

within acceptable levels of health standards. The available data do not in any way suggest, however, that a health hazard exists in the water quality at Lime Lake.

A separate water supply and distribution system would be the best, long term solution for protecting water supplies. As an alternative, however, wells would be made safe for a long period of time once a sewage collection and treatment system were installed.

Water quality can also be protected under special rules and regulations, and by establishing a water improvement district under the New York State Health Law.

Third, roadside drainage ditches and culverts collect storm water and direct it into Lime Lake. There are several such arrangements along the perimeter of the lake. When a drainage culvert (or metal sluice channel) empties into one of the shallow bays of Lime Lake during a storm, it can affect the water and sediments in a major way. The storm water, when it comes in its downhill rush toward the lake, erodes the drainage ditches, collects sediments, and a wide variety of organic material, fertilizers (nutrients from farming operations), salts and other pollutants (associated with vehicle and the use of the surrounding highways), and a wide range of material from cottages, homes, and businesses.

Storm water run-off can be as significant or more so than septic systems as a source of nutrients. The cooperation of (and possible funding from) town, county, and state highway departments would be needed to control storm water run-off. Erosion control measures, settling ponds and other steps are needed to reduce the amounts of silt, organic material and other pollutants from entering Lime Lake during storms. Given the unique location of Lime Lake, which itself drains away in two opposite directions, it may be possible to construct a diversion channel away from the lake. These techniques should be considered if storm water run-off is found to be a significant problem.

c. Use Chemicals in Limited Applications

The Lime Lake Cottage Owners Association (LLCOA) has attempted to control the growth of weeds in their lake during the past decade. Their main line of attack on the weeds has been through the use of chemicals. The dominant weed, *Vallisneria Americana*, literally chokes off large sections of the lake. Swimming, boating and fishing are virtually impossible in certain areas of the lake between July and October of each year. The local point of view is to proceed with using chemicals to kill the weeds so that the property owners can use the lake and enjoy its amenities more fully. Between 1979 and 1986, the LLCOA expended \$20,000 on chemical applications in Lime Lake (i.e., Aqua Kleen 2,4-D).

In 1987, the Cottage Owners Association abandoned the application of Aqua Kleen 2,4-D because of reports indicating that this herbicide was

not effective. Then, when they switched to another, more effective chemical, Hydrothol 191, they ran into regulatory difficulties. The NYSDEC denied the LCOA's permit for using Hydrothol 191 in 1987. The LCOA amended its application by further restricting the area to be treated to a small test patch. The NYSDEC also denied the amended permit. The NYSDEC gave as its reasons for denial that Hydrothol 191 should not be used in lakes because it is toxic to fish and could kill fish even in low concentrations. It was also stated that Lime Lake was an important fishery resource in western New York State for gamefish such as Tiger Muskellunge and Large Mouth Bass.

This type of situation is occurring statewide and has been the driving force motivating land owners on lakes throughout the state to find alternatives to chemicals. Most of these other alternatives are more expensive than chemicals, more labor intensive, and more complicated (financially and organizationally) to implement. In the meantime, since 1986, the LCOA has accumulated \$9,000 for future chemical applications once current difficulties are overcome.

With regard to the use of chemicals, it is recommended that the LCOA continue to seek methods by which chemicals can be used at Lime Lake, and that the LCOA itself continue its current policy of proposing limited applications in target areas. At the same time, it is recommended that the LCOA begin pursuing other alternatives as a long term objective.

For example, across the state, the aquatic plant harvester is becoming a popular answer. Whereas chemicals kill plants and leave them in the water to decompose and recycle as nutrients, harvesters remove plants from the lake entirely (and therefore remove nutrients from the lake).

d. Use Bottom Barriers At Local Sites Only

The use of bottom barriers has shown promise of becoming a standard part of any program to control excessive weed growth in lakes. A variety of techniques are being used for this purpose around the state. Most have still not been proven entirely effective.

In 1987, the LCOA undertook a test program of applying inert fiberglass bottom screen barriers in an attempt to control the weeds. While the test is still being made, the LCOA observed that the bottom screens were too expensive to apply on a large scale, and they had difficulty installing the screens and keeping them on the bottom with the weeds. Fifty patio blocks had to be dropped on top of each 30' X 50' screen (which cost \$150 for each screen).

Given the recent interest shown in the use of bottom barriers, the following recommendations are made:

- (1) It is recommended that each property owner check with NYSDEC and the USACE prior to installing bottom barriers. Permits may or may not be required for bottom barriers depending upon the local situation, the extent of coverage and types of materials and methods of installation. In general, the local use of barriers around docks and swimming areas may be feasible and acceptable.
- (2) It is recommended that if bottom screens are to be used by a variety of property owners on Lime Lake, some means of continuous monitoring, repairing, cleaning, removing, and replacing would need to be implemented. Without such management, in the long term, the cottage owners could themselves create a collective, man-made clutter along with weeds in the shallow areas of the lake.

e. Lower Lake Levels Every Fall

Some lakes in New York State, such as Rushford Lake, are partially drained each Fall at the end of the busy Summer season. The lower water level exposes the root system of aquatic plants. This action dries out the roots of established vegetation and kills some species. The low water level also gives property owners access to the plants and roots to remove them, and to their docking facilities for making repairs.

