional Lake Management, Caledonia, MI

Progressive Architecture & Engineering, Grand Rapids, MI

Local 730 U.A.W.

Freeman Township, Clare County

Lincoln Township, Clare County

ML&SA EXECUTIVE COMMITTEE CONSIDERS GOALS–2001-2005**

* Develop and distribute a brochure on the ECONOMIC VALUE OF LAKES AND STREAMS IN MICHIGAN TO ITS RESIDENTS.
* Develop and distribute an educational pamphlet on the ECONOMIC VALUE OF WETLANDS CONTIGUOUS TO LAKES AND STREAMS, and encourage governmental agencies to prevent further wetland(s) destruction.
* Develop and distribute an educational pamphlet identifying HABITAT NEEDS AND REQUIREMENTS FOR PRODUCTION AND PROPAGATION OF FISH SPECIES NATIVE TO MICHIGAN INLAND WATERS.
* Provide wider distribution of ML&SA's NEWSLETTER. For example, to Municipal Officials, High Schools (incl. H.S. Science Teachers), Public Libraries, Non-Profit Corporations, Churches, Youth Groups, etc.
* Establish REGIONAL OUTREACH CENTER(s) for distribution of ML&SA pamphlets, legal information, and sources of expertise in lake and stream problems.
* Create a LEGISLATIVE COMMITTEE to monitor House and Senate Bills impacting Riparian Property Owners, Lakes, Streams and/or Great Lakes.

(continued on page 13)

SECCHI DISK TRANSPARENCY

Information Source: *Cooperative Lake Monitoring Annual Summary Report – 2000*, by Ralph Bednarz, DEQ, Lansing

Citizen volunteers measure Secchi disk transparency from late spring to the end of the summer. Ideally, 18 weekly measurements are made from mid-May through mid-September. As a minimum, eight equally spaced measurements from the end of May to the beginning of September are accepted to provide a good summer transparency mean (average) for the lake. Frequent transparency measurements are necessary throughout the growing season since algal species composition in lakes can change significantly during the spring and summer months, which can dramatically affect overall water clarity.

A summary of the transparency data collected by the lake volunteers during 2000 is included in Appendix 1. The number of measurements, or readings, made between mid-May and mid-September and the minimum and maximum Secchi disk transparency values are included for each lake that participated in the program. For those lakes with eight or more evenly spaced readings over this time period, the mean, median, standard deviation, and Carlson TSI_{SD} values were calculated and listed.

The mean, or average, is simply the sum of the measurements divided by the number of measurements. The median is the middle value when the set of measurements is ordered from lowest to highest value. The standard deviation is a common statistical determination of the dispersion, or variability, in a set of data.

The data range and standard deviation gives an indication of seasonal variability in transparency in the lake. Lakes with highly variable Secchi disk readings need to be sampled frequently to provide a representative mean summer transparency value. Few measurements and inconsistent sampling periods for these lakes will result in unreliable data for annual comparisons.

The TSI_{SD} values were calculated using Carlson's equations (see page 7) and the mean summer transparency values. (Note: the mean transparency value is converted from feet to meters for the TSI_{SD} calculation.) The graphical relationship (see page 8) can be used to relate the TSI_{SD} value to the general trophic status classification for the lake (i.e., oligotrophic, mesotrophic, eutrophic) as well as to provide a rough estimate of summer chlorophyll *a* and total phosphorus levels in the lake. If the transparency measurements are made properly and consistently year after year, the annual TSI_{SD} values can be compared to evaluate changes, or trends, in trophic status of the lake over time.

During 2000, Secchi disk transparency data were reported for 157 lakes (218 basins). Over 3,000 transparency measurements were reported, ranging from 2.4 to 51 feet. For the lakes with eight or more equally spaced readings between mid-May and mid-September, the overall mean, or average, Secchi disk transparency was 12.1 feet. The median value was 11.0 feet. The Carlson TSI_{SD} values ranged from 27 to 59 for these lakes with a mean value of 42. A Carlson TSI value of 42 is generally indicative of a good quality mesotrophic lake (see page 8).

