

FEBRUARY, 1981

75¢
single copy

THE MICHIGAN **RIPARIAN**

READ BY MORE THAN 32,000 WATERFRONT PROPERTY OWNERS

**HYDRO-ELECTRIC
FACILITY
FRENCH LANDING
VAN BUREN, TOWNSHIP,
WAYNE COUNTY.**



**IS MICHIGAN'S
WATER POWER
BEING WASTED?**

(See Article by Jennifer Kauffman in this issue.)

PROFESSIONAL DIRECTORY



ANNUAL TOWNSHIP BUDGETS REQUESTED

Your editor is making a study of township expenditures. Annual Budgets will be prepared soon and will be available from the township clerk no later than April 4th, the elections Annual Meeting date. Please include the total state equalized value for 1980 and number of properties in your township. Send information to:

Michigan Riparian, 11262 Oak Ave., Three Rivers, Mich. 49093

PREIN & NEWHOF

Engineers - Planners
Environmental laboratory

3000 East Belt Line N.E.
Grand Rapids, MI 49505
(616) 364-8491

McCULLOUGH'S

Underwater Weed Cutters
Free Estimates

Mike McCullough
1030 N. 33rd St., Galesburg MI 49053
Call 616/665-4379



ADVANCED ANALYSIS and TESTING INC.
Environmental Laboratory
Lake
Stream
Groundwater
SPECIALIZING IN
COMPLETE ANALYSIS

345 STATE ST. SE GRAND RAPIDS, MI.
49503 (616) 454-6539

James D. Laarman, P.E.
2390 Walnut Lake Road
West Bloomfield, MI 48033

SHORE & BEACH,
HYDRAULIC, POND, STREAM &
LAKE REGIMEN ENGINEERING

phone 313-851-1440

TGI The Traverse Group, Inc.
Coastal Consultants
2480 Gale Road, Ann, Arbor, MI 48105
(313) 483-6997

- Provide Shoreline Erosion Problem Analysis
- Evaluate Shoreline Erosion Protection Alternatives structural, nonstructural, costs
- Provide Liaison Between Riparian and Engineers/ Marine Contractors
- Prepare Permit Applications
- Environmental Assessments
- Coastal Zone Planning and Management Services

"Nearly 70 years experience
in the coastal zone"

YOUR
PROFESSIONAL
ADVERTISEMENT
COULD BE
HERE!

A LUXURIOUS TOUCH FOR YOUR COTTAGE OR YEAR-ROUND HOME AT DOWN-TO-WATER COST.

ENHANCE YOUR WATER FRONT PROPERTY
WITH A WOLVERINE DOCK ...

- . Virtually Maintenance free
- . Sturdy, galvanized tubular steel
- . Extra-wide 3½ ft. redwood deck
- . Easy in, easy out
(just a simple wrench)
- . Full 5 year warranty
- . Each section vertically adjustable
up to 18"



For further information write:
WOLVERINE DOCK CO., INC.
P.O. Box 422
Comstock Park, MI 49321

or phone:
(616) 784-4530

"Septic-Snooper™" Surveys

*Complete septic leachate effluent
analysis using an ENDECO® type
211 septic leachate detector system.

*ENDECO® "Septic-Snooper™" Sales.

For further information contact:

swanson environmental, inc.
29623 Northwestern Highway
Southfield, MI 48034
(313) 352-0960

Sole authorized sales agent in EPA Region V for ENDECO® "Septic-Snooper™".

**Report Against
Poachers
Call Toll Free
1-800-292-7800**

THE MICHIGAN RIPARIAN

USPS 103-830
11262 OAK AVENUE
THREE RIVERS, MICHIGAN 49093

TABLE OF CONTENTS

THE WATER POWER REVIVAL IN MICHIGAN	4
by Jennifer Kauffman. Ms. Kauffman has a Master's Degree in Regional Planning from The University of Michigan and is employed by Ayres, Lewis, Norris & May, Inc., Ann Arbor.	
DECIDING TO BUY LAKESHORE EROSION PROTECTION	6
by David B. Robbins, R. Bruce DenUly, John M. Armstrong & Charles L. Kureth, Jr.	
LAKE SURFACE OVERUSE—MINIMIZING USER CONFLICT	9
by Russ Kruska. Russ is a graduate student in Resource Development at Michigan State University.	
WEED HARVESTING AT LAKEVILLE LAKE	12
by Robert Swift. Robert is a member of the Board of Directors of Region V and of Michigan Lakes & Stream Associations.	
ML&SA NEWS	13
by Cecile D. Harbour, President, ML&SA Judge John Feikens Challenges Delegates to The ML&SA Annual Meeting	
MICHIGAN LAKE AND STREAM ASSOCIATIONS STATES POSITION ON CURRENT ISSUES	20
by Don Winne	
PONTIAC LAKE IMPROVEMENT: EFFORTS BY PROPERTY OWNERS ASSOCIATION	22
by Michael A. Czuprenski, P.E. (Environmental Engineer/Planner, Johnson & Anderson, Inc., Pontiac, Michigan), and James L. Reid (Chairman, Pontiac Lake Improvement Board).	
WETLANDS PROTECTION WON'T WAIT—OAKLAND TOWNSHIP PASSES ORDINANCE #26 TO PROTECT WETLANDS	19
(Oakland Township is located in the northeast part of Oakland County).	
GREENBELTS PROTECT INLAND LAKES	23
From WATER IMPACTS a publication of the Institute for Water Research and in cooperation with the Cooperative Extension Service of Michigan State University.	
WINDBREAKS SERVE A DUAL PURPOSE	23

EDITORIAL



Donald Winne

WOODSMAN SPARE THAT TREE

A tree is not only a crop and an economic commodity, it is also one part of a giant humidifier to release billions of gallons of water into the atmosphere through transpiration, cooling the ambient air and providing moisture for the next rainfall. In addition its roots hold on to the soil to keep particles from being washed from mound, slope and hill to ditch, gulley, lake and stream creating flood and havoc on its way to the Great Lakes. Trees are also necessary as habitat, source of food and protective cover for birds and wildlife. Trees have an important aesthetic value with each spring of delicate and softening shades of green and exquisite hues of red and yellow each fall.

Due to recent changes in agriculture to accommodate the larger and larger equipment and the demand to raise more and more bushels per acre of food, trees along creeks and streams, along roadsides and fence rows are being leveled. What will the consequences be? A decimation of the natural environment and along with it the familiar wild birds such as the cardinals, finches and doves, and other less familiar ones such as the tanagers, rosebreasted grosbeaks and vireos? A decrease of coldwater streams and resultant demise of coldwater fish and the takeover by suckers, carp and other rough fish? What will happen to the average daily temperature on the land when the trees are gone? What will happen to the oxygen carbon-dioxide balance in the atmosphere? Are we creating a biological desert by removing our protective vegetative cover?

If a tree must go, why not plant at least one and preferably two to replace it. It takes 20 years to grow a tree 12 inches in diameter in Michigan, and the environment can't wait, so why should you? **PLANT A TREE IN 1981.** (Check with your local county Soil Conservation District for information on what trees are available and how they can be secured.)

PUBLICATION DATES: Winter issue, February 1; Spring, May 1; Summer, August 1; and Fall, November 1.

PUBLICATION DEADLINES: At least 15 days in advance of publication dates.

ADVERTISING RATES: Display advertising rates by request. **NOTE:** Stories of general interest are always welcome, especially those accompanied by pictures. All printing is done by offset process so we can use photos, negatives, or polaroid shots. All such material should include return address in pencil on the reverse side if return is requested.

THE MICHIGAN RIPARIAN magazine is owned and published by the Michigan Riparian Inc., a Michigan non-profit corporation. General offices of the quarterly publication are located at 9620 East Shore Drive, Portage, Michigan 49002. Phone 327-5765 (area code 616). Printed by Eagle Printing Co., Inc. Coldwater, Michigan 49036.

SUBSCRIPTION RATES: A blanket subscription includes every dues paying member (family) of the subscribing association. Blanket rates (100% of membership).....\$2.00 each per year

Quantity rates but not a blanket subscription	
200 or more (same rate as blanket).....	\$2.00 each per year
150-199 subscriptions.....	\$2.20 each per year
100-149 subscriptions.....	\$2.30 each per year
75-99 subscriptions.....	\$2.40 each per year
50-75 subscriptions.....	\$2.50 each per year
25-49 subscriptions.....	\$2.75 each per year
1-24 subscriptions.....	\$3.00 each per year

2nd Class postage paid at Kalamazoo, Michigan and Additional mailing offices.

DIRECTORS

Donald Winne, Chairman
11262 Oak Avenue
Three Rivers, MI 49093
(616) 244-5336

Howard H. Wilson
Trenton
Joseph Hollander
Lansing

Cecile Harbour
Portage
Robert Charles
Coldwater

Marti Charles
Coldwater
Terry Garn
Coldwater

Paul Clark
Troy

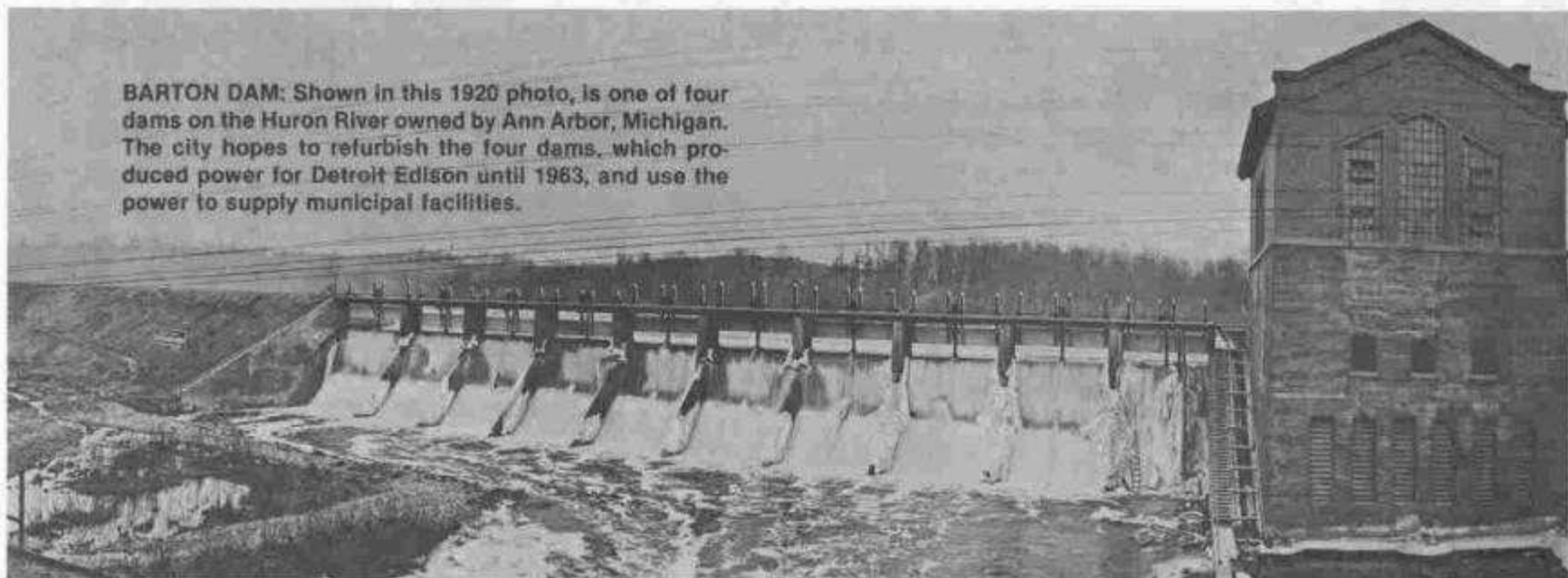
Robert B. Pearce
13321 Ludlow
Huntington Woods, MI 48067
313-398-6146

STAFF

Editor and Publisher.....Donald Winne
Art Director.....David Hodson
Circulation/Marketing.....Cecile Harbour

Publishing Office
Donald Winne
11262 Oak Avenue
Three Rivers, Michigan 49093

BARTON DAM: Shown in this 1920 photo, is one of four dams on the Huron River owned by Ann Arbor, Michigan. The city hopes to refurbish the four dams, which produced power for Detroit Edison until 1983, and use the power to supply municipal facilities.



THE WATER POWER REVIVAL IN MICHIGAN

by Jennifer L. Kauffman

Power from flowing and falling water played a key role in the industrial development of Michigan because it was a cheap and readily available source of energy for a variety of milling operations which dotted the river banks. A census of manufacturers indicates there were 998 waterwheels in operation in Michigan in 1900, with an average capacity of 42 horsepower, (31 kilowatts). In time, most of these small operations were abandoned in light of improved technology which provided for larger, more efficient operations driven primarily by steam generators.

The use of electricity in homes and businesses did not become widespread until this century. After the Niagara Falls hydroelectric project was successfully completed in 1895, construction of hydroelectric facilities in the Midwest began in earnest. Ninety-nine of a total of 124 plants in Michigan were completed prior to 1930. In many cases, hydroplants were built on the same sites as existing dams. However, many of the old mill dams had small heads (hydraulic drops) and streamflows too low to be considered viable hydroelectric sites.

Hydroelectric power provided as much as 50 percent of the electricity consumed for a brief period in the early 1900's. After that time, the total contribution of hydroelectricity declined steadily. Relatively flat topography limited the size of the plants and the number of suitable sites available in the Midwest. A sampling of the hydro facilities in Michigan indicated most had a capacity of 5,000 kW or less. Once the best sites were developed, other sources of power were sought to meet ever increasing demands for electricity.

After World War II, fossil fuels were cheap and readily available while labor costs rose. Hydroelectric facilities had high maintenance cost in relation to the amount of electricity they provided and many plants were decommissioned by utilities and sold. By 1978, only fifty-six of the original 124 plants in Michigan were still in operation.

