1982

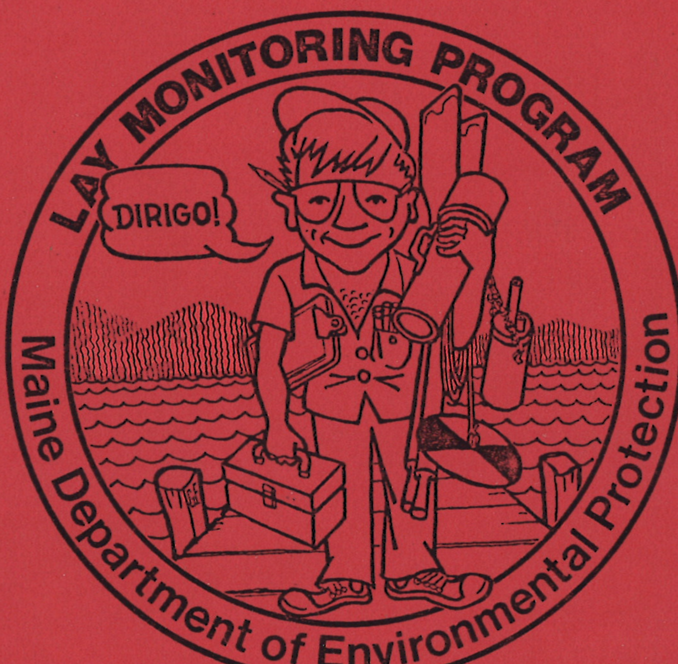
The Voluntary Water Quality Monitoring Program : 1982 Project Report

Barbara Welch

Judy Potvin

Mary Ellen Dennis

The Voluntary Water Quality Monitoring Program



1982

Project Report

Barbara Welch
Judy Potvin
Mary Ellen Dennis
Division of Environmental Evaluation
and Lake Studies

CONTENTS

ACKNOWLEDGEMENT

We wish to thank the Department of Inland Fisheries and Wildlife for supplying the lake maps which appear in this report. All the fisheries information is also courtesy of the Department of Inland Fisheries and Wildlife.