ML&SA EXECUTIVE COMMITTEE CONSIDERS GOALS–2001-2005** *(continued from page 12)*

* Provide educational and informational support to ML&SA members and Member Organizations, who seek to contact (their) Elected Officials in order to promote:

a. LAND USE PLANNING AND ZONING.

b. BAN THE TRANSPORT AND CURB THE SPREAD OF EXOTIC SPECIES IN MICHIGAN INLAND LAKES.

c. DEVELOP EQUIPMENT AND SET GUIDELINES TO MEASURE AND CONTROL SPEED AND NOISE OF MOTORIZED WATERCRAFT for use by Law Enforcement Agencies.

d. ADOPT LEGISLATION THAT WOULD REQUIRE ALL OPERATORS OF MOTORIZED WATER-CRAFT TO HAVE A STATE CERTIFIED WATER-CRAFT OPERATOR'S LICENSE.

e. Adopt legislation that would prohibit the operation of motorized watercraft at a speed in excess of "Slow No-Wake" WITHIN 200 FEET OF ANY SHORELINE OF AN INLAND LAKE.

** ML&SA would be glad to hear your opinion on the above drafted "Goals." If you oppose any or if you think we have left out something very important, please send your comments to the Three Rivers office at P.O. Box 249, Three Rivers, MI 49093.

Chlorophyll *a*

Information Source: *Cooperative Lake Monitoring Annual Summary Report – 2000,* by Ralph Bednarz, DEQ, Lansing

Chlorophyll is the green photosynthetic pigment in the cells of plants. The relative amount of algae in a lake can be estimated by measuring the chlorophyll *a* concentration in the water. As an algal productivity indicator, chlorophyll *a* is often used to determine the trophic status of a lake.

Chlorophyll monitoring was added to the CLMP in 1998 and expanded in subsequent years. Chlorophyll samples were collected on 66 lakes in 2000. For each lake, the volunteers collected and processed five sets of chlorophyll *a* samples, one set per month from May through September.

Results from the chlorophyll monitoring are included in Appendix 3. Results for each monthly sampling event are listed as well as the mean, median, and standard deviation of the monthly data for each lake. The TSI_{CHL} values were calculated using Carlson's equations (see page 7) and the median summer chlorophyll values. Results from the replicate and side-by-side sampling are also provided. Side-by-side and replicate samples were collected and analyzed for nearly half of the lakes.

Over 350 chlorophyll samples were collected and processed in 2000. The chlorophyll *a* levels in these lakes ranged from <1 to 51 ug/l. The Carlson TSI_{CHL} values ranged from <31 to 61 with a mean value of 43.7. A Carlson TSI value of 44 is generally indicative of a mesotrophic lake (see page 8).

PICTURES ON FRONT COVER

Editor's Note: The pictures on the front cover show Ralph Vogel at his beach front on Corey Lake in St. Joseph County. He has been taking Secchi measurements on Corey Lake since 1974 – going on 28 years. Ralph Vogel has produced over 150 Secchi Disks for Michigan Lake & Stream Associations during the past 6 years. He has milled, painted and attached the fiberglas tape to each one produced without charge to ML&SA. He has also taken Chlorophyll a and dissolved oxygen measurements on Corey Lake, and has trained people on other ML&SA member lakes in taking these tests. ML&SA is grateful for all the work he has done over the years. Thank you, Ralph.

Ralph Vogel has been on Corey Lake since the mid-sixties. He came to this area as part of an engineering task force of Essex Group (later a part of United Technologies) to design and build copper casting and rolling systems. Ralph had developed many machines and acquired many patents but this was of particular interest and challenge to him. Though retired now he still does consultant work for his former employer and on occasion, still designs machines.

As a child he was always interested in how things worked. His exploratory venture into his mother's vacuum sweeper's motor at about age six was not appreciated but this didn't stop him. As he grew older, he was encouraged to utilize his interests and talents in the field of mechanical engineering. After high school the Navy intervened but also continued his schooling in this area. After the Navy he finished his schooling at Ohio State in his hometown of Columbus. He remains a Buckeye supporter today despite children and grandchildren attending and graduating from U. of M.

As an adult (?) retiree he loves sailing, building and flying his ultralight, rejuvenating and riding on his velocipede, volunteering on the Coopersville and Marne railroad, and keeping his 1913 antique Richmond car in running condition. He also enjoys working on science projects with grandchildren. He even supplies materials and ideas to his college grandson studying engineering at U. of M. Ralph also stays young by kite flying and waterskiing with grandchildren.

Ralph's early involvement on Corey Lake began with helping Don Winne and others to build a dam after the water level had been set by the court. Since 1974 Ralph has continuously taken secchi disk readings. As new programs have been available through Michigan Lake and Stream Association he has gathered water samples and data. These programs include: phosphorus monitoring twice annually, chlorophyll monitoring five times annually, dissolved oxygen and temperature determination eleven times annually. For approximately five years he participated in the zebra mussel monitoring in conjunction with the Michigan Sea Grant Program. All this has been done with the objective of keeping Corey Lake in great shape for future generations.

