Water Column

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Aquatic Plant Ecology: The Role of Rooted Plants in Lakes

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[*Editor's note*: Several Clean Lakes Program staff attended the 21st NALMS Symposium November 7-9, 2001 in Madison, Wisconsin. In this issue, Mary Wilson writes about one interesting topic.]

One major theme that came out of this year's NALMS conference was the role of plants in aquatic ecosystems. So often in lakes, any rooted plant is considered a weed that should be eliminated. Indeed, excessive macrophyte growth can impede swimming and boating.

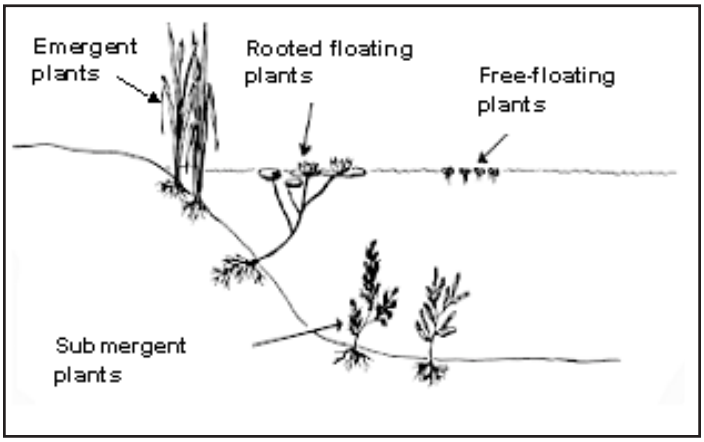
The littoral zone of a lake, the shallow areas where rooted plants can grow, provides important habitat for a number of organisms, including young fish. Littoral zones are considered the most biologically active and productive areas within lakes—that is, when the sediments and rooted plants are left intact and unharmed.

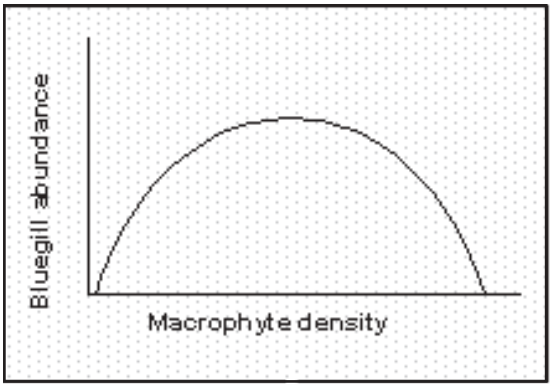
As a result of shoreline development, this valuable habitat is often altered to suit recreational or aesthetic desires. Increased loading of nutrients and sediments to the lake, also related to development, can cause a change in littoral zone habitat as well. Introductions of exotic plants, such as Eurasian watermilfoil or curlyleaf pondweed, further threaten the habitat quality at the lake's edge.

This can have serious consequences for the food web of the entire lake. Aquatic plants provide refuge for zooplankton (microscopic animals that eat algae), attachment sites for some macroinvertebrates (insects, snails, etc.), and spawning and shelter sites for many fish. Fish populations, in particular, may suffer when rooted plants are removed or changed because such changes affect their food resources and nesting habitat.

One specific concern relating to fish communities is the density, or thickness, of macrophyte growth. Aggressive plant control programs and disturbances such as powerboats operating within the littoral zone may thin native plant stands to

A complex littoral zone plant community provides habitat for many fish species.





Many fish, like bluegill, prefer an intermediate amount of plant growth.

the point where they offer little habitat benefit to aquatic populations.

On the other hand, you can also have too much of a good thing. Research from the University of Wisconsin has shown that many fish, such as bluegill and smallmouth and largemouth bass, are most successful when macrophyte density is intermediate. When plant growth is too thick, the mobility of these fish becomes restricted and space becomes limited. Extremely dense macrophyte growth is often the result of exotic plant species taking over native plant communities.

Another feature of the macrophyte community that is important to fish is habitat structure. The Minnesota Department of Natural Resources (DNR) reported that both black crappie and largemouth bass preferred to nest in complex plant communities in the littoral zone. Most often, these areas were adjacent to undeveloped shoreline.

