CLEAN LAKES PROGRAM

Office of Water Management
Indiana Department of
Environmental Management

WATER COLUMN

SPRING 1989
Vol. 1, No. 2

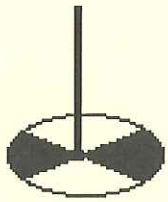
Lake Management Conference Reminder

The Indiana Lake management Conference will be held on Saturday, April 22, 1989 at the Center Lake Pavilion in Warsaw, Indiana. The program agenda includes discussions of state and federal lake assistance programs, management activities at Indiana lakes, aquatic plant management techniques, fundraising ideas for lake associations, and volunteer lake monitoring. The conference program begins at 9:30 a.m. with registration from 8:30-9:30. If you haven't preregistered already, contact Bill Jones at SPEA 347, Indiana University, Bloomington, IN 47405; (812) 855-4556.

Volunteer Lake Monitoring Program

Do you want to help monitor water quality changes in your lake? Become a volunteer in the Indiana Volunteer Lake Monitoring Program. If you have access to a boat, the time to spend 1-2 hours on your lake once every two weeks, and a sincere interest in your lake, you have what it takes. Volunteers use Secchi disks to measure water clarity, which is affected by algal growth, suspended silt, and dissolved color. Changes in Secchi disk transparency give lake managers an indication of seasonal and long-term changes in the water quality of lakes.

Become involved! For more information contact: Christine Mathias, SPEA 340, Indiana University, Bloomington, Indiana 47405.



Secchi disk

Decrease in Pollutants Opens 600 Miles of Indiana Water for Fishing

Indiana Department of Environmental Management, Indiana State Board and Health, and Indiana Department of Natural Resources officials say sportsmen fishing Hoosier waterways will be able to eat their catches from an additional 600 miles of streams and rivers in Indiana this spring.

This reduction in the number of Hoosier waterways containing fish tainted with industrial and agricultural pollutants was announced following the recent completion of analysis of samples of tissues from fish taken from a number of streams, lakes, rivers, and reservoirs. The results of those analyses indicate that the levels of contaminants in all Indiana waterways are decreasing; however, some advisories will remain in effect for streams and waterways covered in previous years. And, new advisories are being issued for approximately 40 miles of waterway not restricted by earlier advisories.

State Health Commissioner Woodrow A. Myers, Jr., M.D., said the advisories include waterways where concentrations of chlordane, polychlorinated biphenyls (PCBs), dieldrin, and/or (DDT) in the tissues of certain fish exceed action levels set by the U.S. Food and Drug Administration.

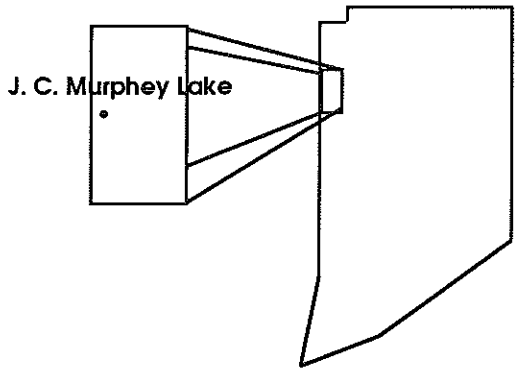
Since the safety of consuming contaminated fish remains unclear

in some cases, ISBH officials believe the best way to protect the health of Indiana's citizens is to limit the consumption of fish known to be contaminated with these chemicals. The risk can be further reduced by preparing fish as skinless fillets, trimming all fat and by baking or broiling the fish so the fat can drip off while cooking. Preparing and cooking fish in this manner can reduce the amount of contamination by nearly 50%, according to Dr. Myers.

The 12-acre Decatur County Reservoir near Greensburg is once again the only lake, other than Lake Michigan, listed on the Indiana Fish Consumption Advisory for 1989. However, due to a decline in tissue concentrations of contaminants, the advisory has been downgraded from level 3 to level 2. This means that an adult many consume up to 1/2 pound of fish per week from this reservoir. However, children and women of childbearing age still should not consume any fish from this water body.

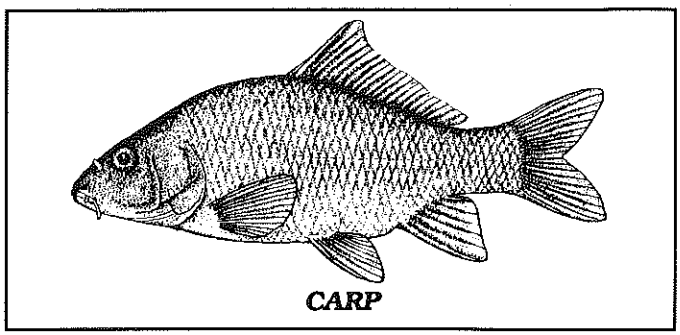
Fisheries Renovation at J. C. Murphey Lake

The planned renovation of J. C. Murphey Lake at Willow Slough Fish and Wildlife Area in Newton County should take care of a troublesome carp population and restore good fishing to this popular northwestern Indiana lake. Many carp will be eliminated with the spring drawdown of the lake.