DREADED ZEBRA MUSSELS ATTACK RIVER LIFE, TOO

By Ted Nadwodnik, Graduate, Grand Valley State University

July 6, around 1 a.m. will long remain as one of the most dark and difficult moments of my life. The proverbial writing on the wall was there for a while. It just took some time for the combination of evidence to hit me. I have been witness to how the zebra mussel is a different, much more ecologically destructive animal in hard-bottom rivers than it is in the lakes. This isn't just about fish, it's about an entire river ecosystem. All who know the Muskegon River as it was should be concerned.

The signs of this impending invasion began to occur in the spring of 1999. One of many bountiful insect hatches that nourished life both in and all along the river's shore, failed to appear. The giant stonefly, a large, defenseless portion of protein to all with fins, feathers, or fur, failed to hatch. It failed to show up this year, also. Not a single one. Previous to 1999, they were so prolific they would coat the bridge above the river. Their only defense and assurance of reproduction was sheer numbers. It didn't work. This year, the assault massively expanded as the water warmed up in June, and invasion has precipitated shore to shore conquering a vast stretch of river below the dam. Here's how I found out, the hard way.

On that night, a warm night when waders are left off, I noticed the river was running low. Earlier in the year, going waderless had been no problem. My plan was to catch a little live bait and move across the river to a choice deep water run and catch one or two each of my favorite species, a Croton combo of walleye and trout, not that uncommon in this river lately. In the 24 years of knowing this river, the fishing was getting unbelievably better and better. This was to the credit of recent Consumers Energy actions and timely Department of Natural Resources plantings and management of trout. Fish reproduction and growth rates had been expanded tremendously.

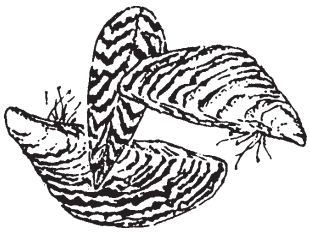
However, 20 minutes later, "that" moment I now write of was to change all of that. Perhaps for the rest of my life.

The occasional slight loss of balance is inevitable when wading rocky rivers at night. No big deal. The usual routine was to just not get too wet. This usually means a one- or two-second "river dance" to regain balance. I missed all but three mussels as I leaned my calf on a rock side and dropped one hand on top of another nearby boulder. I had "brushed" them roughly with my hands before with no problem. The three that I hadn't missed, I crushed. Fishing waderless as I had done for nearly 24 consecutive summers now brought me more pain and blood than all of the past years combined. Years of handling hooks, cleaning knives and fish with real teeth.

Bleeding enough to leave a trail, I carefully moved to shore and asked a fisherman on the other side of the river, where I hadn't waded lately, if the small and moderate sized stones and gravel in that run were infested. He replied that they were coated solid. Using my Maglite in tight focus and my head lamp together, I carefully moved to the edge of the swift water drop-off and focused the two beams together into deep water bottom, usually visible only during low water. **The bottom was black with zebra mussels,** except for an occasional rock top. As for across the river, my lights would reveal an infestation of the mussels.

Walking downstream (out of the water), memories of this river's life in recent past brought about a sudden awareness of what is now totally or nearly absent. Where were the successive hatches of trout which would last for nearly three months? Where were the large schools of minnows which would once churn these waters? Very few this year. Looking up at the bridge and lights above the river, I remembered insect swarms of incredible volume and diversity. This late spring, early summer, I look and see how low numbers of mainly very small species. The usual terrestrial moths, but overall a drastic, sudden decline. It's early July and the light looks like fall.

Looking down in the water, I note most of the larger crayfish have several mussels each on their bodies. Very few 1/2-inch young crayfish are visible. Trout are caught and found to have their stomachs jammed full of mussel shells to the exclusion of all else. Where was the usual minnow and insect mix in their stomachs?



This striped freshwater mollusk, native to the drainage basins of the Black, Caspian and Aral Seas was accidentally introduced into the Great Lakes in the mid-1980s.

The final and hardest pain that night was when I remembered how many species of wildlife depend on the miles of this river for seasonal, migratory and year around food sources. To understand what makes these small creatures so devastating in rivers, one need only consider the major differences between lakes and rivers and where their biological productive originates.

