Waterworks

Summer 1991 Volume 7 Number 3

AQUATIC PLANTS WILL TALK TO YOU

For most lake associations, and particularly those on mesotrophic or eutrophic (nutrient-rich) lakes, aquatic plants and their management are an important component of association responsibilities. Too often, however, the only interest is in eradication (usually impossible and not desirable) or control. Aquatic plant communities can, and should, be used by lake associations as an important indicator of lake "health" and changes in lake health. Fortunately, this does not require a great deal of background or experience and most people will find it to be both interesting and enjoyable.

The first step in understanding the aquatic plant community is to identify the plants. Identification of aquatic plants can be a daunting endeavor, even for experts, but most people already know a good deal about aquatic plants. Water lilies, cattails and milfoil are well known to almost every lake association member. With just a bit more knowledge, individuals can cruise around a lake and determine water quality, depth and sediment type, just by looking at the plants! Floating-leaved and emergent plants are the most obvious and can provide important information about your lake. For example, water lilies (there are basically two types, white and yellow) only grow in relatively shallow, protected water with soft, organic sediments. If the sediments are sandy in nature, the lily pads will be small and sparse, if they are there at all. Cattails also need organic sediments in which to grow. Reeds and rushes (spike-like emergent plants) generally only grow in sandy, nutrient-poor sediments. Thus, if you see reeds growing you can be quite certain that the sediments there are sand or gravel. If your lake only contains reed-like plants it is almost certainly an oligotrophic lake. Recall that oligotrophic lakes are low in nutrients, mesotrophic lakes contain medium levels and eutrophic lakes are rich in nutrients.

The next step is to look at the submerged plants. Now the going gets a bit rougher as there are many species, some which look just like other unrelated species. One thing that has happened over the last thirty years or so is that alien species (non-native species introduced from other areas) are taking over many lakes and causing all sorts of trouble. The two most common of these alien species are *Myriophyllum spicatum*, known and loved as Eurasian watermilfoil (just milfoil for short), and *Potamogeton crispus*, or curlyleaf pondweed. The scientific names can be kind of a nuisance to remember but it is worth the effort as everyone in the world uses the same scientific name, but common names vary greatly from area to area and even from person to person! General identification

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On The Local Scene

BABCOCK LAKE MANAGEMENT PLAN

Babcock Lake is a 46 acre lake located in Rensselaer County, with about 115 homes along the shoreline. The lake association began developing a Lake Management Plan in 1985 to address pollution concerns within the lake and its watershed. After significant review, including four public meetings, the Plan was finally adopted in August 1990.

The plan has two sections - Best Management Practices (BMP's) and Lake Watershed Management. The BMP's describe recommended activities within the lake watershed to preserve and protect the lake water quality. The Lake Watershed Management describes institutional controls recommended for the largest organization in the watershed which is owned and operated by lake residents.

An important part of our lake management plan involved the septic systems. A program was developed to identify the location of septic systems and to encourage periodic pumpouts. Over 80 percent have now been identified and pumped and we are continuing to identify the remaining 20 percent. The most important aspect is to earn people's trust. Some homeowners were initially reluctant to participate, but having a core group of volunteers tactfully asking their friends and neighbors to comply turned out to be an effective way to reach our objectives.

Education has been an important component of Program acceptance by the lake community. The majority of homeowners are concerned enough about their lake to be willing to protect it even if it costs extra money. The lake association delivers an environmental newsletter and additional educational literature to each home within the watershed twice each summer.

For Babcock Lake homeowners, the major concern has been aquatic plant growth. To address this problem, a lake drawdown restoration program has been implemented, a lake cleanout day has been developed, and volunteers have participated in a weed identification program through The Citizens' Statewide Lake Assessment Program (CSLAP). The lake water level is lowered approximately 20 inches during the winter in order to kill shoreline weeds. The lake cleanout is a community event that occurs once during the summer. After an area of the lake is dredged, muck, wood, debris, and weeds are removed by volunteers and are disposed of on association land outside of the lake watershed. A picnic is held afterwards for the workers.

The lake water quality is also monitored so that baseline information can be obtained to see if any trends are developing. Babcock Lake residents have participated in studies of the lake (including CSLAP) since 1973.

Institutional coordination is important to prevent surprises. Several residents of the lake are members of the Town Planning Board and association members attend Town meetings to let the board members know of our concerns. In 1989, the Town passed a resolution banning gas powered vehicles from the lake. The Soil Conservation Service, Rensselaer County Department of Health, and the NYS Department of Environmental Conservation (NYS DEC) have been also helpful sources of information and assistance.

In addition to membership with the Federation of Lake Associations (FOLA) The lake community is also amember of the Rensselaer County Federation of Lake Associations .