Today there is a renewed interest in hydropower, as is evidenced by the fact that the number of applications for water power licenses submitted to the Federal Energy Regulatory Commission has more than doubled since 1977. One may ask why there is such interest if hydroelectric facilities made such a small contribution to the total supply of electricity and proved to be uneconomical. There are a number of reasons.

Changing Economic Conditions: Today, the cost of fossil fuels is rising continuously, which makes alternate fuel sources, particularly renewable resources, more economically attractive. The selling price of electricity is also rising. Recent Federal regulations stipulate that utilities must purchase power from small producers, including hydrodevelopers, at a "fair and reasonable" rate. Thus, hydropower is again becoming a viable, economically attractive alternative.

In many instances, utilities sold their decommissioned hydroelectric facilities to municipalities. Municipalities are beginning to look to refurbishing these plants and using the revenues to offset expenses or the power to supply municipal facilities.

Manufacturers are now beginning to mass-produce old and proven turbine equipment, thus lowering unit cost. In addition, new equipment, suited for dams with very small

heads or low flows, is being developed. Thus, sites once considered to be "marginal" may prove to be economical.

Hydropower is an Environmentally Attractive Alternative: The primary impacts of hydro development are associated with construction of the dam. In all but a few cases, construction or reconstruction of a dam is not necessary to produce hydroelectricity. New generating equipment can be adapted to an existing powerhouse, or if none exists, to a simple low cost structure associated with an existing dam. The Army Corps of Engineers has stated there are an estimated 620 dams in existence in Michigan today. Many are likely to be viable hydroelectric sites.

In the past, most plants were operating in a "peaking" mode, in which water was stored and later released to maximize production of electricity during the peak demand period. This mode causes fluctuations in the impoundment level and downstream discharges, which are stressful to aquatic ecosystems. Today, the environmental problems associated with the "peaking" mode have been recognized and most refurbished plants are designed to operate in a "run-of-the-river" mode. "Run-of-the-river" plants make use of only streamflow available due to natural runoff and do not cause fluctuations in water levels.

Other impacts associated with the generation of electricity at small (low-head) dams have generally proved to be insignificant. Hydro facilities are clean and make use of a renewable resource.

Hydroelectric Projects can be Compatible with Existing Uses of an Impoundment or Stream: Operating a hydroelectric plant in a

"run-of-the-river" mode can be compatible with the existing use of the facility, such as flood control or maintenance of a legally established lake level. It may enhance the recreational use of the area or the historic significance of a site. Operation of a hydro facility will help to ensure a dam is maintained in a safe, unharmed condition.

In 1978, Congress passed PL 92-617, the Public Utilities Regulatory Policies Act. This law established a loan program to finance small-scale hydroelectric feasibility studies. The loans will cover up to 90 percent of project costs and are available through the U.S. Department of Energy. If a site does not prove to be feasible, the loan is forgivable. Both public and private developers are eligible for these loans.

Once a proposed project proves to be feasible and a design is completed, obtaining the State and Federal permits and licenses necessary to construct the facility can be both frustrating and time consuming. However, the Federal government has

authorized simplified procedures for issuing power licenses for small-scale hydro projects and is expected to authorize exemptions from licensing requirements for some projects in the near future. In Michigan, a special legislative committee has been studying various statutory modifications which would promote hydro development in this State.

Hydroelectric projects are once again proving to be viable economic projects for municipalities, homeowners associations and private investors. Though the contribution of hydro projects to the total energy supply of Michigan will remain small due to physical limitations, they can make a significant contribution to the energy supply at the local level. In addition, hydro projects typically pay back the initial investment and generate additional revenues. The photographs on these pages depict successful projects which are now underway in Michigan.

STATEMENT OF OWNERSHIP, MANAGEMENT AND CIRCULATION
(Required by 49 CFR 101.11)

1. PUBLICATION TITLE: THE MICHIGAN RIPARIAN
2. ISSUE DATE: 1/10/81
3. NUMBER OF ISSUES: 4
4. YEAR: 1981
5. PUBLICATION LOCATION: 11262 OAK AVE., THREE RIVERS, MI 49093
6. PUBLICATION TYPE: MAGAZINE
7. PUBLICATION STATUS: REGULAR
8. PUBLICATION FREQUENCY: QUARTERLY
9. PUBLICATION DATES: 1981
10. PUBLICATION DATES: 1981
11. PUBLICATION DATES: 1981
12. PUBLICATION DATES: 1981
13. PUBLICATION DATES: 1981
14. PUBLICATION DATES: 1981
15. PUBLICATION DATES: 1981
16. PUBLICATION DATES: 1981
17. PUBLICATION DATES: 1981
18. PUBLICATION DATES: 1981
19. PUBLICATION DATES: 1981
20. PUBLICATION DATES: 1981
21. PUBLICATION DATES: 1981
22. PUBLICATION DATES: 1981
23. PUBLICATION DATES: 1981
24. PUBLICATION DATES: 1981
25. PUBLICATION DATES: 1981
26. PUBLICATION DATES: 1981
27. PUBLICATION DATES: 1981
28. PUBLICATION DATES: 1981
29. PUBLICATION DATES: 1981
30. PUBLICATION DATES: 1981
31. PUBLICATION DATES: 1981
32. PUBLICATION DATES: 1981
33. PUBLICATION DATES: 1981
34. PUBLICATION DATES: 1981
35. PUBLICATION DATES: 1981
36. PUBLICATION DATES: 1981
37. PUBLICATION DATES: 1981
38. PUBLICATION DATES: 1981
39. PUBLICATION DATES: 1981
40. PUBLICATION DATES: 1981
41. PUBLICATION DATES: 1981
42. PUBLICATION DATES: 1981
43. PUBLICATION DATES: 1981
44. PUBLICATION DATES: 1981
45. PUBLICATION DATES: 1981
46. PUBLICATION DATES: 1981
47. PUBLICATION DATES: 1981
48. PUBLICATION DATES: 1981
49. PUBLICATION DATES: 1981
50. PUBLICATION DATES: 1981
51. PUBLICATION DATES: 1981
52. PUBLICATION DATES: 1981
53. PUBLICATION DATES: 1981
54. PUBLICATION DATES: 1981
55. PUBLICATION DATES: 1981
56. PUBLICATION DATES: 1981
57. PUBLICATION DATES: 1981
58. PUBLICATION DATES: 1981
59. PUBLICATION DATES: 1981
60. PUBLICATION DATES: 1981
61. PUBLICATION DATES: 1981
62. PUBLICATION DATES: 1981
63. PUBLICATION DATES: 1981
64. PUBLICATION DATES: 1981
65. PUBLICATION DATES: 1981
66. PUBLICATION DATES: 1981
67. PUBLICATION DATES: 1981
68. PUBLICATION DATES: 1981
69. PUBLICATION DATES: 1981
70. PUBLICATION DATES: 1981
71. PUBLICATION DATES: 1981
72. PUBLICATION DATES: 1981
73. PUBLICATION DATES: 1981
74. PUBLICATION DATES: 1981
75. PUBLICATION DATES: 1981
76. PUBLICATION DATES: 1981
77. PUBLICATION DATES: 1981
78. PUBLICATION DATES: 1981
79. PUBLICATION DATES: 1981
80. PUBLICATION DATES: 1981
81. PUBLICATION DATES: 1981
82. PUBLICATION DATES: 1981
83. PUBLICATION DATES: 1981
84. PUBLICATION DATES: 1981
85. PUBLICATION DATES: 1981
86. PUBLICATION DATES: 1981
87. PUBLICATION DATES: 1981
88. PUBLICATION DATES: 1981
89. PUBLICATION DATES: 1981
90. PUBLICATION DATES: 1981
91. PUBLICATION DATES: 1981
92. PUBLICATION DATES: 1981
93. PUBLICATION DATES: 1981
94. PUBLICATION DATES: 1981
95. PUBLICATION DATES: 1981
96. PUBLICATION DATES: 1981
97. PUBLICATION DATES: 1981
98. PUBLICATION DATES: 1981
99. PUBLICATION DATES: 1981
100. PUBLICATION DATES: 1981

IS THE TRANQUILITY OF YOUR LAKE BEING SHATTERED BY NOISY MOTORS?

IF YOU ARE EXPERIENCING ANY OF THESE PROBLEMS, YOU CAN DO SOMETHING ABOUT IT. OTHER LAKES IN MICHIGAN HAVE SOUGHT HELP FROM THEIR TOWNSHIP BOARDS AND FROM THE DEPARTMENT OF NATURAL RESOURCES, AND HAVE SUCCEEDED IN GETTING SOME RELIEF FROM THE ABOVE MENTIONED HARASSMENTS.

The major solutions to these problems include the following:

1. Establishing uniform hours for water-skiing and hi-speed boating. The DNR will authorize the prohibition of waterskiing and hi-speed boating from 6:30 p.m. until 10:00 a.m. the following day if supported by the TOWNSHIP board.
2. Prohibit hi-speed boating and waterskiing at any time.
3. Permit only electric motors to propel boats on the lake.
4. Prohibit the use of all motorboats.
5. Limit boats to a slow no-wake speed at any time.
6. Establish maximum speeds at less than the state 55 miles per hour. Other established speeds are 10 mph, 35 mph and 40 mph.

According to the 1979 report from the Department of Natural Resources entitled LOCAL WATERCRAFT CONTROLS, nearly 300 lakes in Michigan now have special watercraft controls to protect their lake. The table below gives a summary of most of the information found in the report:

SPECIAL CONTROL	NO. OF LAKES IN SUMMARY	ACREAGE OF LAKES SMALLEST LARGEST	AVERAGE SIZE IN ACRES
PROHIBITS HI-SPEED BOATING AND WATERSKIING	47	13.6 700.0	68.1
UNIFORM HOURS ESTABLISHED	134	13.0 1280.0	159.0
NO-WAKE SPEED	38	7.5 780.0	80.0
MOTORBOATS PROHIBITED	17	3.7 100.0	37.8
ELECTRIC MOTORS ONLY	4	30.0 413.0	130.0

If you want more information, write: The Michigan Riparian
11262 Oak Avenue
Three Rivers, MI 49093

Advertising Rates

BLACK/WHITE

SPACE	1 Issue	2 Issues	3 Issues	4 Issues
1 Page	500	485	481	434
2/3 Page	345	324	304	285
1/2 Page	275	268	260	248
1/3 Page	209	207	200	200
1/4 Page	194	188	179	161
1/6 Page	164	147	143	113
1/12 Page	95	86	83	66

FOUR-COLOR

SPACE	1 Issue	2 Issues	3 Issues	4 Issues
1 Page	575	570	556	532
2/3 Page	450	441	420	399
1/2 Page	404	391	384	367

Second and Third Cover positions no extra charge. Sold on first-come, first-served basis.

CIRCULATION, 13,000
Readership: more than 32,000 lake and stream water front property owners.

THE MICHIGAN
RIPARIAN

Deciding to Buy Lakeshore Erosion Protection

by David B. Robbins, R. Bruce DenUyl,
John M. Armstrong & Charles L. Kureth, Jr.

The following article is based upon research carried out at the Coastal Zone Laboratory, University of Michigan, by Dr. John M. Armstrong and R. Bruce DenUyl as principal investigators. The authors are presently associated with the Traverse Group, Inc., a consulting firm in Ann Arbor, Michigan.

The Problem

Shoreland owners along the Great Lakes are confronted by a harsh environment. Homes, businesses and other properties along 20% of Michigan's Great Lakes mainland coast are in areas presently classified as "High Risk Erosion Areas".¹ Wind generated waves can erode 400 million cubic yards per year of material from soft shoreline bluffs during years of high lake levels.² During a period of high lake levels from 1972 to 1976, shoreland owners experienced in excess of 28 million dollars in damage from erosion in 27 Michigan counties alone.³

Due to the active geological processes which act on the Great Lakes coastline, shoreland owners face tough decisions with regard to investing in shore protection. Shoreland owners who are experiencing or who anticipate erosion problems should seek answers to the following questions BEFORE taking protective actions:

- 1) Do I have a problem, and if so, what is its cause?
- 2) Should I consider a structural method (e.g. revetment, breakwater, groin, etc.) or a non-structural method (e.g., beach nourishment, dune stabilization, etc.) to protect my shoreline, or is my situation so serious that the cost of protection would be prohibitive?
- 3) What structural or non-structural shore protection methods could be applied to correct my problem?
- 4) What would be the design specifications of these options?
- 5) What are the total expected costs of these options over the entire life of the structure?
- 6) What is the expected lifetime of these options?
- 7) How much would be wise to invest in protection for my shoreline in terms of market value of my property?
- 8) How can I choose among the available alternatives?

Owners of shoreland property commonly base their decision to use a particular erosion protection method on the trial and error results of neighbors or local marine contractors. In the long run, this means an additional investment burden to the owner when struc-

tures or other methods fail to produce the expected result. In most cases, it is advisable for the shoreland owner to seek experienced professional help to answer the questions stated above to make an informed decision concerning what measures should be taken.

The "bottom line" of most decisions is normally how much an owner is **willing** to spend on erosion protection, based upon the owner's perception of the property's market value and their personal value of the property. This approach can either lead to buying protection which is inadequate and thus requires frequent replacement - "nickel and diming" the owner - or to a large investment in a more effective structure which may not be justified in terms of the property's value. Recent research at the University of Michigan shows that many owners invest such large amounts in protection that they essentially "rebuy" their house and land every 20 years, which is partially caused by over estimating the value of their property by 20 per cent.⁴ In most cases their land continues to erode. A more satisfactory approach to the investment decision would be to base it upon an evaluation of the cost of protection in comparison to the preservation of the property's market value which would result by instituting protection. There will always be a personal value attached to a property which may lead the owner to take action which is suboptimal from the market standpoint. This is the owner's prerogative, but even such a decision would benefit from a knowledge of the market and the "best" available options.