The LLCOA's recent experience with lowering the lake to repair the dam created some problems which would recur should this technique be used each year to control weeds. These problems are:

- (1) The lake can be drained a maximum of only two meters, or six feet. The Winter drawdown would have to be as much as 15 to 20 feet each year to be fully effective in reaching all of the established root systems. This is a physical impossibility with the terrain's elevations and the existing structure of the dam.
- (2) It would not be feasible to pump the lake below the six feet to the lower levels because of the underground springs (which feed the lake and would replenish the lake).
- (3) When the LLCOA lowered the lake in 1985 to repair the dam, they received complaints from people whose wells had dried up.
- (4) There may be some possibility that the practice of Winter drawdown would not truly eliminate *Vallisneria Americana*.

This alternative does not appear to be feasible at the present time. It could become feasible only as a part of a larger project to dredge new drainage channels, or to require property owners to dig deeper wells.

f. Undertake Limited Dredging Operations

Dredging is an available technique for controlling weeds at Lime Lake in the long run. Dredging has been known to retard the accumulation and spread of aquatic plants. This removes the root system, stem, leaves, and seeds as well as silt and gravel. The creation of steeper underwater slopes along a lake's edge may play a role in this retardation effect.

Dredging is very expensive. It is probably the most expensive of all alternatives being considered in this report. Local and state funding would be involved as would the U.S. Army Corps of Engineers. Engineering studies would be needed, as would equipment, man power, storage and repair facilities, and disposal areas. Cost estimates apparently begin at \$1.0 million.

This alternative is not feasible at the present time. If the objective is to remove weeds, dredging may not be a feasible alternative. If such dredging had other objectives, such as connecting new gravel pits to Lime Lake and creating new development areas, or creating better drainage systems, then the feasibility outlook could change in the long term.

In addition, state and federal permits would be needed. The lake was created originally because of dredging operations and its resumption could be feasible in limited operations with strict environmental controls. Also, various research requirements could be imposed by NYSDEC for the study of the lake's sediments (e.g., for toxic metals and other purposes).

g. Harvest and Recycle Weeds

Weed removal is a viable alternative to using chemicals in the water. In many cases, it is the best of all available alternatives for keeping a lake clean of excessive weeds. While this technology does not transform a clogged bay into a sand-covered lagoon, it can clean a bay enough to make it available for boating and recreational activities. It is important to keep in mind that this method, at its very best, is a repetitive process year in and year out. The weeds always grow back and need harvesting again, usually the following year.

With regard to the environment, weed harvesting is a safe, non-toxic procedure. It also does something that chemicals cannot do -- it removes nutrients from the lake each year. This may be an important factor at Lime Lake, which apparently is suffering from a slow, long-term accumulation of nutrients in its water and sediments. Removing nutrients may have a long term benefit.

The LLCOA approached the Cattaraugus County Legislature in 1987 for assistance in looking at all available alternatives to control the weed

problem at Lime Lake. One alternative that was discussed would be for the county to provide the up-front, capital cost (\$50,000 to \$100,000) for purchasing a small harvester system for Lime Lake, after which the LCOA would operate it and pay future costs for maintenance and related expenses.

A disposal area or facility would have to be obtained also, or some acceptable arrangement would have to be made for selling or otherwise recycling the weeds once they were removed from the lake. Safety concerns would need to be addressed on a daily basis. A harvester would of necessity operate during daylight hours in July, August, and September of each year -- the very peak of the season. It would be slow moving compared to motor boats and water skiers. It would also intrude upon swimming areas near the shore in order to cut and collect weeds.

The Cattaraugus County Risk Manager, in consultation with the Cattaraugus County Attorney, recommended the following:

- (1) The LCOA should seek funding and operation of an annual weed harvester program directly from the Cattaraugus County Soil and Water Conservation District. The funding could come from the NYSDEC's local assistance program, which can fund a harvester program.
- (2) The county should support the LCOA in its pursuit of one of three alternative methods of obtaining funding from the NYSDEC's Local Assistance Program:
 - The homeowners can apply for the funding directly.
 - The Soil and Water Conservation District can apply for the funding.
 - The County can apply for the funding and give it to the District to run the program.

Under this approach, the Soil and Water Conservation District would purchase and operate the weed harvesting equipment, not the cottage owners, NYSDEC, or Cattaraugus county.

It is also recommended by the Department of Development, Planning and Tourism, that a title search be conducted of county-owned property at Lime Lake. Residents at the lake reported that the county owned three or four "fire lanes" at the lake. Research by the Cattaraugus County Real Property Services Division and the County Attorney's Staff identified only one parcel on Lime Lake as being owned by Cattaraugus County. This issue should be clarified in the future.

h. Participate in Lake Management Networks

The Lime Lake community has an alternative available to it which can be pursued at relatively little cost in the short term, and which

could generate a significant benefit to Lime Lake property owners in the long run. This alternative is to participate with existing associations and experts in the general field of lake management.

Lake Management associations have studied problems such as excessive weed growth for many years. They have benefited from the knowledge and skilled work of scientists such as biologists, water resource experts, environmental management specialists, chemists and engineers.

