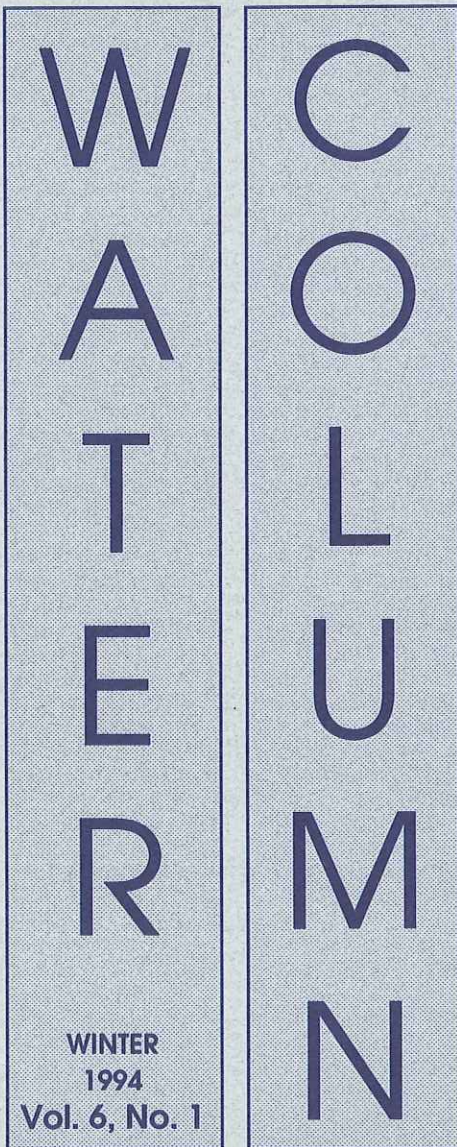




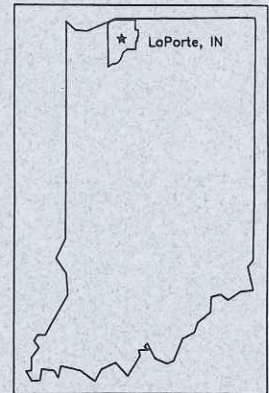
Office of Water Management
Indiana Department of
Environmental Management



6th Indiana Lake Management Conference

The 6th Annual Indiana Lake Management Conference will bring local, state, and federal officials; lake management professionals; academics; and lake citizens together to work toward the common goal of more effectively managing Indiana's lakes. This one-and-one-half day conference will be the only time during 1994 when all those interested in lake management in Indiana will be together in one place.

The conference, sponsored by the Indiana Department of Environmental Management in cooperation with Indiana University's School of Public and Environmental Affairs, will be held at the Pueblo Holiday Inn in LaPorte, Indiana. Historic LaPorte, the county seat of LaPorte County, is a community of 22,000 nestled among six natural lakes. The community has been active in managing its lakes and has completed a feasibility study on Clear Lake through the IDNR Lake and River Enhancement Program.



The conference will begin at 12:00 p.m. Friday, April 29 and will conclude Saturday April 30 at 4:00 p.m. The theme for this year's conference is *Aquatic Plant Management*. The Indiana Lakes Management Society will hold its annual meeting during the conference.

The Holiday Inn offers superb meeting and exhibit facilities and has an indoor pool, sauna, whirlpool, weightroom, gameroom, full service restaurant, and lounge. A block of rooms at the Holiday Inn is being held for the conference until April 18, 1994 at the rate of \$54 for single or double. To reserve a room, call (219) 362-4585, ask for the *Sales Office*, and mention that you will be attending the Indiana Lake Management Conference. A list of other motels will be included with your registration confirmation.

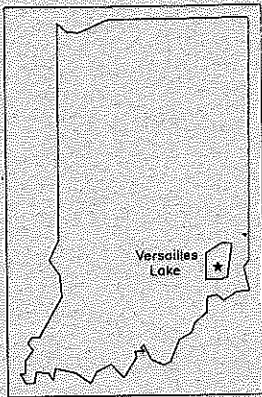
A preliminary program with registration forms will be sent out in the next month.

