AN ASSESSMENT OF THE WATER QUALITY OF

SUMMIT LAKE

WASHINGTON COUNTY, NEW YORK

Completed by

Eichler, L. W.
Rensselaer Fresh Water Institute

March 1988

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Background

Summit Lake is located in the southern portion of Washington County in the Town of Argyle. The lake is classified by New York State as Class A, which means that no waste materials of any kind, treated or untreated, may be discharged to the water body. The best usages include potable water with appropriate treatment and recreation, both contact and otherwise.

The lake has a surface area of 83.2 acres (33.7 ha). Elevations within the watershed range from 1048 feet (319 m) to 772 feet (223 m) above sea level at the lake surface. The only outlet is located on the southeastern margin of the lake. Inlets are located on the north and south shores of the lake. The lake can best be classified as mesotrophic. This classification indicates that nutrients necessary for the growth of algae in the waters of the lake are moderate.

The surficial geology is primarily Nassau rock outcrops (exposed bedrock) with scattered gravel and silty loam deposits (Bernardston). Depth to bedrock is only 10 to 20 inches in the Nassau associations on the west and southwest margins of the lake, though somewhat deeper in the Bernardston soils along the northeastern shoreline. Slopes in the Nassau associations are quite steep and not well suited to development. The Bernardston associations have somewhat gentler slopes and better drainage for development purposes. All of the soil types in the basin

Table 1. Physical Features of Summit Lake.

SUMMIT LAKE - Argyle, Washington County, New York		
Latitude	43 degrees 12 minutes 24 seconds	
Longitude	73 degrees 27 minutes 43 seconds	
Surface Area	33.7 Ha	(83.2 acres)
Elevation	223 meters	(732 feet)
Shoreline Length	3.17 km	(1.97 miles)
Classification	Class A	(mesotrophic)

are poorly suited for septic systems, due to either too rapid drainage (steep slopes and gravel) or slow drainage (silts and loams).

Summit Lake is a residential/recreational lake with boating, fishing and swimming the primary uses. The lake however, also serves as a reserve water supply for the Town of Argyle. New York State lists Summit Lake as having no public access by their definition, which requires that a state operated park or launch ramp be present. There is limited public access via the seasonal resorts. The watershed is sparsely populated, and areas of undeveloped shoreline with potential for residential use remain. Commercial land use on the shore of the lake exists in the form of seasonal resorts.

Sewage treatment is on an individual septic system basis.

Bacterial water quality of Summit Lake has been sampled on a number of occassions to assure its suitability as a drinking water source. Samples were collected in the distribution lines for the Village of Argyle water system, generally after chlorination. A single sample taken on March 9, 1987 at the intake point from the lake however, appears to be an untreated water sample with very low levels of coliform bacteria. The bacterial levels in this sample are within acceptable limits for use as potable water with approved treatment or contact recreation (swimmming) as set by New York State Department of Health. The relationship of coliform bacterial testing to water quality goals will be explained in detail in a later section.

Sampling Locations

In order to characterize the chemistry of Summit Lake water, three sampling sites were selected (Figure 1). Sites were selected to provide samples representative of the lake as a whole. Selection criteria, which were discussed with association members prior to sample collection, included: water depth, degree of shoreline development, density of aquatic weed growth, and proximity to inlets or outlets.

Sampling Methods

At each lake site a surface grab sample for chemical analysis was collected. Samples were collected by submerging a one liter bottle below the surface of the water and then inverting it to fill in such a manner that the mouth of the bottle was as far as possible from human skin. Care was taken to avoid collecting portions of the surface film in the sample. A large volume sample was collected at site 2 (midlake) for later analysis of chlorophyll a concentration.

All samples were stored on ice until return to the laboratory. Immediately upon arrival at the laboratory a portion of each sample was analysed for pH, specific conductance and alkalinity. A separate portion to be used for total phosphorus determination was frozen until analysed. A third portion was preserved with nitric acid for determination of metals. The remainder of each sample was filtered (0.4 um Nuclepore filter) and stored at 4°C until analysed for nitrate, ammonia, chloride and soluble silica concentrations. The sample for chlorophyll a analysis was filtered through a glass fiber filter and the filter frozen in a dessicator for later analysis. The analytical methods used for all determinations are listed in Appendix A.

Results

Samples were collected from Summit Lake on August 26, 1987 by members of the lake association. In addition, they embarked on a program to measure water temperature and transparency throughout the summer season. Although they will be reporting their results separately, a brief discussion of some of the implications of their work is included here.

Temperature

Thermal stratification, when used to describe a lake, refers to an increase or decrease, sometimes abrupt, in water temperature from the surface to the bottom of the lake. Since most of the heating of the lake occurs at the surface, temperature in the surface waters during the summer months is highest and decreases with depth. There is however, a zone of rapid temperature change over a small increase in depth. This zone is referred to as the thermocline. This thermocline acts as a barrier, effectively preventing mixing of the waters above it with the waters below. The part of the lake above the thermocline is referred to as the epilimnion and the portion below the thermocline is known as the hypolimnion.