Understanding Maine's Lakes and Ponds

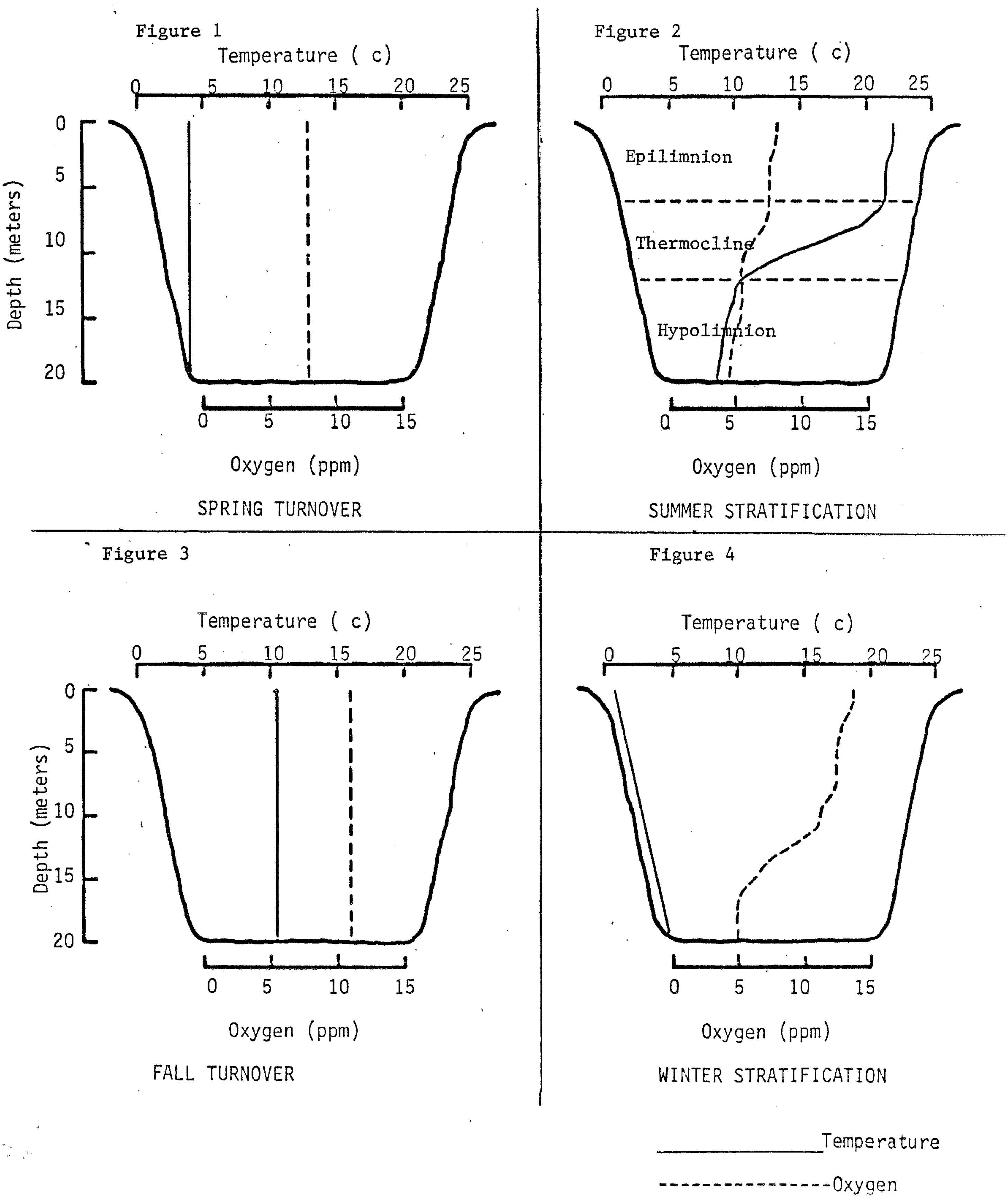
A lake is more than just a standing body of water. It is the habitat for a variety of plant and animal life. It is a highly complex system with interrelating physical, chemical, geological, and biological factors.

Temperature

All Maine lakes undergo annual cycles. Temperature, a physical element, undergoes an annual cycle that greatly influences chemical and biological cycles. Immediately after ice-out in the spring, the surface water is about $0^{o}C$ (32^{o} F), and the bottom water is about $4^{o}C$. Water is most dense and, therefore, heaviest at $4^{o}C$ (39^{o} F). As the air temperature rises, the surface water warms and then sinks until the water temperature of the entire lake is essentially a uniform $4^{o}C$. Winds set up currents which help mix the lake water. This process of complete mixing is known as spring turnover (Figure 1). As the air temperature continues to rise, water temperatures rise. As long as the weather remains windy, the lake will continue to mix. In shallow lakes mixing can occur throughout the summer. Extremely deep lakes, or deep, well protected lakes may never completely mix; these lakes are called meromictic.

As soon as a calm period occurs, the lake will stratify thermally, the lake water separating into layers due to the differences in temperature. The warmer, lighter surface water becomes segregated from the colder, heavier bottom water. Initially this separation is weak and can be easily broken down by wind. As the summer progresses and the temperature difference between top and bottom increases, the stratification becomes more stable (Figure 2). The

TEMPERATURE CYCLES



water layers are now isolated from each other. The surface layer is known as the epilimnion. Next is a transition layer called the thermocline where the temperature drops at least one degree Celsius per meter. The bottom has the coldest (4°C-10°C), most dense layer called the hypolimnion. The water in the epilimnion is well mixed, of nearly uniform temperature and can generally be considered homogeneous. Significant differences may exist in the water chemistry between the three layers, and are most pronounced by mid to late summer.

As the air temperature drops in the fall, the surface water temperature falls. Gradually the thermal gradient is broken down and the lake water again becomes homothermous and mixes (Figure 3). This is fall turnover. As water temperature continues to drop, the lake mixes until it reaches a uniform 4°C. Once the lake surface has reached 0°C, a cold, calm night can leave a sheet of ice on the surface.