Versailles Lake Receives Federal Grant

The Indiana Department of Environmental Management (IDEM) recently awarded a grant to the Historic Hoosier Hills Resource Conservation and Development (RC&D) Council to conduct a diagnostic/feasibility study of Versailles Lake in Versailles, Indiana. The grant was funded in the amount of \$50,000 by the U.S. Environmental Protection Agency through the Clean Water Act Section 314 Clean Lakes Program. Matching funds were provided by the Indiana Department of Natural Resources (\$45,000) with the Versailles Town Board and the Tyson Foundation each contributing \$2,500.

Versailles Lake is located in Versailles State Park in southeastern Indiana's Ripley County. The park is the second largest in the state and offers swimming, fishing, camping and a number of other recreational activities. It is a significant local and state resource which generates a large economic benefit for the surrounding area.

A dam was constructed on Laughery Creek creating the lake in 1956. The lake has a surface area of approximately 230 acres and a



watershed of 115,200 acres. The lake serves as a sole source of drinking water for the towns of Versailles and Holton and Versailles State Park.

The diagnostic/feasibility study will focus on understanding the dynamics of the lake and the watershed system. The ultimate goal is to find ways to provide long-term protection and improvement of the lake and downstream

water quality. The management plan which will result from this effort will provide vital guidance for local officials charged with protecting and enhancing this important regional body of water and its watershed. For more information, please contact Sharen Jarzen of the IDEM at (317) 243-5145.

Summary of Ambient Biological Monitoring Program Collections and Progress

The Biological Studies Section within IDEM's Office of Water Management conducts a wide range of biological monitoring and surveillance studies on Indiana lakes and streams. Here is a summary of recent activities within the Section.

Fish Tissue Contamination Monitoring Program

The 1993 fish tissue contamination monitoring program included locations previously sampled and/or currently listed on the state's fish consumption advisory list or suspected of possible contamination. Biological Studies personnel submitted 56 fish tissue samples for contaminant analysis from 26 different locations on 13 different streams in 7 counties to a contract analytical laboratory in Wisconsin. All samples were analyzed for percent fat, percent moisture, organochlorine pesticides, total PCBs, lead, cadmium, and mercury. In addition, 44% of the samples were analyzed for specific polycyclic aromatic hydrocarbons by high pressure liquid chromatography (HPLC) method. These analytical results will be available next spring.

Aquatic Sediments Contamination Monitoring Program

No aquatic sediment samples were collected for contaminant analysis by the Biological Studies Section in 1993 as there were inadequate funds available within our laboratory services contract for both fish and sediment contaminant analyses.

Biological Community Monitoring

Macroinvertebrate Sampling: The Biological Studies Section is currently involved in a long-term effort to accumulate an extensive database of benthic macroinvertebrate community data on Indiana rivers and streams. Benthic macroinvertebrates are organisms, such as crayfish, snails, and aquatic insects, that live on stream or lake bottoms. Many of these organisms can be used as indicators of environmental change. This multi-phase program will be used to help establish biological criteria (biocriteria) for the Indiana water quality standards. Results of this study will also be used to support the permits program and potential enforcement actions. To date, approximately 75% of the state, including the northern one-half of the state, the White River Basin, and the Wabash River Basin through Knox County, has been sampled. This includes 647 sites on 456 rivers and streams in 79 counties. The data set includes 2958 benthic macroinvertebrate subsamples. For the 1993 field season 209 sites on 155 streams in 48 counties were sampled for a total of 481 field collections. These samples (1993) will be subsampled and processed to family level identification throughout the winter months.