Dissolved Oxygen

Depth profiles of dissolved oxygen and temperature in nutrient rich lakes generally show oxygen levels near zero in the deeper parts of the lake during the summer months. These low levels of oxygen in the hypolimnion control the type of organisms capable of utilizing this portion of the lake. This lack of oxygen is due to decomposition occurring in the deep waters and sediments. Bacterial activity in the sediments of the lake bottom consumes oxygen and once the lake is stratified, the deep waters are effectively cut off from the primary source of oxygen to a lake, the atmosphere. A by-product of some of the bacteria capable of living in the absence of dissolved oxygen is hydrogen sulfide which gives the water a "rotten egg" odor.

Transparency

Secchi depth is a simple measure of water transparency. Water transparency is controlled by the density of plankton (floating microscopic plants) and the amount of fine grained silts and clays present in the water. Nutrient rich lakes, for example Saratoga Lake listed in Table 3 for comparison, generally have large numbers of plankton in the water which result in low transparency. Shallow lakes in areas where the soils are mainly fine clays and silts also have generally low Secchi depth readings due to constant resuspension of the fine sediments via wave activity. Secchi disk transparency data for the lake at the time the water samples were collected indicated a Secchi depth of 3 meters. This transparency is moderate when compared to other lakes in the region (see Table 3).

Phosphorus

The chemical constituents of primary concern for Summit Lake residents would be those which promote the growth of algae and aquatic weeds. These materials, notably phosphorus and nitrogenous compounds, are fertilizers in that they are present in the shortest supply relative to the amounts needed to sustain algal growth. Addition of one or both of these nutrients generally results in a reduction of water quality since the concentrations of these nutrients control the amount of plant, and thus animal, material capable of growing in the lake. Sources of nitrogen and phosphorus to the lake include: 1) the atmosphere through rain, snow, etc.; 2) surface runoff of soils; 3) septic system leachate; 4) resuspension from the sediments of the lake; 5) runoff of fertilizers from farm fields or lawns and gardens; and 6) fecal material from domestic animals.

Phosphorus is generally considered to be the primary limiting nutrient to plant growth. Total phosphorus concentrations listed in Table 2 indicate that the amount of phosphorus in the surface waters of Summit Lake is moderate (Table 3). At any one time, most of the phosphorus is probably tied up in the cellular material of the organisms in the lake.

<u>Nitrogen</u>

The methods used to determine the amount of nitrogenous compounds in the lake water only measure materials not contained in living tissue or particulate material. From Table 2, it is apparent that there were little or no nitrogenous compounds (ammonia and nitrates) available in the surface waters of Summit Lake (less than 10 parts per billion) at the time of sampling. Most of the nitrogenous material is probably bound up in living tissue (i.e. algae, plants, fish, etc.). The lack of available ammonia and nitrates indicates that nitrogenous material may be limiting to algal productivity in Summit Lake. Water samples collected in November of 1975 had moderate levels of ammonia, 0.11 mg/l however the limit of detection of the method used for nitrate (0.2 mg/l) was not sensitive enough to detect this compound. Elevated levels of ammonia in the surface waters of moderately productive lakes are common following Autumn overturn (mixing). The ammonia is a by-product of bacterial decomposition occurring in the deeper, oxygen depleted portions of the lake during summer stratification.

Alkalinity and pH

Alkalinity and pH records for Summit Lake are listed in Table 2. The pH at all sites was quite alkaline (pH above 7.0). The ability of a lake to neutralize additions of acid via acid rain or surface runoff is measured by alkalinity or the buffering capacity present in the lake water. The alkalinity of Summit Lake ranged from 170 to 180 mg/L as $CaCO_3$ in the surface waters (epilimnion). This alkalinity value is quite high indicating that adequate capacity exists to buffer whatever acids are presently entering the lake. The greatest amount of acid enters a lake during the spring when rapid melting of snow occurs. This is generally the time when the most acidic (less than 7) pH values are observed in lakes and streams. Since spring water samples were not included in this study, the effects of spring snowmelt on the pH of Summit Lake remains to be determined. However, the high alkalinity present in the lake makes even spring acidification unlikely.

Specific Conductance

Specific conductance is a measure of the total dissolved ions present in the water. Conductivity values in the surface waters ranged from 212 to 216 umhos. These conductivities are moderate but in line with other chemical constituents reported for Summit Lake. New York State guidelines for Class A waters such as Summit Lake limit conductivity to a maximum of 1000 umhos.

<u>Chloride</u>

The chloride concentrations for all samples from Summit Lake ranged from 5.3 to 6.5 milligrams per liter. Concentrations of chloride in this range are average for a lake with a moderate amount of development (compare Tables 2 & 3) and present little or no hazard. The lack of major highways within the watershed should limit the amount of road salt drainage into the lake. Since spring samples were not collected specific statements on input of chlorides to the lake via road salt cannot be made at this time.