Ice cover protects the lake from the effects of wind. The water just below the ice will be 0°C, with increasing temperatures toward the bottom where the temperature is about 4°C (Figure 4). This gradient is called inverse stratification because the warmer water is at the bottom of the lake.

Dissolved Oxygen

The amount of dissolved oxygen in the lake is dependent upon the temperature cycles. Cold water can hold more oxygen than warm water. At 4°C (39° F) water-saturated air would have 13 milligrams per liter (mg/l) of dissolved oxygen; at 21°C (68° F), the dissolved oxygen content would be 9 mg/l. Water becomes oxygenated when it comes in contact with the atmosphere and by the photosynthetic process of plants.

When the water mixes at spring turnover, it becomes saturated with oxygen. As the lake stratifies, the thermocline and hypolimnion become isolated from the atmosphere, and the oxygen supply cannot be replenished. Bacterial decomposition of organic material depletes this oxygen. Sources of the organics could be dead algae, zooplankton, and leaf litter. The degree of oxygen depletion in the hypolimnion depends on temperature, the amount of organic matter, and volume of the hypolimnion. Severe oxygen depletion may reduce habitat and eliminate certain fish species from the lake. Trout and salmon, species that need cold water and at least 5 parts per million of dissolved oxygen to survive, will not be able to survive if the lake looses its hypolimnetic oxygen.

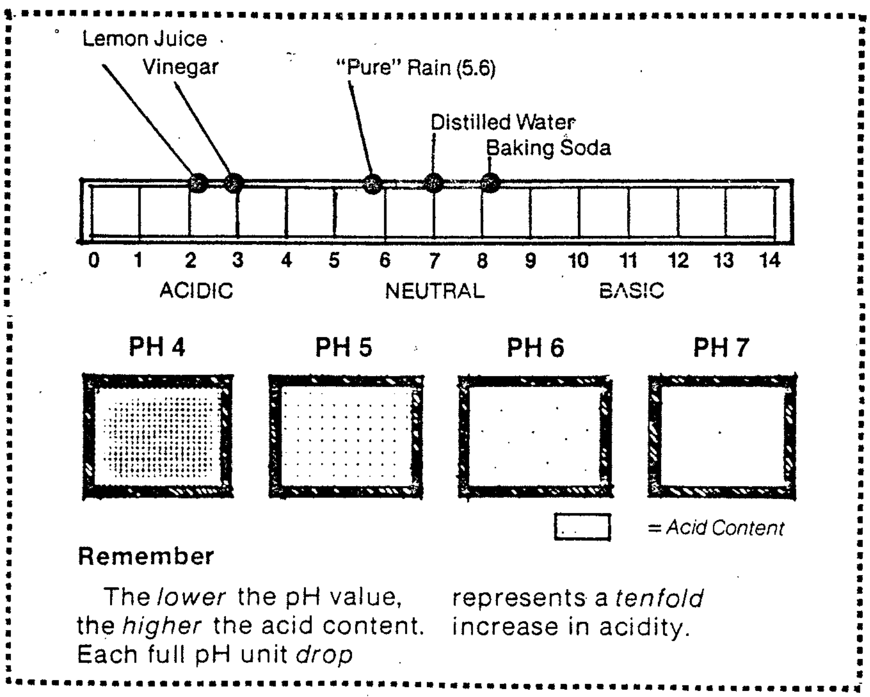
At fall turnover, the lake mixes and oxygen becomes replenished at all depths. As the lake cools, the dissolved oxygen concentration increases as cold water can absorb more oxygen than warm water. With the onset of ice, mixing stops and decomposition starts to deplete oxygen at the bottom. Due to colder temperatures decomposition is much slower, and the amount of available oxygen is greater, so oxygen depletion is usually less severe in winter than in summer.

The degree of oxygen depletion in the hypolimnion at late summer can be a clue to the health of the lake. If a lake shows a tendency over a period of time to use up increasing amounts of oxygen, probably the lake's organic load is increasing. Oxygen content is quite sensitive and can be the first sign of trouble. If the phosphorus loading to the lake has increased, steps should be taken quickly to reduce the load.