Our recommendation to other lake communities is to start developing a lake management plan by first forming an environmental committee and then identifying major problem areas. The publication Diet for a Small Lake: A New Yorker's Guide To Lake Management, by NYS Department of Environmental Conservation and the Federation of Lake Associations, is excellent for outlining how to identify problems, develop solutions, and prepare a lake management plan.

by James VanHoesen, Chairperson, Babcock Lake Environmental Committee

Waterworks is published four times a year. Individuals who wish to submit articles, calendar items, artwork, or photography to *Waterworks* are welcome to contact the editor, Anne B. Saltman, FOLA, 2175 Ten Eyck Avenue, Cazenovia, NY 13035 (315) 655-4760. For address changes, contact John Colgan, FOLA, 273 Hollywood Avenue, Rochester, New York 14618 (716) 271-0372. Permission to reprint articles is granted with credit.

Federation News...

CSLAP UPDATE

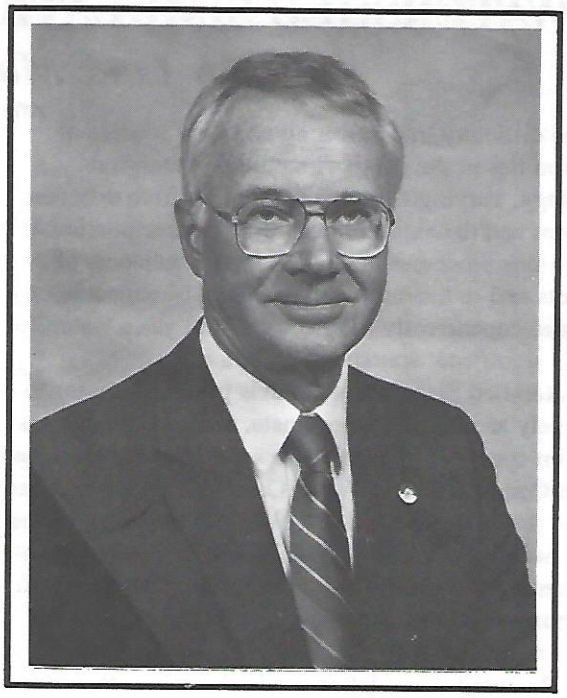
The Citizens' Statewide Lake Assessment Program (CSLAP) is off and running this year. Ninety four lake communities are participating in this volunteer-based lake water quality monitoring program. In addition to collecting water samples for laboratory analyses, many of these groups are also participating in dissolved oxygen and temperature profiling, lake level gauging, and aquatic vegetation collections.

Seven Field Technicians and Program Coordinators are visiting each lake for training sessions, quality assurance testing, and the distribution of supplies and equipment. Preliminary laboratory data for each lake is now being generated from the Albany Department of Health where the chemistry analyses are being performed. Please ask your Field Technician for these laboratory updates.

In recognition of the CSLAP program, Scott Kishbaugh from the Department of Environmental Conservation, and Anne Saltman from the Federation of Lake Associations, had the honor of attending a three-day *Searching for Success* Environmental Leadership Conference held at the Smithsonian Institute in Washington D.C. They were joined by a wide selection of government, environmental and corporate leaders who actively participated in problem-solving workshop seminars. The conference participants were invited to a White House briefing in the Old Executive Building, an awards dinner at the Russel Senate Caucus Room on Capitol Hill, and a reception at the Soviet Embassy. They also had the opportunity of viewing the breathtaking film, Blue Planet, at the National Air and Space Museum.

CONFERENCE UPDATE

The Federation sponsored two excellent conferences this year. One was a three-day event held at Paul Smiths' College in June. This was co-sponsored by the NYS Department of Environmental Conservation, Division of Water, and the NYS Soil and Water Conservation Committee. Another one-day regional conference was held in the Lower Hudson Valley region. Audio tapes and copies of conference handouts are available by contacting the Federation office at (315) 655-4760.



Robert Canfield, FOLA President

WELCOME NEW BOARD MEMBERS AND OFFICERS!

The Federation of Lake Associations would like to extend a warm welcome to the following new members of the Board of Directors and Officers who were elected at the annual meeting held in June at Paul Smith's College:

Robert Canfield was voted in as the new President of the Federation. Following a twenty-seven year career with the IBM Corporation, Bob retired in 1983 and since then, he and his wife Helen have been very active with community work and with their 7-acre vineyard located in the heart of the Finger Lakes region of New York State.

Bob has been very involved in surface water resources over the past several years. He has served as a member of the Board of the Keuka Lake Association, is Chairman for the Water Resources Committee, and is currently active with the Watershed Management Project Planning. He also plays an active role in community events by serving as a member of the Town of Wayne Planning Board, contributes time as a town zoning officer, and provides volunteer support to the Hammondsport Community Services.

Many of the Federation members have had the pleasure of working with Bob over the past several years during preparations for the FOLA annual conferences. He formerly served as Vice President of the Federation.