<u>Chlorophyll</u>

Chlorophyll <u>a</u> is the primary photosynthetic pigment found in algae and is generally used to estimate the amount of algae present in lake water. Most naturally mesotrophic waters have chlorophyll <u>a</u> concentrations of between 2 and 8 micrograms per liter. Chlorophyll <u>a</u> concentrations for Summit Lake are at the lower end of this range (3.3 ug/l) indicating that the lake is mesotrophic. This classification indicates that Summit Lake is intermediate in algal productivity.

<u>Coliform Bacteria</u>

The coliform group of bacteria are used as the principal indicator of suitability of water for domestic and recreational use. These bacteria are found in the digestive tract of warm blooded animals and excreted with fecal material. Coliform bacteria though not generally pathogenic (disease causing) in humans indicate the presence of sewage which frequently carries other potentially pathogenic bacteria and viruses. Ratios of the different groups of coliform organisms are used to determine whether the sewage source was human or from other warm blooded animals, e.g. cattle, poultry, etc. Assays of total coliform bacteria in Summit Lake were made at the village intake in March of 1987 by the Argyle Water Department. This was probably a poor time to collect samples for bacterial analysis for two reasons. In the first place, the low water temperature severely restricts survivability of intestinal bacteria of the coliform group. Secondly, seasonal residences on the shore of the lake have been unoccupied for an extended period of time, thus negating any impact the septic systems of these residences may have on bacterial water quality. The only advantage to sampling at this time of year is that it is probably the time of maximum surface runoff due to snowmelt. Thus highest groundwater levels should occur at this time of year causing the most severe problems for marginally operating septic systems. Notwithstanding the limitations of the time of collection, the results of the sample indicate that levels of coliform bacteria in the lake are well below the allowable limits set by New York State for contact recreation (Table 4, Class B) and drinking water use with appropriate treatment (Table 4, Class A).

Aquatic Plants

Aquatic weeds do not presently appear to be a severe problem for boating or other recreational activities. A certain number of aquatic plants are beneficial since the weed beds provide habitats for numerous fish and other organisms allowing for a good warm water sports fishery. Non-native aquatic plants such as Eurasian Watermilfoil have begun turning up in more remote lakes and have the potential for causing a variety of problems and an overall degradation in water quality. If the suspicion exists that Eurasian Watermilfoil is present in Summit Lake, the Fresh Water Institute would be glad to identify, free of charge, any plants suspected to be Eurasian Watermilfoil. Procedures for plant collection and identification are included as Appendix D. A drawing of Eurasian watermilfoil is included as Figure 2.

Bathymetry

Although bathymetric (depth profile) maps of Summit Lake are not available, water depth at the three sampling sites was recorded. Water depth at the sampling sites were; site 1 = 7 m (23 ft); site 2 = 9.5 m (31 ft) and site 3 = 4 m (13 ft). Site locations presented on the attached map (Figure 1) however, are only approximate.

SUMMARY AND SUGGESTIONS

At present, the water quality of Summit Lake is quite adequate for the primary use of its' residents, namely recreation and potable water following appropriate treatment. The chemical and bacteriological results are well within guidelines set by New York State for these uses (Classes A & B, Table 4). Use of Summit Lake water for drinking or food preparation without prior treatment (chlorination) is not advisable. If it is necessary to use lake water for these purposes, chlorination is desirable to kill any potential pathogenic organisms and filtration to remove particulates are well worth the small additional cost. Location of intakes for lake water systems should be given careful consideration. The intake should be no deeper than 5 meters (15 feet) to assure well oxygenated water and should be no shallower than 2 meters (6 feet) to avoid sediments mixed by wave action and recreational activity. Without active concern the good water quality presently enjoyed by residents is not guaranteed.

Since the lake serves public and private users as a bathing area, elimination of all inputs from septic systems should be of primary concern. Initiation of a Septic Survey by Washington County should be pursued. The survey will determine any severe problems and it then becomes the New York State Department of Health's (NYSDOH) responsibility to oversee correction of any problems encountered. If the NYSDOH, as a result of a lack of manpower, is unable to complete the survey, the association members may wish to do their own survey. A sample septic survey form is included for your information (Appendix B). The only shortcoming of doing your own survey is the lack of any legal right to force residents to correct failing systems. NYSDOH or Washington County may be willing on a case by case basis to help you with this. After completion of the survey, lake residents should still police themselves since systems that were operational during the survey may fail shortly afterward.

As previously discussed, nitrogen and phosphorus compounds entering the lake are likely to cause the greatest problems for recreational users. There are a number of ways that the amount of these nutrients entering the lake can be reduced. Methods for reduction will be discussed in relation to the source of input.

Nutrient additions from the atmosphere through rain, snow, etc. are a large part of the total nutrients added to a lake each year. The ability to reduce inputs from this source is limited. Reduction of the amount of impermeable surfaces adjacent to the lake (paved roads and driveways, sidewalks, etc.) will slow the flow of rainwater to the lake by forcing it to percolate through soils prior to entering the lake. Soils act as a natural filter removing much of the nitrogen and phosphorus compounds before the water reaches the lake. Eliminating stormwater drains emptying directly into the lake is also helpful. The drains may be redirected to small gravelled areas for slow dispersal of the water.