Other Measures of Lake Water Quality

The pH of a lake is important in determining the plant and animal species living there. pH is a measurement which reflects the instantaneous free hydrogen ion concentration in a water sample. Free hydrogen and hydroxide ions exist in equilibrium in all aqueous solutions. If these ions are present in equal amounts, the sample is described as neutral and has a pH value of 7. If the hydrogen ion concentration is less than the hydroxide ion concentration, the solution is said to be basic and has a pH value greater than 7. If the hydrogen ion concentration is greater than the hydroxide ion concentration, the solution is acidic and has a pH value less than 7. (1)

FIGURE 5 THE PH SCALE



From: Acid Rain, EPA
Office of Research & Development
July, 1980

(1) Peter DeFilipp and William Seretta, A Citizens Guide to Conducting Water Quality Monitoring and Stream Classification, Freeport, Maine, 1979.

pH and acidity are often thought to be the same. They are not. Two solutions can have the same pH but entirely different acidities. For example, a rainstorm is sometimes described as having the same acidity as that of vinegar. Although the pH's may be the same, vinegar is much more acidic (a more powerful acid) than the rain.

Acidity is a measure of a solution's ability to resist change, or its buffering capacity. Acid rain is weakly buffered so the pH is easily changed; vinegar is more strongly buffered so the pH is much harder to change.

Many species can tolerate only a narrow range of pH and a large pH change can adversely affect them. Most Maine lakes have a pH between 5.5 and 7.5, but high photosynthetic activity can increase the pH to 9 or even 10 on a daily basis.

Alkalinity is a measure of the ability of water to act as a buffer to prevent widespread pH changes. The three major ions contributing to alkalinity are hydroxide ($OH-$), bicarbonate (HCO_3-), and carbonate ($CO_3=$). The availability of these buffers depends on the bedrock of the area. In areas of limestone the alkalinity will be high because the limestone which is high in carbonate will dissolve in water. In areas of granite (most areas of Maine) the alkalinity will be lower because granite is low in carbonate ion. In Maine lakes alkalinity generally ranges from 4-20 parts per million (ppm).

Conductivity is a measure of the ability of water to carry an electrical current and is directly related to the dissolved ions (charged particles) present in water. Conductivity does not identify which ions are present; other chemical tests are needed to determine this. Natural sources of these ions are precipitation and erosion. The values for Maine lakes are generally low, 20-40 micro mhos per centimeter (umhos/cm).

Color is another water quality parameter frequently measured. There are two types of color, apparent and real. Apparent color is due to suspended material such as algae which makes the lake look green. Real color is due to dissolved material. Most of the real color in Maine lakes is from dissolved organic matter. Moderate to high water color is common in lakes surrounded by boggy areas. Water coming into lakes through bogs becomes tea colored due to humic and tannic acids from decaying vegetation. Clear lakes can be defined as ranging in value from 0-30 standard platinum units (SPU); 31 SPU and over are colored lakes, even though color is a continuous gradient, not a one step change. Color does not adversely affect water quality. A tea-colored lake can be just as high quality as a clear water lake. (Maximum and minimum values found in Maine for each parameter are given in Appendix A).

Nutrients

Phosphorus is one of the major nutrients needed for plant growth. It does not readily leach or filter through the soil and in most Maine lakes it is present in small amounts. This scarity of phosphorus usually limits plant growth in lakes, but when phosphorus is added in large enough quantities by man's activities, the result is excessive plant growth usually in the form of algal blooms. It is possible to get an increase in shoreline rooted aquatic plants by adding phosphorus but other factors such as site suitability, light penetration, and concentrations of other nutrients influence the response more than phosphorus. It is important to minimize any nutrient additions, especially phosphorus, in order to maintain water quality.

There are many sources of phosphorus to a lake. Sources can be divided into two groups, point and non-point. Point sources are direct discharges that can be specifically identified. In the past these sources such as industries, laundromats, and treated or untreated sewage outfalls have been the major polluters of water bodies. Environmental laws in Maine have nearly eliminated these sources of pollution.

