



incremental improvements

In the big picture, water quality was great in 1932, poor in 1972, better in 1983, and stayed the same or a little better now. The simplest way of looking at water quality is through the clarity of the water itself. Water clarity in lakes is primarily affected by phytoplankton and tiny suspended soil particles, including clay. The simple way of measuring this is with a 6" inch black and white disk called a secchi disk. This disk is lowered into the water on a sunny day to a depth at which it can no longer be seen. This is known as the secchi depth.

The slow improvement in the clarity of Saratoga Lake is illustrated in the graphic below. The positive impacts of the sewage diversion were also clearly shown by dramatic decreases in the levels of total phosphorus. Following the diversion of sewage, a 50% decrease in the levels of total phosphorus has occurred in between the 1974 to 1984 sampling results.

Since that reduction, total phosphorus has remained stable in the Saratoga Lake. The 1984 fall total phosphorus concentration was 0.020 mg/l, as was the average fall total phosphorus during 1993-1996. This reinforces the observation made with the secchi disk that little has changed from since 1984.

The stability of the water clarity and phosphorus levels needs to be re-evaluated as part of the watershed management plan. Is this as good as the water quality gets? The answer is, we don't know. To the person boating on the lake getting stuck in weeds, the answer is simply yes, it needs to be better. The history of the lake shows that it was better at one point.

At this time, competing forces may interfere with continued lake water quality improvement. The competing forces include continued milfoil growth and expansion, zebra mussels which feed on algae causing increase in water clarity, possible diversion of lake water for municipal supply, conversion of camps to year-round homes, and new development in the watershed. The watershed community, as a whole, needs to decide how much it is willing to contribute towards the improvement of the water quality of Saratoga Lake. ●

Watershed Plan announced for Saratoga Lake

The Saratoga Lake Protection and Improvement District (SLPID) has received a grant to update the 1983 Management Plan for Saratoga Lake. Over the next several years, this project will assist SLPID in improving the water quality for approximately one-third of Saratoga County.

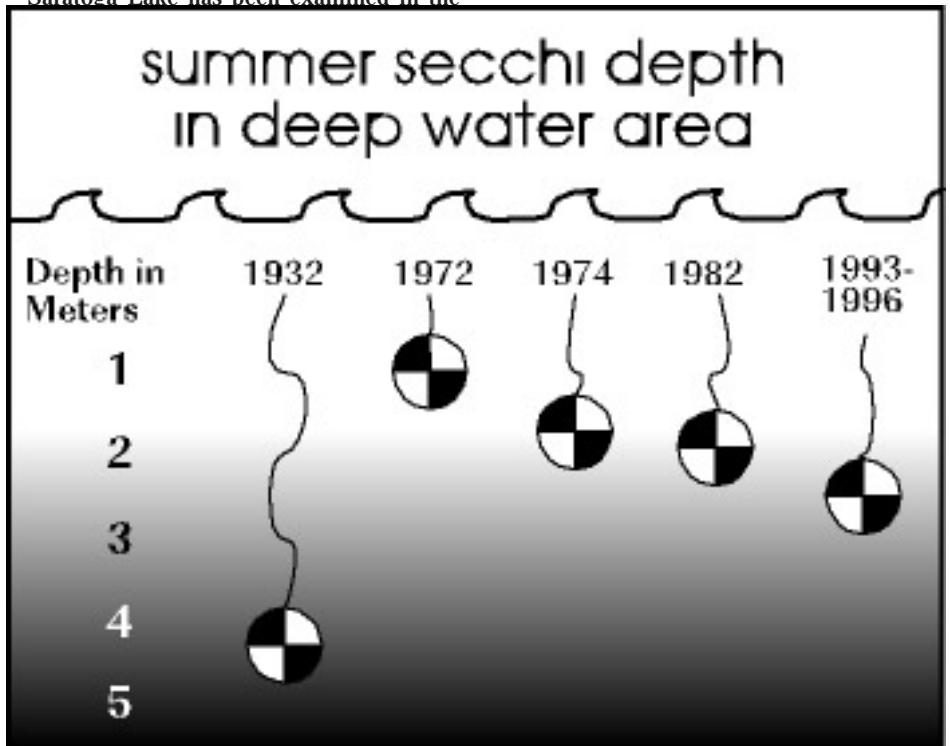
Since 1983, much has changed in the concept of lake management. At the same time, Saratoga County has experienced significant changes in land use and development patterns. SLPID has worked extensively on managing problems in the lake itself and examining watershed issues as they arise. In-lake management has focused on the control of invasive Eurasian water milfoil as directed in the 1983 Management Plan. Aquatic vegetation control technologies, however, have changed dramatically since 1983.