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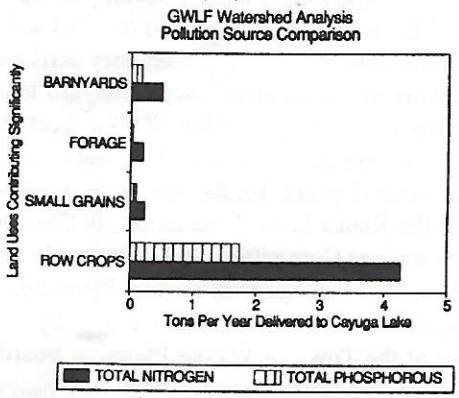
WATERSHED SIMULATION COMPUTER MODELING

A Lake Management Tool

The difficulty in controlling nonpoint sources of pollution lies in the complex nature of watershed hydrology, varying degrees of pollution from different land uses and the extreme variability in precipitation. The various processes that result in total amounts of nutrients and sediment loads entering a lake must be evaluated concurrently to effectively analyze a watershed and it's significant sources of pollution.

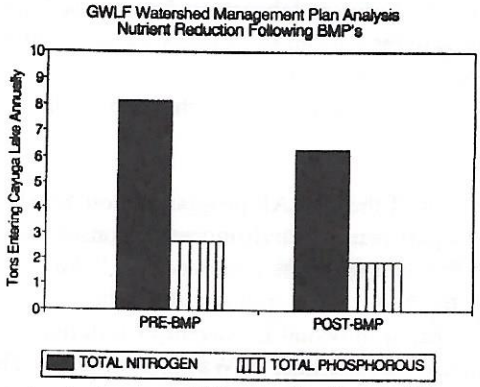
Watershed Simulation Models provide a means to effectively and accurately evaluate, analyze and address nonpoint sources of pollution on a watershed scale. The Seneca County Soil and Water Conservation District has applied the watershed model GWLF (Generalized Watershed Loading Function). GWLF has been used to quantify monthly and annual pollution loads, identify significant sources and evaluate the effectiveness of different control measures.

As the word "simulation model" implies, this computer technology simulates or reproduces complex watershed hydrologic and nonpoint source pollution processes. GWLF uses specific field level data in combination with local weather records to determine total monthly and annual nutrient and sediment loads entering a lake. Following the simulation of a watershed a number of reports are generated. They include total monthly and annual nutrient and sediment loads reaching the lake and the contribution of the respective land uses to this total. The following figure illustrates nonpoint source pollution data generated from the simulation of a watershed draining to Cayuga Lake.



As you can see from these data, there are significant amounts of nutrients and sediment leaving this 950 acre watershed, and that row crops are contributing most significantly. It is important to point out that this is a predominately agricultural watershed. If this were an urban watershed, urban land uses would be identified and prioritized.

The prioritization of land uses within the watershed that are of concern will help to most effectively direct limited management resources. Following the prioritization of land uses the model is then applied to evaluate the effectiveness of various Best ManagementPractices (BMP's). The following figure illustrates watershed phosphorous and nitrogen loading reductions realized through the "modeled" implementation of primarily tillage BMP's. This represents a significant reduction considering only 13 of the 96 fields in this watershed were effected. The 13 fields are characterized by row crops of 5% slope or greater which were identified as those contributing significantly to the total nutrient load to the lake. A much greater reduction would be achieved if a wide range of BMP's were implemented over the entire watershed.



These are just some of the applications of the watershed simulation model GWLF. Watershed model analysis is an extremely powerful tool and is used to scientifically identify significant nonpoint sources within a watershed. GWLF can be used to develop watershed management plans and to evaluate the water quality and cost effectiveness of such plans. Although developing the required watershed data base is time consuming, the benefits of comprehensive watershed model analysis are far reaching and result in scientifically valid information from which sound management decisions can be based.

Watershed model analysis can take the guess work out of nonpoint source pollution management and greatly increase the effectiveness of lake management programs. With the increasing political, social and economic sensitivity of land use regulations and water quality management in general, the value of this technology will soon be fully appreciated.

by Richard A. Williams, Water Quality Program
Seneca County Soil and Water Conservation District

(The GWLF computer disk and documentation are available by contacting Anne Saltman, FOLA, 2175 Ten Eyck Avenue, Cazenovia, NY 13035 (315) 655-4760)

Changes in Fish Species in Canandaigua Lake

Canandaigua Lake is the fourth largest of the Finger Lakes. It lies 29 miles southeast of Rochester in Ontario and Yates Counties. Historically, Canandaigua was a Lake Trout-Cisco Lake. Fish stocking and natural succession have greatly altered the ichthyofaunae (species diversity) of the lake.

The first intensive study of the lake was conducted by Eaton in 1928 as part of the Biological Survey of the Oswego River system. A total of 37 species of fish were reported in the lake. Seven species (Smelt, Common Whitefish, Brown Trout, Carp, Yellow Perch, Yellow Pike (Walleye), Smallmouth Bass) had been stocked by the New York State Department of Environmental Conservation and may not have been part of the original fish population. The numbers of many species of fish have fluctuated greatly through the years as a result of artificial stocking, since some introduced species occasionally crowd out other native species.

Many species that had been introduced did not maintain population levels when artificial stocking was discontinued. Whitefish, which were stocked before 1900, were extremely abundant in the early 1900's but had declined to very low levels by 1945. Walleye were one of the most numerous game fish through 1930 but were relatively scarce by 1945. Rainbow Smelt stocked in 1925 to improve forage base increased in numbers until 1941 but suffered a crash decline in 1943. Since that time, they have recovered to some degree but have never returned to the abundance of 1941. In 1953 Alewife were stocked in the lake by unknown persons. Now firmly established, they provide the major food for Lake Trout. Lake Trout have been stocked since 1900. Since the early 1970's the Department of Environmental Conservation's management plan for Canandaigua Lake has concentrated on the stocking of Lake and Brown Trout. Today they are two of the best represented predators in the lake.