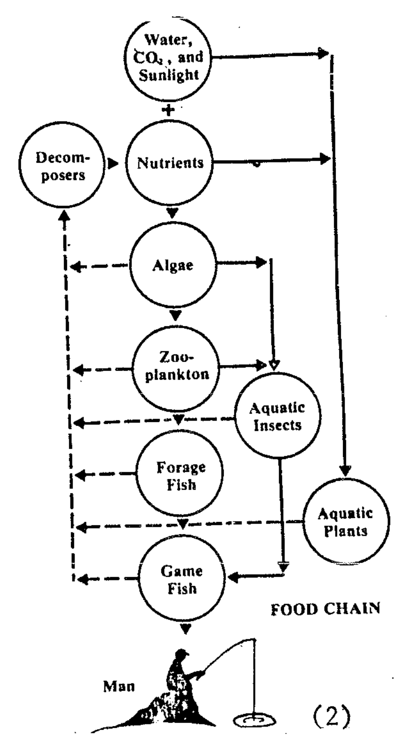
With the reduction of point source pollution, non-point sources have become more significant. These sources are much harder to pinpoint. Examples are agricultural and urban runoff, malfunctioning septic systems, poor land management and forest activities. Even lake sediments can be a source if conditions are right for recycling the phosphorus.

Whether one is looking at point or non-point sources, one must consider the whole watershed. A lake's watershed is defined as the area where if a drop of water were to fall anywhere in that area, it could find its way to the lake picking up nutrients along the way.

The level of nutrients in the lake determines the level of plant growth. Plants are the basis for all life in the water. Algae are microscopic plants that live in the water column or on rocks, plants and shallow bottoms of the lake. Algae are the food for minute animals (zooplankton) which in turn are eaten by minnows, which provide food for the game fish. This process is called a food chain. If there were no plants there would be no game fish. It has been well demonstrated that fish production varies directly with the amount of algae. A knowledge of the fishery is helpful in knowing the productivity of the lake.

FIGURE 6

FOOD CHAIN



(2)

(1) Sherman Hasbrouck, "Maine's Prime Recreational Lakes", Land and Water Resources Center, University of Maine at Orono.

Algae and Chlorophyll *a*

Algae use the sun's energy to produce food to maintain cell activities. This process is called photosynthesis. Chlorophyll *a*, a green pigment in algae, is the major chemical involved in photosynthesis. Water samples can be analyzed to determine the amount of Chlorophyll *a* contained in that sample. This value will give an idea of the abundance of algae and an indication of productivity in the lake. Chlorophyll *a* is used because all photosynthetic plants contain it. When Chlorophyll *a* values are compared with Secchi disk transparency and total phosphorus concentrations, a better view of the lake's overall condition may be obtained.

Most Maine lakes probably have their maximum period of algal production in the spring or fall. Nutrients brought by spring runoff stimulate growth along with warmer water temperatures and increasing light. By summer much of the spring nutrient load has been removed from the epilimnion by sinking algae, and little recycling from the hypolimnion occurs while the lake is stratified. In the fall nutrients from runoff and recycling are available favoring increased production.