It is recommended that the Lime Lake community develop its own strategy and program of lake management in cooperation with these other experts and lake associations, all of whom have experience in developing successful programs elsewhere. In this manner, the LCOA could expect to avoid unproductive steps which "re-invent the wheel".

The Lime Lake community should join the following two organizations:

- (1) The Federation of Lake Associations, Inc. (FLA). The FLA is five years old. Its purpose is to solve the problems of water pollution in lakes, to control the growth of weeds in lakes, and to lobby elected officials in Albany to assist in protecting lakes and enhancing the use of lakes in New York State. It sponsors conferences at which members can meet and discuss their concerns with various experts, state agency representatives, environmental organizations and others regarding the latest techniques and solutions for lake-related problems. The federation also publishes an informative newsletter, and assists members in networking efforts.
- (2) The Water Resources Board of the Finger Lakes Association, Inc. (WRBFLA). The WRBFLA has a 15 member board representing 15 counties in the Finger Lakes region of New York State (including Cattaraugus County's neighbor, Allegany county). It has an experienced technical advisory committee and a professional, full time staff. Its program is well established. It works directly with officials in Albany on state funding for lake management programs and in getting items submitted for the state budget each year (the state's fiscal period starts each year on April 1st). Special studies for specific lakes is a common proposal. A major concern each year in the Finger Lake's Region is how to control excessive growth of aquatic vegetation.

The Cattaraugus County Department of Development, Planning, and Tourism contacted the WRBFLA staff in the Spring of 1988 with regard to assisting Lime Lake. The WRBFLA staff was very helpful and discussed the matter with their Executive Committee. The response was supportive, indicating that Lime Lake could participate in the coming year as a non-contributing member.

In summary, the Lime Lake community could benefit greatly from the experience, knowledge, and programs of existing lake management networks in New York State and across the nation. It would also find strength in numbers, more so than if Lime Lake tackles its problems and seeks state funding on its own.

For example, the New York State legislature is expected to pass new legislation in the next several years to create a "Clean Lakes Program". This new program will benefit not only the Finger Lakes region, but other regions as well. Another legislative approach is being used already -- it is the use of "member items" in the state Legislature for putting items in the state budget. Perhaps a funding proposal for 1989 could be developed called, "An Aquatic Vegetation Control Program for Cattaraugus County".

i. Support Scientific Studies

The Scientific study of Lime Lake has been conducted periodically by the NYSDEC in permit reviews, and by the Cattaraugus County Health Department in its septic system and water sampling investigations. There is a need to begin collecting and storing data on Lime Lake for easy retrieval in a longitudinal format. Longitudinal data would create a baseline of available information that could be used in Environmental Impact Statements, grant applications, permit applications, and program design and implementation oversight discussions. This will become very important if the state legislature enacts the proposed, statewide "Clean Lake Program", or if a state legislator sponsors a member item for Lime Lake.

The following types of data illustrate the range of scientific study that will be needed in the coming years for Lime Lake (i.e., in easily retrievable formats in a longitudinal context in comparison with other lakes in upstate New York):

- (1) Develop a base map and present high quality, up-to-date aerial photographs for comparison and inventory purposes.
- (2) Compile basic information on physical characteristics of Lime Lake.
- (3) Monitor water quality by sampling water during clear weather and just after major storms and snowmelts on a spot check basis. Water chemistry should also be sampled each year before and after the busy summer season in shallow water, deep water, and surface water.
- (4) Develop a clear understanding of ecological processes in Lime Lake based on the scientific study of Lime Lake.

- (5) Compile inventories on all species in the fish community and its structure, diversity, and condition, in cooperation with NYSDEC's fish stocking program.
- (6) Compile inventories of existing and proposed land uses in the Lime Lake, Machias Junction area, including land based drainage systems, wetlands, and wildlife habitats. Areas for future anticipated installation of sewers should be indicated, as should old dump sites which have been covered over.
- (7) Study special problems such as the potential for certain aquatic plants to grow new plants from cut or broken fragments (which can cause the weed to spread if cut and harvested).
- (8) Study and test new methods of weed control. For example, the grass carp (white amur) is currently being tested across the nation as a biological control method for weed control. This species of fish eats aquatic plants as its food source. It is allowed in New York State only under permits that require sterilized carp in controlled, test areas, to prevent migration and reproduction of this fish species in state waters. Biocontrol has great potential for long term cost savings if it is found to be safe.

j. Establish An Appropriate Type of Lake Management District

The Lime Lake community should consider establishing a lake management district which would have the ability to charge taxes for lake clean up and management. Under New York State Town Law, for example, an Aquatic Plant Growth Control District may be established in two ways, either by resolution of a town board or by a petition of the people.

Once established, the district's board of directors would become responsible for solving problems at Lime Lake such as excessive weed growth. A district also could play a lead in obtaining a sewage treatment plant, and for developing a comprehensive, integrated program for protecting Lime Lake and its surrounding properties.

In summary, lake management districts in general provide an institutional mechanism for solving lake-related problems over the long term. Depending upon its authorized scope and mandate, such a district may acquire the experience, staff and resources to perform successfully the following types of functions:

- Control areas of the lake which suffer from excessive growth of aquatic plants.