A complete eradication should take care of the remaining undesirable fish. Once the eradication is complete, hatchery trucks will move in with 50,000 channel catfish, 500,000 bluegills, 500,000 redear sunfish, and 100,000 largemouth bass.

By the end of 1990, some of the panfish will be big enough to interest fishermen, and by 1991 and 1992, the fish populations should be going strong. This technique of restoring a lake's fish populations has been successful at Sylvan Lake in Noble County, Starve Hollow Lake in Jackson County, and Palestine Lake in Kosciusko County in recent years.


CARP

DNR Fisheries Surveys Scheduled for 1989

The Indiana DNR plans to conduct lake surveys at over 60 lakes and ponds during 1989. A DNR lake survey consists primarily of a fisheries survey using electroshocking, gill nets, traps and/or shoreline seining. At the time of the survey, DNR personnel also measure temperature and dissolved oxygen profiles and collect water samples for analysis of pH, alkalinity, total phosphorus, nitrates, ammonia, and other parameters if warranted. Most of the lakes to be sampled are listed below.

County	*Lake*
Allen	Ft. Wayne Ponds
Brown	Yellowwood
Carroll	Freeman
Davies	Dogwood Prairie Creek
Fayette	Manlove
Howard	Kokomo
Huntington	Salamonie
Kosciusko	Hoffman Dewart Beaver Dam Palestine Caldwell Silver Winona

County	*Lake*
LaGrange	Shipshewana
	Little Turkey
	Fish
	Adams
Lake	Cedar
LaPorte	Pine
	Stone
	Fish
Marshall	Lake-of-the-Woods
Monroe	Bryant's Creek
	Cherry
Morgan	Whip-Poor-Will
Noble	Cree
	Sacarider
	Crane
	Bristol
	Skinner
	Gilbert
	Crooked
Owen	Owen-Putnam S.F.
	Ponds
St. Joseph	Pleasant
	Riddles
Steuben	James
	Snow
	Jimmerson
	Marsh
	Long
	Clear
	Crooked
	Hamilton
Starke	Koontz
	Bass
Sullivan	Reservoir #29
Union	Whitewater
Wabash	Hominy Ridge
Wells	Kunkel
White	Shafer

Questions from Readers

Q. What is spring turnover?

A. Spring turnover occurs when the upper layers of a thermally stratified lake warm until the whole water column is approximately the same temperature (homothermic). With homothermic conditions, a small input of energy, such as wind, can cause all the layers in the lake to mix completely. This mixing is important because it oxygenates all the water and mixes nutrients which had been released from the sediments during winter stratification. The nutrient release can enhance aquatic weed and algal growth, especially in eutrophic lakes, once warmer temperatures return. The reoxygenation of the water creates an environment better suited for fish survival. During the summer, cold, dense water lies at the bottom of the lake and warm, less-dense water is at the lake surface. This layering of water due to temperature differences is called thermal stratification. As the surface water cools in the fall, homothermic conditions again result and the lake undergoes fall turnover.

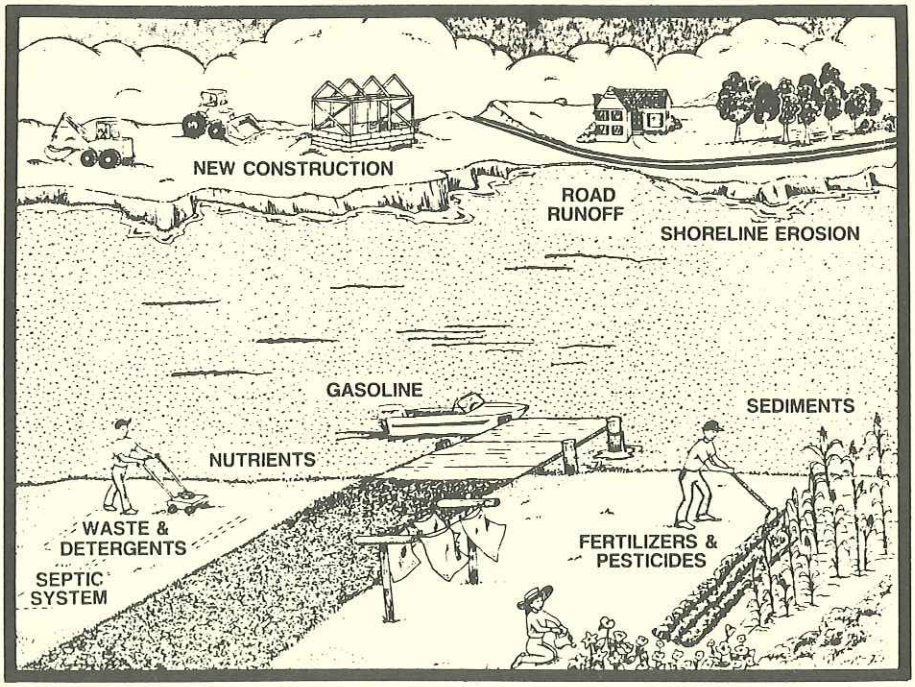
Q. As a farmer, what types of plowing practices can I follow to help maintain the water quality of a nearby lake?