THE INVESTMENT DECISION MODEL

The investment decision model is a computer model which simulates what would happen to the market value of a shoreland property undergoing erosion. It then compares the cost of various methods to protect the land or buildings to determine which method best preserves the property's market value at the lowest cost. The model predicts the value of the property saved in terms of today's dollars at any point in time. This is important to know because the loss of property value occurs unevenly as the bluff is eroded. The model is unique in its approach as compared to other economic analyses which are sometimes employed. It must be kept in mind that the model is limited by the

inadequacies in the information which must be supplied to the model, chiefly lake levels and recession rates. The model allows, however, **relative comparisons** of alternatives to be made.

To understand how the model works, we will begin by examining how the model simulates the effect of erosion upon the market value. Real estate appraisers in sample shoreline areas were consulted to determine how the market value of shore property will change as erosion takes place. It was determined that the value of shore property could be broken down into two components, that is, structure value and land value. Structure value is the value of the house and auxiliary structures located on the property. The land value is composed of two elements, simple land value, which is the value of a similar property located inland, and aesthetic value, which is the additional value of the property resulting from its lakeside location. The aesthetic value is due to the recreational opportunities, physical beauty and prestige which are related to a lakeside location. The total land value is thus the sum of the simple land value and the aesthetic value.

A case study for the Benton Harbor area shows the general way in which property values can be expected to decline as erosion proceeds. The distances and percentages given in Figures 1 and 2 are for the Benton Harbor area and must be determined for each new area, since they will vary depending upon the local real estate market and the past rate of shoreline or bluff recession.

Figure 1 depicts the decline in structure value as erosion proceeds. The market value of the structures will begin to decline long before there is any great risk of damage to them. This is because a prospective buyer of shore property will be concerned that his investment will be in jeopardy if erosion continues to decrease the distance between the shoreline or bluff and the house. This risk of damage to the house must be compensated by a lower sale price within the market for such properties. For this reason, there will be a 30% decline in the structure value when the bluff is eroded to within 100 feet of the house. When the distance between the house and bluff becomes 75 feet, the value of the house will decline at an increased rate. By the time the bluff has receded to a

distance of 50 feet from the house, about 70% of the structure value will be lost. At this distance, the house can no longer be sold if a mortgage is required.

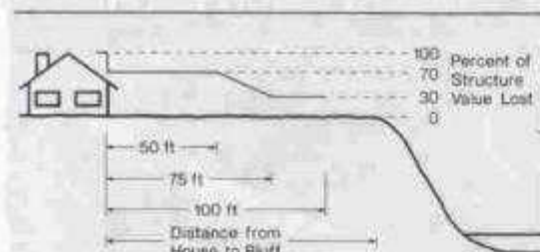


FIGURE 1. Distribution of Structural Value Over a Lakeside Lot in the Benton Harbor, Michigan Region

Land value will decline in a different manner than will the structure value. When erosion processes first become a factor, the width of the beach will begin to decline. The opportunity to use the beach may thus become considerably impaired. We would expect this loss to result in a decline in the market value of the lot, but realtors in the survey area indicated that the loss of recreational opportunities will not have an appreciable effect. This may not be true in other shoreland areas.

As erosion proceeds, the waves will begin to erode the bluff face, which will undermine the vegetative cover and steepen the bluff angle. Hence, the attractive appearance of the shoreline will be reduced, and access to the lake will be lost. The aesthetic value of the property in the study area was found to have been reduced by approximately 25% after the vegetative cover of the bluff had been lost, as shown in Figure 2. Continued recession of the bluff had little further effect on the aesthetic value until the lot was no longer deep enough on which to build. Although some trees will be lost, there will be little change in the view of the lake, access to the lake, etc., from the time that the vegetative cover of the bluff was lost. Even if the house were lost and the depth of the property were sufficient to build another structure, the remaining 75% of the aesthetic value was found to be left intact. A person who builds a new home on the property would retain the original aesthetic value minus the 25% originally lost. When the property is no longer deep enough to build on, the entire aesthetic value is lost.

The second element of land value, that is, the simple land value (value of a similar inland property), will not significantly decline until the lot is no longer deep enough on which to build. The approximate decline in simple land value is shown in Figure 2. In the case of a very large lot, however, there will be a marked loss in simple land value before reaching the minimum lot depth for rebuilding the structure.

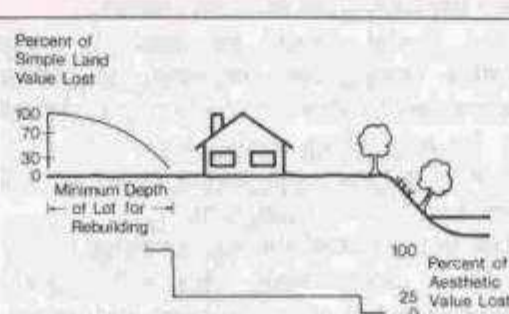


FIGURE 2. Distribution of Simple and Aesthetic Value Over a Lakeside Lot in the Benton Harbor, Michigan Region

In some areas, an additional factor must be considered. Recession rates cannot be explicitly taken into account by the real estate market when determining the value of a property because the recession rates may not be well known. This leads to a psychological impact in coastal areas having subareas which experience a significantly higher rate of erosion. For example, in the Benton Harbor, Michigan region there was a 2- to 3-mile subarea along the coast that experienced recession rates as high as 20 ft per year from 1972 through 1974. This extensive erosion was well documented in the media throughout the state and even the nation. As a result, the value of shore property within this entire region was substantially discounted, even though other subareas within the Benton Harbor region had experienced no recession at all. In another shoreland area in Michigan, which has a greater overall recession rate, the discounting effect was not as severe. This is attributed to the absence of an intensely eroding subarea that would influence the market's perception of the recession rate for the entire area.

This discussion has shown how the erosion of shoreland property can be described or "modeled" by evaluating the structure value, aesthetic value and simple land value. At this point, it becomes possible to look at various alternative protection methods to determine which would give the property owner the best "return", or net benefit, or his/her investment. Alternative protection structures have varying rates of effectiveness, meaning the ability to reduce the erosion rate that would occur in the absence of a protective structure. For example, if the natural long term erosion rate is four feet per year and the structure is 50 percent effective, then the long term erosion rate with the structure in place is treated as now being two feet per year. The effectiveness of a structure will decline over time as it is subjected to wave energy, ice and weathering, and the rate of decline will depend on, among other things, the type of structure.

To use the model, four types of information must be collected for the particular area where the model is to be applied. These

include: real estate data, recession rate data, measurements of the property and data regarding the alternative erosion protection methods being contemplated.

The results generated by the investment decision model indicate whether or not a particular erosion protection alternative is economically justified, and further, which alternative would be optimal. The model takes the cost of the structure along with estimates of how many feet of erosion it will prevent over its effective life and compares this with the estimate of property value loss prevented. If the value of the property thus preserved is greater than the cost of the structure (including maintenance) over its effective life, the structure is said to produce a **positive net benefit**. This means that the owner should realize a **gain** from his/her investment. Property owners who desire to protect their property should realize that protection can be implemented either too soon or too late. If protection is implemented before the home or other buildings are threatened, enough of the total property value may **not** be preserved to justify the cost of protection over the life of a protective structure. If, on the other hand, much of the total property value has already been lost due to erosion, it may not be a worthwhile investment to install protection. Results from the model can help determine the most appropriate time to build a protective structure.

Just as the model is a valuable tool to individual home owners in determining their options to the erosion protection question, the model is also a valuable decision-making tool for groups of property owners who desire to study their alternatives and select the wisest choice. Property owners who combine their resources to pay the cost of erosion protection may realize several potential benefits:

- 1) More effective designs might be achieved by reducing the "interaction" that might occur when individual owners construct their own particular erosion control structure.
- 2) Higher quality construction might be obtained by joint action.
- 3) The group might realize "more for its money" by being able to afford a larger structure capable of absorbing higher wave energies.

When a large structure or series of structures are being evaluated to protect a reach of shoreline owned by more than one individual, the benefits of the protective structure may not be evenly distributed to each individual property owner. For example, one owner may expect to gain more than another if his property is worth more and yet he pays the same price as his

(Continued On Next Page)

LAKESHORE EROSION PROTECTION...

(Continued From Page 6)

neighbors for protection. In turn, this realization may make his neighbors unwilling to pay for the protective structure. The investment decision model can help remove the uncertainty related to the distribution of net benefits to individual property owners. It can thus help owners make an informed decision about the project as well as help determine the fair distribution of cost among the owners.

A special advantage offered by the investment decision model is that it can determine if particular factor will have a large influence on the outcome of the investment decision. This may become important if a particular factor is not well known as, for example, may be the case with lake levels, offshore topography, and storm frequency and intensity.

Using the Model

The investment decision model is relatively simple to apply, in that a relatively small set of data is required which can be easily collected. Since the model has been fully computer programmed, the costs of using the model are well within range of

even the individual property owner.

The model should be used to make **relative** comparisons between alternative approaches to shore protection and should not be applied to predict specifically how much of a return the owner might expect from a particular investment.

Use of the model should be carried out by qualified professionals who will provide expert appraisal of the problem and recommendation of sound structural or non-structural solutions. Those who use the model must also be able to apply experienced judgment in determining the effectiveness of the structure, the expected appreciation/depreciation of lakeside real estate, the distance between house and bluff at which some percentage of the structural value will be lost, and so forth.

Summary

The investment decision model provides a method to logically evaluate the many interacting factors involved in shore protection and management. The model is useful to individuals or groups faced with selecting an approach to deal with a shore erosion problem. By evaluating an alternative protection approach on the basis of net benefits, the property owner can compare alternatives and estimate the benefits to be gained by selecting an alternative.

What do you need most next to a good boat?



an AQUA-MATIC PIER!

The safe pier with non-skid surfaces and rounded edges — the pier that beautifies any shoreline.

But above all, it's the permanent pier with husky steel structural parts galvanized for long life — with the weatherproof, fiberglass deck that can't fade — never needs paint. It's the pier that's tough enough for marinas and affordable for homes and cottages.

How affordable? Call or write. Or send a dimensioned sketch and we'll quote.

Don Williams & Associates

20070 Caryell Dr.

Birmingham, Michigan 48010

(313) 647-4107

clearly first

with the **BEST SOLUTIONS** to your problem water areas

**DIFFERENT TYPES ALGAE...
DIFFERENT GROWING SITES
NEED DIFFERENT
TYPES OF TREATMENT**

that's why we have...

- A LIQUID ALGAEICIDE
- A GRANULAR ALGAEICIDE

CUTRINE-PLUS Algaecide (Liquid)

- For use in lakes, farm, fish and fire ponds
- Effective control of pond scum, moss and pea soup algae



- NO WAITING TO USE WATER after treatment
- Less chemical needed — 2 gal. per acre, diluted with 9 parts water



CUTRINE-PLUS Algaecide (Granular)

- For use in lakes, farm, fish and fire ponds
- Effective control of all bottom-growing algae
- NO WAITING TO USE WATER!
- For large areas — apply 60 lbs. per acre. For spot treatment — 1 lb. for 730 sq. ft.



\$4.95

The ONLY Complete GUIDE for WATERWEED & ALGAE CONTROL on Lakes and Ponds

This 64-page, full color guide graphically describes and illustrates the most common water weeds and algae. Lake and pond management experts present recommended control methods, application rates, equipment needed — everything you want to know about this important subject.

The guide was written and produced by Applied Biochemists, Inc., aquatic nuisance control pioneers, with over 50 years research and experience.

APPLIED BIOCHEMISTS, INC.

5300 W. County Line Rd., Mequon, WI 53092

Please send me _____ copies of "How to Identify and Control Water Weeds and Algae" at \$4.95 each.

Enclosed is check _____ Money Order _____

Name _____

Address _____

City _____ State _____ Zip _____

LAKE SURFACE OVERUSE — MINIMIZING USER CONFLICTS

by Russ Kruska

Introduction To Surface Overuse

In the last few decades, a dramatic rise in recreational use of surface water has occurred. The Bureau of Outdoor Recreation found that 41% of our national population preferred water-based recreation over any other type. As would be expected, the effects of this increased leisure time pursuit is especially pronounced in Michigan, with its 7,500 lakes over five acres (Michigan Department of Natural Resources, 1979).

The Department of Natural Resources' 1979 Recreation Plan identifies southeast Michigan as having the highest rate of population growth, both now and in the future. This area, however, has a smaller amount of the state's water resources on a per person basis when compared to the northern regions. The recreation plan states the 49% of persons studied selected places closer to home to recreate because of gas cost. Consequently, more and more pressure will be exerted on the water resources of Michigan, especially those in the southeast lower peninsula.

As lake recreation has become more popular, overuse of the lake surface has become an increasing problem. In many areas, crowding has occurred to the point of rendering the recreational experience unsatisfactory to many. For example, the existence of too many motorboats on a lake at one time may invade a person's "space" or subject him/her to unsafe anxiety provoking situations. Also, different types of use may conflict which result in a reduced recreation experience. Often times a direct conflict occurs between fishermen and water-skiers because both prefer a calm, glass-like water surface. Obviously, it is impossible for the two activities to occur in the same vicinity without conflict. Likewise, a regatta of sailboats and group of pleasure cruisers may be in competition for use of the lake surface. The following are some likely consequences of crowding (Urban Research Development Corp., 1977):

- 1) People compete rather than cooperate
- 2) Personal space desire violated
- 3) Increased litter
- 4) Noise, discourteous behavior
- 5) Physical resources often abused
- 6) Increased vandalism
- 7) More accidents
- 8) Mobility constrained
- 9) Rules and regulations frequently violated
- 10) Increased visitor turnover, more complaints, more inquiries about alternative recreation in area.

In addition, overuse of the lake surface may contribute to the degradation of the lake's water quality. Too much boating activity, for instance, may stir up the water so much that bottom sediments contribute to increased turbidity (aesthetically unpleasing). Resuspension of plant nutrients may also result, contributing to increased eutrophication. Exhausts and oil and gas leaks from boat engines may also damage the aquatic ecosystem.

Lake restoration projects may also complicate the overuse problem. For example, Lake Lansing, Ingham County, is usually dominated by sailboats. This is due mainly to the large amount of aquatic plant growth that makes the lake unattractive to water-skiers (they do not like to fall into beds of slimy plant growth). The current restoration project, dredging, may prompt increased water skiing and other uses because the water quality may improve. The lake, already overcrowded, may have even greater user conflicts in the future.