The majority of studies conducted on Canandaigua Lake and most other lakes have concerned major game fish and their prey, but many non-game species exist in most lakes and add to the diversity and stability of the ecosystem. From April to October 1990 the shallow water fisheries of Canandaigua Lake were inventoried each month by seine and trap nets, to access the diversity of the fish species present and to compare today's populations with those present historically. Ten locations were selected for seining. The seine net used was 40 feet long and 8 feet deep, with a trailing bag. It's stretch mesh size was 3/8 inch. The portable trap net was constructed of 1.5 inch stretch mesh netting. The pot was 5 feet on each side and was attached to shore by a 100 foot long, 6 feet deep leader. The net was set at or just below the surface in 6 - 10 feet of water.

Twenty-nine species of fish were found during the course of the study. Spottail Shiners, Bluntnose Minnows, and Banded Killifish were the most abundant species taken in the seine nets and comprised 89% of all the fish sampled. Alewife were the most commonly captured species in the trap net set (89%). In addition to the species captured during the netting, Brown and Lake Trout were taken by angling. In April 1991, a Burbot was taken by a fisherman. With the addition of this species, a total of 30 different species were identified in the lake.

Since 1927 there has been a 19% reduction in the number of species in Canandaigua Lake. Stocking has influenced this more than natural succession within the lake. A total of 15 species have been lost from the lake, while 7 new species have been added. The dominant species of Canandaigua Lake have been changed due to heavy stocking. The competition from the introduced species resulted in the loss of native species and, therefore, a less stable ecosystem.

Stocking of artificially propagated fish in large numbers is a widely used and effective management technique. Care must be taken, however, not to stock fish which will dramatically alter the natural balance of predator and prey within an ecosystem. A little research before stocking any lake can prevent undesirable interactions in the future.

by Dr. Frank Smith
Professor of Natural Resources Conservation
Community College of the Finger Lakes
Canandaigua, New York

For additional information on fish stocking, contact the author or your local Department of Environmental Conservation office.

RENSSELAER COUNTY LAKE STUDIES

BACKGROUND

Rensselaer County, located in the eastern part of central New York State, is richly endowed with well over 100 lakes and ponds, giving it the distinction of being the "Lake Region" of the Capital District. These water bodies range from virtually pristine shallow bogs to highly developed lakes used for seasonal and year-round residents and recreation. Because of the geologic nature of the County, its surface-water resources are located at two distinct elevation ranges: on the "lowland" plain, a few hundred feet above sea level, or on the highlands (Plateau) at elevations between 1400 and 2000 feet. Also because of the geology, Plateau lakes tend to be acid-sensitive, and as a rule, are more shallow, and much less highly developed than lowland lakes.

Over the last half century many sporadic, focused studies of County water bodies have been done. Due to the selective nature of these various studies, the type of information available varies widely, making comparison of data and identification of trends difficult. Many significant studies of County lakes, ranging from multiple lake surveys to studies of a single or small group of lakes, have been conducted by, or in conjunction with, Federal and State agencies and a variety of government, educational, and private entities within the County.

LAKE WATER QUALITY ASSESSMENT PRGRAM

Beginning in 1988, the Rensselaer Fresh Water Institute (FWI), an aquatic research unit affiliated with Rensselaer Polytechnic Institute, and the Rensselaer County Environmental Management Council (EMC) jointly initiated a long-term program to systematically study all lakes and ponds in the County. The overall program was divided into three major phases:

Phase I - Identification of Data Sources;
Phase II - Collection, Generation, and Evaluation of Available Data;
Phase III - Development of Data Management System Accessible to Both Decision Makers and General Public

Database Development

In the first phase, the sources of prior data obtained over the years on County water bodies were researched. A report was produced tabulating these sources, along with general geographic and morphometric information on each lake and pond previously studied.

The initial part of Phase II involved examination of the existing water quality data on a group of about 20 water bodies identified by an EMC committee as being representative of County waters. This effort consisted of compiling relevant chemical data found in a variety of sources, such as published reports, files of government and educational institutions (even individual notebooks) in a consistent form which could then be analyzed for trends in water quality. Each of the water bodies included in this study were qualitatively evaluated based on: quality of the data set, clarity of the water, dissolved oxygen status, acid sensitivity, and any observable trends in the available data.