A. Minimum tillage techniques help to slow nutrient movement to lakes. Limiting exposure of bare earth to the shortest possible time also helps reduce erosion and nutrient movement. When plowing or planting, leave undisturbed areas of natural vegetation near streams and edges of lakes. These buffer strips help to filter fertilizer and pesticide runoff from the fields. Plowing and planting along the contours of the land can also save land from erosion. If two crops can be planted side-by-side (stripcropping), the differing root structures can enhance soil stability, especially in high slope (8-15%) areas. Contact your local Soil Conservation Service office for more information.

Q. Why can't we get rid of these mosquito-ridden swamps and fill them in for parks or homes?

A. Wetlands play an important role in improving and maintaining water quality. They remove nutrients such as phosphorus and nitrogen and thus help prevent over-enrichment of waters (eutrophication). Wetlands also filter harmful chemicals, such as pesticides and heavy metals, and trap suspended sediments, which otherwise would produce turbidity and sedimentation in the lake. They, therefore, serve as natural buffer for nonpoint pollution sources. In fact, in some areas artificial wetlands

How Many of These Non-Point Sources of Pollution Do You See Out Your Window?



Source: *Lake and Reservoir Guidance Manual, EPA 440/5/88-002.* U.S. EPA, 1988.

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are being constructed to filter runoff and wastewater before it is discharged into lakes. In addition, wetland vegetation reduces shoreline erosion by dissipating wave energy. Wetlands also serve as excellent fish and game habitat and hence are more valuable to the well-being of your lake than shoreline developments. For more information, contact IDEM—Office of Water Management: (317) 243-5035 or the IDNR—Division of Water: (317) 232-4160.

Aquatic Vegetation—Part I: Benefits and Detriments

Aquatic vegetation is often considered a nuisance and an eyesore by many lake property owners. In an attempt to beautify the lake front, gain access to open lake water, improve fishing, or to simply increase the area of the lake available to motor boating, chemicals and other techniques are often used to eradicate aquatic "weeds." People who consider all aquatic plants as weeds, fail to consider the positive benefits provided by aquatic vegetation.