As improvements continue to be achieved in the quality of point source discharges within the state, the overall ecological integrity of the streams and rivers will be controlled by less regulated sources of pollution such as nonpoint or diffuse sources. Biological monitoring integrates the cumulative effects of all environmental stresses and provides an appropriate tool to measure and detect the effects of this pollution.

Habitat Evaluations: Habitat evaluation methods are being used at all locations where samples are collected. Currently, staff are using three methods of rapid evaluation: (1) USEPA's Habitat Evaluation Procedure (HEP) explained in their Rapid Bioassessment Protocol manual (EPA/444/4-89-001), (2) Ohio EPA's Qualitative Habitat Evaluation Index (Ohio EPA, 1989), and (3) Habitat Assessment by Barbour and Stribling, in Proceedings of Biological Criteria: Research and Regulation (EPA-440/5-91-005). The habitat

information is being used for correlation and evaluation with macroinvertebrate and fish communities, and to identify habitat impaired stream reaches.

Fish Community Sampling

IDEM has been working cooperatively with Tom Simon of U.S. EPA Region V's Water Division, to develop an enhanced biological monitoring program for fish communities. For this work, Indiana was divided up according to geographic provinces or ecoregions. Ecoregions represent geographic areas which are relatively similar in land use, topography, soils, and potential natural vegetation. The first report from this work has been published for the Central Cornbelt Plain Ecoregion (EPA-905/9-91/025). A total of 197 headwater and wading stream sites were sampled in the Central Corn Belt Plain Ecoregion in order to develop and calibrate an Index of Biotic Integrity (IBI) for use in this Indiana ecoregion. Most of this fieldwork was done in 1990.

Biological Studies Section personnel participated in fish community sampling of the Huron/Erie Lake Plain Ecoregion in 1991, and the Interior Plateau and Interior River Lowland Ecoregions in 1992. Similar documents describing the development of a calibrated IBI for each of these ecoregions will be forthcoming from the U.S. EPA. A draft version of a report entitled *Large River Biocriteria Report For White River, Indiana* (EPA 905/R-92/006) was reviewed last spring. In the summer of 1993, staff from the Special Projects and

Biological Studies sections participated in a Wabash River fish community study. Future ongoing monitoring and IBI determination for biological criteria development will be performed by the Biological Studies Section. Biological Studies Staff are currently working out the details for computerization and database management of all field data generated from this effort, and from future fish community monitoring (Jim Stahl, IDEM).

Aquatic Plants: Through the Looking Glass

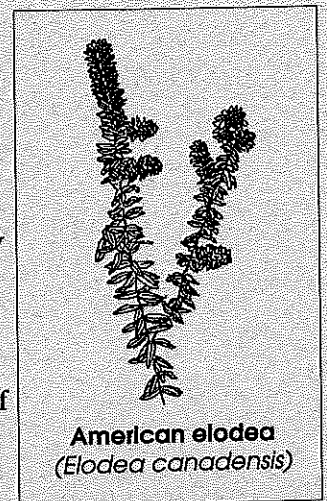
by Susan Borman
WDR-Western District Aquatic Botanist
(reprinted from *Lake Tides*, 18(4))

As winter envelops our lakes and ponds, an icy ceiling is constructed between the life of the aquatic world and our own. For years it was assumed that aquatic plants were dormant during the winter months, but research has shown a number of plants continue to grow under the ice. These winter-hardy plants add oxygen to the water and structure to the water fish habitat.