There is no doubt that zebra mussels take from and change a lake's character. However, they are more or less confined to successful colonization on hard surfaces. Also, the plankton and other near-microscopic plants and animals that zebra mussels feed on tend to inhabit and reproduce in the warmer, upper 30 feet of a lake's water column, rising toward the surface and falling on a day and night cycle. Weedy and soft bottom areas also support a great deal of the lake's essential needs for biological productivity.

I believe through extensive observation, that very young mussels that attach themselves to aquatic plants or soft bottoms may find themselves washed up on shore, preyed upon by swarms of small panfish which inhabit many lakes, or washed into deep waters, which are low in temperature, oxygen and food availability. None of these limiting factors exist in the river about which I will now tell an unfortunate story.

I wish none of the following was happening. If you doubt that it is, bring your waders and a few bucks for your half of the canoe rental. Please, prove me wrong. I wish this was just a nightmare, all a bad dream.

With nutrient input from a vast water-shed and abundant life from the micro end of the food chain flourishing in the three reservoirs upstream, a tremendous supply of the zebra mussels food source is assured. A river flow distributes even-tempered, well oxygenated and food-rich water, and now zebra mussels young, in a constant territory expanding downstream direction. The river's flow will now assist in the constant and efficient distribution from however far upstream they exist to the river mouth at Muskegon.

The natural and manmade forces that once combined to bring so much life to the waters of this fresh water river "reef" habitat have been harnessed and thoroughly dominated by these invaders. They have been able to anchor, grow, feed and reproduce at an almost devastating rate. The visible change here in the last seven weeks is astounding. They even grow attached to each other.

Nearly 100 percent coverage and/or penetration of its once-native life-filled rock cavities has developed. Salmon, trout, likely all fish spawning success rates and aquatic insect hatch, mating and egg return cycles have been heavily impacted. An unnatural rate of predation from "cleared" water and lack of normal rates of micro-life have noticeably reduced this spring's newly emerged fish life.

I believe next year's aquatic season of growth and renewal holds no reason for optimism. Perhaps in the lower river where weeds exceed rock bottom, native river life can avoid the direct impact of physical displacement. It is going to be a long, cold fall and winter for all life that depends on the river as a food source.

It is blind optimism to believe this river will ever begin to return to what it was just one or two years ago without a response from us. This will only happen when we realize what's at stake. It is likely that science will someday be able to limit or eradicate this biological threat to our rivers, fish and wildlife. I only hope I live long enough to see it happen.

Ted Nadwodnik is an environmental activist and resident of Greenville.

Great Lakes Fish in Trouble

The Associated Press

CHICAGO – A primary source of food for young fish is disappearing quickly from the Great Lakes, according to scientists who fear it could jeopardize decades of progress in restoring fish populations.

Diporeia, half-inch long shrimp-like crustaceans, are extinct in Lake Erie and declining at alarming rates from lakes Michigan, Ontario and Huron – a phenomenon scientists suspect is linked to zebra mussels, a Black Sea native that arrived in this country in the late 1980s.

"It's one of those issues that is just so scary because... we have seen such recovery (of fish species) in the 30 years since the Clean Water Act was passed," said John Gannon, science coordinator at the U.S. Geological Survey's Great Lakes Science Center in Ann Arbor. "We had this wonderful success story running, and then one of the main food sources starts to disappear."

The demise of diporeia could have dire consequences for many types of fish, scientists said. Many fish that eat diporeia in turn are eaten by larger fish such as salmon and lake trout. The problem has not affected such sport fish, but whitefish, which are harvested commercially, have suffered.

Exactly what is causing diporeia, which live on lake bottoms, to disappear remains a mystery.

One theory is zebra mussels, which are thumbnail-sized mollusks that arrived in the ballast water of oceangoing ships, are competing with diporeia for the same food – and winning, said Marc Tuchman, an environmental scientist in the EPA's Great Lakes National Program Office in Chicago. Both dine on bacteria and algae, but the mussels multiply rapidly and can filter vast amounts of water.

There also is speculation that there is enough food but mussels are extracting from it a nutrient essential to diporeia, that mussels introduced a pathogen lethal to diporeia, or a mucous-like substance excreted by mussels is killing diporeia, said Thomas Nalepa, a research biologist at the Great Lakes Environmental Research Lab in Ann Arbor. The lab is part of the National Oceanographic and Atmospheric Administration.

Researchers have found no diporeia in Lake Erie since the early 1990s – Tuchman said fisheries experts have reported a dramatic decline in rainbow smelt and young whitefish there – and diporeia levels have collapsed in Lake Ontario and are disappearing from shallow waters of southern Lake Michigan.