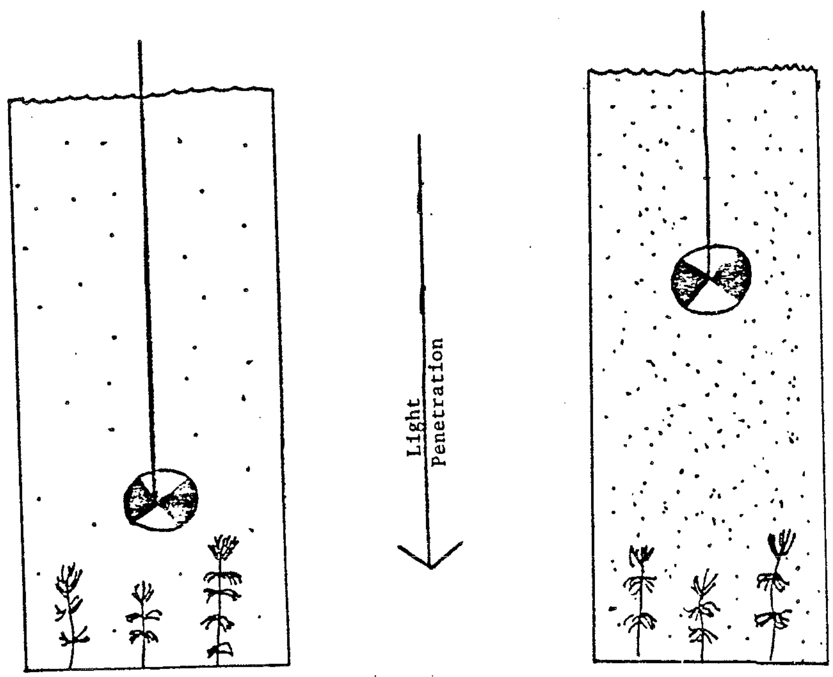
It is the more productive lakes that often have their maximum algal production during the summer. These are the lakes that receive an excessive amount of nutrient loading throughout the year from point sources, non-point sources and/or from sediment contribution.

Transparency

Secchi disk transparency is a measure of the clarity of the water, and a quick, simple, and accurate method for estimating lake water quality. Factors which reduce the clarity are algae, zooplankton, water color, and silt. Since algae is usually the most abundant item, by measuring transparency one is indirectly measuring the algal population (see figure 7).

FIGURE 7

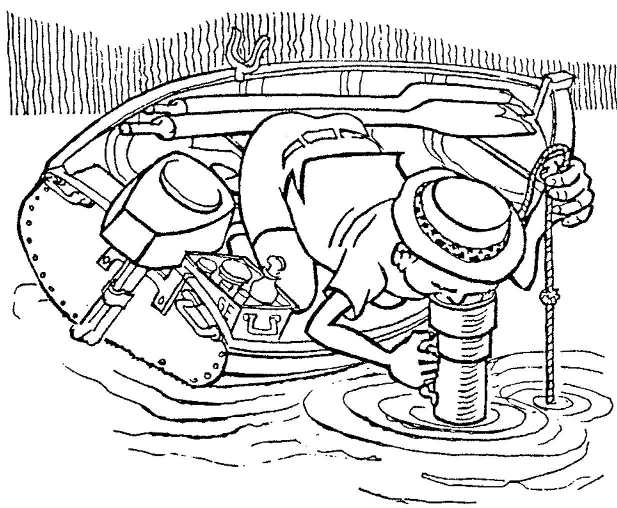
HOW SECCHI DISK MEASURES WATER QUALITY



Clear lake having small algal population results in deep Secchi disk reading, high clarity

Turbid lake having large algal population results in shallow Secchi disk reading, low clarity

Transparency is measured using a Secchi disk which is a 20 cm (8 inch) circle painted black and white to provide maximum visual contrast. The disk is lowered into the water, and the depth at which the disk is no longer visible is noted. The disk is raised until just visible. The average of the two depths is recorded as the Secchi disk transparency.



.... HECK OF A WAY TO SPEND A WEEKEND.

Morphometry

The term morphometry refers to the various measures such as surface area, depth and volume which describe the size and shape of a lake's basin. A lake's morphometry determines to a large extent how it will respond to physical and chemical influences. For example, a shallow lake will not maintain temperature and oxygen stratification in the summer as a deeper lake would. Depth is also a deciding factor on whether enough sunlight can reach the lake bottom to allow plants to grow there. Lake volume determines, in part, how much nutrient inputs will be diluted. The ratio of the volume of drainage area runoff to lake volume determines the flushing rate of a lake which is how often the lake water is renewed. A lake with a high flushing rate will purge itself of excessive nutrients faster than one with a slow rate. Flushing rate and volume influence the rate at which a lake reacts to the addition or removal of a nutrient source.