- Adjust lake levels in the different seasons of the year, to repair facilities or control weeds.
 - Initiate steps to protect water quality and water resources, and work with local and state agencies.
 - Impose certain restrictions on the use of the lake and adjacent properties.
 - Resolve issues such as public access to the lake, and liability insurance concerns.
 - Apply for grants, conduct studies, and propose public improvements for the land around the lake.
 - Pay for its operations and programs by assessing properties that are located within the district.
- k. Encourage the Town of Machias to Begin Using Available Planning and Zoning Tools.

The Town of Machias has never prepared a comprehensive plan to guide development in the areas around Machias Junction and Lime Lake. Such a plan would have guided the location and density of all land uses at the lake, at Machias Junction, and along Route 16. It would also have defined areas that should be served by carefully laid out sewer, water and storm drainage systems. These systems would have been designed to protect assets such as Lime Lake from becoming polluted and overdeveloped. In this manner, the town would have been protecting one of its own landmarks (and tax revenue streams) for future generations.

It is not too late for the Town of Machias to begin planning for its future. The long term historical trend is towards greater development and use of Lime Lake. This continued trend is causing potential problems, one of which may be greater than average growth of aquatic vegetation, *Vallisneria Americana* in particular. This problem is related to the increasing development and use of Lime Lake as a year round community.

In order to assure the Town of Machias that it will continue to control its own local destiny, the following recommendations should be considered by the Town in the coming decade:

- (1) Recognize that the problem of excessive weed growth at Lime Lake is only a small part of much broader ecological processes and developmental, land use trends in the areas surrounding Lime Lake.
- (2) Support the proposal to establish a special lake management district which would be designed specifically to meet the unique needs of the broader Lime Lake community. The town

should study various zoning options for the lake, and whether or not it should delegate various powers to a lake management district for it to control not only weeds but also land uses around the lake (including limiting the types and sizes of buildings and docks such as multi-story docks with sun decks). This approach is being used at the present time at Keuka Lake.

- (3) Study more carefully the extent and implications of the existing trend to convert seasonal cottages into year round residences. Currently 25% of the cottages around Lime Lake (many of which are 40 years old or more) have been converted to year round use (some local estimates are higher). Currently, school busses pick up more than 50 children during the school year from around Lime Lake. Several new homes have been built recently in the price range exceeding \$80,000. New homes are being built also along the hillside to the east of the lake. These trends are continuing, with no end in sight.

Historically, seasonal cottages have been built on small lots along relatively narrow streets in a resort setting (i.e., a seasonal subdivision has evolved). By converting these seasonal cottages into year round residences, however, the seasonal, resort subdivision is being transformed into a permanent residential subdivision for which small lots and narrow streets are not appropriate. A new, perhaps voluntary, approach is needed to improve design standards for use in the Lime Lake community. This issue should be studied carefully.

- (4) Conduct a survey of the Lime Lake/Route 16/Machias Junction community asking the question "Will you support greater land use regulation to achieve the following objectives (such as are recommended in this report)." A ten page survey of this nature was recently conducted at Keuka Lake (with a 70% response rate). This type of survey for Lime Lake could be modeled after the Keuka Lake survey.

The Town of Machias should discourage all land uses that are substandard or that lead to the decline of the environment or to property values. For example, all new buildings and conversions of old buildings should meet state building code standards. All streets and storm drainage channels should be examined and adapted to meet town standards, and county and state standards where appropriate. The end result of this type of local policy and enforcement over the next decade would be an up-scale, high quality, protected residential environment in which property values continue to appreciate and tax revenues would increase.

- (5) Re-examine the capacity for continued, scattered growth by preparing a comprehensive plan based on the steps that are recommended above. Such a plan should be based on a

careful study of existing and proposed land use. The Town of Machias has authority under existing state law to begin preparing such a plan and related zoning districts and standards. The area along Route 16, and surrounding Machias Junction and Lime Lake, has great potential for continued development. Proper planning and design guidelines are needed, however, to prevent problems of over development, congestion, and pollution.

The town should work with the Lime Lake community in developing its goals and objectives. A comprehensive plan should include community services and infrastructure elements for water and sewer, traffic circulation (e.g., linking Yacht Club Drive to Hazelmere Road by means of a new street one block in length), boat launching facilities, public parking, and public access to the water. The purpose of this plan should be to control the density of (and direct) all future development in to certain areas around Route 16, Machias Junction and Lime Lake.

This local plan should recognize that Lime Lake and Machias Junction are significant landmarks and destinations along the transportation corridor which stretches along Route 16 between Yorkshire (near Arcade) and Franklinville. From a regional perspective, this special corridor is located between the City of Buffalo to the north and the City of Olean to the south.

The local plan should also examine the three new, man-made gravel pits, or lakes, south of Lime Lake, which have the potential of being joined together in the future to form one large lake. These ponds or lakes were created since 1955 aerial photographs were taken, and apparently are up to 60 feet deep. Their existence creates potentials for new development in the next twenty years (and thereby intensifying the Lime Lake situation).

- (6) Enact appropriate zoning regulations to carry out the purpose and elements of the comprehensive plan recommended above. Under New York State law, zoning is the only direct power given to local governments to control the location of land uses and to set locational standards for the public welfare and safety. Although these steps may be difficult for the local community to take, they are among the most effective alternatives that are available to preserve the lake and its environment for future generations (and to protect and increase the town's tax base into the next century).