Their numbers have declined in Lake Huron, but have not disappeared in any locations there yet, Tuchman said, and in colder Lake Superior, where there are few zebra mussels, diporeia continue to thrive.

•• The primary food source for many young fish is extinct in Lake Erie and is rapidly vanishing from lakes Michigan, Huron and Ontario.

In the past few years, diporeia also have begun disappearing from deeper waters of northern Lake Michigan. In waters off Manistique, in Michigan's Upper Peninsula, for example, researchers found 10,000 diporeia per square meter in 1997, but none in 2000.

Gannon, with the Great Lakes Science Center, said that is particularly alarming because whitefish, which feed on diporeia and are important commercially, have made a phenomenal recovery in the upper Great Lakes in the past 15 years.

Fish may develop a taste for other food, such as mysis, a shrimp-like organism similar to diporeia. But that could put a strain on mysis populations, researchers said. The EPA plans to monitor mysis and other fish food.

In areas of Lake Michigan where diporeia disappeared, whitefish even began eating zebra mussels, which were not very healthy for them, Nalepa said. He said the fish, whose guts became packed with shell material, were so skinny that fishermen no longer could get a fillet from them.

The diporeia decline has not affected sport fish such as trout and salmon because their food – including alewives and smelt – still find alternatives to diporeia, researchers said.

But the lack of diversity – especially if bottom-feeding fish begin to decline – could affect popular species, they said.

"The fish that are affected now are not glamorous fish like trout or salmon," said Randy Owens, a fishery biologist studying Lake Ontario for the U.S. Geological Survey in Oswego, N.Y. "It's just that, from a scientific standpoint, we will have a big void in the whole food web out here."

"We would be getting down to a system where we're just depending on a few fish to keep things going, instead of a wide variety of fish. If something happens to the alewives and smelt, then it's crunch time on trout and salmon."

Scientists say they fear the diporeia disappearance is just beginning, and the area in which they are declining expands every year.

"It may be slow or it may be fast, but a decline is occurring, and we will see more and more impacts on fish," Nalepa siad.

He believes the decline of diporeia is related to zebra mussels, although he is not sure how and, in some cases, there is no obvious connection. In St. Joseph, where diporeia disappeared within six months in 1992, researchers had never found a zebra mussel, he said.

But most disturbing is there does not appear to be any way to stop the disappearance, Tuchman said.

"Unfortunately, all we can do is keep an eye on it... note the decline and hope it reverses. There is nothing we can do."

WETLANDS CRITICAL TO FISH POPULATIONS

Natural Resources Register June 1989

A vital relationship exists between Michigan's outstanding sport fishery and its wetland areas. Sometimes labeled nature's masterpieces, Michigan's wetland areas are critical to our state's fish population.

Good fish production and survival depends on good water quality. And good water quality depends upon how the water moves over the land, through the soil, and into our state's lakes, streams and groundwater reserves.

The water quality of a given lake or stream then is largely determined by the water which flows into it. Michigan's wetland areas effectively protect those waters in a variety of ways.

Of particular importance to fish, is the recharge of surface water runoff. Wetland areas also serve as critically important spawning, nursery and feeding grounds for the state's fish population. They furnish critical home habitat for most of Michigan's turtles and various other reptilian species, and for the state's amphibian population of frogs, toads, and salamanders as well.

Whether water-covered on a year-round basis or during times of seasonal flooding only, marshy wetlands are often adjacent to the state's many streams and lakes. Here they function in the important role of natural nursery area and cafeteria, hosting various fish, bird, and mammal populations. Especially crucial to juvenile fish, these marshy wetland areas and the wealth of plants found growing in them may also offer the young needed cover from predators.

A variety of sport fish species popular with Michigan anglers, including the bluegill and other sunfish, both large and smallmouth bass, yellow perch, and northern pike as well as carp, spend all or part of their lives in wetlands. Those Michigan wetland areas where fish can be found provide countless hours of angling enjoyment each year to the state sportsperson who actively fishes them. Bass anglers, in particular, regularly prowl such areas in search of trophy fish.

It can be shown that virtually all of Michigan's freshwater fish species have wetland ties of one sort or another. For example, many forage fish, upon which other fishes routinely feed, reside at one stage or another of their lives in the state's marshy wetland areas. Attracted there by the wealth of foodstuffs and suitable habitat found in such wetlands, forage fish are a key link in the food chain and of critical importance to predatory sport species.

