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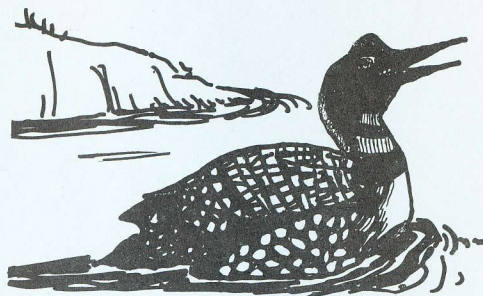


Lake
Tides

DECEMBER 1976
Vol. 2 No. 2

A Newsletter for People
Interested in Wisconsin's
Inland Lakes

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IN THE WAKE OF A LOON

We have just completed a document in which we discuss the past and future role of the University of Wisconsin Extension in the management of Wisconsin's inland lakes. While we expect to follow the general program outlined in the document, we want to modify it as necessary to meet your needs. Therefore, we would very much like to receive your reactions to our plans. Limited quantities of the full document are available upon request, and we have reproduced the summary in this issue.

Sincerely,

Ron Hennings

Lowell Klessig

Ron Hennings & Lowell Klessig
Lake Management Specialists

MANAGING WISCONSIN'S INLAND LAKES: THE ROLE OF UNIVERSITY EXTENSION

The University of Wisconsin Extension played a lead role, in cooperation with the Department of Natural Resources, in the evolution of Wisconsin's Inland Lake Management Law. The 1974 law formalized

the Extension involvement and two lake resource management specialists were hired to provide educational leadership and assist county-based Extension staff.

1974-76

The central effort of the first two years was to increase awareness of the new law and assist communities that decided to create a lake management district. To that end:

- Regional conferences were held in Cable, Minocqua, Waupaca, Waukesha, Crivitz, Green Lake, Rhinelander, Shawano, Eau Claire, Spooner and Milwaukee.
- Over 200 separate meetings and hearings were held with lake associations and local governmental bodies in 57 counties.
- Informational booklets were prepared and about 20,000 distributed throughout the state.
- Training opportunities were provided for local professionals and private consultants.

Other major efforts included assistance to the Department of Natural Resources in the development of administrative codes and design of feasibility studies.

By January, 1976, over 60 lake management districts were functioning and four had received major construction grants from the U.S. Environmental Protection Agency. Based on accumulated experience and suggestions from these communities and from communities that had not succeeded in forming a district, "clean-up" amendments to the law were drafted and enacted.

In 1976 programming emphasis began shifting from district creation to district operation. About 60% of the 300 lake district commissioners attended

regional workshops at West Bend, Waupaca, Antigo, Rice Lake, and Whitehall.

1976-78

The central effort of the next two years will be to maintain and improve the functioning of existing lake management districts. To that end:

- Lake Tides--a newsletter for people interested in Wisconsin lakes--will continue to be published.
- A Reference Handbook for Lake District Commissioners will be written.
- 1977 workshops on "The Operation of a Lake District" will be held in Eau Claire, Antigo, and Fond du Lac.
- Evaluation research on lake projects will be commenced under a grant from the U.S. Environmental Protection Agency.
- As schedules permit, local annual meetings will be attended.

Citizens from lake communities which have not yet organized a district will continue to have opportunities for local educational meetings, for winter conferences in urban centers, and for regional summer seminars.

In 1977 a major conference will be held in Madison for private and public lake professionals.

In 1978 a series of regional conferences will be held throughout the state to report on the successes and failures of the first set of projects under the program.

1978-80

The vague crystal ball of long range planning shows the following programming threads:

- Continued assistance to lake district commissioners.

- Development of general educational programs for non-farm rural landowners.
- Use of the media for general public education on lake ecosystems.
- Increasing emphasis on lake protection.
- A major report to the Legislature.
- Program evaluation.
- Continued commitment to individualized public service.

PERCENTAGE TIME ALLOCATION CHART
Extension Lake Resources Management Specialists

	1974	1975	1976	1977	1978	1979	1980
General public education on lakes...				5	5	5	10
Lake district creation.....	70	50	30	15	15	15	15
Lake district operation.....		15	35	35	35	35	35
Development of state policy.....	30	15	15	10	5	5	5
Involvement in feasibility studies.		20	10	5	5	5	5
Involvement with implementation projects			10	15	20	20	20
valuation				15	15	15	10
Total	100	100	100	100	100	100	100

BUDGET

The bill which created Chapter 33 provided \$50,000 annually to the University for education. This budget provides salary and fringe benefits for two professionals, secretarial assistance, travel, telephone, office supplies, and educational materials. The widespread interest in the program has resulted in a severe strain on that budget, especially in the travel category. In addition, the program receives uncompensated assistance from other state specialists and community faculty.