The report resulting from this study also contained the major general conclusions regarding Rensselaer County water bodies developed from analysis of all the data collected together and examined as part of the study. These conclusion were:

o The data sets available for many of the water bodies in the County were seriously deficient either in length of record, number of measurements made or, in many cases, from the lack of any data at all;

o The water bodies most sensitive to acid deposition were those at higher elevations, and some of these water bodies had experienced decreases in alkalinity over the past 55 years;

o Several of the water bodies showed elevated (although not toxic), and increasing concentrations of sodium chloride;

o Water bodies at lower elevations in the County showed no impacts of acid deposition, but many did show signs of stress related to excess nutrients and sedimentation; and

o Unlike acid-impacted waters, the cause and corrective action needed for water bodies with excess nutrients and sediments were essentially unique to the particular water body, and were related to its morphology, the state and nature of development within its watershed, and its entire historical pattern of use or abuse.

Database Management
All data gathered in this study was entered into Lotus ~ 1-2-3™ worksheets through the assistance of a variety of volunteers. The data structure used provided basic capabilities for data entry, statistical analyses, and graphical presentations. Care was taken to allow for future transfer of the data to more sophisticated data management systems. This system was determined to be necessary to accomplish many of the tasks considered essential to accommodate, manipulate, and use the data resource available on Rensselaer County waters.

Development of this data management system will be the initial thrust of the Phase III project. The long-term goal of this final phase of the program is the creation of a publicly accessible electronic database which would include all available information on the County's water resources and which would be updated on a regular basis. Such a system would provide a tool for effective management of these vital resources. Implementation of such a system will, however, have to await the support of government agencies as well as the private sector.

RECENT PROGRAMS

Summer 1990 Lake Sampling
As noted above, there are many water bodies within the County that lack an adequate baseline of data, and work on that aspect of the overall program (Phase II) has continued over the last year and a half. Through the summer of 1990 a sampling project funded through the County EMC was completed to significantly enhance and extend the information on six of the water bodies found to have deficient databases in the initial part of Phase II. An additional 28 water bodies were sampled at varying degrees of intensity during this project. Results of this work were compiled in a report released in May of this year.

Milfoil Survey
Another project conducted in conjunction with last summer's water quality project, but funded by a State local assistance grant, was a survey of County lakes for the presence and extent of infestation of Eurasian Watermilfoil. Some County water bodies have been suffering the effect of nuisance growth of this invasive plant for many years. However, the full impact of the problem was unknown, both in the extent of the infestation in lakes known to have milfoil and in the number of other lakes with overlooked or misidentified milfoil populations. There was some cause for optimism based on the results of this survey in that several potentially vulnerable lakes were found to have no milfoil populations (based on reasonably intensive shoreline surveys and requests of sightings from residents) and in some lakes with milfoil, the sites and densities of infestations were limited.

Tomhannock Reservoir Programs
Currently a project is underway to examine the largest single surface water body in Rensselaer County, the Tomhannock Reservoir. The major agricultural focus within the 42,400-acre watershed of this drinking water supply presents a potential threat to its future. Many barnyards are relatively close to watercourses which act as conduits to transport soluble nutrients (e.g., compounds of phosphorus and nitrogen) into the Reservoir. Also, because of the relatively high average slope and runoff potential of cropland soils within the basin, soil erosion and nutrient runoff are particularly problematic in this watershed. Other concerns include the presence of two recently closed town landfills, and private development.

In March of 1991, Rensselaer County and the USDA Soil Conservation Service officials signed a PL-566 Watershed Plan Agreement, aimed at stabilizing and improving the Tomhannock Reservoir's water quality. The primary targets of the Plan are elevated turbidity from suspended sediment, and excessive algal and macrophyte growth resulting from nutrient runoff. Under PL-566, cost-sharing funds are made available to farmers to implement Best Management Practices (BMP) such as manure storage structures, barnyard water management systems, and gully anti-erosion techniques.

As an initial step in the monitoring of the success of the Watershed Plan, Dr. Roger Armstrong of Russell Sage College, working with the Rensselaer Fresh Water Institute, has begun to assemble baseline data on the current levels of chemical nutrients in both the Reservoir, and in the principal streams which flow into it. Prior to initiating this work, a portion of a 1990 NYS local assistance grant to the Rensselaer Fresh Water Institute was used to develop a monitoring plan for the Reservoir. The current baseline-gathering project is supported by a grant from the Rubin Foundation, which encourages faculty at institutions in Rensselaer County

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MAINTAINING YOUR SEPTIC SYSTEM

Special Considerations for Shoreline Property Owners

If you live on shoreline property, maintaining your septic system requires more care than maintaining a similar system located elsewhere. Soil and water conditions near the shoreline may make the system less efficient which could, in turn, cause harmful pollutants to get into your lake, stream or pond.

This article is designed to help shoreline property owners understand what they can do to effectively maintain their septic systems to preserve the quality of their lake, stream or pond and protect the health of their families. These tips are best used in conjunction with the information in Cooperative Extension publication FS1 - *Your Septic System* .

How Septic Systems Work In Shoreline Property Areas

The purposes of a septic system are to treat liquid wastes from your house and to prevent biological and nutrient contamination of your well and nearby lakes and streams. Most of this treatment happens in the soil below the absorption field.

Because septic systems on shoreline property are often close to both surface and ground waters, and absorption fields are sometimes saturated during high water periods, partially treated wastewater is likely to enter adjacent lakes and streams. Also, when shorelines erode, the distance between the septic system and the shoreline decreases, making it more likely that wastewater could move horizontally through the soil to the shoreline and then quickly into the lake or stream.