Sewage from failing or improperly located septic systems can be a major source of nutrients to a lake. In a properly maintained and located septic system, solid material is allowed to settle in the septic tank where microorganisms can decompose it into water soluble material. The water soluble components (leachate) are allowed to pass into lateral drainage fields where the liquid slowly percolates into adjacent soils. In the soil, chemical reactions and bacteria remove the nitrogen and phosphorus compounds from the water and convert it to insoluble material, cellular material and gaseous material. Thus, in a properly operating system nitrogen and phosphorus are removed before the water finally percolates back to the lake. In a system which is not operating properly, insufficient time is available for complete removal of nitrogen and phosphorus compounds before the leachate reaches the lake. Septic system failure is likely to occur when the systems are:

1) built in fill over an old wetland or natural drainage area whose water table is near the surface of the soil.

2) not of sufficient size to handle normal and peak loading rates.

3) located where the depth of soil present over bedrock is less than six feet.

4) located less than 50 feet from the shore of a lake or a stream.

5) located in soils with extremely high permeability or steeply sloping ground resulting in too rapid a movement of liquid through the system.

6) receiving excessive amounts of undigestable or slowly digested materials (i.e. plastics, bone or eggshells) without frequent pumpout.

7) older than 30 years and have never been upgraded.

Extreme septic system failures may be observed as clogged toilets and drains or puddling of water on the surface of the ground near the location of the septic leaching device of the system. Puddling is most likely to occur when the soils are quite wet primarily during the spring of the year and after periods of heavy rain in the summer. Surface pooling of water is also most common at high water usage times of day, generally in the morning. Septic inputs directly into the lake generally result in excessive growth of dense filamentous mats of algae near the point where the sewage enters the lake.

Eroding soils carry considerable amounts of nutrients into the lake. Soils generally contain much greater amounts of nitrogen and phosphorus compounds than lake water. If soils are stabilized by good vegetation cover, only small amounts of nutrients are washed into the lake. If large areas of timber are logged or if roads and developments are improperly designed, large scale erosion of soils frequently results. Soil erosion may be controlled in several ways by: 1) maintaining or planting effective ground cover vegetation (e.g., Crown Vetch) in erosion prone areas, 2) restricting the amount of acreage that may be logged at any one time and the time of year when logging operations occur, 3) providing guidelines on road construction within the basin and methods that contractors use to develop property, and 4) maintenance of a vegetated area along the shoreline. Considerable amounts of soils are deposited in the lake by streams. Some of the soils may be removed by minimum adjustments to the stream bed to reduce the water velocity in the stream prior to entry into the lake. Reduced water velocity in the stream will cause the bulk of the suspended soils to be deposited in the low velocity area and with occasional cleanout this area can be maintained fairly easily. Your local Soil Conservation Service representative or County Extension Agent can provide valuable assistance in determining the extent of erosion problems and suggesting methods for soil conservation.

The runoff of fertilizers applied to lawns and gardens can frequently add nitrogen and phosphorus to a lake. There are a number of "common sense" methods for reducing the inputs from these sources. Don't fertilize early in the spring or at other times when soils are saturated from recent rainstorms. Try to apply small amounts of fertilizer more frequently (i.e. twice per year add one-half the amount usually applied once per year). Don't locate vegetable gardens or other gardens that you plan to fertilize heavily close to the lake. Don't fertilize immediately before a rainstorm is forecast.

Continued monitoring of Summit Lake water quality by your association is desirable. A chemical assay program is probably not necessary on an annual basis. Lake Association members in conjunction with their water quality committee can make certain measurements that will prove useful in observing any long-term trends in water quality. The Fresh Water Institute currently assists the Lake George Association in operating a Lay Monitoring

Program on Lake George. A similar program was organized on Summit Lake during the summer of 1987. Association members have acquired Secchi disks and thermometers to record the transparency and temperature of the lake once per week during the summer months. At the end of the year, the data is gathered and compared to results from previous years to provide a measure of any significant changes in water transparency. On a three or five year basis, more complete chemical assays and observations of the lake may be advisable. These lake observations and chemical assays may be conducted by such groups as RPI Fresh Water Institute, RPI Department of Environmental Engineering, or a host of consulting companies. If the association feels that they want to collect samples and make their own assessments, laboratories such as Bender Labs in Albany, C.T. Male in Latham, or the Fresh Water Institute are certainly capable of sample analysis on a fee per sample basis.

An informed community is also an important asset. The first step, forming a lake association, has already been done. Joining the statewide federation of lake associations, or the North American Lake Management Society, both of which put out a number of interesting publications, may also be worthwhile. The FWI currently provides a lecture series at our Bolton Landing facility, one evening each week during the summer months, covering environmental and other topics of general interest. Your association could sponsor a similar program at little cost. A list of 1987 summer lecturers is enclosed to give you an idea

Table 2. Results of Chemical Analysis of Summit Lake Samples.