The new watershed management plan will address how these new technologies can be implemented in Saratoga Lake. The plan will also make recommendations regarding specific guidelines for land use and development practices in the watershed that will aid in the protection of the water quality of the lake.

past as part of state and federal government regional studies. These studies will form the background information for this project and aid in the identification of necessary remedial measures. The first substantial examination was made in 1932 as part of the New York State Biological Survey. Next, came studies sponsored by United States Environmental Protection Agency (USEPA) during 1972-1974, followed by the 1982-1983 USEPA Diagnostic Feasibility Study.

The subsequent evaluation in 1972 was prior to construction of the Saratoga County Sewer, which has a treatment facility in Mechanicville which effectively eliminated treated sewage effluent from the Kayaderosseras Creek. The 1983 study occurred just after the extension of a sewage collection system to residences along NYS Route 9P and other roads adjacent to Saratoga Lake. This study evaluated the lake during a period of time when water clarity was improving due to the diversion of sewage effluents out of the basin and elimination of septic effluent from the immediate lakeshore area. ●

Saratoga Lake has been examined in the



What will be happening on Saratoga Lake this summer?

Present in-lake management strategies are being reviewed and considered. In-lake management will include the evaluation of new Eurasian water milfoil management techniques including use of fluridone (SONAR), herbivore beetle larvae, harvesting techniques, inventory of recreational boating, and analysis of the dam outlet structure. ♣

Why does SLPID need help with this project?

A lake management plan is not just about the lake, it is about the watershed. The quality of land management in the watershed determines the quality of water that reaches the lake. SLPID cannot change land management policy and does not believe such a change is necessary. A desired result of this management plan will be to improve the implementation of existing water quality protective activities in the watershed. Some of the enhanced water

quality protection activities include seeking grants for the agricultural sector to fund more effective animal waste management, determining the need for local or regional water quality management structures along state or county roadways, and plans for improved stormwater management. All these programs require input from all groups represented in the watershed. ♣

Saratoga Lake Bio-control Research Project An Experimental Eurasian Water Milfoil Control Measure

As part of a comprehensive Watershed Management Plan administered by the Saratoga Lake Protection and Improvement District (SLPID) and the LA Group, an innovative and experimental technology to control the growth and spread of Eurasian water milfoil (*Myriophyllum spicatum*) will be implemented on Saratoga Lake in late May or early June of 2000.

A weevil species native to North America, *Euhrychiopsis lecontei* (commonly referred to as the milfoil weevil), will be introduced into Saratoga Lake on an experimental basis. For the past decade, researchers have been evaluating this organism as a potential biological control agent for the exotic plant Eurasian water milfoil (hereafter, referred to as EWM). The weevil, which is a small (adults are roughly 2mm in size) herbivorous insect of the beetle family Curculionidae, has been associated with significant declines in EWM populations in lakes, such as Brownington Pond in Orleans County, Vermont, Fish Lake in Dane County, Wisconsin, and McCollum Lake in McHenry County, Illinois.