Sources of Lake Users

It is important then, to define exactly who the users of the lake surface are, and where they originate from. First consider the riparian. He/she has a legal right to the "reasonable" use of the surface of the water. In addition, many riparians often own more than one boat, and/or allow guests to moor their boats at their docks. To control this problem, many lake associations prohibit guest boats in their association bylaws.

Private marinas, resorts, or other businesses may also be a source of users. Docks or boat ramps may be provided for use by vacationers or other non-riparians by these lake front businesses.

"Keyhole development" may also provide access to the lake if not controlled. "Keyhole development" is defined as a type of development that seemingly provides lake access to backlot non-riparian users. Usually a small (narrow) parcel of riparian land extends back to and connects to a much larger lot. Often the large lot will be developed for multiple family dwellings, and all of these backlot residents can secure access to the lake through the narrow lake

front land. Although generally considered by the courts to result in unreasonable use of the lake, "keyholing" is a prevalent source of lake users. Lake communities must therefore make every effort possible to obtain or keep strict zoning ordinances against such development if, under the circumstances, "keyholing" would be any unreasonable use. Multiple family housing and small lot sizes should not be allowed if possible. Variance from single family residential zoning must be watched for constantly.

The Cass Lake Residential Property Owners Association has been extremely successful in limiting uncontrolled lake access through "keyhole developments" and private businesses. Cass Lake riparians became very concerned about a private bar owner that also operated a marina on the crowded lake. The association joined the Beechland Subdivision in a suit against Shelley's Bar on Cass Lake Road in Keego Harbor. The plaintiffs wished the defendant's property to conform to single-family deed restrictions (the property was zoned single family residential). In the spring of 1975, Oakland County Circuit Court Judge Farrel Roberts determined that the operator of the marina would have to limit the amount of boats it could launch in a given day to 40, that an attendant must be present at each launch, and that no drag boats could be launched. Consequently, the unlimited access to the lake was controlled, relieving some of the overuse problems.

The Cass Lake P. O. Association was also instrumental in stopping a boat launching ramp that was being constructed by the Cass Lake Shore Apartments. The project was underway without a DNR permit or a township resolution. The association, realizing the "keyholing effect" such a ramp would have in funneling the hundreds of apartment dwellers and their boats onto the lake, voiced their opinion to the township. The township then notified the DNR of the project. In the summer of 1975, the DNR issued a stop work order on the ramp.

The Cass Lake P. O. Association has also been involved in stopping many other such unreasonable access problems. They have been quite successful in keeping their lake from becoming more crowded than it already is. For further information, contact: **The Cass Lake Property Owners Association, 4559 Pointview, West Bloomfield, Michigan 48003.**

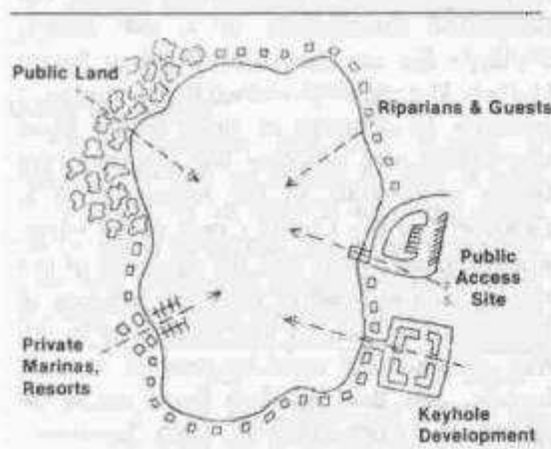
The public user has a legal right to the lake surface if she/he can legally secure access. This stems from the fact that the title of the waters are held in trust for the public. Therefore, the Waterways Division of the DNR implements the Public Access Site Program which provides a doorway to the

(Continued On Next Page)

LAKE SURFACE OVERUSE...

(Continued From Page 9)

waters for a number of boats determined mainly by the size of the lake. Limited parking facilities are used to determine the number of boats allowable on the lake through the public access site. Lake communities must stress that nothing other than strict enforcement of parking rules will be tolerated, because the access site becomes virtually an unlimited entry point when people park along the road or in undesignated areas after the facility is at capacity. The public user also gains access through public parks, forests, and other public land. Figure 1, below, depicts the various sources of lake users.



Lake Carrying Capacity

Lake managers, recognizing the problems of overuse, have for long looked to the idea of "carrying capacity" to limit the number of users of a recreational resources. Carrying capacity is defined as the amount of recreational use of a resource that will result in the continued protection of the resource and the satisfaction of the user.

Such a capacity limit would be extremely useful in lake management, and this "magic number" has been sought in many studies. However, the results of such studies have generally found carrying capacity to be an elusive and complex entity, especially for water recreation.

For lake systems, carrying capacity research has dealt mainly with the social element — user satisfaction. This is because by the time surface overuse would adversely affect the water quality of a lake, the user satisfaction would be already far exceeded. Social carrying capacity, then, is usually reached before the environmental carrying capacity.

Early attempts to find carrying capacity concentrated on the number of acres of water surface needed for certain uses. For example, 20-40 acres of water surface would be needed by water-skier, 3.5-8 acres by fisherman, and 12-200 sq. ft. by a swimmer

(Bureau of Outdoor Recreation, 1967). The carrying capacity of a 100 acre lake, then, for water-skiing would be five water-skiers, if one considers 20 acres of water surface per boat. This simplified approach is less useful, however, when considering mixes of various uses, different speeds, and other such dynamic aspects of the recreation experience.

A North Carolina study (Hammon, 1974) was probably one of the most complex done on carrying capacity for lakes. Through the use of questionnaires, interviews, shoreline-based observation, and aerial photography, the authors concluded: "Thus managers and planners' continued search for the magic number called capacity, which if found and used is believed to be the solution to many management problems, appears to be an unnecessary pursuit." Jackson (1976), contends that "quite possibly, universal standards will never (and perhaps should never) be established, since carrying capacity is only one consideration among many others in planning and as such can be expected to vary from one location to another."

People have been shown to differ very widely in what exactly they consider a satisfactory recreation experience. This is one reason that carrying capacity is so difficult to find. Furthermore, those people that have found a lake to be unsatisfactory for recreation more than likely will go elsewhere. This is called "self-selection" and may be the reason that Ashton (1971) observed boaters to express low levels of dissatisfaction in spite of high levels of use. Hammon (1974) found that boaters at the study site appeared to have acclimatized themselves to the frequently heavy use conditions which sometimes even exceeded one boat per six acres of water. It is no wonder then, that the public is usually more tolerant to overuse conditions than the riparian who may have experienced a dramatic increase in use over the years.

Surface Water Controls

Stynes (1979) states, "approaches to recreation management dictated by a focus in carrying capacity have turned us to searches for ways to limit and control use..." Although research continues, to find acceptable carrying capacities, there are ways to control crowding and minimize user conflicts.

Michigan's Marine Safety Act (Act 303-P.A. 1967 as amended 1975) can aid in reducing surface overuse. Here are a few of the rules that apply to all waters of the state (these can only help when strictly enforced by the local sheriff marine patrol who is called by watchful riparians):

1. Any person who operates a vessel or person being towed who carelessly and heedlessly in disregard of the rights or

safety of others, or without due caution and circumspection and at a speed or in a manner so as to endanger or be likely to endanger any person or property is guilty of reckless operation. (Section 74)

2. Vessels and those towed shall maintain a distance of 100 feet away from any dock, raft, buoyed or occupied bathing area, or vessel moored or at anchor, except when proceeding at a slow-no wake speed or when water-skiers are being picked up or dropped off. (Section 75)
3. Persons operating vessels in areas not marked by well defined channels, canals, rivers or stream courses shall operate in a counter-clockwise fashion insofar as it is reasonably possible. (Section 75).
4. The exhaust of all engines used on any waters shall be muffled effectively by equipment so constructed and used as to muffle the noise of the exhaust of the engine in a reasonable manner. The use of cut outs, bypasses or similar devices is prohibited. (Part 1, rule 8)

For a more complete listing of the rules of the Marine Safety Act, write: **Marine Safety Act - Administrative Rules, Law Enforcement Division, Box 30028, Lansing, Michigan 48909.**

In addition, section 12 of the act allows the Law Enforcement Division of the DNR to establish "special rules" where deemed necessary. These rules are the best available way to solve specific overuse problems. Furthermore, the DNR is now realizing the increased need of such regulations and are becoming more willing to cooperate with local governments. This is evident by the 39 Michigan lakes that obtained special watercraft rules in 1979 as reported in the February issue of the **Michigan Riparian**.

These special watercraft rules are most often in the form of water surface zoning. A recent study (Brown, 1979) divides surface zoning into five types: speed zoning, special use zoning, time zoning, protective zoning, and limited density zoning.

Speed Zoning

Speed zoning is based on limiting boat speed and/or horsepower. Since increased speed of uses is more space consumptive, limiting the speed of an existing number of boats for example, will allow more space for boaters and probably reduce many conflicts. A certain speed control or horsepower limitation may even exclude certain uses. For example, a 35 mile per hour speed limit on Lakeville Lake, Oakland County, has almost completely excluded the use of high speed jet boats and other high speed activity on the overcrowded lake. For more information, contact: **Lakeville Lake Property Owners Association, P.O. Box 90, Lakeville, Michigan 48036.**

Special Use Zoning

Special use zoning consists of special zones in which certain recreation activities are either prohibited or limited. Such zones might include no motorboating, no motors over a certain horsepower, no wake, public swimming zones, and water-ski zones. Often buoys are used to mark the various zones. For example, Lake Columbia, Jackson County, has five "slow-no wake" zones within its boundaries to limit boating where necessary. For further information, contact: **Lake Columbia Property Owners Association, 11281 Hewitt Road, Brooklyn, Michigan 49230.**

Brooks Lake, Newaygo County, has three special use zones. One on a small bay-zoned "slow-no wake" and two prohibiting skiing and high speed boating in specific areas. For more information, contact: **Brooks Lake Association, P.O. Box 533, Newaygo, Michigan 49337.**

Lake Ovid, completely within the boundaries of Sleepy Hollow State Park, Clinton County, is the only water body large enough in the area to provide opportunities for high speed boating and water skiing (400-559 acres). Yet, a no-motorboating policy is implemented, which helps supply a greater number of user-hours to more space economic recreation activities. This is especially significant because this man-made lake lies in the so-called lakeless region of Michigan, where lake recreation demand far exceeds the supply. Contact: **Parks Division, Department of Natural Resources, P.O. Box 30028, Lansing, Michigan 48909.**

Time Zoning

Restricting the time of various activities is a common control in Michigan — especially to limit skiing and high speed boating. This may give other users a better chance to use the water surface, and may also keep the noise to a minimum at critical times. On Clear Lake, St. Joseph County, water-skiing is permitted **only** between 10:00 a.m. and 6:30 p.m. Contact: **Clear Lake Improvement Association, 11960 Coon Hollow Road, Three Rivers, Michigan 49093.**

Lake Ogemaw, Ogemaw County, restricts high speed boating and water-skiing to between 10:00 a.m. and 6:30 p.m. May 15th to September 15th, on Saturdays, Sundays, Memorial Day, Independence Day, and Labor Day. Contact: **Lake Ogemaw Summer Resort Association, P.O. Box 472, West Branch, Michigan 48661.**

Protective Space Zoning

Protective space zoning involves a protective barrier of space between various uses. A typical example would be a swimming area in which the boundaries are marked off with buoys to keep other uses away. Likewise, a protective zone of a hundred feet or more

may be required around shoreline activities or objects (docks, rafts, etc.), that prohibits high speed boating or skiing that might interfere or create unsafe situations. For example, on Lake Charlevoix, Charlevoix County, vessels less than 26 feet in length must maintain a slow-no wake speed when within 500 feet of any shore, dock or pierhead. Vessels 26 feet or over in length must maintain a 1000 feet distance in order to exceed the slow-no wake speed. Contact: **Lake Charlevoix Property Owners Association, P.O. Box 294, Charlevoix, Michigan 49720.**

Limited Density Zones

Limited density zones simply limit the number of users of a certain activity. For example, on one Vermont lake the number of water-skiers is limited to four between 10:00 a.m. and 6:00 p.m. In Michigan, however, such limitations are rare. Reluctance to limit certain activities may be because the state constitution gives all citizens equal rights to use the water surface. Also, the absence of an accepted carrying capacity determination makes such density zones difficult to create.

However, on Portage Lake, Livingston county, there exists a limit on the number of sailboats that can use the lake for racing purposes on a given day. The riparians felt that there were too many sailboats racing, too often, in the prime area of the lake, for too long a period, during the best times. The result of court action by the association against the Huron Portage Yacht club resulted in an injunction. The court limited the racing on Portage Lake to one race per weekend, **60 boats**, two hours maximum duration, alternating Saturdays and Sundays, sharing holidays and extending until after Labor Day weekend (Livingston County Circuit Court on May 14, 1976). However, another permit was issued by the DNR in 1977 allowing more sailboats and increased sailing time. The association is now back in court fighting the increases. Contact: **Portage and Base Lakes Association, 9294 Dexter-Pinckney Road, Pinckney, Michigan 48169.**

For a complete listing of all of the special local watercraft controls in Michigan, write for the pamphlet: "Local Watercraft Controls," Law Enforcement Division, DNR, P.O. Box 30028, Lansing, Michigan 48909.

Instituting Special Watercraft Controls

A lake association or other group of concerned citizens wishing some sort of special regulations to be instituted on their lake should follow these steps:

1. The group of people wishing the special regulations to be passed **must** obtain support of the local unit of government in which the water body is located (i.e.,

township board). Counties are the local representative if more than one local unit jurisdiction. Petitions are helpful when presenting the local unit with the request.