Analyte	Sampling Site 1	Sampling Site 2	Sampling Site 3
pH	8.20	8.32	8.38
Specific Conductance (umhos)	212.0	214.0	216.0
Secchi Depth (meters)	3.0	3.0	3.0
Alkalinity (mg/l as $CaCO_3$)	180.0	176.0	170.0
Chloride (mg/l)	5.7	6.5	5.3
Nitrate (mg N/l)	<0.01	<0.01	<0.01
Ammonia (mg N/l)	<0.01	<0.01	<0.01
Total Phosphorus (ug P/l)	9	9	11
Soluble Silica (mg Si/l)	0.54	0.56	0.52
Calcium (mg/l)	28.4	22.0	28.4
Sodium (mg/l)	3.9	3.6	3.7
Chlorophyll a (ug/l)		3.3	

Table 3. Surface Water Chemistry for Selected Lakes.

Lake	Secchi Depth (meters)	Total Phosphorus (ppb as P)	Chloride (ppm)	Trophic Status
Lake George Warren Co., NY	8	5	6.5	oligotrophic
Summit Lake Washington Co., NY	3.0	10	5.8	mesotrophic
Glass Lake Rensselaer Co., NY	3.3	13	8.2	mesotrophic
Saratoga Lake Saratoga Co., NY	2.2	100		eutrophic

D	Secondary contact recreation. Waters are not suitable for propagation of fish	Waters must be suitable for fish survival	------	------	-----	3 mg/l	------	------	------	6.0-9.5	------	------
N	Employment of water in its natural condition for whatever compatible purposes	No waste discharges without approved filtration through 200' of unconsolidated earth	Natural	Natural	Natural	Natural	Natural	Natural	Natural	Natural	Natural	------

Notes: Additional Standards applicable to the above classifications: Turbidity - no increase that will cause a substantial visible contrast to natural conditions; Color - None from man-made sources that will be detrimental to the specified best usage of waters; Suspended, colloidal or other solids - None from any waste discharge which will cause deposition to the best usage of water; Oil and floating substances - No residue attributable to a waste discharge nor visible oil films nor globules of grease; Taste and Odor producing substances, toxic wastes and deleterious substances - None that will be injurious to fish life or to make the waters unsafe or unsuitable for any classified use.

With reference to certain toxic substances affecting fish life, the establishment of any single numerical standard for waters of New York State would be too restrictive. There are many waters, which because of poor buffering capacity and composition will require special study to determine safe concentrations of toxic substances. However, most of the non-trout waters near industrial areas in this state will have an alkalinity of 80 mg/l or above. Without considering increased or decreased toxicity from possible combinations, the following may be considered as safe stream concentrations for certain substances to comply with the above standard for this type of water. Water of lower alkalinity must be considered since the toxic effect of most pollutants will be greatly increased. Ammonia or Ammonium Compounds - Not greater than 2.0 mg/l expressed as NH_3 at pH 8 or above: Cyanide - Not greater than 0.1 mg/l expressed as CN: Ferro or Ferricyanide - Not greater than 0.4 mg/l expressed as $Fe(CN)_6$: Copper - Not greater than 0.2 mg/l expressed as Cu: Zinc - Not greater than 0.3 mg/l expressed as Zn: Cadmium - Not greater than 0.3 mg/l expressed as Cd.