This pollution can happen even though your system appears to be working well and complies with local health department codes.

The Effects Of Septic System Wastes On Lakes And Streams

Nutrients (especially phosphorus) from leaky septic systems play a major role in causing excessive weed and algae growth in lakes and ponds. Just a small amount of additional phosphorus in a lake or pond can make a large difference in aquatic weed growth.

Excessive weed growth, in turn affects the ability of fish to grow and could even result in fish kills.

Excessive weed growth also makes boating, fishing and swimming less enjoyable due to weed-tangled boat motors, weedy swimming areas, etc.

Wastewater from your septic system that reaches adjacent surface waters also increases the chance that swimmers near your shore could catch a variety of infectious diseases that are associated with these wastes.

How To Tell If Contaminants Are Reaching The Water

Look for these symptoms to tell if waste from your system is reaching surface water:

*** Excessive weed or algae growth in the water near your shore.** Phosphorus leaking from septic systems would be a major cause of this type of growth. Other factors, such as a combination of shallow water and a lake bottom rich in organic matter, or sediment and lawn fertilizer runoff, could also lead to this type of problem.

*** An increase in infections or illnesses associated with swimming in the area.** These are most often minor ailments, such as ear or eye infections,but could be major diseases, such as dysentery or hepatitis.

*** Unpleasant odors, soggy soil or sewage flow over the land surface.** These symptoms often indicate failure and the need for drastic action such as replacement of the system. Under these conditions, wastewater could travel directly into nearby surface waters instead of being treated in the soil.

*** Water test results indicate the presence of biological contamination.** These tests may show the presence of harmful bacteria in the water. Although wastes from septic tanks are not the only source of these contaminants, they are likely suspects. Your local health department can advise you as to where to have testing done.

*** Indicator dye put into your septic tank reaches lakes or ponds.** Special dyes may be available from your local health department and may help to find problems that may otherwise be difficult to notice. This method can help verify the other symptoms listed above.

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How To Prevent Problems

You can do many things to help prevent the problems associated with having a septic system near shoreline areas. Try these activities:

*** Regularly pump and maintain your septic system.** This is the simplest yet most effective thing you can do to prevent excessive amounts of pollutants from reaching your lake, stream, pond or water supply. Regular maintenance also protects the value of your home by helping to ensure a safe water supply and disposal system.

*** Conserve water in your home.** The smaller the amount of water that enters your septic system, the less the likelihood of liquid wastes reaching lakes or ponds. Water conservation devices such as faucet aerators, water-saving shower heads and toilet tank inserts installed in your bathroom and kitchen are inexpensive and effective. Other practices such as spreading the daily effluent load by running the dishwasher and clothes washer at night are easy and don't change your present lifestyle.

*** Redirect surface water flow away from your absorption field.** Many times, water from driveways, roof downspouts or lawns travels toward the absorption field putting an extra load on the system.

*** Plant a greenbelt between your absorption field and the shoreline.** This involves planting areas of small shrubs and trees to help intercept and absorb some of the nutrients before they reach the shoreline. They also can reduce erosion and create a very attractive landscape.

*** Participate in a community sewage system or alternative disposal methods, if available.** Sometimes these systems offer cost effective, long-range solutions to the problems caused by septic systems. Alternative systems may include multiple-home "cluster" septic systems, mound septic systems, grey water recovery and reuse systems, or improved treatment systems. The use of some of these systems may be restricted by local health department codes or require design and construction by experienced engineers and contractors, as well as special permits. Consult your local health department regarding alternative disposal methods.

Before selecting a larger-scale, community-based solution, be sure that it will yield the anticipated results. Many factors contribute to excessive weed growth and other effects, so it is possible that wastes from septic systems may have a relatively minor impact on lake or stream quality.

*** Replace your septic system.** Although this alternative is costly, sometimes it is the only alternative, especially when your system is undersized because of conversion of a seasonal residence for year-round use.

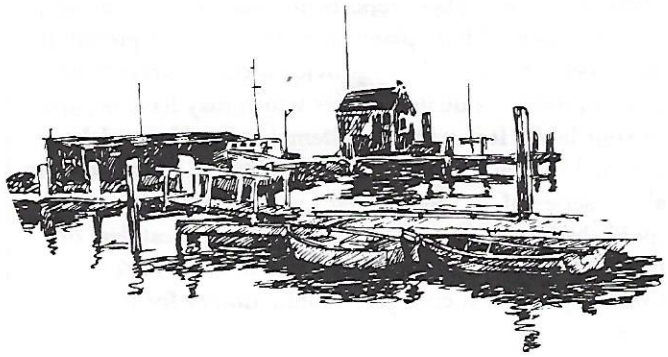
*** If you're building a new home, construct the septic system as far away from the shoreline as possible.** This distance should be even farther than health department codes require. Those regulations are designed primarily to protect human health rather than prevent other effects, such as excessive weed growth. Pollutants, especially nutrients, can easily travel farther than those minimum distances in some soils.