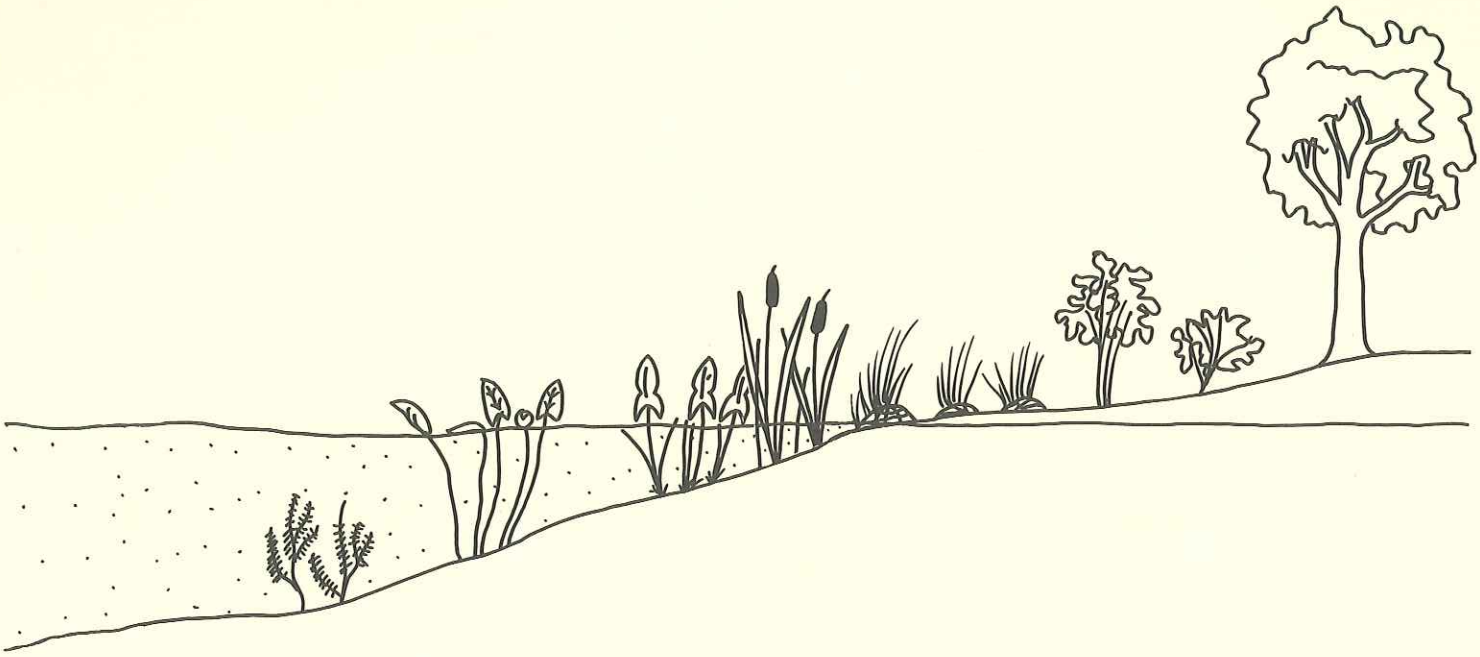
The natural lake shoreline is colonized by a variety of plants adapted to different moisture conditions and water levels. Trees and shrubs grow on the upland areas, sedges and grasses grow on wet beach soil, emergent plants are rooted under water with stems above water, submergents grow entirely under water, and finally, free-floating algae (phytoplankton) grow in the open water (see Figure 1).

Aquatic plant communities protect the shoreline from erosion by dampening the force of waves and stabilizing shoreline soils. Severe shoreline erosion can result in the absence of vegetation. Vegetation can also provide screening for the lakeshore homeowner and buffer noise from motor boats. Many species of aquatic plants, such as the white water lily and pickerelweed, are aesthetically pleasing because they have showy flowers or interesting shapes. Aquatic vegetation also provides fish habitat and spawning sites, waterfowl cover and food, and habitat for macroinvertebrates. These aquatic bugs are a valuable part of the food web (see Table 1, page 6).

On the other hand, some aquatic plant species interfere with water uses because of their rapid growth rates, high productivity, long growing season or body shape. Excessive aquatic vegetation can hamper boat access and swimming, is aesthetically displeasing, and may be too dense to benefit fish and wildlife.

How much aquatic vegetation is too much? The answer to this really depends on lake uses and whether the vegetation interferes with desired uses. For example, although Lake Shakamak's surface area is nearly one-half covered by a diverse blend of rooted aquatic vegetation, it is this vegeta-

Figure 1
Aquatic Plant Succession



Open Water	Submergent Aquatics	Floating Aquatics	Emergent	Wet Meadow	Shrubland	Trees
e.g., algae	e.g.,water milfoil pondweed	e.g., pond lily spatterdock	e.g. arrowhead cattail	e.g., sedges grasses	e.g., willow buttonbush	e.g., aspen silver maple

tion that allows the lake to produce the nice panfish that attract anglers to the lake.

One management goal is to produce stable, diverse, moderately dense aquatic plant communities containing high percentages of species with desirable attributes. In lakes dominated by a single species, additional species can be planted to provided greater diversity and benefits. Where dense vegetation limits boat access to fishing areas or docks, pathways can be opened with mechanical harvesters or vegetation screens. Dense vegetation around docks, piers, boat ramps or beaches can be managed by the selective use of herbicides, vegetation screens or harvesting. Again, the goal is to *manage* aquatic vegetation, not *eradicate* it.