Steven A. LaMere, a Certified Lake Manager and Certified Fisheries Professional, and owner of Adirondack Ecologists (AE), a lake management consulting firm located in Crown Point, New York, has been retained to design, implement, and oversee the research project. The primary objective of the bio-control project will be to determine the efficacy of the milfoil weevil in controlling EWM in Saratoga Lake. This will be accomplished by assessing the aquatic plant and herbivore communities of Saratoga Lake prior to and after stocking roughly 20,000 weevils into the lake.

The research protocol calls for an investigation of the aquatic plants and herbivores currently present in Saratoga Lake in June of 2000. The investigation will take place in a number of permanent research sites selected and established by AE, and the weevils will be stocked shortly after the initial investigation is

complete. Follow-up investigations in July and August of 2000 and June, July, and August of 2001 will hopefully allow AE the opportunity to evaluate the "initial" impact of the weevil stocking. It will likely take a minimum of five years, however, to assess the full impact of the project.

Based on some of the research that has been conducted around the country (e.g., Minnesota and Vermont), there is reason for optimism. We know a considerable amount about the lifecycle of the weevil and its herbivorous effects on EWM. Adult weevils spend the winter in the leaf litter and mud near the shoreline of a lake or pond. In May or June, they return to the lake to spend the summer in EWM "beds". The female, which is capable of laying 30 to 100 tiny yellow eggs throughout her lifespan on the apical meristems ("growing tip") of EWM plants, usually lives for about one month. After hatching (which normally takes about three days), the weevil larvae feed on the lateral shoots of EWM and then burrow into the stems of the plants.

It is this burrowing behavior that is particularly damaging to EWM plants. The larvae, in the process of entering into the stem, destroys the vascular tissue of the plant, thus exposing the plant to a potential loss of stem buoyancy. If and once this occurs, the EWM plant falls out of the water column where light may not be able to reach it, resulting in a loss of the plant's ability to photosynthesize. In addition, it is theorized, that bacteria and other disease-causing vectors may become introduced into the EWM plant through the hole burrowed by the weevil, and this may also play a role in the plant's demise.

Over the course of about 11 days, the larvae pupate into adults. The adult females mate and lay more eggs, and the cycle begins anew. In the late summer or early fall, the adults either fly into shore or "raft" in on EWM fragments. Natural (undeveloped) shoreline areas which possess a significant amount of leaf litter make good

over-wintering habitat for the milfoil weevil. They normally are found buried underneath the leaf litter within 1 or 2 meters of the shoreline or in the shoreline mud.

The Saratoga Lake bio-control project will be the first research project of its kind in New York. It promises to be a very high-profile undertaking, with a tremendous amount of interest expected on the behalf of state regulatory agency personnel, local and state government officials, academicians, and of course, Saratoga Lake residents and other riparian shoreowners from all over the northeastern U.S.

In order for the Saratoga Lake bio-control research project to be successful, AE will be selecting research sites in areas where no other EWM management techniques will be employed by the SLPID during the lifespan of the program. Mechanical harvesting activity, which cuts the tops of the plants (apical meristems), removes the food source for the weevils and removes the weevils themselves, thus eliminating any chance of success that they might have of controlling the EWM. Chemical use (e.g., SONAR) would have much the same effect.

The research team is equally concerned about the effects of boating traffic within the confines of the established research sites, which will measure about 100 square meters each. To prevent boat propellers from destroying the growing tips of the EWM plants, and thus disrupting the weevils before they have a chance to exert control, AE will be applying for the permission to install surface markers (buoys) around the research plots to delineate their position. A plan to post educational signs near launch sites to the lake which describe the project and its scope is also being discussed.

We are hopeful that, with the cooperation and consideration of all stakeholders and users of the lake, that this will prove to be a very interesting and valuable research effort. ♣

The Watershed Planning Process

It is clear that SLPID cannot develop a watershed plan without the support of the watershed communities. To explore and develop consensus on these issues, SLPID will form a steering committee that will meet 7-9 times over the next 16 months. The major committee will be known as the Saratoga Lake Watershed Advisory Committee and will focus its attention on the land use and regional water use issues. The Advisory Committee will appoint a limited number of subworking groups on: boating and recreational issues and Eurasian water milfoil management.