2. If the local government agrees, they **must** request assistance for adoption of special regulations from the Law Enforcement Division of DNR.
3. The DNR investigates the problem, makes recommendations, and then holds local hearings so that the public can comment on the proposed regulations.
4. If the proposed rule is generally accepted at the hearing, it is presented to the local government.
5. If the local unit of government accepts the proposal, a state rule is adopted and a local ordinance is enacted which are both identical. If the local unit rejects the proposal, no further action is taken.

Conclusion

In conclusion, it is evident that lakes will continue to attract millions of recreationists at increasing rates in the future. Crowding and conflicts have been around for years and may become more intense, especially around highly populated areas with inadequate supplies of water resources. The use of the all elusive carrying capacity as a solution must wait for further research. For the time being, the use of surface water zoning in the form of special watercraft controls, in combination with strict enforcement of Marine Safety Act rules, and regulations to reasonably control both public and private access points is the controlling mechanism in surface overuse problems.

POROX® Treatment FOR CLOGGED DRAINFIELDS

- Invented, developed, and tested at the University of Wisconsin and patented by the Wisconsin Alumni Research Foundation
- Minimal disruption of lawn and landscaping
- Less costly than a new drainfield
- Written Guarantee

**CALL (616) 361-2353
FOR AN INSPECTION**

**NEW LIFE SEPTIC SERVICES
2920 FULLER AVENUE, N.E.
GRAND RAPIDS, MICHIGAN 49505**



HOCKNEY Underwater
Weed Cutter

2 Models: Self-Propelled or Portable

Hydraulically controlled cutter. Cuts
10' swath up to 5' deep. Used by
Parks, Lake Assoc. & Conservation-
ists SINCE 1903.

For information write:

Hockney Co., MRL
Silver Lake, Wis. 53170

Phone: 414-889-4581 or 414-862-2628

*Trout, Walleye, Hybrid Bluegills,
Bass and others*

for Lake & Pond Stocking

Aquatic Weed Control

Aquatic Chemicals

Aeration Equipment

ROSE CITY TROUT FARMS

2646 N. Townline Rd.
Rose City, MI 48654
(517) 685-2200

Hawks Beach Improvement

Lake Bottom Resurfacing With Sand

20 years experience in dealing with
soft and weed choked lake bottoms.
All operations (are) done in swim-
ming season, with (a) portable
pipeline.

1628 Huron St. Niles, MI 49120
616/683-1049

evening & weekend calls welcome

PROGRESSIVE ENGINEERING CONSULTANTS

OF GRAND RAPIDS, INCORPORATED

2920 FULLER AVE., N.E., GRAND RAPIDS, MICHIGAN 49505
TELEPHONE: (616) 361-2664

CIVIL, MECHANICAL AND ELECTRICAL ENGINEERS
PLANNERS AND LAND SURVEYORS

COMPLETE LAKE COMMUNITY SERVICES

- ENVIRONMENTAL STUDIES
- FUNDING ASSISTANCE
- WATER, STORM AND
SANITARY SYSTEMS

Lakeville Lake Weed Harvesting, A Huge Success in Oakland County

For many years Lakeville Lake in Oakland County has been the victim of extremely heavy weed growth to the point that it was difficult for any type of watercraft, especially power boats and sailboats, to properly navigate.

The membership of the association, for many years had asked for some kind of action to alleviate the problem. Outside contractors came in for several years and cut some of the weeds but due to the high cost and also to the fact that only volunteer contributions paid the bills, this method was impractical. Finally in the Fall of 1979 the Board of Directors decided to form a Lake Board, according to The Inland Lakes Improvement Act of 1966 (of the State of Michigan).

Petitions were signed by over 1/3 of the property owners abutting the lake and were presented to the Township Board requesting that a Lake Board be formed. Immediate action followed and the Lake Board consisting of a local representative, the drain commissioner, a local county commissioner and a representative of the D.N.R. held the first meeting. The first action was to order an engineering survey of the lake to determine the feasibility of the project and present the findings to the people at a public hearing. This was done and after considerable discussion and explanation of the problem the Lake Board was ordered to proceed with the next step.

This involved a review of the costs and a study of the best and fairest method of assessing the property owners in order to raise the needed money. The formula used was based on front footage with a minimum charge for lots to seventy five feet. Larger lots were charged for extra footage and commercial lots, such as the public access, bathing beaches and boat liveries paid a higher rate. A public hearing was then held explaining the plan and again, almost unanimous approval was obtained for approval to the plan (to assess) the tax roll by special assessment for a period of five years.

The Lake Board then, according to the 1966 Act, advertised for public bids on the harvesting contract. The local association name was awarded the contract. (This public bid is no longer necessary if the local association owns its own equipment).

After much deliberation and examination review of various makes of harvesting equipment the necessary pieces were ordered, consisting of a harvester, land conveyor and a trailer for the harvester. This equipment was delivered on July 25th, and was welcomed by all the property owners.

The work began, even though the summer was half over and weeds were at their maximum growth. Paid labor was hired to operate the harvester and transporting truck. A part-time maintenance man was hired for daily maintenance, etc. Properly trained volunteers have been used for extra hours of cutting and on weekends and the response has been most gratifying. Surrounding farmers have almost begged for the weeds as it is all known what excellent fertilizer they are. Over eleven hundred tons of the weeds will have been removed this year and many property owners for the first time in years have been able to enjoy using their boats.

In 1981 the season of harvesting will cover a period of approximately May 15th through Labor day and with this expanded work schedule (there will be) accomplished a well-planned program of weed removal for all assessed areas.

Much of the success of this project is due to the dedicated efforts of several of the property owners and to the response of volunteers who were willing to give of their time. The association has been blessed by the talent of a few who have the know-how to maintain hydraulic equipment which is very important. Many visitors are inspecting the operation, some from out of state, and the property owners seem to be very well satisfied. By the end of the 1981 season the lake will show a marked improvement and will be under complete control.

ML&SA OFFICERS AND DIRECTORS

CECILE HARBOUR, President
9620 E. Shore Dr.
Portage, MI 49002
616/327-5785

ROBERT MCALPINE, Vice President
3777 Lk. Lapeer
Metamora, MI 48455
313/797-4114

SHIRLEY KEITH, Secy./Treas.
23985 Wakeman Rd.
Mendon, MI 49072
616/496-7302

JOSEPH H. HOLLANDER, Legal Council
One Business & Trade Center
200 Washington Square North
Lansing, MI 48933
517/487-8566

DONALD WINNE, Executive Director
11262 Oak Ave.
Three Rivers, MI 49093
616/244-5336

ROBERT B. PEARCE, Aquatic Biologist
13321 Ludlow
Huntington Woods, MI 48067
313-398-6146

Region I

WARREN SCHUG, Vice President
R 3, Three Rivers, MI 49093

DONALD HOHOLIK
226 Deer St., Manistique, MI 49854

ARNOLD PETERSON
362 W. Park St. Marquette, MI 49855

Region II

JULIUS MARTINEK, Vice President
1184 Sunset Dr. Frankfort, MI 49635
616/352-9947

LOU HELDER
R 3, Box 305, Newaygo, MI 49337

GEORGE PINKERMAN
R 1, Box 300B, Central Lake, MI 49622

MARGARET BLATTENBERGER
9037 Johnson Rd., Kaleva, MI 49654

DENNIS HANSEN
2654 Blue Haven Ct., E. Lansing, MI 48823

Region III

HUGHES SOUTHWELL, Vice President
P.O. Box 70, Lake MI 48632

GERALDINE RORABACHER
34503 Lytle, Farmington Hills, MI 48024

BERNADINE BISCHOFF
4896 Arnold Lk. Rd., Harrison, MI 48625

LARRY BOSTOW
R 2, Box 310, Gaylord, MI 49735

WARREN OAKLEY
R 2, Box 3310, Hale, MI 48739

Region IV

KENNETH BRUBACKE, Vice President
13069 Stacey, Greenville, MI 48838
616/754-5104

ALBERT CRANE
6025 124th Ave, Fennville, MI 49408

CHARLES STUTZMAN
5503 E. Carleton Rd., Palmyra, MI 49268

CECILE HARBOUR
(See Officers)

DONALD WINNE
(See Officers)

Region V

ROBERT MCALPINE, Vice President
(See Officers)

JAMES MANN
6922 Colony Dr., Orchard Lake, MI 48033

BETTY O'SHEA
4589 Forest Dr., Pontiac, MI 48054

NORMAN PAULSON
2407 Margaret, Fenton, MI 48430

ROBERT J. SWIFT
71 Peninsula Dr., Leonard, MI 48058

ML&SA NEWS

By Cecile Harbour

AUSTIN LAKE IMPROVEMENT ASSOCIATION, Kalamazoo Co. A committee is working to determine if seasonal lake levels can be established so that ice damage can be minimized. Working with inter-connected lakes, West and Long, the committee hopes to have useful information at an early date.

ALGONQUIN LAKE COMMUNITY ASSOCIATION, Barry Co. The association had an all-time high membership in 1980. Don Montgomery who had been president for the past 10 years has stepped down, but under his leadership, the association has prospered.

BIRCH LAKE ASSOCIATION, Cass Co. This young (1 year) association is looking forward to an expanded Self-Help Program as well as educational projects. There is a possibility of a cooperative project with the County Health Dept. to test house-hold drains extensively. No swimming signs have been posted at the fishing sites.

ELK-SKEGEMOG LAKES ASSOCIATION, Antrim, Grand Traverse & Kalkaska Co.'s. This association was organized 30 years ago. It was reported that 62% of the riparians on the 2 lakes and rivers (over 41 miles of shoreline) were members in 1980 for a total of 536. According to the Newsletter, it appears that the members receive many services from the association.

GOGUAC LAKE ASSOCIATION, Calhoun Co. The November 1980 newsletter summarized the activities of the association since 1977. They now have a Clean Lakes Project Grant for the purpose of devising a storm water management plan in cooperation with the Calhoun County Road Commission, the City of Battle Creek, and the Township of Battle Creek. The U.S. EPA will underwrite 70% of the cost. The association share is only 7.5% to be paid over a 3-year period.

GREAT BEAR LAKE ASSOCIATION, Van-Buren Co. In 1980 the association had 170 members, the highest in recent history. During the summer several projects were completed... water sampling through the DNR Self-Help Program; a bacteriological study by a lake resident; weed harvesting; the annual garage sale and raffle (first prize a paddle boat); and bingo. The association also assisted residents in bringing natural gas around the lake, about 20 children attended boating safety classes and 3 issues of the newsletter were published.

HEART LAKE ASSOCIATION, Otsego Co. NEMCOG and students from the U of M Biological Station at Pellston performed an in-depth lake study last summer. A copy of the final report will be provided each homeowner.

KEARSLEY LAKE ASSOCIATION, Genesee Co. A malfunction of a sewage pumping station allowed raw sewage to go directly into the lake Sept. 7. The Township Supervisor and the Health Dept. explained how the problem was corrected. There is continuing good relationship between the association and local governmental officials. A copy of the ML&SA letter seeking contributions was included with the Oct. report of the Board of Directors Meeting to the members. (Thank you).

LAKES PRESERVATION LEAGUE, Livingston Co. The association is taking an active part in the discussion of plans for an alcohol producing plant in the area that would require 600,000 gallons of water per day for operation. There is concern for local water supplies. This statement from the Nov. newsletter is thought provoking ... "People go to lake areas to get away from the cities but soon start wanting the same things they had in the city ... laundry facilities, increased water use, retail services, etc., and soon the same needs are **required** as in the city ... fire and police protection, sewers etc. Again problems need to be anticipated and precedents set."

LAKE OGEMAW SUMMER RESORT ASSOCIATION, Ogemaw Co. The Lake Ogemaw Security Patrol, a volunteer group, started a patrol of the area on a trial basis in December. Residents are asked to volunteer time, make contributions and to offer comments pro and con.

LAKEVILLE LAKE PROPERTY OWNERS ASSOCIATION, Oakland Co. The weed control program has become a reality. About 1100 tons of weeds were removed from the lake after Aug. 1. It is hoped that harvesting in the future will catch the weeds before they ripen and drop their seeds, thus helping to slow weed activity. The ML&SA letter asking for contributions was included with their Dec. newsletter. (Thank you.)

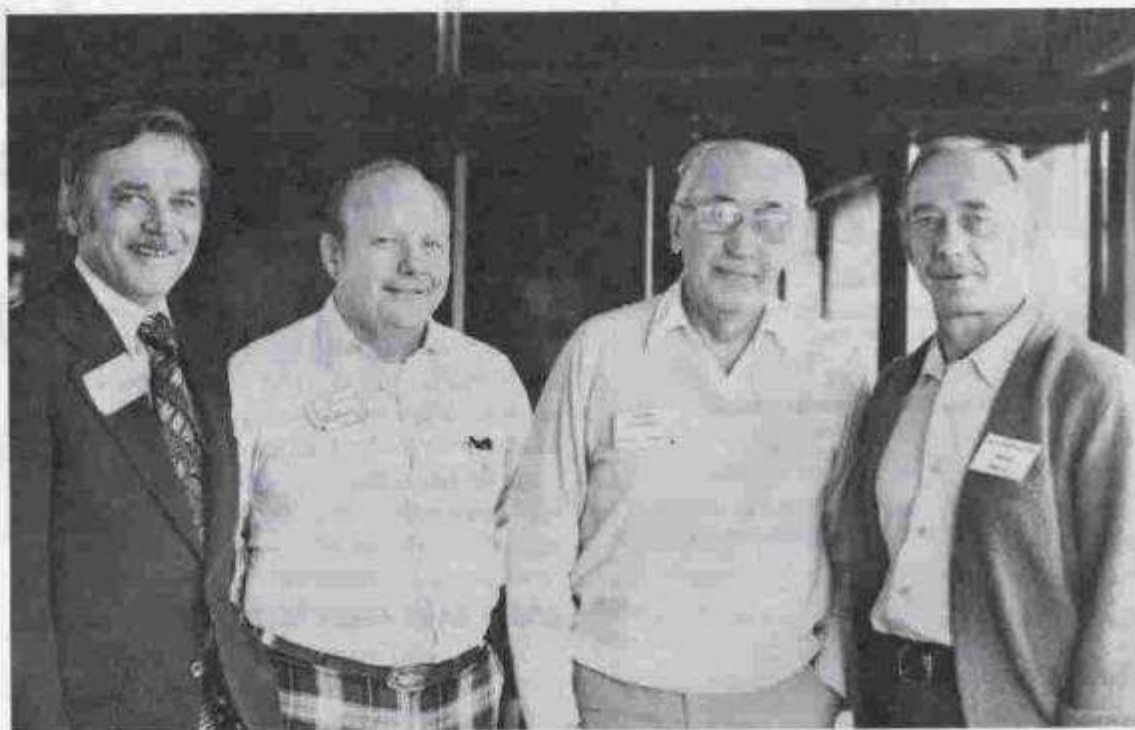
(Continued On Next Page)

PROPERTY OWNERS ASSOCIATION OF LINCOLN LAKE, Kent Co. The first annual meeting of this new association attracted 110 people, including children. The goal to sign up 100 members in 1980 was within reach. Congratulations. A good monthly newsletter is a part of this success.