THE DIRECTOR'S OPEN DOOR

By Oliver D. Williams
Director, Office of Inland Lake Renewal
Department of Natural Resources

On a recent trip through Ohio, my wife and I visited the Air Force Museum near Dayton. The courage, daring and persistence of America's aviation pioneers shines through those exhibits. What we hadn't realized, however, was the scientific study which the Wright brothers had engaged in before the historic flight at Kitty Hawk. They had built wind tunnels and had conducted extensive analysis of aerodynamic principles before they built and successfully flew their first powered airplane.

In a sense, Wisconsin's Inland Lake Program is in that pioneering stage. Lake districts will soon, in partnership with DNR and UW-Extension, be "testing their wings" in a variety of projects. There may be some failures and some soaring successes. But whatever the degree of success, those efforts will be guided by the best scientific analysis available. And each project should be a building block toward ever more successful lake management activities in the years ahead.

As the new Director of the Office of Inland Lake Renewal, it is a thrill and a challenge to have a role in one of the most forward-looking programs in Wisconsin. My background includes assignments as a news reporter and editor (Wautoma and Wisconsin Rapids) and, since 1967, as an Administrator in the DNR environmental programs. I suspect, however, that my boyhood experiences growing up on a Waushara County farm will prove of equal value to this task. I have watched lake communities grow, while at the same time, the resource that attracted them was rapidly deteriorating. The magnitude of the task is sobering, but not frightening.

The Office of Inland Lake Renewal was recently the subject of an intensive study by the Legislative Audit Bureau. The "report card" was generally favorable, leading State Auditor Robert R. Ringwood to conclude that "the Office has been administering the program well in its first two years of operations." Of equal significance, in my view, was the comment by one of the lake district officials in response to an Audit Bureau questionnaire: "DNR and UW personnel have been helpful, courteous and prompt to respond. They have talent and knowledge. . ."

Those are the qualities of the small but dedicated technical staff which have impressed me most in my first few months in this assignment. My pledge is to build upon that level of service, hoping to merit continued public confidence and support.

There will probably be no major changes in the program over the next biennium. We anticipate that the Legislature will appropriate something over \$1 million per year for the grant program in the next biennial budget. Although we may never again achieve the resounding success of obtaining 50 percent of all of the Federal dollars released by the Environmental Protection Agency in its first year of operations, we will continue to solicit grant funds from this source. We are also actively seeking funding for somewhat more specialized projects through the Corps of Engineers.

As a personal goal, I look forward to getting to know many of the Commissioners of the lake districts who give so unselfishly of their time to make this program a success. And if, at any time, we do not live up to the standard of being "helpful, courteous and prompt to respond," please let me know. My telephone number is (608) 266-3125, and the office door is always open.

ECOLOGICAL NEWSNOTE

Christmas Under the Ice

"Let it snow. Let it snow. Let it snow!"

These are the lyrics to one of our favorite winter songs. Whether you are an active winter sports enthusiast involved in activities like skiing, skating and ice fishing, or a passive winter spectator relaxing by the warm fire and enjoying the quiet, clean contrast of sparkling new snow and afternoon shadows, your lake is making adjustments for the season. Ice cover, lower water temperatures, and snowfall are key factors.

Fall Turnover

Deep lakes will thermally stratify into a warm upper layer (epilimnion) and a cold lower layer (hypolimnion) during the summer. However, the lake water will mix or "turnover" in the fall when the upper layer of water cools to the same temperature as the lower layer of water. As the water at the surface is cooled, it becomes more dense and sinks allowing warmer water to be exposed at the surface which in turn cools and sinks. This process continues until the entire lake is cooled to a temperature of 4° C (30° F) which represents the maximum density of water. Then as the surface water cools to freezing (0° C, 32° F) it expands its internal structure, solidifies and floats at the surface forming ice.