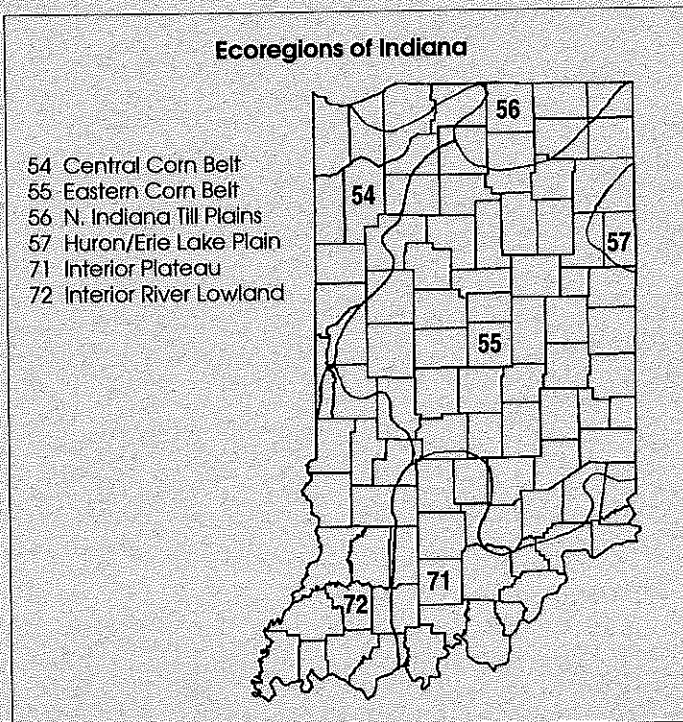
The winter hardiness of aquatic plants has a lot to do with their success or failure to grow the following spring. It is an important competitive adaptation we often overlook during mid-summer plant surveys when we are sorting through the contributing factors that make one plant species more successful than another. Plants that don't have an effective strategy for winter survival are not likely to become dominant members of the aquascape.

Through the looking glass of ice-covered lakes, you will find a variety of strategies aquatic plants have developed for getting through the winter.

Put on a heavy coat and sleep through it. The bushy pondweeds (*Najas* spp.) and horned pondweed (*Zannichellia palustris*) are true annual plants in the Wisconsin aquascape. They produce seeds with heavy coats to withstand the rigors of winter and then they completely die back, depending on the viability of their seeds to produce new plants the next spring. The winter survival strategy of



American elodea
(*Elodea canadensis*)



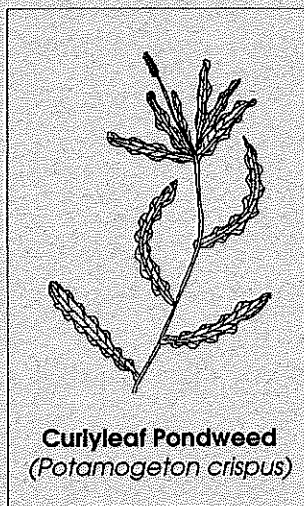
these annuals includes producing large numbers of seeds to compensate for losses giving the advantage of new genetic combinations to enhance survival in the next season.

Make special provisions. Many of our aquatic plants produce specialized over-wintering structures that they use to reproduce. These vegetative structures are called *propagules* and include winter buds, bulb-like offshoots called turions, hardy rhizomes and tubers. These propagules lack the genetic diversity of seeds, but they are larger with more stored carbohydrates and nutrients to support rapid growth in the spring. If you take a close look at the narrow-leaved pondweeds (*Potamogeton* spp.), native watermilfoils (*Myriophyllum* spp.) and bladderworts (*Utricularia* spp.) in the fall, you will find these specialized turions or winter buds on many branches. The tubers of wild celery (*Vallisneria americana*) are another good example of an over-wintering structure high in stored energy.

Tough it out. A number of aquatic plants have adaptations to tolerate cool temperatures and low light so the entire plant can survive under the ice. A check through an ice fishing hole may reveal growing green shoots of a number of plants including common waterweed *Elodea canadensis*, coontail (*Ceratophyllum demersum*), curlyleaf pondweed (*Potamogeton crispus*), largeleaf pondweed (*Potamogeton amplifolius*) and fern pondweed (*Potamogeton robbinsii*).

The growth of these winter-hardy species is dependent on light penetration through ice and snow cover. On clear winter days with minimal snow cover these plants can achieve about 10-20% of their summer photosynthetic rates. This winter growth can put them at a competitive advantage when spring arrives and other aquatic plants are just breaking dormancy to sprout from seeds, turions and rhizomes.