Also, design the system to meet your present as well as future needs. If, for example, you are building a small summer home with plans to enlarge and convert it to year-round use when you retire, design the septic system to accommodate that increased future use.

Where To Go For Help

For advice about your septic system's operation, condition or possible alternatives, contact your local health department, or Cornell Cooperative Extension.

This article was taken, in part, from Cornell Cooperative Extension Fact Sheet Number SS-2



AQUUATIC PLANTS *(continued from page 1)*

of aquatic plants can be accomplished through the use of various guide books. I would not recommend those guides (''keys'') based on botanical characteristics, but there are guides available (some from aquatic herbicide companies such as Pennwalt) which have photographs of the plants to help in the identification. These are easy to use and perfectly adequate for most purposes.

It is not known why some introduced species do spectacularly well in a new environment while most others die out quickly. Often successful new alien species become extremely abundant for a period of time and then decline to lower, more stable, levels. Milfoil may be showing a decline in some lakes now. Both *M. spicatum* and *P. crispus* appear to have the ability to crowd out native species and in some lakes almost all of the biomass can be milfoil. The loss of native species is tragic in itself, but lakes with less diverse (fewer species) plant communities are probably less stable than those lakes with a wide variety of plant species.

Many lakes in New York appear to be changing over time, both in terms of water quality and the kinds and numbers of organisms present in them. I am currently involved with a study of the kinds of plants found in several lakes in western New York, and we are finding that fifty years ago there may have been 60 species of aquatic plants reported while now we can only find 15 or 20. How do I know what was present 50 years ago? It turns out that the then New York State Conservation Department did a biological survey of the lakes of New York in the late 1930's. These reports (which can be difficult to track down but should be in local libraries) are fascinating reading. In many cases, at least in western New York, the ''good old days'' of 50 years ago really weren't so good after all. Pollution was rampant in many lakes and streams which today are relatively clean. These reports discuss water quality and also the kinds of fish, plants and other animals present in each body of water. They provide a good reference which you can use to evaluate changes which may have occurred in your lake. It is worth an attempt to see if your lake was included in that survey and to obtain a copy. there is also a series of volumes called Lakes of New York State (published in the late 1970's) which has a great deal of information about many of the lakes in New York. Consult your local college or public library for these books.

How do you survey what plants (or other species) are present in a lake? It is much more difficult than it sounds! Except in small lakes, you really can't search and examine the whole lake. Instead you must choose sampling sites which hopefully accurately represent the whole lake. Collecting the plants from even small areas (say, 25 square centimeters) is hard if you can't reach the bottom with your hand and still have your nose above water (I can't hold my breath more than about 45 seconds). We use SCUBA gear even in 3 - 4 feet of water. This allows us to put our nose right on the bottom and carefully pick the plants in the quadrat. For statistical purposes, these ''quadrats'' should be randomly chosen within the site. For the survey that we are doing on Chautauqua Lake, which is 5,300 hectares (13,000 acres), we clearly can't sample the whole lake so we are resampling sites which were analyzed both in 1937 and in 1972, allowing us to make direct comparisons. Sampling protocols can get quite involved, but individual lake associations can obtain useful information with a simple sampling procedure. The New York Citizens' Statewide Lake Assessment Program (CSLAP), for example, offers a volunteer-based plant sampling and identification program for lake communities.

What can cause changes in the plant and animal communities of lakes and streams? Changes in nutrient concentrations (usually these increase) are a common culprit. Introduction of new species by humans is common and continuing. Milfoil arrived from Europe about 40 years ago and has now spread throughout North America. The zebra mussel, as a recent example, arrived in the Great Lakes from Europe in ship ballast water around 1987 and is spreading with incredible speed. Management programs can also affect lakes. Fish populations are heavily managed (e.g. creel limits and stocking) but aquatic plants may also be affected by management procedures. A very controversial question involves whether weed control programs (mechanical harvesting or herbicides) can change the species composition of a lake. What little information is available suggests that they can, but it will be very difficult to determine this for sure. If your lake association is engaged in weed control programs it would be worthwhile to attempt to keep track of the kinds of plants growing in the treated areas. If milfoil, for example, increases its dominance after control techniques, we may need to develop new strategies.

It is remarkable how little is really known about lake ecology. There are many reports in the scientific

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literature but, except for some general principles, each lake seems to follow the beat of its own drummer. A lake is a living, dynamic entity which changes with the season and over longer periods as well. Humans can't see beneath the surface very well and therefore tend to be unaware of how much is going on. There are literally tens of billions of organisms in even a tiny lake, ranging from bacteria to moose (which eat large amounts of aquatic plants), all interacting in complex ways. Add the human component and the whole system can quickly become chaotic and unstable. Our job as informed lake managers is to attempt to minimize human disruptions and still manage the lake for human priorities. Your lake has certain inherent characteristics which determine what it will be. Human management programs should be designed to recognize that and not attempt to move the lake very far from its normal equilibrium position. A lake with crystal clear waters, miles of sandy beaches and teeming with fish is impossible. You can have the first two, but not the third, and vice versa. Your lake will talk to you if you let it. Listen to your lake, it will tell you a great deal and make management much easier.

by Ken Mantai
Biology Professor
State University of New York at Fredonia

RENSSELAER COUNTY *(continued from page 7)*

to focus their expertise on problems of direct concern to the local community. This project to assess the current nutrient concentrations in Tomhannock waterways will be complemented by RPI graduate student projects on Tomhannock watershed hydrology, and another focused on primary productivity in the Reservoir itself.