The individual mayors and supervisors from each of the thirteen communities located partially or wholly in the watershed will be invited to appoint one official and one citizen representative to the Advisory Committee. These include the following communities: Town of Ballston, Village of Ballston Spa, Town of Charlton, Town of Corinth, Town of Galway, Town of Greenfield, Town of Malta, Town of Milton, Town of Providence, City of Saratoga, Town of Saratoga, Town of Stillwater, and the Town of Wilton.

Additional stakeholders have been identified from SLPID, the Saratoga Lake Association, local, county and state agencies, the Saratoga County Chamber of Commerce, environmental organizations, and fish and game organizations. The Advisory Committee will meet monthly or bimonthly to discuss the environmental and land use issues in the watershed. Each meeting will focus on a specific topic and presentations will be made by specialists on the individual topics to be explored. Issues relating to the topics will then be explored in-depth and alternative solutions will be identified by committee members.

The date of the first meeting is scheduled for Thursday, June 1 in the Saratoga County Auditorium in Ballston Spa. This meeting will be of an introductory nature designed to explore and develop a series of goals and objectives for the watershed management plan. Public attendance is welcomed and all future meetings will be announced.

Topics to be covered by the committee are as follows: Water Quality Improvement; The Watershed Approach; Water-Based Recreation Issue; Protection of Critical Environmental Areas; Aquatic Vegetation Management Issues; Fish and Wildlife Management Issues; Point and Nonpoint Source Pollution Sources; Role of Local Governments; A Strategy for Implementing the Watershed Management Plan. ●

Meeting on SONAR Application

An estimated 125 people attended a meeting of the Saratoga Lake Association on March 30 to hear presentations on the anticipated application of the chemical SONAR. There are two 100 acre sites that have been earmarked for the treatment of Eurasian water milfoil- one at the north end of the lake and one at the south end of the lake.

A professional company has been hired to spread the chemical which has been designated as safe to use in drinking water

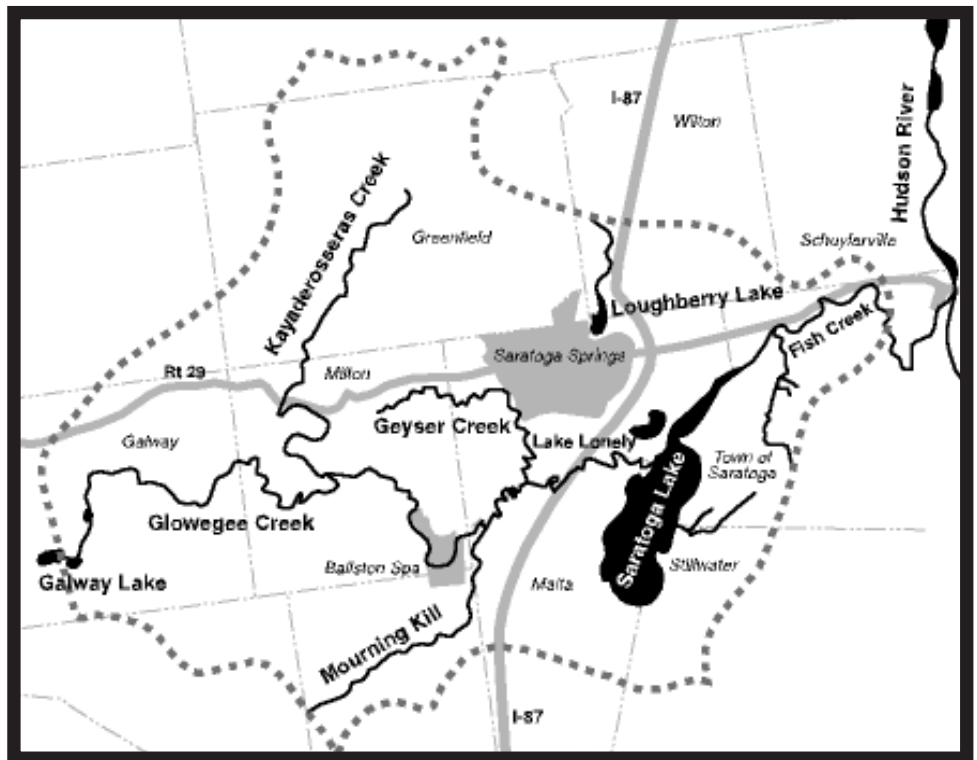
resources. Markers will be set around the treatment area and information notices posted before treatment.