The most thoroughly winter-adapted of these plants is curlyleaf pondweed. It is native to cold water streams of Europe and actually has a growth cycle that is designed for dormancy during the heat of summer rather than the cold of winter. Curlyleaf pondweed forms mature turions by mid-July and the summer shoots begin to decay. As water temperatures cool in the fall, the curlyleaf turions sprout green winter shoots. These are different in appearance from the summer shoots: the leaf-



Curlyleaf Pondweed
(*Potamogeton crispus*)

margin is quite smooth and the leaves are more translucent. Look for these bright green shoots during winter lake outings.

Whether they over-winter with durable seeds, germinate from winter buds, or tough it out intact, the aquatic plants we see in the summer have an effective strategy to survive the winter. The importance of this plant community during winter and spring has often been overlooked and has an important role to play in providing fish habitat as well as influencing the overall dynamics of the aquatic ecosystem.

Grass Carp Stocking in Hoosier National Forest Ponds

Analysis of recent fish surveys indicate that Henderson Pond, a two-acre fishing pond within the Hoosier National Forest in Lawrence County, is experiencing reduced growth rates and survival of managed large-mouth bass and bluegill populations. It appears the cause is extensive growth of watershield (an aquatic plant), which now covers 80% of the water surface. In an effort to control the aquatic plants, reproductively sterile grass carp will be introduced in the spring of 1994 to this pond. As a pilot project, the carp's effect will be monitored closely. An IDNR stocking permit has been received, and final planning is now underway. A decision document should be complete by mid-February, with fish being introduced in the spring of 1994. Contact Libby Rice at (812) 358-2675 with any comments or for more information (*Hoosier Quarterly*, Jan. 1994).

Wildlife habitat Restoration Efforts Focus on Baugo Creek and Lake-of-the-Woods Watersheds

Since 1988, the U.S. Fish and Wildlife Service (FWS) has restored over 3000 acres of drained wetlands throughout Indiana. Valuable cooperation has come from local Soil and Water Conservation Districts, the Soil Conservation Service, the Indiana Department of Natural Resources, private organizations such as Ducks Unlimited, and hundreds of private landowners. Now, through a special grant, the FWS has obtained funds specifically to restore wetlands in the Baugo Creek and Lake-of-the-Woods watersheds in northern Indiana.

Baugo Creek is located along the border of Elkhart and St. Joseph Counties. In Elkhart County, its watershed includes parts of Locke, Union, Olive, Harrison, Baugo, and Concord Townships. In St. Joseph County, the watershed includes parts of Penn, Center, and Madison Townships. Lake-of-the-Woods is located in northeast Marshall County and the watershed includes much of North Township and the western edge of German Township.

Wetlands are important because they provide habitat for literally hundreds of species of wildlife in Indiana, including many threatened and endangered species. Some animals, such as waterfowl, use wetlands for most of the year. Others may use them only seasonally. For example, the dense vegetation in wetlands provides excellent winter cover for pheasants. Wetlands also benefit people by retaining or slowing flood waters, eliminating contaminants in groundwater, providing water during periods of drought, reducing soil erosion, and affording recreational opportunities such as hunting and wildlife watching.

Because so many wetlands have been drained over the years, there is renewed interest in restoring them wherever possible. Sites that have been drained by field tiles and ditches are good candidates for restoration. Many such areas become too wet to farm when drainage tiles break down or ditches become plugged. Often landowners feel it is not worth their money or time to improve drainage on these wet areas and they become interested in restoring the wetland. Many landowners also have a desire to see more wildlife on their property.

The FWS will usually restore wetlands at no cost to the landowner. These wetlands are not fish ponds, but are shallow water areas between one and three feet deep that provide benefits to wildlife and the landowner alike. The landowner must agree not to drain the wetland for at least ten years, during which time the FWS will pay for any repair costs that might occur. There are no easements or other restrictions involved and the landowner retains ALL property rights. Cooperation on the part of the landowner is completely voluntary.