Components of a complex macrophyte community include submergent plants (e.g., pondweed), rooted floating plants (e.g., pond lily, spatterdock), free-floating plants (e.g., duckweed), and emergent plants (e.g., cattail). Eurasian watermilfoil and other exotic plants threaten this complexity—they can choke out native species and create a simplified habitat not suitable for many desirable fish species

On many lakes, there are varying land uses and human interests along the shoreline. Some shoreline owners choose a more natural lakefront while others may prefer a sand beach for recreational use. Many human shoreline manipulations can mean danger for fish populations. When littoral zone habitat becomes fragmented or patchy, spawning fish are concentrated in discrete areas of the lake. According to research by the Minnesota DNR, this makes such fish more vulnerable to fishing pressures and weather conditions. In addition, research in Wisconsin has concluded that lakes with native plant populations in an undisturbed state are more resistant to invasive species gaining a foothold.

When developing a management strategy for aquatic plants, it is important to remember that all aquatic plants are not "weeds." Many plants, especially natives, have great structural and functional value to the ecology of a lake.

Sources used to prepare this article

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14th Annual Indiana Lake Management Conference—The Future of Indiana Lakes

The 14th Annual Indiana Lakes Management Conference will be April 5-6, 2002 at the Radisson Hotel at Star Plaza in Merrillville, Indiana. The Indiana Lakes Management Society (ILMS) sponsors this conference along with the Indiana Department of Environmental Management (IDEM).

Keynote speaker for this year's conference is Dr. Steven Souza, president of the North American

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Lake Management Society (NALMS) and a scientist with Princeton Hydro, a lake consulting firm in New Jersey that provides ecological, engineering, and planning services for water and wetland resources.

The registration fee for the conference is $60 per person, and covers admittance to all conference programs, all written conference materials, breaks, Friday lunch, Friday evening banquet, and Saturday breakfast and lunch.

The annual Silent Auction on Friday is lots of fun and helps raise money for the Society. Donations for the auction are encouraged.

Special conference room rates at the Radisson Hotel are $89 per night. Make your reservations soon by calling (800) 333-3333 and mention that you will be attending the Lake Management Conference.

For more information, contact Tina Hissong, Registration and Exhibit Coordinator, by phone: (574) 842-3686 or e-mail: <Imec@culcom.net>.

New Fish and Wildlife Rules

New administrative rules governing hunting, fishing, and endangered wildlife in Indiana went into effect on January 25.

The Indiana DNR began reviewing fish and wildlife administrative rules in March 2000. During the review process, biologists conducted more than 30 public meetings across the state to gather input.

"Hundreds of people contributed their ideas in the process," said Jon Marshall, public affairs chief for the DNR Division of Fish and Wildlife. "With this input, I think we have developed a package that strikes a balance between protecting wildlife and addressing social and ethical concerns."

The recently adopted rule package includes, among other things, extension of the deer season in urban deer zones, reduction of the antlered deer bag limit, expansion of Indiana's turkey hunting range and hours, and adjustments to fish size limits at various lakes.

A summary of rule changes is available at: <http://www.IN.gov/dnr/fishwild/about/finalsumm.htm>.

Information about the rule change process is available at: <http://www.IN.gov/dnr/fishwild/about/rules.htm>.

Contact: Jon Marshall, phone: (317) 232-1076.

Boat Ramp, Fish, and Wildlife Property Improvements

The Indiana DNR is planning a number of construction projects for this year that will improve angler access to public water and service at state fish and wildlife areas. The projects are funded by federal sport fish restoration and wildlife restoration programs.

Fishing and Boating Access

Boat ramp and public access site improvements, including the installation of handicapped accessible fishing piers and docks are scheduled for:

- Prickett Park, St. Joseph County
- Diamond Lake Public Access Site, Noble County
- Engle Lake Public Access Site, Noble County
- Sacarider Lake Public Access Site, Noble County
- Sparta Lake Public Access Site, Noble County
- Oliver Lake, Lagrange County
- Wall Lake Public Access Site, Lagrange County

Fishing Ponds at Jasper-Pulaski FWA

DNR officials also plan to build four one-acre fishing ponds at the Jasper-Pulaski Fish and Wildlife Area near Medaryville, Ind.