FUTURE PROGRAMS

As pointed out by the programs outlined above, there has been a continuous and high level of interest and investigation of the water quality of the surface waters of Rensselaer County over the last three years. An equally aggressive program of work has been focused on the ground water resources within the County and a coordination of these activities is being fostered between the groups involved in these projects as well as through the auspices of a variety of government agencies and private organizations. One of the potentially more important organizations in this endeavor is the Rensselaer County Federation of Lake Associations which has conducted educational symposiums on several water quality issues and will attempt to coordinate a project of lake assessments for interested individual lake associations during the summer of 1992.

by Dr. Reginald J. Soracco, Rensselaer Fresh Water Institute, Troy, NY 12180

Editors Note: If you want further information on these studies, contact the author at the Rensselaer Fresh Water Institute (518) 276-6757.

The Federation of Lake Associations, Inc.

MEMBERSHIP CATEGORIES

Lake associations with less than 50 members.....$30.00/year
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Lake associations with 100 to 199 members $75.00/year
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Additional copies of *Waterworks*.....$.50 each

Membership dues over $5.00 are tax deductible contributions to the Federation of Lake Associations, and will be used for educational, scientific, and public information activities of the Federation.

APPLICATION FOR MEMBERSHIP

THE FEDERATION OF LAKE ASSOCIATIONS, INC., 273 HOLLYWOOD AVE., ROCHESTER, NY 14618

Type of Membership (please check) ☐ Association ☐ Individual ☐ Corporate

Association Name: _____

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President/Contact Person: _____

Summer Address _____ Winter Address _____

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Total number of newsletters requested of each issue: _____

FEDERATION NEWS *(continued from page 3)*

Jack Colgan has served as Federation President since 1981. The Federation has been strengthened by the endless hours of hard work and dedication contributed by both Jack and his wife, Betty. In appreciation for their many years of loyalty and tireless effort, a loon table lamp has been presented to the Colgans by the Board of Directors and the Scientific Advisory Board. Jack will continue his involvement with the Federation by serving as Treasurer on the FOLA Executive Board.

Elaine Horstmyer was elected Vice President of the Federation. She is past President of Cazenovia Lake Association and Vice President of the Madison County Federation of Lakes.

Shirley (Kris) Hansen is a past President of the Shore Owner's Association of Lake Placid, a member of the Camp Safety Advisory Council of New York State and New York State Bathing Facility Committee.

Randy Fuller is an associate Professor in the Biology Department at Colgate University. He is an aquatic ecologist with a special interest in small streams.

Nancy Jarvis is the Cortland County Groundwater Management Coordinator and is responsible for coordinating groundwater related activities including public education. Nancy also coordinates the County's Aquatic Vegetation Control Program.

Lyle S. Raymond, Jr. is Extension Associate at the Center for the Environment, N.Y.S. Water Resources Institute, at Cornell University. He is very involved in public awareness and educational programs dealing with resource conservation and development.

Richard S. Burton is Administrator of Environmental Health Lab in Monroe County and has been in the environmental field for 24 years with a special interest for lake and watershed management. He is a representative of Monroe County on the Water Resources Board and is also involved in the restoration of Irondequoit Bay and its watershed improvement.

David Pendergast has been nominated to the Executive Committee of the Federation. He is currently the Executive Director of the New York State Soil and Water Conservation Committee.

Martin Culik works with the Cornell Cooperative Extension and has been very active with the Canandaigua Lake Watershed Task Force.

Howard Kimball has been instrumental in generating the necessary funding and momentum for the the formation of the Seneca Lake Pure Waters Association in Lakemont, N.Y.

AND MORE...

* Looking for water saving devices to reduce water use at your summer cottage? The Seventh Generation catalog lists low-flow shower heads, faucet aerators, toilet dams and more than 300 other environmental products. Call 1-800-456-1177 for a free copy.

* A Request for Information: The Peck Lake Protective Association would appreciate receiving copies of by-laws and newsletters from other lake associations. They are in the process of reviewing and updating their documents and your input would be helpful. Send information to John Mars, President, Peck lake Protective Association, HC 4 Box 82J, Gloversville, NY 12078.

* A directory is now available which contains a description of more than 1200 successful environmental programs from around the nation. The Environmental Success Index is recognized nationally by policy makers, political leaders, government officials and the environmental community as a resource for those taking action to protect, restore, and enhance our environment. A listing of these programs, along with names, addresses and phone numbers is provided by state. For a copy, send a check for $25.00 to Renew America, 1400 16th St. N.W., Suite 710, Washington, D.C. 20036, Attn: Index Orders, or call (202) 232-2252.

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