In addition to restoring wetlands, the FWS is restoring bottomland hardwood forests and planting native prairie grasses. Areas along streams and rivers where trees have been removed are good candidates for bottomland hardwood restoration. FWS will pay for the trees, the actual planting, and the first year of weed control. Likewise, costs of establishing prairie grasses are paid for by the FWS.

Often, landowners ask if these types of habitat restorations can be done on land enrolled in the

Conservation Reserve Program (CRP). The answer is usually "yes" and property owners should not be afraid to ask about this program for land already in CRP.

For more information about habitat restoration opportunities, contact the U.S. Fish and Wildlife Service, 620 South Walker Street, Bloomington, Indiana 47403, or call (812) 334-4261. The Service restores habitat throughout the state, so you do not have to be in the Baugo Creek or Lake-of-the-Woods watersheds to participate (*John Conomy, U.S. Fish and Wildlife Service*).

Hoosier National Forest Lakes Get Fishing Piers

A decision memo was signed December 7, 1993 allowing for the construction of two handicapped-accessible fishing piers on lakes within Hoosier National Forest. One pier will be at Tipsaw Lake, and another at Celina Lake. Both will be constructed through challenge cost share agreements with Indiana BASS Chapter Federation. The work is likely to begin in January and should be complete in March before water levels rise. For more information contact Lloran Johnson (812) 547-7051 (*Hoosier Quarterly, Jan. 1994*).

Zebra Mussels and Carp

A note in *Water Newsletter* informs us that the zebra mussel may soon meet its match, with a worthy opponent—the black carp. The black carp has powerful teeth which can crush mollusks the size of golf balls. According to *Water Newsletter*, at least three U.S. fish farms are preparing to farm the fishy challenger so that the carp can be released to challenge mussels in the nation's lakes and waterways.

Worried about the possibility of exchanging one problem for another, conservation officials are looking for nonreproducing black carp before encouraging raising and release (*Water Newsletter 35 (12)*).

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Meetings

April 29-30, 1994. Sixth Indiana Lake Management Conference. Holiday Inn, LaPorte, IN. Contact: Bobby Brooking, (812) 855-4556.

May 2-3, 1994. "Empowering Watershed Stakeholders: a Training Workshop," sponsored by NE Illinois Planning Commission, U.S. EPA, USDA and CTIC, Blackstone Hotel, Chicago, IL. Contact: Bob Kirschner, (312) 454-0400.

May 4-5, 1994. "Enhancing the States' Lake Management Programs: Building Partnerships for Lake and Watershed Protection," sponsored by NE Illinois Planning Commission and U.S. EPA, in cooperation with North Am. Lake Mgmt. Society, Blackstone Hotel, Chicago, IL. Contact: Bob Kirschner, (312) 454-0400.

July 12-15, 1994. "Sustaining the Ecological Integrity of Large Floodplain Rivers: Application of Ecological Knowledge to River Management," La Crosse, WI. Contact: Kenneth Lubinski, US Fish & Wildlife Service, (608) 783-7550.

October 31-November 5, 1994. 14th International Symposium of the North American Lake Management Society, Orlando, FL. Contact: NALMS Business Office, (904) 462-2554.

WATER COLUMN

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PERSPECTIVES

Unlike the environmental disasters encountered by prehistoric and primitive man, the modern crisis is largely man-made—a consequence of the failure of human insight and ingenuity to predict and prevent the ill effects of human imagination and purpose. Yet, this shortcoming of perception does not appear to be inherent in human mentality, but more likely an evidence of its uneven expression in human culture. The remedy for failure to assess the needs for continued life on earth lies in the exercise of the human capacity to observe, to learn, and to apply, with restraint appropriate to the circumstances.

—Lynton Keith Caldwell in
International Environmental Policy

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