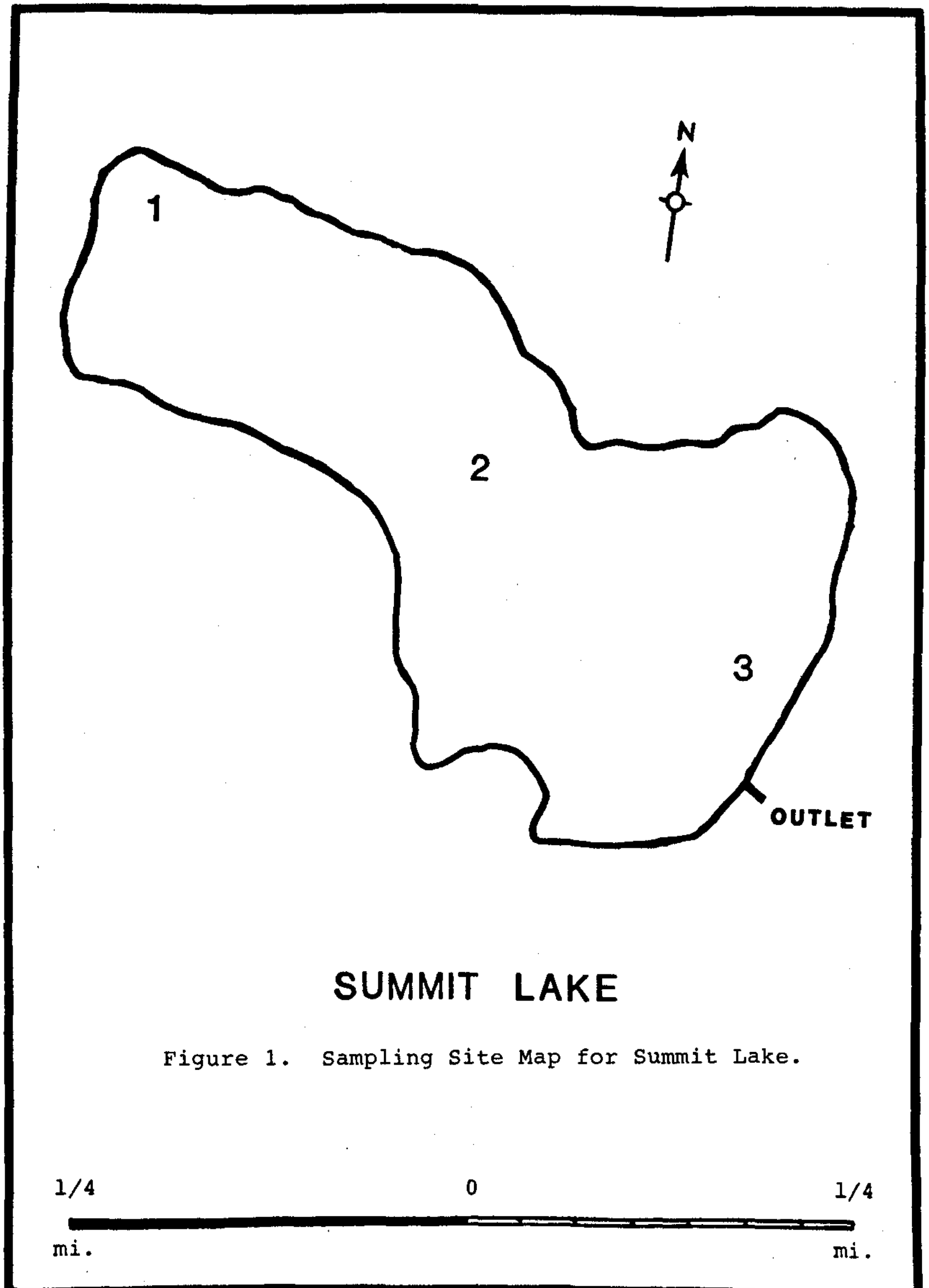

Figure 1. Sampling Site Map for Summit Lake.