During the cooling process, the cooler surface waters which are usually saturated with oxygen, descend from the surface down to refresh the oxygen-deficient deeper hypolimnetic zone. Eventually, the lake waters are all of the same temperature and density and the bottom waters are able to circulate and become distributed throughout the lake. At the time of complete mixing of the lake (holomixis), nutrients that have accumulated in the bottom waters

throughout the summer are also mixed throughout the lake. These nutrients may then feed a fall algae bloom that surprises many lake observers.

Winter Conditions

Once the ice has formed at the surface, a lake, essentially becomes sealed from further interactions with the atmosphere. The lake must now proceed through the winter months as a sealed vessel; no longer will there be gas exchange between the lake and the atmosphere; no longer will there be wind generated currents that mix the lake; and no longer will there be adequate sunlight in the upper waters to foster oxygen production from plant photosynthesis.

The reduced circulation, light and temperature during this period slows the living processes which occur in the lake. This is nature's way of compensating for the reduced supply of oxygen during the winter. For example, with no further interaction between the lake water and the atmosphere, the dissolved oxygen is no longer replenished via atmospheric introduction; therefore, the amount of oxygen in the lake at the time of ice cover must last all winter, with the exception of photosynthetic oxygen production by algae which is dependent upon available sunlight penetration through the snow and ice. Under these conditions, highly fertile shallow lakes often experience winter fish kills because of diminished oxygen supply as the winter season progresses.

Several of the techniques that have been tried in an attempt to alleviate low oxygen conditions in problem lakes are:

- (1) Plowing the snow off the ice to allow better sunlight penetration and therefore increase photosynthetic oxygen production under the ice;

- (2) Spreading carbon black on the snow to absorb more sunlight and thereby melt the snow:
- (3) Artificially aerate the lake with compressed air.

Several different aeration techniques have shown localized improvement in the dissolved oxygen levels within lakes. The success is dependent upon a variety of stress factors such as size of lake and the oxygen demand of the rotting plants in the lake.

The value of these techniques for a particular lake can best be determined on an individual basis by contacting the DNR area fish manager.

For further information on aeration, the DNR has available the following publications:

Aeration as a Lake Management Technique
(DNR Technical Bulletin 87)

Mixing and Aeration Systems in Wisconsin
Lakes (T. L. Wirth)

Total and Hypolimnetic Aeration of Lakes
in Wisconsin (T. L. Wirth and D. Knauer)

LANDOWNERS CONFERENCES

University of Wisconsin Extension is again coordinating a series of winter conferences for owners of rural land. Typical topics will include forest management, wildlife management, and rights and obligations of landowners. Lake front property management will also be covered in Stevens Point and Eau Claire.

For more information about the following programs, contact the County Extension Office in the county where you may attend:

Milwaukee	-- February 12
Madison	-- February 26
La Crosse	-- March 5
Stevens Point	-- March 12
Superior	-- March 12
Eau Claire	-- March 19
Green Bay	-- March 26

LITTLE MUSKEGO LAKE WINS A BIG JACKPOT

Little Muskego Lake was the last lake to receive a grant from the Fiscal Year 1976 Federal appropriation, but it was not the least. In fact, the \$995,000 grant from the U.S. Environmental Protection Agency was the largest in the state.

The Federal grant represents 50% of the expected cost of dredging the Waukesha County lake. The lake district and the State of Wisconsin together must match the Federal grant.

With this grant, the Office of Inland Lake Renewal has a perfect batting record for FY-76; all their Federal applications were funded and Wisconsin received half of the Federal funds available.

LAKE NOQUEBAY IS FIRST FOR 1977

Although exact plans for rehabilitation of Lake Noquebay have not been finalized, the Lake Noquebay District has been awarded \$200,000 in the first set of grants announced by the U.S. Environmental Protection Agency for 1977.

The District has voted to match Federal and State funds in an effort to reverse the encroachment of nuisance weeds in this 2000-acre lake in Marinette County.

COMMISSIONERS' CORNER

About 60 percent of commissioners that responded to our letter indicated a preference for regional workshops rather than a single convention. Therefore, workshops are being planned for 1977 and 1978 and a statewide convention is being planned for 1979.

Mark your calendar for the 1977 workshops on the "Operation of a Lake District":

Eau Claire	-- March 24
Antigo	-- March 25
Fond du Lac	-- March 26

P.S. If you have not sent us the names and addresses of your new commissioners, please do so as soon as possible.