4. Methodology and Data Sources Used in this Study

The purpose of this study is to identify alternatives for controlling the aquatic weed problem at Lime Lake. The study recommends various steps that need to be taken in the short run (the next several years) and in the long run (the next five to twenty years). The methodology and data sources that were used in preparing this study are described below.

a. Design and Approach

This report describes a distinct and complex public issue in the Town of Machias — the question of how to protect and enhance Lime Lake and adjacent land uses in the coming years. The immediate concern is focussed on the excessive growth of aquatic plants in the lake. The study's scope has been limited to identifying alternative ways of controlling the weed problem at Lime Lake. A combination of solutions will no doubt be needed for the long term. The optimal combination of techniques that should be used can be determined only through further feasibility studies and discussions at the local level.

This study's methodology has been limited to a descriptive case approach (i.e., providing relevant background information, findings, conclusions and recommendations specifically tailored to the Lime Lake situation). As such, this study should serve for many years as a useful reference document and as a practical input to (1) future policy discussions on the choice of weed control techniques to be used, (2) planning and development guidance for the Town of Machias, and (3) future studies and analysis of conditions and trends.

There is a need to understand the natural and ecological processes of a lake whenever weeds become a problem. The need for a special understanding is inherent to the problem itself, and the assumption is made in this study that public policy should be based on an accurate perception of the problems being solved. It is for this reason that an ecological approach is used in this study in which the interrelationships between aquatic vegetation and the surrounding environment is examined (i.e., the problem of excessive weed growth in Lime Lake is studied in the context of the lake's development and use). This assumption is based on the life-cycles of lakes and ponds and the negative effects that settlements, recreational uses and urbanized, storm water run-off and septic system leachate can have on these life cycles. This approach has produced the many recommendations that are presented in this study.

This study is not itself an Environmental Impact Statement (EIS). An EIS would require a specific proposal in which the county would have some discretionary decisions to make, such as, approving a permit, constructing a facility, or authorizing funding. As of the Summer of 1988, this is not the case. This study can, however, serve as an input to any future EIS, should one be required, especially for those sections of an EIS pertaining to the evaluation of alternatives.

The approach described above is appropriate to the particular issue and situation at Lime Lake. The many participants have been dealing with a complex situation without budgetary support and with incomplete information. This study brings all available information together in one place, thereby creating a valuable resource document that can be used by cottage owners, concerned agencies, and by scientists who conduct future studies or Environmental Impact Statements (EIS).

In addition, most of the available information does not reflect an over arching framework, or perspective. This study attempts to provide such a broader ecological view with the expectation that it will make it easier to make the best decision possible (i.e., based on an accurate understanding of the problems and of available alternatives and probable outcomes). In this sense, this report presents a variety of lessons that have been learned and directs the attention of all participants to the future.

b. Methodology

The Department of Development, Planning, and Tourism did not itself conduct scientific studies of Lime Lake, its environment, and land use development. Such an effort would have required a large budget and scientific personnel. This study therefore made use of available, existing information (through interviews, examinations of existing files and records, telephone calls, and correspondence). Extensive review and analysis of available information provided the basis for the descriptive material, findings, conclusions, and recommendations which are presented in this study.

In completing this work, the following agencies and individuals were contacted:

(1) Town of Machias/Lime Lake

- Barbara Cline, President, Lime Lake Cottage Owners Association, Machias.
- Richard Jordon, Cottage Owner, Lime Lake Cottage Owners Association - Machias.
- Gary Taylor, Chairman, Weed Control Committee of Lime Lake Cottage Owners Association-Elma.
- Marjorie Tellon, Town Clerk, Town of Machias-Machias.
- Eugene Very, Supervisor, Town of Machias-Machias.

(2) Cattaraugus County

- Chester Halgas, Director, Cattaraugus County Health Department-Olean.

- Ken Kloeber, Kloeber Engineering, Boston (Consultant to Health Department).
- Becky Johnson, Environmental Health Technician, Cattaraugus County-Little Valley.
- Dennis Tobolski, County Attorney, Cattaraugus County-Little Valley.
- Tammy Williams, Paralegal for County Attorney, Cattaraugus County-Little Valley.
- Janice Grossman, Risk Manager, Cattaraugus County-Little Valley.
- Bernard Miller, Director, Cattaraugus County Real Property Tax Service-Little Valley.

93) Environmental /Lake Management Experts

- Matthew Perkins, District Field Manager, Cattaraugus County Soil and Water Conservation District-Ellicottville.
- Bruce Hopkins, District Conservationist, Cattaraugus County Soil and Water Conservation District-Ellicottville.
- Rodney Sergel, Director, U.S. Department of Agriculture, Stabilization and Conservation Services-Ellicottville.
- Douglas Anderson, Chairman, Chautauqua Lake Association-Lakewood.
- Kenneth Skinner, Representative, Rushford Lake Recreation District-Rushford.
- Walter lang, Representative, Cuba Lake District Commission-Cuba.
- Robert Brower, Program manager, Finger Lakes Water Resources Board-Penn Yan.
- Rob Schwarting, Director, Yates County Department of Planning and Development-Penn Yan.
- John Herring, Consultant, Yates County Department of Planning and Development-Penn Yan.
- David Gore, Superintendant, Yates County Highway Department-Penn Yan.
- David Allee, Profesora, Cornell University-Ithaca.
- Richard Hinterman, Aquatic Nuisance Plant Control Corporation-Michigan.