PINE LAKE PROPERTY OWNERS ASSOCIATION, Oakland Co. The association has made a study of the need for time zoning for the use of the lake. A good questionnaire was sent to the members and at a subsequent special meeting the matter was discussed in detail. No action will be taken at this time but they plan to take advantage of the Sheriff's Dept. Education Program, publish the Sheriff's Dept. telephone number and enforce current laws on a volunteer basis for a year.

WOODBEEK CHAIN OF LAKES, Kent Co. Guest speakers at the annual meeting were Deputy Sheriff Webster of Kent County with safe boating tips and Jan Prawdzid, from the Kent County Drain Commissioner's office, who explained the need for the control structure on the outlet of Half Mile Lake. 65 people attended the meeting.

NEW MEMBERS OF THE ML&SA BOARD OF DIRECTORS



(Left to Right) Larry Bostow; Gaylord, MI, James Mann; Orchard Lake, MI, Hughes Southwell; Lake, MI, Norman Paulson; Fenton, MI.

INTERNATIONAL JOINT COMMISSION REPRESENTED AT ML&SA ANNUAL MEETING



Carol Y. Swinehart

Carol Y. Swinehart, information officer for the International Joint Commission was present on Saturday and Sunday, October 25 and 26 to answer questions about the Commission and to explain the provisions of the newly revised (1978) Great Lakes Water Quality Agreement between Canada and the United States.

Ms. Swinehart announced that a 12 minute slide/tape show entitled PRO-MISES TO KEEP, which explains the development, purpose, content and implementation of the GREAT LAKES WATER QUALITY AGREEMENT between Canada and the United States, is available to organizations and individuals throughout both countries. The program uses color slides, graphics, narration and music to tell the Agreement story in an informative way.

A twenty-page booklet explaining the Agreement in more detail is also available upon request. For more information or requests for the slide/tape show and booklets should be directed to:

International Joint Commission
Great Lakes Regional Office
100 Ouellette Avenue
Eighth Floor
Windsor, Ontario
N9A 6T3

Phone: (United States) 1-313-963-9041
(Canada) 1-519-256-7821

MEMBER DUES

1-39	\$25.00
40-49	30.00
50-59	35.00
60-69	40.00
70-79	45.00
80-89	50.00
90-109	55.00
110-129	60.00
130-159	65.00
160-189	70.00
190-219	75.00
220-249	80.00
250-289	85.00
290-329	90.00
330-369	95.00
370-409	100.00
410-449	105.00
450-499	110.00
500-549	115.00
550-599	120.00
600-649	125.00
650-699	130.00
700-799	135.00
800-899	140.00
900-999	145.00
1000-1099	150.00
1100-1199	155.00
1200-1299	160.00
1300-1399	165.00
1400-1499	170.00
1500-1599	175.00
1600 & Up	180.00

EXIBITORS AT CONVENTION

Lake Lawns, Inc.,
10095 Burgess Ct., Union Lk. MI 48085
(Roy Fix)

Progressive Engineering, (Porox)
2920 Fuller Ave., NE
Grand Rapids, MI 49505 (Don
Schrauban)

Wolverine Dock Co., Inc.
P.O. Box 422, 716 Marway,
Comstock Pk., MI 49321 (Rick & Wanda
Barry, Jim Hickman)

Mudcat National Car Rental
Dick Tillotson, Dist. Mgr.
Altosar Weed Harvester
15679 Q. Ten Mile, Suite 107
Southfield, MI 48075

Ecological Composting Toilets, Sales
R 1, Lake Rd., Mears MI 49436

Ortho Chevron Chemical Co.
William J. Cohill, Box G
Comstock Park, MI 49321

Swanson Environmental, Inc.
29623 Northwestern Hwy.
Southfield, MI 48034 (Barbara Tell, John
Kennedy)

Applied Biochemists, Inc.
Bob Rowe, 5232 Glenloch Way,
Toledo OH 43615

Clean-Flo Lk. Improvement of Mich.
Art Laing, 13903 Stratford
Riverview, MI 48192

Edmands Engineering, Inc.
P.O. Box 580, Bay City, MI 48707
(Brian Kroll)

Aquatic Engineering, Inc.
680 Indianwood Rd. Lk. Orion, 48035
(Bob Woodward)

Great Lks. Sand Grabber, Tenon Corp.
415 W. Main St.
Hartford, MI 49057

Sunwood Energies
Marquette, MI 49855
(Sue Oliver, Mike Collier)

COMING EVENTS

FEB. 12-13, Natural Resources Commis-
sion; Lansing.

FEB. 17, Air Pollution Control Commis-
sion; Lansing.

FEB. 18, Resource Recovery Commis-
sion; Lansing.

FEB. 19, Water Resources Commission;
Lansing.

FEB. 23, Michigan Environmental
Review Board, Lansing.*

MARCH 12-13, Natural Resources Com-
mission; Detroit.

MARCH 17, Air Pollution Control Com-
mission; Lansing.

MARCH 18, Resource Recovery Com-
mission; Lansing.

MARCH 19, Water Resources Commis-
sion; Lansing.

MARCH 22, Region V Meeting to be held
at Village Oaks, MI.

MARCH 26, MERB; Lansing.

APRIL 1,2 & 3, Conference; "The effects
of Acid Precipitation on Ecological
Systems in the Great Lakes region of the
United States." MSU Conference Center;
for more info. contact: Howard Bernson,
Conference Coordinator, 49 Kellogg
Center, MSU, East Lansing, MI 48824;
(517) 355-4557.

APRIL 4, Region IV, ML&SA; Kalamazoo
Center; Sponsors include Dept. of
Agriculture, WMU; Institute of Water Re-
search, MSU; Cooperative Extension
Service; Soil Conservation Service and
ASCS. Theme: COMPETITION FOR
WATER IN MICHIGAN.

APRIL 9-10, Natural Resources Commis-
sion; Lansing.

APRIL 27, MERB; Lansing.

MAY 16, Region II meeting to be held at
Blue Lake Township Hall.

SEPT. 24,25 & 26, 20th Annual Meeting
of ML&SA will be held at Caberfae at
Cadillac; theme: CLEAN WATER for the
80's.

To: ML&SA & Individual Members
of Lake Associations

If Michigan Lake & Stream Associa-
tions is to continue to expand its ser-
vices to members and individuals, to
promote the purposes of ML&SA before
the Legislature and regulatory boards
and agencies of State government, to
seek new members for the organization
and to support riparian property owners
in their efforts to protect their invest-
ments, the annual budget of ML&SA
must be substantially increased. The
current budget for this 20,000 member
organization is approximately \$6500,00.

The opportunity to increase the
budget through contributions is now
possible because the Internal Revenue
Service has granted tax exempt status
under section 501(c)(3). Individual con-
tributions made during this calendar
year to ML&SA are fully tax deductible
from the 1981 Federal Income Tax
return.

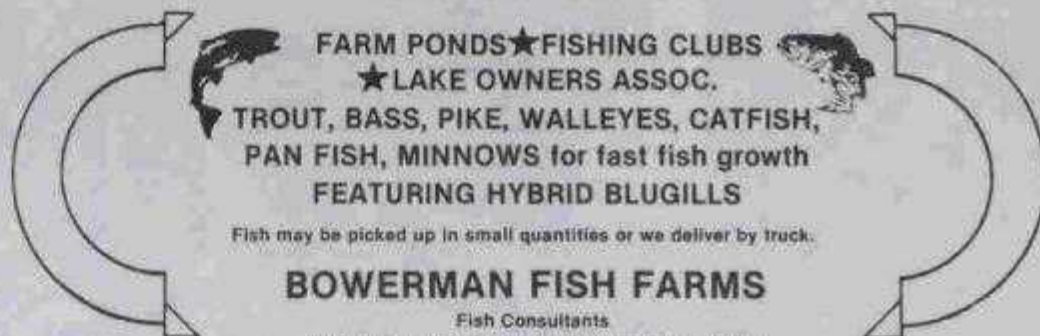
**ML&SA NEEDS HELP TO GROW:
WILL YOU MAKE A CONTRIBUTION
TODAY?**

Make checks payable to:
Michigan Lake & Stream Assns., Inc.
9620 E. Shore Dr.
Portage, MI 49002

CONTRIBUTIONS TO ML&SA 1980

Lakes Preservation League	\$150.00
Cecile Harbour	50.00
Russell Mohney	29.80
Albert Crane	10.00
Arnold Lake PO Assn.	25.00
Floyd & Gerri Rorabacher	25.00
Hubert Getzinger	25.00
Hughes Southwell	50.00
Wayne Clark	7.00
James H. Hanna	25.00
Total	\$396.80

FISH for STOCKING



**FARM PONDS★FISHING CLUBS
★LAKE OWNERS ASSOC.**

**TROUT, BASS, PIKE, WALLEYES, CATFISH,
PAN FISH, MINNOWS for fast fish growth
FEATURING HYBRID BLUGILLS**

Fish may be picked up in small quantities or we deliver by truck.

BOWERMAN FISH FARMS

Fish Consultants
1442 N. Summers Rd., Inlay City, Michigan 48444
11 Miles East of Lapeer on M-21, 1 1/4 Miles North on Summers Road
PHONE: 313-724-2185

CERTIFICATE FOR SERVICE AWARDS PRESENTED TO:



Harold & Wray Moran



Wayne & Florence Clark



Paul & Gerda Clark

PRESENTERS:



Dr. Don Garling - M.S.U.



Charles Wolverine



(Left) Jack Balls - DNR (Right) Robert McAlpine MI&SA, V.P.



Dr. James Lampky

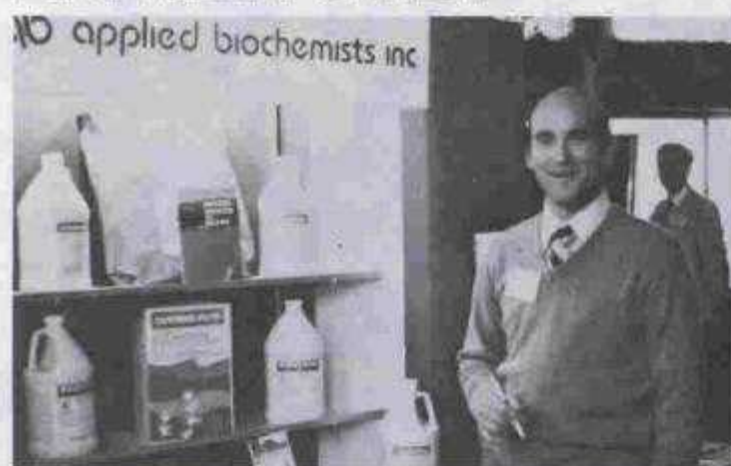


Ruth O'Gawa



Ray White

EXHIBITORS:



Bob Rowe - Applied Biochemists



Brian Krull



(Left) Ednie Maier
(Right) Bill Cahill



(Left) Ray Fix (Right) John Schrauben
Progressive Engineering



Dick Tillotson



Arthur Laing



Wanda Berry



Mike Czuprenski



Chevron Chemical Display

KEYNOTE SPEAKER COMPLIMENTS AND CHALLENGES CONVENTION DELEGATES AT ANNUAL MICHIGAN LAKE AND STREAM ASSOCIATIONS MEETING AT HILTON SHANTY CREEK. (October 25, 1980)



President, Cecile Harbour, presents certificate of appreciation to Judge John Feikens for keynote address.

Honorable John Feikens, Chief Judge of the United States District Court for the Eastern District of Michigan, complimented members of ML&SA for their "interest in the preservation of our natural environment, and that a very strong ally of those who are interested in the environment are the courts of our country and the judges who are here to enforce those laws. The time for enforcement of the laws we now have in place is overdue."

Judge Feikens pointed out some of the basic differences between state and federal courts stating that the Federal Judiciary has limited jurisdiction in areas of social concern. Under the constitution of the United States, "All powers not specifically granted to the federal government are reserved to the states." So state governments govern a much greater and broader spectrum of the lives of individuals. Those areas include property rights, marriage and divorce, education and a host of criminal laws. The federal courts interpret the law and Constitution of the United States.

IMPORTANCE OF GREAT LAKES STRESSED

The Great Lakes, said the Judge, are a priceless economic and social resource both to the United States and to Canada. The activities which the lakes support are purely staggering in their diversity and magnitude. Over three billion gallons of Great Lakes water are consumed every day for domestic use only. One-hundred fifty-seven million gallons per day sustain agriculture. Thirty-six million more gallons support vital manufacturing industries. Over 115 thousand tons of iron ore and grain are transported annually through the lakes.

For utilization of the tremendous benefits of the lakes, permits, indeed requires concentration of people in various areas scat-

tered throughout the Great Lakes. These concentrations of population make possible the development of the lakes potential for the good of all. They also create dangers which threaten to overwhelm the advantages which the lakes are able to bestow.