NEXT ISSUE—Part II: Management Techniques

WATER COLUMN

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Table 1. Attributes of Shoreline Vegetation Buffer

Positive Attributes	*Recommended Plant Types*
Shoreline Erosion Protection	Grasses, Emergents
Wave Dampening	Emergents
Screening	Emergents, Shrubs
Shade	Trees
Noise Buffer	Emergents, Shrubs
Aesthetics	Pretty Flower or Plant Form
Fish Cover	Submergents, Floating Leaves
Fish Spawning	Varies
Animal Cover	Emergents, Shrubs
Animal Nest Sites	Varies
Animal Food	Varies
Macroinvertebrate Habitat	Submergents
Negative Attributes	*Management Options*
Hamper Boat Access	Harvesting, Herbicides, Screening
Hamper Swimming	Harvesting, Screening, Sand Blanket, Herbicide with Restriction
Block View	Harvesting
Unaesthetic	Harvesting, Herbicide, Screening, Shades
Too Dense for Positive Fish and Wildlife Benefits	Harvesting, Herbicide, Screening, Shades

Source: Klessig, et al. 1986. *Lake and Reservoir Management*, 2: 436-442.

Meetings

April 22, 1989—Indiana Lake Management Conference. Center Lake Pavilion, Warsaw, Indiana. Sponsored by: Indiana Department of Environmental Management. Contact Bill Jones, (812) 855-4556.

April 23-26, 1989—Making Non-Point Pollution Control Programs Work, A National Conference. Clarion Hotel, St. Louis, Missouri. Sponsored by: National Association of Conservation Districts, U.S. EPA, North American Lake Management Society, Soil and Water Conservation Society, Soil Conservation Service and others. Contact (202) 547-6223.

(Continued on page 8)

Lake Enhancement Program

The Department of Natural Resources Lake Enhancement Program has provided technical and financial assistance to 21 projects in Indiana over the past year. Most of the projects involved feasibility studies to diagnose lake problems and make management recommendations. Two projects have moved on to the design phase. The status of lake enhancement projects is given below. For more information, contact Gary Doxtater, Lake Enhancement Program at (317) 494-8383, or your local Soil and Water Conservation District.

Lake Name	*Entity*	*County*	*Project*	*Cost*
Maxinkuckee	Lake Maxinkuckee Environ. Board, Inc.	Marshall	Design Plan	$22,000
Manitou	Lake Manitou Association, Inc.	Fulton	Design Plan	32,095
Koontz	Koontz Lake Environmental Enhancement Committee	Marshall	Feasibility Study	18,410
Fish	Fish Lake Property Owners Association	LaPorte	Feasibility Study	25,200
Sylvan	Sylvan Lake Improvement Association	Noble	Feasibility Study	15,300
21 Different	LaGrange County Commissioners	LaGrange	Preliminary Investigation	9,200
24 Different	Kosciusko County Lake Preservation and Development Council	Kosciusko	Preliminary Investigation	9,500
Shafer	Monticello Greater Chamber of Commerce	White	Preliminary Investigation	32,000
Flint	Valparaiso Lakes Conservancy	Porter	Feasibility Study	23,760
Prides Creek	Prides Creek Conservancy District	Pike	Feasibility Study	9,717
Crooked	Steuben County Lakes Council, Inc.	Steuben	Feasibility Study	6,900
James	Steuben County Lakes Council, Inc.	Steuben	Feasibility Study	6,500
Hudson	Hudson Lake Conservation Club	LaPorte	Feasibility Study	27,157
Salinda	City of Salem	Washington	Feasibility Study	16,378
Shipshewana	Shipshewana Community Lake Improvement Association	LaGrange	Feasibility Study	25,425
Waveland	Waveland Division of Parks and Recreation Board	Montgomery-Parke	Feasibility Study	10,464
Nyona and South Mud	Nyona Lions Club	Fulton	Feasibility Study	16,120
Hamilton	Hamilton Lake Association, Inc.	Steuben	Feasibility Study	21,870
Bixler	Kendalville Park and Recreation Deptartment	Noble	Feasibility Study	21,725
Bruce	Bruce Lake Association	Fulton	Feasibility Study	19,320
Cree	Cree Lake Association	Noble	Feasibility Study	23,331

(MEETINGS

Continued from page 6)

May 18-19, 1989—Enhancing the States Lake and Wetland Management Programs. Blackstone Hotel, Chicago, Illinois. Sponsored by U.S. EPA, North American Lake Management Society and Northeastern Illinois Regional Planning Commission. Contact Bob Kirschner, (312) 454-0400.

May 18-20, 1989—Restoration and Preservation of Great Lakes Coastal Ecosystems. Indiana University Northwest, Gary, Indiana. Contact Dr. Ken Cole, Indiana Dunes National Lakeshore, 1100 N. Mineral Springs Road, Porter, Indiana 46304.

May 22-23, 1989—Ohio Lake Management Society Annual Conference. Kings Island Inn, Cincinnati, Ohio. Contact Bob Mason, OLMS, P.O. Box 14, Struthers, Ohio 44471, (513) 791-3872.

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