The elimination of a wetland area which normally hosts such forage species could result in a subsequent reduction of the number of sport fishes available to Michigan anglers. A wetland's destruction can also harm the state's sport fishery in a direct manner by cutting the amount of productive spawning and nursery habitat they need.

Lake St. Clair is a prime example of the critical relationship which exists between Michigan's wetland areas and its sport fishery. One of the midwest's most respected sport fisheries, it's reputation depends in large part on the rich coastal wetlands of the St. Clair River and adjacent St. Johns marsh. This famed St. Clair Flats area is acknowledged as one of North America's top freshwater wetlands. The variety of fine non-salmonid fishing opportunities offered in Michigan waters of the Great Lakes – such as the world-class walleye fisheries which have developed in recent years in Lake Erie and Saginaw Bay – can be traced, at least in part, to our state's rich coastal wetlands. Sadly, more than two-thirds of that wealth of coastal wetland has been destroyed since Michigan's pre-settlement days due to human activity.

It's been estimated that the annual economic value of sportfishing activity in our state is in excess of $2 billion. A significant portion of that amount results from the state's top-notch salmon fishing opportunities. Not surprisingly, those opportunities owe much to the existence of Michigan's coastal wetlands.

It's these wetlands, particularly the ones located around the so-called drowned river mouths, such as Muskegon Lake and Lake Macatawa, which empty into Lake Michigan, in which large populations of forage fish can be found. Reared in the wetlands, these forage species, such as the alewife, routinely spend their adult lives in the big lakes where they serve as prey for the salmon. Such prey species are crucial to the state's fine salmon sport fishery.

In the final analysis though, the single most valuable product of a wetland area just may be those public amenities which would seem to hold relatively little monetary value for the private landowner. In recognition of the public's growing appreciation for Michigan's wetlands, some of the state's more progressive developers and builders as well as a number of concerned private individuals are at work on ways in which to preserve existing wetland areas whenever possible.

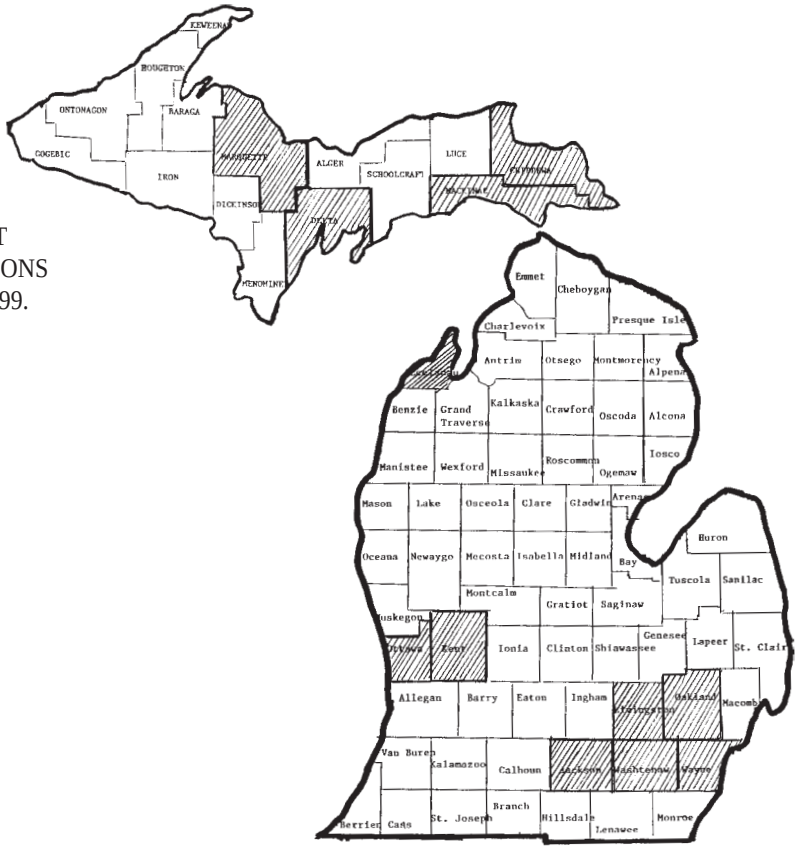
As part of a report published in 1978 on the fish, wildlife, and recreational values of Michigan's coastal wetlands, authors Eugene Jaworski and C. Nicholas Raphael estimated that an acre of wetland was worth $286.00 to the state's sport fishery. While Jaworski and Raphael made no similar estimate of the economic value attributed to Michigan's inland wetlands (areas where data is too often non-existent) and its fishery, it may be assumed to be similar. General inflation over the intervening years no doubt renders the 11-year-old estimate of coastal wetland value low.