The challenge we face is to fully utilize this resource for the best mix of industry, agriculture, transportation, recreation and preservation. That mix must be balanced. It must not produce side effects which over the long run cancel out the lakes themselves. Both the complexity of this challenge and the inadequacy of our present efforts to meet it can easily be outlined.

TWO MICHIGAN PROBLEM AREAS IDENTIFIED — Some Twenty Counties in the Northwest Lower Peninsula and the Saginaw River Basin.

Not long ago a blue-chip federal commission released its second assessment of national water resources. Some of the problems identified in this federal commission study were quoted as follows: "Water quality problems are caused by municipal discharges, septic systems and agricultural run-off. Potable water supplies are diminished by wetland loss and by groundwater contamination because of abandoned oil wells and improper use of septic systems. These water supplies have also been limited by natural mineral content. Rural and minor urban flooding is a problem in scattered locations. Throughout this area urban expansion and resort development threatens wildlife habitat, prime agricultural land and natural areas. Exploration and drilling activities for oil and gas are being undertaken. The use of all-terrain vehicles damages Lake Michigan sand dunes and protective vegetative cover."

The report goes on to describe how problems in this particular area have conse-

quences which ripple throughout the state and the rest of the Great Lakes region. Those problems include chemical contamination which enters the food chain, soil erosion, sedimentation, nutrient enrichment, careless oil drilling and flooding. All of these problems have economic and social costs which are felt throughout the state.

SAGINAW RIVER BASIN

Also taken from the national assessment is the Saginaw River basin. The area lies south of Saginaw Bay and includes the area of Flint, Saginaw, Bay City and Midland. Basic problems in the area include municipal and agricultural wastes, sewer overflows and industrial pollution. Much of the difficulties here are that these core problems interact with each other and are exacerbated by the needs of an urban industrial community. Such needs for large scale navigation create a need for dredging. Dredging disturbs the aquatic ecosystem threatens commercial and sport fishing. The availability of transportation makes large scale agriculture possible, but storm run-off can contain hazardous levels of excess nutrients, pesticides and sediment. Urban expansion can aid the states economy but it threatens to escalate the severity of all those problems. The straight-forward economic costs of all these problems can only be guessed. One of the costs of urbanization is flood damage. Estimates of costs of urban flood damage only in the Saginaw River basin are as follows:

Saginaw River	\$104,000
Tittabawassee River	351,000
Shiawassee River	89,000
Flint River	105,000
Cass River	187,000
Rural Areas	1,164,000

for a total of over two million dollars. The challenge I would like to put before this con-

vention is that something more must be said and done. Far too much of the literature on these topics is nothing more than a repeat of the litany of the problems.

THE ENVIRONMENT WON'T WAIT

We need to accelerate the steps toward answers. The answers must address particular problems in particular communities, said the Judge. In describing the clean-up of the Detroit River, Judge Feikens said that the first step was to identify the problem. It appeared that the management of the Detroit waste water system was highly inadequate. The EPA suggested that the solution would be to turn the management over to the Army Corps of Engineers. This solution was rejected because of the involvement with private property rights which are a foundation of American jurisprudence. The solution decided upon was to place it in receivership and place the operation directly under the authority of the Mayor of Detroit. By cutting through red-tape rapid progress is being made, and it is anticipated that by the spring of 1981 that the Detroit waste water treatment plant will be in complete compliance with Federal law, and the the system can be returned to its executive department for operation — to the Board of Water Commissioners.

Anyone who is familiar with the Detroit River of the past will vouch for the vast improvement that has occurred. Both swimming and fishing are recreational activities in the Detroit River now. More still remains to be done. There are problems of toxic chemicals being washed into the river and into Lake Erie. The natural run-off from farm lands surrounding Lake Erie are still a very major contributor to the build-up of phosphates in Lake Erie. The Raisin river is a carrier of a great amount of herbicides and pesticides into the water. So there is still work to do. The time for talk has ended. **THE TIME FOR ACTION IS HERE.**

Honorable Judge John Feikens
Chief Judge, United States District Court
for the Eastern District of Michigan

Mr. Feikens is a graduate of Calvin College, receiving a B.A. Degree in 1938 and a J.D. Degree from the University of Michigan in 1941. He received an honorary degree from the University of Detroit in 1979.

Judge Feikens received an interim appointment as United States District Judge for the Eastern District of Michigan on October 13, 1960. His appointment expired on September 27, 1961. He received a permanent appointment on December 1, 1970 and entered on duty December 14, 1970.

Judge Feikens is a member of a number of legal associations in the state and has served as Director and President of the Detroit Bar Association.

TOWNSHIP OF OAKLAND COUNTY OF OAKLAND STATE OF MICHIGAN

FLOOD PLAIN AND WETLANDS PROTECTION ORDINANCE NUMBER 26*

An ordinance to protect the watercourses, flood plains and wetlands of Oakland Township, Oakland County, Michigan; to regulate the use of land areas subject to periodic flooding; to protect economic property values, aesthetic and recreational values, and other natural resource values associated with the flood plains and wetlands of this Township; to provide for review procedures for the use of these resource areas; and to provide for penalties for the violation of this Ordinance adopted to secure the public health, safety, and general welfare under the combined authority of Act 127 of the Public Acts of 1970 and Act 246 of the Public Acts of 1945.

The Township Board of the Township of Oakland, County of Oakland, State of Michigan ordains:

01.00.00. ARTICLE I SHORT TITLE

This Ordinance shall be known and may be cited as the Oakland Township FLOOD PLAIN AND WETLANDS PROTECTION ORDINANCE and referred to as Ordinance No. 26.

*This Ordinance was first passed on January 26, 1973 revised and approved in its present form on March 27, 1979.

02.00.00 ARTICLE II PURPOSE

02.01.00

Consistent with the letter and spirit of Act 127 of the Public Acts of 1970, and Act 246 of the Public Acts of 1945, the Township Board of Oakland Township finds that rapid growth, the spread of development, and increasing demands upon natural resources have had the effect of encroaching upon, despoiling, polluting or eliminating many of its watercourses and wetlands, and other natural resources and processes associated therewith which, if preserved and maintained in an undisturbed and natural condition, constitute important physical, aesthetic, recreational and economic assets to existing and future residents of the Township.

02.02.00.

The Township further finds that the pollution, impairment or destruction of the Township's flood plains, watercourses, and wetlands has and will continue to cause substantial harm to the property of other landowners and to the rights of the public and that the protection of the natural resources is essential to the protection of the public health, safety, and welfare within the Township.

This Ordinance shall:

01.

provide for the protection, preservation proper maintenance, and use of Township watercourses and wetlands in order to minimize disturbance to them and to prevent damage from erosion, turbidity or siltation, a loss of fish or other beneficial aquatic organisms, a loss of wildlife and vegetation and/or from the destruction of the natural habitat thereof;

02.

provide for the protection of the Township's potable fresh water supplies from the dangers of drought, overdraft, pollution, or mismanagement which will affect human, animal, or plant life;

03.

secure safety from damaging flood heights and velocities caused by obstructed flows and reduced storage; reduce the financial burdens imposed upon the community through rescue and relief efforts occasioned by the occupancy or use of areas subject to periodic flooding; prevent loss of life, property damage and other losses and risks associated with flood conditions; preserve the location, character and extent of natural drainage courses.

For more information, you may contact:

Carolyn Phelps, Clerk
Oakland Township
4393 Collins Road
Rochester MI 48063



WILLIAMS & WORKS

ENGINEERS • PLANNERS • ARCHITECTS
GRAND RAPIDS, MICHIGAN AND OTHER CITIES

ML&SA STATES POSITION ON CURRENT ISSUES

1.) WATER CONSERVATION (May 1980)

WHEREAS: Increasing demands are being placed upon the available freshwater supply of the State of Michigan through increasing population growth, industrial development, residential and commercial irrigation, and other causes.

WHEREAS: The pollution of the freshwater supplies is increasing at a rate faster than attempts to clean and restore the quality of water for human use.

WHEREAS: Unnecessary and wasteful use of the freshwater supply increases the use of energy sources adding to inflation and increasing the costs of providing for the necessities of life for food, clothing and shelter.

WHEREAS: Unnecessary and wasteful use of the freshwater supply increases the costs of government thereby increasing the tax burden upon the citizenry.

BE IT RESOLVED THAT: The Board of Directors of Michigan Lake and Stream Association, Inc. encourages its members to conserve their use of freshwater. The Board recommends that its members give consideration to such water conservation practices as:

1. Clean vegetable and fruits efficiently.
2. Defrost frozen foods without the use of running hot or cold water.
3. Use the dishwasher only when a full load is used.
4. Use the least possible amount of soap or cleaning agent. Use low phosphate detergents.
5. Keep bottle of drinking water in refrigerator.
6. Do not heat more water than is needed for coffee, tea, etc.

2.) PRESERVATION OF DAMS IN MICHIGAN

WHEREAS: Dams across streams and rivers of the state serve important social and important economic functions. They create reservoirs for the generation of hydro-electric power. They provide for stormwater management and flood control. They create additional spawning areas for fish and increase recreational areas for such activities as fishing and boating.

BE IT RESOLVED THAT: ML&SA opposes the removal of dams unless they have ceased to serve and cannot be made to serve any important social or economic function and unless it can be conclusively shown that the disadvantages of the dam outweigh the advantages of maintaining the structure.

BE IT FURTHER RESOLVED THAT: ML&SA supports the preparation of an environmental impact study prior to the removal of any dam in that state.

3.) FUNNEL DEVELOPMENTS ON INLAND LAKES (May 1980)

WHEREAS: Funneling developments, defined as the use of a waterfront lot or parcel to provide access to a body of water for property owners within a larger development

located away from the waterfront, are increasing at a rapid pace.

WHEREAS: Lakes without wastewater treatment facilities are experiencing degradation of the water quality of the lake as evidenced by algae blooms, profuse weed growth, imbalance of aquatic plants and animals, offensive odors, etc.

WHEREAS: The costs of maintaining the quality of water in a lake devolves primarily upon the riparian property owners.

WHEREAS: The use and enjoyment of a body of water by riparian property owners declines as the use of the water by non-riparians increases.

BE IT RESOLVED THAT: The Board of Directors of Michigan Lake and Stream Association, Inc. supports and encourages the efforts of lake and stream associations to promote the adoption of anti-funneling ordinances by local governing bodies.

4.) NATURAL RIVERS DESIGNATION (September 1980)

WHEREAS: Trees are being removed right to the waters edge along rivers and streams of the state.

WHEREAS: Trees along streams are necessary to provide and protect fish and wildlife habitat, to prevent rapid water run-off and to prevent bank erosion and sedimentation of other streams and lakes, including the Great Lakes.

BE IT RESOLVED THAT: The Board of Directors of Michigan Lake and Stream Associations, Inc. supports the efforts of the Natural Resources Commission in identifying wilderness, wild scenic and country scenic rivers of the state and preventing the destruction of their environmental values.

5.) GREAT LAKES SHORELAND PROTECTION (September 1980)

WHEREAS: Before 1900 the Great Lakes had ample supplies of lake herring, trout, whitefish, sauger and blue pike.

WHEREAS: During the first half of the 20th century the population of the above mentioned species declined one after another to the point of near extinction.

WHEREAS: The causes of the declines in fish populations in the Great Lakes were due to such causes as filling and dredging of spawning grounds, infiltration of industrial and municipal wastes, invasion by the sea lamprey and overfishing.

BE IT RESOLVED THAT: The Board of Directors of Michigan Lake and Stream Associations, Inc. supports and encourages the Natural Resources Commission in designating and controlling the development of environmental areas around the periphery of the Great Lakes to protect and preserve the spawning grounds of the natural and implanted species of fish that can survive in the Great Lakes environment.

BE IT FURTHER RESOLVED THAT: The Board of Directors of Michigan Lake and Stream Associations supports and encourages the Natural Resources Commission in regulating the fishing in the Great Lakes for the purpose of maintaining ample supplies of desirable fish populations.

6.) RECREATIONAL TRESPASS ACT (September 1980)

WHEREAS: Decisions in court cases in Michigan have established beyond any doubt the right of ownership by the shoreline property owner of submerged land to the center of the inland lake or stream.

WHEREAS: Decisions in court cases in Michigan have established beyond any question that there are non-navigable streams in the state which are privately owned and not open to public use.

WHEREAS: Common law both in England and the United States has confirmed a public right to the use of surface water of a navigable stream for navigational purposes.

WHEREAS: The use of the surface water of a navigable stream by the public DOES NOT confer or include riparian rights to the public to the use of the submerged land under the stream at times of high water or to the use of the exposed bottomland at times of low water.

WHEREAS: Agencies of State government may desire to expand their jurisdiction to include control of non-navigable streams.* (See note at end of next column)

WHEREAS: The legislature of the State of Michigan has passed an Act (Act #323, P.A. of 1976) which has eroded the riparian rights doctrine within the State and has brought about harassment of private property owners along private non-navigable streams.

BE IT RESOLVED THAT: The Board of Directors of Michigan Lake and Stream Associations, Inc. views Act #323 known as The Recreational Trespass Act as vague and contributory to harassment and in conflict with private land owners across the state.

BE IT FURTHER RESOLVED THAT: The Board of Directors of Michigan Lake and Stream Associations, Inc., respectfully request that the legislature of the state take steps at the earliest possible time to either repeal or amend the Act. Any amendments to the Act should define terms used in the Act and include the authority to promulgate rules by the enforcing agency deemed necessary to enforce the provisions of the Act.