(4) New York State

- Patricia McGee, State Assemblywoman from Franklinville, who represents the Lime Lake community in Albany.
- Sheila Gordon, Associate Attorney, New York State Office of the State Comptroller-Albany.
- Thomas Smith, Senior Attorney, New York State Office of the State Comptroller-Albany.
- Steve Mooradian, Regional Fish Manager, New York State Department of Environmental Conservation-Buffalo.
- Glenn Reinhardt, Senior Pesticide Inspector, New York State Department of Environmental conservation-Albany.
- Jay Bloomfield, Chief of Lakes Services, New York State Department of Environmental Conservation-Albany.
- Joseph Evans, Conservation Biologist, New York State Department of Environmental Conservation-Olean.
- James Pomeroy, Senior Aquatic Biologist, New York State Department of Environmental Conservation-Olean,

c. Data Sources

Unless otherwise noted in the text or herein, all information that was reviewed and used in this study came from extensive notes made, or material obtained from the contacts that are described above (i.e., between February and July 1988).

Land use data was collected by using Cattaraugus County Real Property Tax Assessment rolls. By comparing the individual parcels on the rolls for the Town of Machias and the individual parcels located in the Lime Lake area, it becomes possible to arrive at a total acreage figure for Lime Lake area landowners. Machias town contains 26637 acres of which 301 1/2 acres are located in the Lime Lake area.

Using the same tax rolls, it also becomes possible to obtain figures showing the amount of taxes (County, town and special levies) paid on each individual parcel. The tax rolls also provide an assessment figure which can be used to calculate full value of assessment (Market value).

Data compiled from 1988 Real Property Tax Rolls for Machias show that Lime Lake Property owners contribute \$93135.40 or 23.44% of the towns \$397,343.57 for county taxes, and \$61,118.12 or 23.21% of the towns \$263327.60 for town taxes. Lime Lake property owners paid \$8248.79 (44.3%) of the towns total of \$18580 for light levies and \$8808.72 (23.18%) of the town's total of \$38000 for fire protection.

Of the 599 parcels (301.542 acres) purchased by Lime Lake area owners, Land assessment is \$224560.00 or 25.01% of the Town of Machias total on 1577 (26636.88AC) parcels of \$897965.00 with land assessment with structures of \$1079230.00 or 22.46% of the towns total of \$4805453.00. Full value of assessment (Market value) of Lime Lake area properties is \$11554925.07 or 22.46% of the towns total of \$51450246.25.

With the use of tax rolls and tax maps (showing location and dimension of each individual particular) it was possible to determine that of the 1577 parcels located in the Town of Machias 599 are located in the Lime Lake Area. Of the total of 599, 31 are from outside New York State, one from Canada. Of the 567 from within New York State, 228 are from Cattaraugus County.

The location of vacant land was arrived at by using the property type classification code as assigned to that parcel by the assessor. The term "vacant land" is defined as property that is not in use, in temporary use, or without permanent improvement. Vacant land includes vacant lots or acreage in residential areas, and residential land including a small improvement but not being used for living accommodations. Water front vacant lots are lands considered best suited for improvement for residential or seasonal purposes.

A recent tour of the lake front lots revealed very little, if any, vacant land. In comparing on site visit and property type classification it was noted that:

1. Some areas classified as vacant are currently being developed.
2. Some lands are docking areas belonging to either permanent or seasonal resident landowners.
3. Some lands are adjoining parcels belonging to resident land owners.

In other words, it was found that many landowners at Lime Lake own multiple lots.

In addition to the data sources that are mentioned in the text of this study, described above, or included as attachments to this study, the following materials were reviewed and found to be useful in providing guidance.

- (1) Gary Taylor, Chairman, Weed Control Committee, Lime Lake Cottage Owners Association, provided four large binders containing extensive documentation (1982-1988) of correspondence and telephone conversations with various experts and agencies, reports, newspaper articles, and manufacturers brochures and specifications (e.g., on chemicals, weed harvesters, bottom barriers, and dredging.)
- (2) Lime Lake Cottage Owners Association, Lime Lake Directory (Quaker-Park Press Inc., 49th Annual Edition, Copyright 1988).