Because wetlands are so vital to Michigan fish and the state's sport fishery and because they play a host of other no less important roles as well, the DNR Fisheries Division stands firmly committed to efforts aimed at the protection and preservation of these incredibly rich areas. The knowledgeable Michigan angler aware of wetlands' value to the state's fishery would surely concur in those efforts.

By Steve Acker,
Fisheries Division

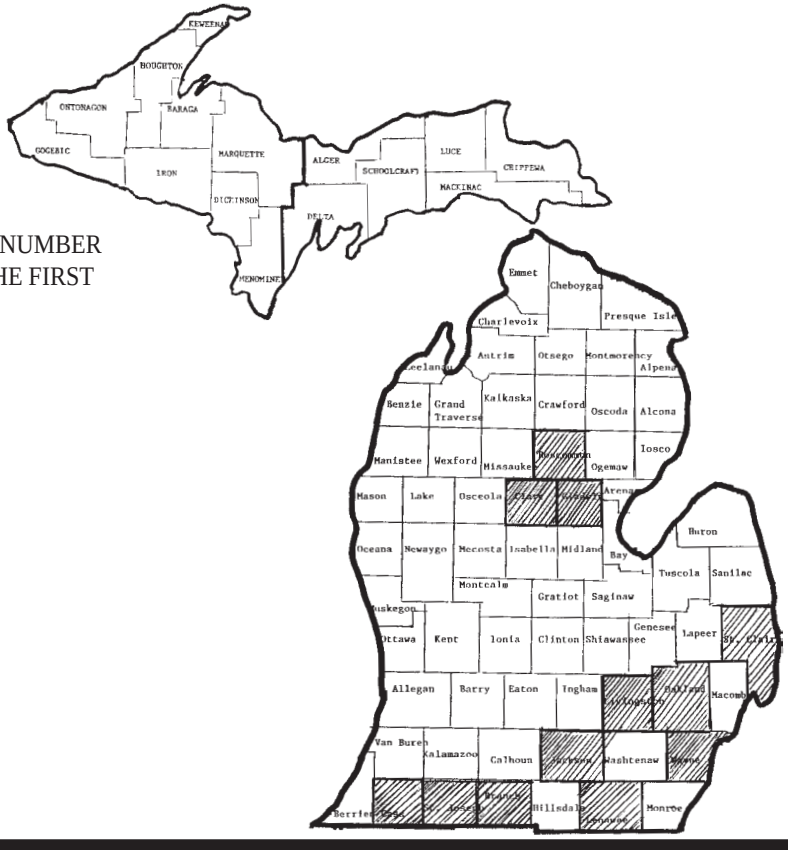
(See maps next page)

FISH ARE BEING SQUEEZED OUT OF SPAWNING GROUNDS AND HABITAT NURSING AREAS BY WETLAND FILLING AND SEAWALL CONSTRUCTION



12 COUNTIES WITH THE GREATEST NUMBER OF WETLAND APPLICATIONS IN THE FIRST NINE MONTHS OF 1999.

COUNTY	NUMBER
Oakland	76
Kent	45
Chippewa	41
Washtenaw	39
Marquette	39
Wayne	31
Leelanau	27
Livingston	26
Mackinac	22
Ottawa	22
Delta	22
Jackson	21



12 COUNTIES WITH THE GREATEST NUMBER OF BULKHEAD APPLICATIONS IN THE FIRST NINE MONTHS OF 1999.

COUNTY	NUMBER
Oakland	113
Gladwin	109
Jackson	78
St. Clair	70
Clare	69
Wayne	50
Roscommon	49
Livingston	48
Branch	44
Lenawee	44
St. Joseph	42
Cass	41

DIVERSIONS AND CONSUMPTIVE USES OF GREAT LAKES WATERS

Senate Bill No. 40 was introduced on January 30, 2001 by Senators Bennett, Byrum, Sikkema, Stille, Steil, Bullard, Schuette, Smith and Hammerstrom, and referred to the Committee on Natural Resources and Environmental Affairs.

The bill will amend PART 327 GREAT LAKES PRESERVATION, Act #451, Public Acts of 1994. The bill more clearly defines "Diversion" as follows: Section 32701 (D) "Diversion" or "Interbasin Diversion" means the withdrawal or transport of waters of the Great Lakes basin to one or more locations outside of the Great Lakes basin." The Great Lakes basin means the watershed of the Great Lakes and the St. Lawrence River.