Presenters at the meeting stressed that this is an experimental program for Saratoga Lake and there will be other programs going on in other locations of the lake. Since Saratoga Lake will be the largest lake in New York State to be permitted to apply SONAR, other lakes with Eurasian watermilfoil problems will be anxiously watching the results. ●

What is the Saratoga Lake Watershed?

The Saratoga Lake watershed is very large, covering an area of over 244 square miles. The watershed boundary is shown in the below map and includes a part or portion of 11 townships, plus the Village of Ballston Spa and City of Saratoga Springs. Most of the water that reaches the lake through runoff and streams, therefore, must pass through roughly one-third of Saratoga County. As a result, land use activities and pollution sources throughout the watershed have a tremendous impact on

Saratoga Lake. Action based on watershed boundaries rather than political boundaries can better target the pollution point and nonpoint sources that are in need of mitigation. The watershed approach will offer a unique opportunity for citizens to improve water quality based on specific knowledge of their watershed area, and for communities to link together to develop innovative ways to solve pollution problems within their local watershed boundaries. ●



Saratoga Lake Watershed Map

Questions? Call George Hodgson at 884-4778
or Dean Long at 587-8100

Public participation to guide plan development

Public involvement and partnerships are essential components to the success of the Watershed Management Plan. Achieving the goals of the Management Plan depends on greater public awareness, local community actions and partnerships between governments, the public sector and the public. Objectives of the public participation program include increasing public awareness about watershed issues, obtaining public trust and support for the planning process, locating volunteers willing

to work, and encouraging public responsibility for action. Public outreach will be directed on several levels. This newsletter will serve as the first in a series of newsletters that will update the communities on a regular basis about the issues and ways the public can become involved in the planning process. Outreach will extend to the 13 local planning boards beginning in May. A presentation, developed to educate people about the watershed approach to watershed protection, will be offered to each

of the boards and any other interested group. A web page is in the design stage and will be available in the near future. Information from the newsletters will be on this page, as will all water quality and other important reports. There will also be the opportunity for public comment on the web page including input via a survey, and the opportunity to have your questions answered by professional lake managers. ♦

Saratoga Lake Watershed Advisory Committee Meeting

Thursday, June 1, 2000
7:00 PM

Saratoga County Cooperative
Extension Auditorium, Building 5
Ballston Spa, New York

What are some questions that this project needs to address?

- What should the plan include?
- What has changed and what has not changed in the watershed?
- What has changed about the lake's water quality?
- Should Eurasian water milfoil be managed differently?
- What can be done to improve or preserve water quality?
- What is the best management technique for Eurasian water milfoil?
- How do changes in the watershed relate to changes in water quality?
- What role do wetlands, especially the Great Bear Swamp, play in water quality management?
- What improvements in stormwater management can be implemented without legislative changes in site plan review?
- Do watershed communities need stormwater management ordinances?
- Does SLPID need a lake manager?
- Would the appointment of a scientific advisory board be of value?
- Should Saratoga Lake be a regional drinking water source?

The LA Group, P.C.
40 Long Alley
Saratoga Springs, New York 12866

BULK RATE
US POSTAGE
PAID
Ballston Spa, NY
12020
Permit No. 67