- (3) By Laws of Federation of Lake Association, Inc., (copyright 1984).
- (4) 1984 NYS Lake Association Conference (The Federation of Lake Associations, June 23, 1984).
- (5) Paul M. hetland, Harter, Secret & Emery. (Federation of Lakes Association, Inc.) 1984 Conference of Canandaga Comparative outline of Activities Permitted Through Section 501 (c) (3) and 501 (c) (4) Tax Exempt Organizations (no recorded date).
- (6) How to Identify and Control Water Weeds and Algae (Applied Biochemists, Inc., 1976 3rd edition, Revised 1983).
- (7) Neal D. Madden (New York State Bar Journal) Case Law Developments Under NYS Environmental Quality Review Act (April, 1984).
- (8) GaryL. Schmidt, Ralf Colson, Lawrence Skinner. Programatic Environmental Impact Statement on Aquatic Vegetation Control Program of the Department of Environmental Conservation, Division of Lands and Forest (NYS Department of Environmental Conservation, December, 1980) (Draft).
- (9) Peveryly, John H., and Robert L. Johnson, Aquatic Plant Management and Control, Information Bulletin 107 (A Cornell Cooperative Extention Publication, Revised 1987).
- (10) New York State Department of Environmental Conservation, Self-Help for Small Communities for Wastewater Treatment Plants (Water Bulletin May 1988).
- (11) John H. Pevely, 1985 Recommendations for Chemical Control of Aquatic Plants for New York State Section IX-A (Department of Agnomy Cornell univeristy November 12,13, 14, and 15 1984).
- (12) Cucular 866: Part 327-Rules and Regulations Relating to the Use of Chemicals for the control or elimination of Aquatic Vegetation, NYS Department of Environmental Conservation (Revised 1973).
- (13) U.S. Department of Health and Human Services, U.S. Department of Labor, Occupational Health Guidlines for 2,4-D (September 1978).
- (14) Pennwalt Chemicals Equipment Health Products Hydrothol 191: Granular Aquatic Algicide and Herbicide; (Agchem Division Pennwalt Corp.), No recorded date.
- (15) USDA Soil Conservation Service, Mechanical Control of Aquatic Weeds: A Guide for Lakeshore Owners (New york State Department of Environmental Conservation, December 1983).

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- (16) Jim Sewart, DOW, The Mechanics of Weed Harvesting, NYSDEC Water Bulletin, May, 1988).
- (17) Aqua Screen, Installation Considerations, (Menardi-Southern Corporation) no recorded date.
- (18) Edward Woltman, Project Manager, Christine Setari, Project Technician, An Evaluation of Aquatic Vegetation Control with Sterile Grass Carp: Year two Project Report, (New York State Department of Environmental Conservation Bureau of Fisheries, April 1, 1986.
- (19) Final Supplemental Environmental Impact Statement: For proposed Biochemical of Aquatic Weeds in Walton Lake, Town of Monroe, Orange county, New York (EA Science and Technology, June 12, 1987).

ATTACHMENTS

The thirteen attachments to this study are too voluminous to reproduce here. Copies of all thirteen attachments are available upon request from the following sources:

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(716) 353-4677

Gary Taylor, Chairman
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SUMMARY OF FINDINGS AND IMPLICATIONS OF RECENT
INVESTIGATIONS AT LIME LAKE BY THE
CATTARAUGUS COUNTY HEALTH DEPARTMENT

The Lime Lake Cottage Owners Association (LLCOA) and the Cattaraugus County Health Department conducted a study of water quality and septic systems in 1984 and 1985 in order to qualify Lime Lake for construction grants for sewage treatment systems. This action apparently came late at the end of a program for construction grants. The lakeside community did not achieve a priority status for funding in competition with more severely affected communities across the state. Although the Lime Lake community did not receive funding, the county's study did produce useful findings that should benefit the Lime Lake community for many years to come.

The county found that the lake continues to have good water quality, probably due to the high rate at which the lake is recharged with ground water. They found some problems but not enough to constitute a health hazard. The study results did suggest that the problem of high weed growth may be related to the leaching of septic system discharges and overflows.

The study included a survey of septic systems at Lime Lake which was distributed to all property owners around the lake. More than 300 responses were completed and returned to the county. Many of the septic systems around the perimeter of the lake were found to be obsolete, failed or substandard (and presumably not adequately filtering the wastewater coming through these systems). In addition to the cottages, the groundwater above the west side of Lime Lake receives thousands of gallons of waste per day (the equivalent of 30 houses) from the Cattaraugus County Nursing Home. In 1987, after it became clear that a sewer system would not be funded at that time for Lime Lake, the nursing home built a new septic system. The older, obsolete system had a surface filter bed design which was replaced with a new subsurface sand trap bed.

The wastewater in all of these cases at Lime Lake is filtered through septic systems which drain into the soil and groundwater. The groundwater replenishes the lake, carrying with it dissolved nutrients from septic systems. Lime Lake is the ultimate discharge receptacle for all septic systems, new or old, high capacity or substandard. Even with the best septic systems, nutrients still enter the lake. The county health department found in its 1967 study that Lime Lake apparently already suffers from a long term accumulation of nutrients in its water and sediments.

From this point of view, Lime Lake is an aging lake. As the level of nutrients continues to increase so does the aging process. This is especially the case along the shallow areas of the shoreline where weeds flourish.

More rigorous study is needed of the linkage between increasing numbers of septic systems (some of which are failed or obsolete systems) and the excessive growth of weeds in the shallow areas of the lake. This is apparently a problem especially in those areas where hundreds of cottages on small lots are located on the shoreline in low lying areas with high water tables. It is very difficult to install septic systems which meet state standards in low lying areas next to the lake which have high water tables (i.e., where the subsurface water table comes within two feet of the ground surface next to the lake). This apparently is the case in several of the low lying areas next to the water's edge. In some cases, 55 gallon drums may have been used horizontally in previous years due to the lack of space for a more modern system and leach field.