Sampling

Some parameters, such as conductivity and color are conservative, that is do not change greatly and, therefore, do not need to be tested frequently. Other parameters such as Chlorophyll a and transparency change daily and should be tested frequently. Transparency, in general, is the most important test for which to have frequent values. Ideally, Secchi disk readings should be taken every week to two weeks, evenly spaced throughout the open water season. The reason for this schedule is that some lakes have the most algae in the spring and/or fall while others have the maximum amount of algae in the summer. Total Phosphorus and Chlorophyll a are also important factors in determining water quality; however, the expense in analysis and logistical problems with the collection of these samples limits their sampling frequency.

The remainder of the parameters are usually sampled once a year in late summer. It is generally true that if a lake is going to be in a stressed condition it will reach the peak in late summer, the height of stratification. This is the time at which dissolved oxygen would be lowest. Alkalinity, pH, and conductivity would be highest at this time, reflecting photosynthetic activity.

Protection

People affect water quality in many different and usually adverse ways. Various state and federal statutes have evolved to protect and improve water quality. Amoung these are a State law which prohibits all new wastewater discharges to Great Ponds, The State Plumbing Code which regulates disposal of septic wastes, The Great Ponds Act and the Stream Alteration Act which are aimed at controlling shoreline dredging and filling which destroy fish and wildlife habitat, and The Shoreline Zoning statutes which protect lakes from improper development of shoreline. These and other laws, however, do not prevent other more subtle degradation of water quality resulting from man's activities, some of which are located away from the shoreline.

Considering the effect nutrient enrichment has on a lake, shoreline owners should do everything possible to minimize their impact on the lake.

Following is a list of suggestions:

1. Septic Tanks. In addition to being properly designed and constructed in accordance with criteria specified by the Maine Department of Human Services, regular maintenance must be performed if the system is to function satisfactorily. Settled solids accumulate in the septic tank and must be periodically removed. If not, they are washed into the soil and result in clogging of the absorption field and subsequent failure. (1) A septic system is a living system and treatment of the wastes depends on micro-organisms that live in the system. These micro organisms can be killed or hampered by certain products.

   Signs of Septic System Problems are: Toilets backing up; drains that won't drain. Foul odors around the septic tank and leach field. Excessive moisture or surfacing wastewater over the leach field.

   a). Septic tanks and leachfield should be functioning properly. Systems used year round should be pumped every 2-3 years; seasonal use requires pumping every 5-6 years.

(1) See footnotes at the end of this section, pg. 21.

b). See to it that all parts of your filter bed are at least 100 feet from the high water mark on the lake. Place it as far away as possible to reduce lake contamination.(2)

c). Consider the terrain; avoid planning a waste disposal system that threatens the present or future drinking water supply of your own home or of your neighbor. If in doubt, hire a trained engineer or expert to recommend safe solutions.(2)

d). Avoid excessive use of strong cleaning agents, such as drain cleaners and bleach.(1)

e). Cigarette butts, hair, facial tissues, paper towels, band-aids, etc., belong in the garbage, not the toilet. (1)

f). Grease does not break down in a septic tank. Put cooking grease in a can, then into the garbage. (1)

g). Do not use a garbage disposal unless the septic system was designed to accomodate it; ground up garbage burdens your septic tank. (1)

h). Be wary of commercial items that claim to clean septic tanks. They may not harm, but it hasn't been proven that they are effective. (1)

i). If problems arise, investigate the cause before using chemical products.(1)

j). Do not put paint or chemicals down the drain into your septic tank. Do not put water softener waste brine in your septic tank; the salt clogs the leachfield reducing its life.

k). Make a map of the location of your septic tank. Knowing its location is helpful when checking sludge levels or when trying to determine the cause of any problems.