Hoosier Boaters Provide $1.1 Million to Protect Water Quality, Reduce Soil Erosion

The state has awarded 30 grants that will improve lakes and rivers in 33 counties and the money is being provided by Hoosier boaters.

The grants, which supplement local budgets for local projects, will help fund lake and watershed diagnostic studies, lake and watershed management plans, post-construction monitoring, engineering feasibility studies, design and construction, and land treatment projects.

The grant monies come from annual fees for boat registration. Five dollars from each registration is reserved for the DNR grant program. The grants are approved by the State Soil Conservation Board and administered by the DNR Division of Soil Conservation.

"This is a great example of Hoosiers working together to improve our environment," said Larry D. Macklin, then director of the DNR. "These projects are funded by boaters and they will certainly be beneficiaries of the enhancements.

Have you checked out the Indiana Clean Lakes Program Web page lately?

Take a look at:

<http://www.spea.indiana.edu/clp/>

and see what's new and happening with the Program and with Indiana lakes!

"But the projects do more. They will restore not only natural beauty but also ecosystems," he said. "They'll result in more varieties of fish, better fishing, boating, and other recreation. In the end, all Hoosiers benefit."

The grants continue a 13-year program that provides technical and financial assistance to local units of government and organizations. The projects address soil erosion- and nutrient-related problems affecting public-access lakes and streams.

The counties with projects receiving grants are: Allen, Brown, Cass, Clinton, Decatur, Fulton, Greene, Howard, Jackson, Jasper, Jefferson, Jennings, Kosciusko, LaGrange, Lawrence, Marshall, Miami, Monroe, Montgomery, Newton, Noble, Orange, Parke, Posey, Pulaski, Randolph, Ripley, Scott, Steuben, Sullivan, Wayne, White, and Whitley.

The projects improve water quality through the installation of grass cover, filter strips, and projects such as wetlands, to reduce sedimentation and nutrient runoff. The grants will also fund studies to document water-related problems and solutions.

The 2001 grants bring to 230 the number of projects that have received state boating-funded monies since 1988. Those projects have enhanced 133 rivers, lakes, and streams and 65 watersheds in 51 counties. *(Division of Soil Conservation News Release)*

Upcoming Meetings

April 5-6, 2002. 14th Annual Indiana Lakes Management Conference, "The Future of Indiana Lakes." Radisson Hotel, Merrillville, Indiana. Contact: Mark Mongin, (317) 580-8299; e-mail: <markm@sepro.com>.

April 23-26, 2002. Enhancing the States' Lake Management Programs, "Managing Invasive Species in Lakes and Reservoirs." Congress Plaza Hotel, Chicago, IL. Contact: Bob Kirschner, (847) 835-6837; e-mail: <bkirschn@chicagobotanic.org>.

October 7-9, 2002. Wetlands 2002. Association of State Wetlands Managers' annual conference, "Restoring Impaired Wetlands and Other Waters." Downtown Indianapolis. Contact: James Robb, Indiana Department of Environmental Management, (317) 233-8802; e-mail: <jrobb@dem.state.in.us>; website: <http://www.core4.org/wetlands>.

October 30-November 1, 2002. NALMS 2002: A New Frontier, "Staking Our Claim in the Management of Our Lakes and Reservoirs." Anchorage, Alaska. Contact: Terry Thiessen, (608) 233-2836; website: <www.nalms.org>.

In Memoriam

Richard "Dick" Reed, long-time Volunteer Lake Monitor for Crooked Lake at Angola (Steuben County) passed away in January after losing his long and valiant fight with cancer.

Dick truly loved the lakes and fought the cause of good stewardship and planning for growth and development in the county. He was a past president of the Steuben County Lakes Council.

Dick was an inspiration and role model for everyone living on and enjoying the lakes. His footsteps will be seen for generations to come.

Andy Hosey is carrying on the Secchi disc transparency and water quality analyses for Crooked Lake.

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