A problem can exist even in the higher elevation areas where there is a greater vertical distance between the ground surface and the underground water table. A properly designed septic system and leachfield can become filled and lose its capacity after only ten to twenty years, depending on use and size. Many of the systems at Lime Lake are older than ten to twenty years, and should be examined in greater detail.

In both high and low lying areas, substandard and failed systems further compound an already existing problem. A greater septic load is being put collectively into the ground water surrounding Lime Lake. This existing problem is slowly increasing as surrounding land is developed for more housing, and as increasing numbers of older cottages are converted to year-round use.

M E M O R A N D U M

Lime Lake is a non-navigable, inland lake with individual lakefront property owners. The question has been raised, "Who owns the water and bed of Lime Lake?"

The owners of property adjoining the lake have riparian or littoral rights to the water and the land under the lake to the center of the lake being the width of their individual property. The riparian owners convey this right upon the sale of their property unless expressly reserved in the deed.

Such lakes or ponds as.....Lime Lake, Cattaraugus County.....have been classified as small lakes or ponds, the ownership of the bed of which is in the Riparian owners. Hazelton v. Webster, 20 AD 177; 63 NYJur 209.

".....Lime Lake being an inland and non-navigable body of water, the presumption arises that, unless restricted by some reservation in the deed, the title extends to the center of the lake." Smith v. City of Rochester, 92 NY 463; Hazelton v. Webster, 20 AD 177.

The above cases alone support my opinion that the lakefront property owners own the water and the land lying under the water of Lime Lake.

It is well established that if the boundary touches the water, or is along the water or by the water, title is presumably carried to the center of the lake. "A description using the words low water mark in the absence of an express reservation carries title to the center of the lake.....and is consist with the rule followed at common law that a conveyance bounded by a small inland lake.....carries title to the center or the thread of the current unless there is expression to the contrary." Brant Lake Shores, Inc. v. Barton (1970) 61 Misc. 2d 902. "The description which runs the boundary by the river or pond, or which is so framed as to touch the water of the river or pond, carries title to the center thereof." Gouverneur v. The National Ice Company, 134 NY 355.

With regard to the question, "Who owns the water and bed of Lime Lake?", upon reviewing various deeds dating from 1834 to present, phrases such as: along said lake, west by Lime Lake, to the low water mark of the lake, head of Lime Lake, etc., can be found throughout the deeds, expressly conveying the waters and the land lying under the water to the center of the lake, and in no way restricting the conveyance of such water rights. Based on the above, the water and land under the water of Lime Lake belong to the lakefront property owners. The lakefront property owners own the water and the land under the water to the center of the Lake.

By: Dennis V. Tobolski
Catt. Co. Attorney
July 6, 1988





Janice M. Grossman
Risk Manager

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ATTACHMENT No. 13

July 7, 1988

TO: Terry Martin, Chief Planner
FROM: ^{JMG} Janice M. Grossman, Risk Manager

Inquires have been made by individual members of the Lime Lake Cottage Owners Association about Lime Lake. As I understand it, they are concerned about the following:

- 1) The Lake has a lot of aquatic plants built up on the surface of it, as evidenced by pictures.
- 2) The Lime Lake Cottage Owners Association would like the County to consider providing equipment or funding to them so that they can undertake to clean up the lake.
- 3) The Lime Lake Cottage Owners Association has also asked the County to study various alternatives for solving the aquatic vegetation problem.
- 4) The Lime Lake Cottage Owners Association has, in the past, spent a large sum of money on cleaning the lake.

Any time the County accepts responsibility, it accepts liability. In a conversation with Gary Taylor of the Lime Lake Cottage Owners Association he stated that other counties run a "harvester program" to clean the lakes and supplied me with two names to call to see how the liability issue has been handled:

Jay Bloomfield - 518-457-7470 - NYSDEC
Bob Brower - 315-252-8073 - Finger Lakes Water
Resources Board

I spoke with both men. They were very helpful and willing to answer any and all questions. Both suggested we call again if we need more help.

The facts I found out were as follows:

New York State owns all the water and fish. The shoreline and bottom follow the land title, which may be state, homeowner or unknown.

Most of the lakes involved have the harvester program run by the Soil and Water conservation District. The District buys the harvester and cleans the lake, not the homeowners. The Counties do not buy the harvester.

The DEC has a local assistance program which can fund a harvester program (not just a harvester).

This local assistance program can be funded through several different ways:

- 1) The homeowners can apply for the funding directly;
- 2) The Soil and Water conservation District can apply for the funding;
- 3) The County can apply for the funding and give it to the District to run the program.

Mr. Bloomfield stated that while many counties apply for the funds, none actually purchase the harvester or run the program. The Districts run all the programs.

Both Mr. Bloomfield and Mr. Brower stated that public access is needed in order to capture this funding.

Mr. Bloomfield did not believe the question of liability had ever been raised before.

The county should support the Lime Lake Cottage Owners Association pursuing one of the above three alternatives rather than buying the harvester itself, to avoid liability which may arise.

In discussing the above with Dennis Tobolski, the County Attorney, we mutually agreed that it would be in the county's best interest liability wise, for the Lime Lake Cottage Owners Association to obtain the funding and operation of the program directly with the Soil and Water conservation District.

JMG:mep