The bill provides that the Governor shall notify the DEQ whenever he receives a request for the following:

1. A proposed interbasin diversion from the Great Lakes basin.
2. A proposed increase in an existing interbasin diversion from the Great Lakes basin.
3. A proposed consumptive use of the water of the Great Lakes basin in excess of one million gallons per day average in any 30-day period.
4. Notice of an increase or other alteration in an existing interbasin diversion.

The Department of Environmental Quality, upon receipt of a notice from the Governor as identified above, shall do all of the following:

1. Notify the applicant of the proposed diversion or consumptive use whether sufficient information has accompanied the proposal to permit proper evaluation.
2. Notify other state departments such as community health, consumer and industry services, agriculture, transportation and the public service commission of the proposal and solicit their comments.
3. Publish a notice in the Michigan Register containing the following information:
4. Name of person proposing the diversion, his or her state or province of residence, the state or province to which the water will be diverted or in which the water will be used.
5. The Department will hold a public hearing on the proposed diversion or consumptive use when requested.
6. The DEQ shall transmit a report to the Governor and the legislature. The report shall include all comments received and a recommendation on the proposal.
7. The DEQ recommendation shall include the following:
   a. Whether the proposal is consistent with applicable state plans.
   b. Whether the proposal incorporates maximum economically feasible conservation practices.
   c. Whether the proposal will have a significant adverse impact on navigation within the Great Lakes basin.
   d. Whether the receiving state, region or province has developed a plan to manage and conserve its own water quantity resources.
   e. Whether the proposal will impair the ability of the residents of the Great Lakes basin to meet their own water needs.
   f. Whether the proposal will have a significant impact of lake levels, water use or the environment of the Great Lakes basin.
   g. Whether the proposal is consistent with all applicable federal, regional, interstate and international water resources plans.

The DEQ shall prepare a document responding to all comments regarding a proposed consumptive use from within Michigan's boundaries in excess of one million gallons per day average in any 30-day period. The Department shall not approve a consumptive use of the basin's water without observing the required public notices and comment procedures. The Departments decision shall be made at a public meeting held in accordance with the open meetings act.

PERMIT ME *(continued from page 11)*

prohibited—that is, if the DEQ issues a permit for the project requested by the applicant (or something less than that which was requested by the applicant), the project as approved by the DEQ can proceed, unless otherwise regulated or prohibited by county or local regulations. The permit approval rate by the DEQ is quite high in some of these areas, particularly with regards to the filling or alternation of wetlands.

The Permit Process

If you, your neighbors or your lake association are opposed to an area property owner engaging in one of the above-mentioned activities, what can be done? First, one must ascertain whether a permit application has been filed. Contrary to popular belief, the DEQ does not always have to notify adjoining residents of the pending permit application or hold a public hearing. For certain minor projects, the DEQ can issue a permit with virtually no notice to area property owners or the local governmental unit. For more significant projects, the DEQ will normally give notice prior to a permit being issued to neighboring riparian owners and the local governmental unit. Therefore, you may desire to ask the local government to notify you immediately if it receives such a notice. Members of the public and the local government do have a right to petition the DEQ to hold a public hearing before a particular permit is issued. Whether or not to hold such hearing is, however, generally within the discretion of the DEQ. If you desire to have a public hearing, you should submit a written request for one to the DEQ shortly after the DEQ sends out notice of a pending permit. If you do not act quickly, the deadline could pass regarding the holding of a public hearing.

Is there any right of appeal regarding the denial or granting of a permit? Yes. The aggrieved property owner [if a permit is turned down (or alternately, aggrieved neighbors if a permit which they oppose is granted)] can appeal to an Administrative Law Judge within the DEQ. If the aggrieved property owner or aggrieved neighbors do not prevail with the Administrative Law Judge, they can appeal the matter to the Director of the DEQ. Beyond the Director of the DEQ, the appeal process proceeds to the local county circuit court.

What can be done if someone commences one of the above activities without first obtaining a permit or exceeds the scope of a permit? First, the local DEQ office should be contacted. It is also often helpful to have the local municipality also contact the DEQ. Given the DEQ's limited budget and staff, the old adage "the squeaky wheel gets the grease" is often applicable. If the DEQ does not act vigorously, you, your neighbors or your lake association may have to commence court action to stop the violation. It is important to act quickly when violations occur. Those who "sit on their hands" where a known violation occurs could potentially lose their remedies in court. Also, many violators believe the old adage that "it is easier to seek forgiveness afterwards than to obtain permission beforehand," and proceed even without required permits or approvals.