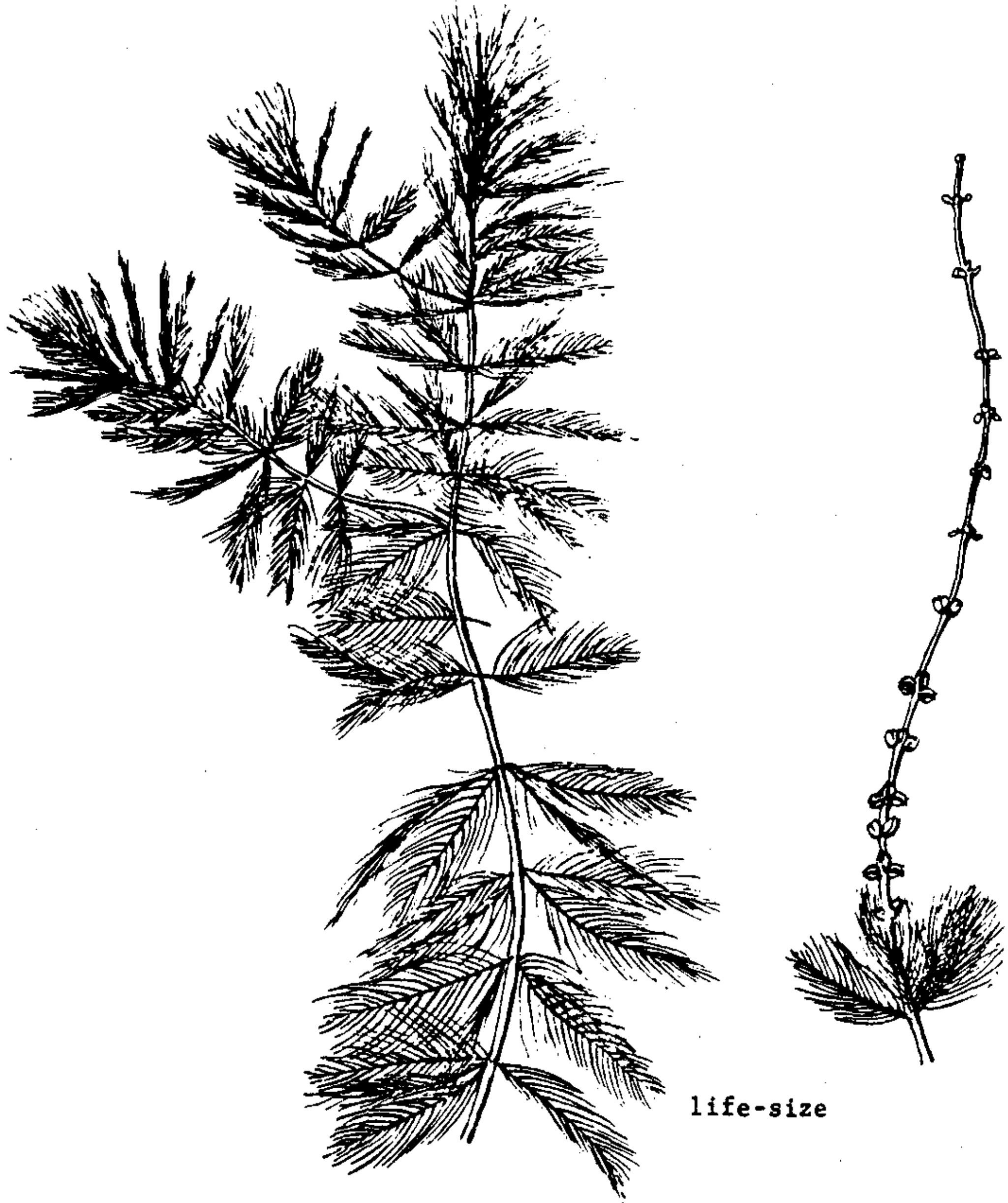

Figure 2. EURASIAN WATERMILFOIL, *Myriophyllum spicatum*

Fresh inland water and fresh to brackish coastal water; California; and Wisconsin to Vermont, Texas, and Florida.

This plant has been in the United States for at least seventy years. Since 1955 it has become very abundant in Upper Chesapeake Bay, the tidal Potomac River, and several Tennessee Valley reservoirs.

Leaves look like weatherbeaten feathers because of their 12-16 pairs of close-together leaflets.

Resembles Northern (page 32) and Whorled (page 34) Watermilfoils, with which it sometimes grows; but can be told from them by its more featherlike leaves.

APPENDICES

Appendix A. Analytical Methods and Equipment.

Analysis	Method	Instrument
pH	Expanded Scale pH/millivolt meter	Orion, Model 811
Alkalinity	Gran Plot Titration	Orion, Model 811
Specific Conductance	Wheatstone Bridge type meter	YSI, Model 31
Chloride	Ion Chromatography	Dionex, QIC
Nitrate	Automated Cadmium Reduction	Dionex, QIC
Ammonia	Automated Phenate	Technicon Autoanalyser II
Total Phosphorus	Single Reagent Ascorbic Acid	Bausch and Lomb Spectronics 70
Soluble Silica	Automated Molybdate	Technicon Autoanalyser II
Calcium	Atomic Absorption Spectroscopy	Perkin Elmer Model 403
Sodium	Atomic Absorption Spectroscopy	Perkin Elmer Model 403
Total Coliform	Membrane Filtration LES Endo Agar	
Fecal Coliform	Membrane Filtration mFC Agar	
Fecal Strep.	Membrane Filtration KF Streptococcus Agar	
Chlorophyll	Spectrophotometric Methanol Extraction	Bausch and Lomb Spectronics 710

Appendix B. Sanitary Survey Form.

FORM NO.__________

SANITARY SURVEY

1. SITE DESCRIPTION

A. NAME OF OCCUPANT____

B. MAILING ADDRESS____
Street Address, Box Number

____
City, Town, Zip Code

____
Telephone

C. NAME OF OWNER____

D. PROPERTY LOCATION_______________________________________

E. TAX MAP NUMBER____

2. TYPE OF BUILDING

A. PRIVATE RESIDENCE
B. APARTMENT BUILDING
C. HOTEL OR MOTEL NUMBER OF UNITS___________
D. RESTAURANT
E. OTHER DESCRIPTION_______________

____

F. YEAR BUILDING CONSTRUCTED_______________________________

G. LENGTH OF OCCUPANCY:
SEASONAL FROM________TO_______
YEAR ROUND
VACANT

H. AVERAGE NUMBER OF OCCUPANTS OR PATRONS_________
I. COLOR AND CONSTRUCTION TYPE___________________________
____

J. APPROXIMATE SIZE (FT^2) OF LAWN AND GARDEN________________
K. USE LAWN OR GARDEN FERTILIZER
YES_____ ANNUAL AMT (IF KNOWN)_____LBS.