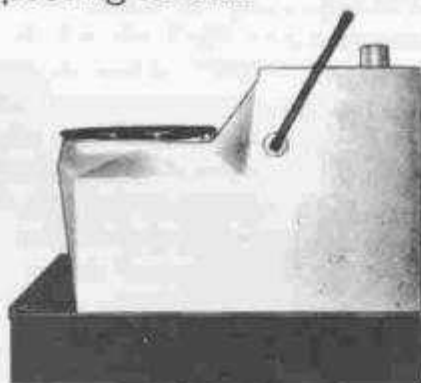
* In the MECOSTA COUNTY BOARD OF SUPERVISORS v. CONSERVATION DEPARTMENT case (381 Mich 180) the attorney general urged the Court to extend the State's jurisdiction to all non-navigable streams. The argument from the attorney general's brief stated, "...if the State of Michigan intends to protect for all time the navigable capacity as well as the many uses which the public may make of the Saginaw river, by necessity, it should exercise control over the entire Saginaw valley system including its upper and remote regions among which is the south branch of the Chippewa river. The result is that all of the tributaries that contribute to the total capacity and the flow of the Saginaw river, in a sense, should be considered in fact and in law the navigable waters of the State. It is only in this manner that the State could effectively exercise its trusteeship and its surveillance over these waters."

Had the Court agreed with this argument, private control of small non-navigable streams and creeks in all or parts of seventeen (17) counties would have been eliminated. Precedent would have been established for state control of all non-navigable streams and creeks throughout the state.

THE SHAPE OF THE FUTURE! The BIO-SYSTEMS Model M-C

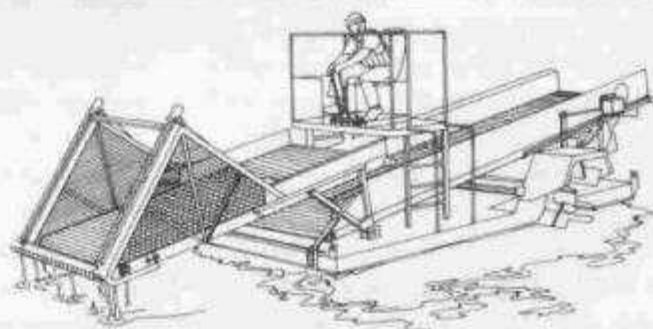
This model is ideal for cottage applications, and represents the results of our long experience in designing and manufacturing composting toilets.

Featuring the only self-contained Bio-Toilet which operates WITHOUT chemicals or electricity.



BIO-SYSTEMS TOILETS CORP. LTD.
P.O. Box 761 Massena, N.Y. 13602
1-613-632-9502

Aquatic Weed Harvester



- ☐ Diesel Engine ☐ Hydraulic Power Train
- ☐ "Side Feeds" to Eliminate Weed Fragmentation
- ☐ High Performance ☐ Cost Effective

Add Useful Life to your Lakes and Waterways

CALL TOLL-FREE! **800-328-7333**



MUD CAT Division
National Car Rental System, Inc.
P.O. Box 16247
St. Louis Park, Minn. 55416

CHECK

PONTIAC LAKE IMPROVEMENT:Efforts by a Property Owners Association

By Michael A. Czuprenski (Environmental Engineer/Planner, Johnson & Anderson, Inc., Pontiac, Michigan), and James L. Reid (Chairman, Pontiac Lake Improvement Board)

Pontiac Lake is a 615-acre impoundment of the Huron River located in central Oakland County. It is a large warmwater lake with about 70 percent of its depths less than 5 feet, and with one distinct hole (Figure 1) of 34 foot depth. The lake boasts a 16 mile shoreline perimeter, with two long and narrow arms of densely developed residential land jutting into the lake. The lake is almost entirely surrounded by the 3,700 acre Pontiac Lake Recreation Area administered by the Michigan DNR. Being approximately 7 miles west of the City of Pontiac and 30 miles from Detroit, and offering two public fishing access sites, two public picnic areas, a huge public bathing beach, and a 25 unit campground, this lake is intensely used year-round by the metro area public as well as by the actual lakeshore residents.

The lake's deep hole is characterized by depleted oxygen in the bottom waters both in summer and winter stratification periods. Since the lake is so shallow, the peat bottom is covered with an excessive growth of aquatic vegetation (Figure 2) not to mention the numerous stumps and logs from the initial flooding. Deposition and decay of this material over successive winters has created accumulations of up to 6 feet of organic sediment, while the lake also appears to be supporting blue-green algae blooms on the surface.

In the summer of 1977, the residents on the lake felt that they would like to have Pontiac Lake improved so that movement through the lake would be less restricted by weeds, stumps, and shallow water. In October of 1977, the Pontiac Lake Improvement Board was formed through the mechanics of the Inland Lake Improvement Act of 1966 [Act 345], and in February 1979 the firm of Johnson & Anderson, Inc. was retained to provide the required professional engineering services. In the meantime, the Pontiac Lake Property Owners Association acquired a stump pulling barge from the Huron-Clinton Metropolitan Authority, and have marked problem stumps with milk bottle floats attached to weights.

In order to first find out more information on the lake and riparian attitudes, a lakeshore resident survey questionnaire was prepared and distributed to all lakeshore residents. Questions in this survey dealt with what the residents felt were the critical problems, in what areas were they most affected, how much money they were willing to spend on an improvement project, how much they spent each year on lake maintenance, how deep their groundwater wells were, what condition their septic systems were in, and miscellaneous questions on fertilization, user days per activity on the lake, etc. This information, along with color (Figure 2) and false-image aerial photos, water quality data, an aquatic vegetation survey, nutrient budget determination, and cost figures, allowed an evaluation of alternative lake improvement techniques in terms of specific applicability to Pontiac Lake.

Lake bottom dredging, mechanical weed harvesting, dilution with groundwater, herbicidal weed control, aeration, covering up the lake bottom sediments, and winter lake level drawdown techniques were analyzed, along with their associated advantages, disadvantages, and costs. Realizing that these are just "cosmetic" short-term improvement methods since they have little or no effect on incoming nutrients to the lake, the consultant also sought to recommend long-term nutrient control management program guidelines (next page), and the Pontiac Lake Property Owners Association have passed these out to each lake area resident.

After numerous meetings and field trips with the Property Owners Association, DNR biologists, and others involved with lake management activities, it was decided that the winter drawdown technique would be recommended. This method allows exposure of the aquatic vegetation to the winter freeze, and will hinder regrowth of many types of weeds. In addition, the bottom sediment should consolidate over the winter. While the lake level is kept down, the Pontiac Lake Property Owners Association could then coordinate a group clean-up effort under an Inland Lakes & Streams Act permit, they could relocate stumps to designated fish habitat areas, they could trim tree branches which protrude too close to the water surface, and they could improve their docks, seawalls, and beaches. Also, the Association is looking into the practicality of coordinating group septic tank pumping programs on a regular basis. For long-term benefits, the Township has retained the firm to analyze the pollution problem in the

region under Section 201 of the Federal Clean Water Act, and to recommend the wastewater facilities necessary to abate this pollution.

In conclusion, the Inland Lake Improvement Act does indeed provide a mechanism to find the most cost-effective means of improving a lake; however, riparians must be willing to become committed to their lake clean-up efforts, and need to plan on spending a lot of time and/or money to achieve such improvements. The closer riparians follow the "Guidelines" developed for them, the less time and money will be needed to be spent later on.

WINDBREAKS

Americans could save 10 to 25 percent on their heating fuel bills by planting windbreaks around their homes, says Robert Hartung, a forester with the U.S. Department of Agriculture's (USDA) Soil Conservation Service (SCS).

The USDA tests trees and shrubs to determine their suitability for use in windbreaks. The Plant Materials Center in Rose Lake, Michigan, recently released a Carolina poplar for windbreak use in the Midwest and the Northeast.

Hartung said experiments show that windbreaks, long in use in the Midwest, may have application nationwide. At Princeton University, N.J., researchers built a windbreak model around a townhouse, substituting triangular wire screens for trees. Heating fuel costs dropped by 20 percent. Windbreaks save energy in winter by slowing the speed of winds and causing a more even distribution of air around buildings. This reduces the air infiltration rate, the rate at which warm air is replaced by cold air.

Air infiltration alone is responsible for a third of the cost of heating buildings, according to Hartung. "This means that a 75 percent reduction in air infiltration, which is not uncommon, results in about a 25 percent savings in heating expenses," Hartung said.

Trees Provide Protection From Summer Sun

Much less is known about the cost-saving effects of trees in summer. Trees such as the Norway maple, sugar maple, cherry bark oak and southern red oak provide good shade in summer and allow the sun's heat to reach buildings in winter. When used for cooling purposes, these trees should be placed close to the south side of buildings.

Conversely, conifers and other evergreens used in windbreaks should be planted in one, two or three rows at about one mature tree length from the structures. Properly located, they will deflect northern, northwestern and western winds in winter.

Trees Provide Protection From Winter Winds

Windbreaks provide the best protection, Hartung said, when the plantings include a row of shrubs. The shrubbery keeps air from flowing under the tree leaf barrier. 'King Red' Russian olive and 'Barranco' desertwillow are among the shrubs that have been released by USDA for use in windbreaks.

The costs of constructing and maintaining windbreaks varies, according to the size of trees used and the kind of windbreak planted. A 150 foot, one-row windbreak, for example, consisting of trees five to six feet in height and set six feet apart, cost about \$445 in 1980, not including labor.

Greenbelts Protect Inland Lakes

A simple, economically feasible and aesthetically pleasing method of reducing the nutrient load to inland lakes is gaining popularity among lakefront owners. "Greenbelts," or vegetative buffer zones, effectively trap runoff sediment and utilize nutrients before they reach the lake.

A greenbelt is a strip of vegetation, usually about 20 feet in width, planted between the shoreline and the home, lawn, or other development. The buffering action of a greenbelt can offset the effects of two major sources of nutrient loading in inland lakes — septic systems and lawn fertilization. The vegetation traps and utilizes nutrients which run off the lawns from over-fertilizing, takes up nutrients from fertilizers and septic wastes in soil, and removes nutrients from the groundwater caused by septic system leakage.

Greenbelts usually consist of a mixture of groundcover, bushes, and trees. The roots of the smaller plants and groundcover prevent soil erosion by anchoring the soil particles in place. The roots also trap sediment from runoff and rain. By removing the nutrients from the soil and drawing up by-products of septic system wastes, these shallow rooted plants also reduce nutrient loading to the lake. Deep rooted vegetation, such as large shrubs and trees, tap directly into the groundwater and perform two beneficial functions — removing nutrients from groundwater and lowering the water table in areas where a high water table is causing the septic system to pollute the groundwater.

A variety of plants can be used for greenbelts. These can be plants indigenous to the area or ornamentals used for landscaping. Advantages of native plants are that they require less maintenance and are better suited to survive in the conditions of the area. Both evergreens and hardwoods may be used, although the annual leaf loss from deciduous plants can contribute to bottom sedimentation and increase nutrient enrichment in the lake. Therefore, autumn leaves should be raked away from the lake.

Where native vegetation has been removed, the local County Cooperative Extension Service can recommend the best types of plantings for a particular site. In sandy, dry soils, bracken fern and juniper make good groundcovers. Autumn olive, staghorn sumac, and honeysuckle are shrubs which grow best in this type of soil. Trees that can be utilized include white, red, and jack pines, red oak and maple, and black locust.

For moist sandy soils, good greenbelt groundcover is myrtle, periwinkle, or wintergreen. Mountain ash, gray dogwood and crabapple are well-suited shrubs; and cottonwoods, Norway spruce, and sugar maples are good tree choices. Lilies of the valley are an excellent groundcover for moist, fertile soil, and lilacs, silky dogwoods, and yews are the best shrubs for this type of soil. Cottonwoods and weeping willows also grow well in wet soils.

Lawns do not make effective greenbelts, and can actually cause pollution and runoff problems due to fertilization. Lake owners should use little or no fertilizer on their lawns. If a fertilizer is used, it should not be applied in the spring or during a rainy period. Fescue grass mixtures make better lawns in lake areas than bluegrass because they require less than half the nutrients of bluegrass.

Greenbelts can enhance a property owner's frontage in other ways by providing excellent wind and sound breaks, and attracting birds and wildlife. A natural or imaginatively landscaped greenbelt can also add to the aesthetics of a lakefront owners' property.



**THE ECONOMICAL SOLUTION
To Aquatic Weed Control**

AQUATIC ENGINEERING INC.

680 Indianwood Road

Lake Orion Mi 48035


313-548 8340

cutters - harvesters

&

shore conveyors

we care about your lake



**Environmental
Chemistry
Laboratory**

**SPECIALIZING IN
COMPLETE ANALYSIS**

*Lake
Stream
Groundwater*

**FREE: Descriptive Brochure Including Results
From an 160 Acre Lake Study**

**345 STATE ST. SE GRAND RAPIDS, MI.
49503 (616) 454-6539**



NO QUESTION WHERE THESE WEEDS ARE GOING

Does your weed control program fertilize someone's garden or does it continue to fertilize your lake bottom?

MANEY'S AQUATIC WEED HARVESTING CORP.

115th Ave., Ewart MI 49631
616/734-2770

THE MICHIGAN RIPARIAN

11262 OAK AVENUE
THREE RIVERS, MICHIGAN 49093

2nd Class postage paid at Kalamazoo,
Michigan and additional mailing offices.

(Note to Subscribers; So that you will not miss a single issue, please notify us promptly of any change in address.)

NEW CONCEPT AQUASHADE FILTERS SUNLIGHT

controlling aquatic plant growth
Also Turns Pond a Natural Blue.

Simple and Proven.

Harmless to Fish, Wildlife,
Livestock, and Humans.

AQUASHADE®

Dealer requests welcome
write:

P.O. Box 198
Eldred, N.Y. 12732
(914) 557-8077



P.S. For EARLY control. Just POUR on the ICE. It will melt a hole and disperse underneath.

A CLEAN LAKE IS A HEALTHY LAKE

Unchecked water weeds and algae can reduce swimming enjoyment, tangle fishing lines and outboard motors, and could create an imbalance in fish populations in your lake or pond.

Rose Aquatic Service can help control the spread of water weeds and algae making your lake cleaner, healthier and more enjoyable for summer's activities.

Rose Aquatic Service - an intelligent part of a complete lake management program. Call today for a free survey and estimate.

(313) 588-7005



ROSE AQUATIC SERVICE

A division of Rose Exterminator Co.
1130 Livernois, Box 1402
Troy, Michigan 48099