3. WATER_SUPPLY

A. TYPE PUBLIC MAINS
PRIVATE WELL APPROXIMATE DEPTH (FEET)_____

B. CHLORINATED YES
NO

C. WATER USAGE

SHOWERS ______
BATH TUBS ______
DISHWASHERS ______
GARBAGE DISPOSAL ______
SINKS ______
TOILETS ______
WASHING MACHINE ______

4. WASTEWATER_DISPOSAL_FACILITIES

A. TYPE OF SYSTEM

CESSPOOL__ SEPTIC TANK-SEEPAGE PIT__
SEPTIC TANK-TILE FIELD__ HOLDING TANK__
OTHER DESCRIPTION________________________________
____

B. TANK CONSTRUCTION

SIZE (gallons)______________________
AGE (years) ________________________
TYPE OF CONSTRUCTION:
CONCRETE___
METAL___
OTHER___ DESCRIPTION________________________
____

HOW MANY YEARS SINCE PUMPED?___________________

APPROXIMATE DISTANCE FROM LAKE (feet)___________

C. TILE FIELD

APPROXIMATE LENGTH (feet)____________
AGE (years)
APPROXIMATE DISTANCE FROM LAKE (feet)_________________

D. SEEPAGE PITS

NUMBER OF PITS________ AGE(years)___________
SIZE________ APPROXIMATE DISTANCE FROM LAKE (feet)___________

E. SKETCH OF BUILDING AND SYSTEM

5. PROBLEMS

A. WHAT PROBLEMS HAS YOUR SYSTEM CAUSED?

ODORS____
SLOW DRAINING OF PLUMBING____
SURFACING OF SEWAGE________
BACKUP OF SEWAGE INTO HOUSE____
NONE _____
OTHER___ DESCRIPTION______________________________________
____

B. HOW OFTEN DO PROBLEMS OCCUR?____________________________
____

C. IF YOU LIVE ALONG THE LAKESHORE, DO YOU NOTICE ANY OF THE FOLLOWING, ADJACENT TO YOUR PROPERTY?

ALGAE OR SCUM ON ROCKS ________
AQUATIC VEGETATION ("WEEDS") ________

6. OTHER INFORMATION

A. WHAT TYPE OF SOIL DO YOU HAVE:

SANDY LOAM	SILTY LOAM
CLAY	DON'T KNOW

B. SOIL COLOR

BLACK-DARK BROWN
LIGHT BROWN
GRAY
REDDISH-BROWN

C. HOW WELL DRAINED IS YOUR SOIL?

WELL DRAINED_________
DRAINS SLOWLY________
DON'T KNOW___________

D. ARE THERE ROCK OUTCROPS ON YOUR PROPERTY?

YES _____
NO _____

E. WOULD YOU BE WILLING TO ALLOW AN ONSITE TEST OF YOUR WASTEWATER DISPOSAL SYSTEM: YES____ NO____

7. SIGNATURE OF PERSON (S) WHO FILLED OUT FORM

_______________________________________ DATE______________

8. COMMENTS OR REMARKS

____

____

____

____

____

Appendix C.

FRESH WATER INSTITUTE

1987

Summer Lecture Series

Concerning the Lake George Region and The World Around Us

Rensselaer's Fresh Water Institute, located on route 9N in Bolton Landing, is pleased to host a weekly series of presentations to the general public by distinguished professionals.

Monday July 6	J. P. Sweet: Publisher of Lake George's First Tourist Guide *Betty Buckell*, Regional Author, Lake George
Monday July 13	Light and Color in the Open Air *Charles Bean*, Institute Professor, Rensselaer Polytechnic Institute, Troy
Monday July 20	The Stories of Lake George — Facts and Fancy *Thomas Lord*, Regional Historian, Silver Bay Association
Monday July 27	Winter in New York: Weather Patterns over Land and Water *Ray Falconer*, Senior Research Associate, Atmospheric Sciences Research Center, SUNY, Albany
Monday August 3	Rambling the Byways: Birds, Wildflowers and Fungi *Pat Santora*, Journalist & Naturalist, Chestertown
Monday August 10	The Garden of Eden *Steven Clemants*, Botanist, New York Natural Heritage Program, Delmar
Monday August 17	Champ: Beyond the Legend *Joe Zarzynski*, Founder and Director, The Lake Champlain Phenomena Investigation, Wilton
Monday August 24	ET: Are You There? Discussion of Life in the Universe *Alan Meltzer*, Professor of Physics, Rensselaer Polytechnic Institute, Troy
Monday August 31	Lake George: Immediate Concerns — Long Range Prognosis *Charles Boylen*, Director, The Rensselaer Fresh Water Institute, Bolton Landing

Programs begin at 7:30 PM. The public is cordially invited free of charge. Programs are nature-oriented slide talks lasting approximately 1 hour.

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Appendix D.

MILFOIL IDENTIFICATION PROGRAM

Rensselaer Fresh Water Institute has an ongoing program of identifying new sites with Eurasian Watermilfoil both in Lake George, and in nearby lakes. If you have a plant that you think may be Eurasian Watermilfoil, we will gladly identify it for you free of charge.

To have plants identified, bring at least three intact plants to the RFWI laboratory facility in Bolton Landing on Lakeshore Drive (Route 9N). The plants should be in a plastic bag or container with water. In addition, we would like the following information: name of collector, lake name, site of collection, depth at which the plant was growing, date of collection, the name and phone number of a person to contact with the results. Three specimens will be mounted, with one available to the person or group submitting the specimen.

Plants for identification should be directed to John Madsen. For more information, contact the RFWI site at ph. 644-3541 or in Troy at 276-6757.