(1) (2) See footnotees at end of section, pg. 21.

l). Check the sludge level in your tank every two years. Get it pumped if the sludge and scum level exceeds half of the tank volume. (1)

m). Your lake association may coordinate a group septic tank pumping program on regular time intervals.(1)

n). Washing machines and sink drains should not run into a drywell, but should be run into a septic tank because the drywell will discharge phosphorus into the lake once the soils surrounding it becomes saturated.

o). A septic system survey organized by the lake or camp association is a good idea to spot malfunctioning systems. Faulty systems can be reported to the local plumbing inspector for investigation and correction with complete assurance of confidentiality of the source.

p). The Maine Plumbing Code, effective July 1, 1974, requires that you dig a trench and have a satisfactory soil analysis permit for a septic system. The Department of Environmental Protection has a helpful booklet about the various kinds of private sewage disposal systems called Cleaning up the Water, which you should study before planning a house on the lake. Available from the Division of Human Services, State House, Augusta, Maine 04333. (2).

2. Conserve Water. (1)

The less Water You Use the Better Your Septic System Works:

a). Avoid flushing for trivial reasons.

b). Plug the bathroom sink when washing or shaving.

c). Don't use a garbage disposal unless the septic system was designed to accomodate it; they use incredible amounts of water and the ground up garbage burdens your septic tank.

d). Don't let water run while brushing your teeth.

(1)(2) See footnotes at end of section, pg. 21

e). Use your dishwasher or clothes washer only when you have a full load.

f). Repair dripping faucets and toilet leaks.

g). Take showers rather than baths, but limit your shower time. Turn off water when soaping up.

h). Add a plastic jug filled with water or a brick or two to your toilet tank to save one-half to one gallon of water per flush. An average flush uses 5-7 gallons of water.

i). Buy water conservation devices like flow control shower heads, low flush toilets and low flush attachments for regular toilets.

3. Leachfield Do's and Don'ts (1)

a). Map the location of your drainfield.

b). All rain gutters should direct rain water away from the leachfield.

c). Never build or cement over a leachfield.

d). Keep vehicles away from the leachfield and septic tank.

4. Phosphate Containing Products

a). Non phosphate detergents should be used. (See appendix B)

b). Avoid washing cars near lake or stream edges, as the runoff will easily find its way to the lake.

c). If you have a lawn, use fertilizer sparingly. A hay mulch will start a new lawn almost as well as fertilizer, while at the same time conserving moisture. A soil test can determine how much and what type of fertilizer is best if it is required at all.

5. Site disturbance (2)

a). Minimize disturbance of the site (i.e. soil exposure and paving). All areas that are exposed during construction should be revegetated to prevent erosion. Save natural topography and groundcover if possible or plant an abundance of deep rooted, woody vegetation for

(1) (2) See footnotes at end of section pg. 21.

erosion control, nutrient uptake and aesthetics. Allow vegetative buffer strips to remain around lakes and streams; wider strips are needed on steeper slopes.

b). Consider not having a road or wide pathway to the water. It is usually not necessary. If you do have one, consider curving it or angling it, so that you don't expose the house from the water. Roads can create siltation and bank erosion problems, and they are unsightly as seen from the lake. Maine law allows a gap in the lakeshore treeline of no more than thirty feet. Try to make it less.

c). If your property has rocks along the lake front, don't disturb them. Nature's own arrangement has an appeal that can't be duplicated. Maine law requires a permit that must be secured from the Department of Environmental Protection (DEP) before the shoreline can be altered in any respect.

d). The dumping of sand, the moving of rocks, and the bulldozing of banks or lake bottom in order to make a swimming beach, boat landing, or for any other purpose is forbidden by state law (The Great Ponds Act), unless a permit is first obtained from the DEP. Penalties for violation can be severe. The reason is that alterations of the shoreline destroy the fish and wildlife habitat of the lake as well as its natural beauty, which is what we all come for in the first place.

e). Try to make any waterfront equipment, such a docks, floats, and storage arrangements as unobstructive as possible. Keep waterfront alterations to a bare minimum. A removable float or dock does not need permits from DEP if they are removed at the end of each summer season. Permanent structures because of the long term effect they have on the lake shore do require permits.

6. Siting The House (2)

a). Don't allow your house and property to intrude upon the lake in such a way that it destroys the beauty of the lake for you and for others. Think how it will look from the lake. Ideally it should be hardly noticeable.

b). Mask the house from the lake by siting the house well back from the lake and by keeping a belt of trees between house and lake. The arrangement may actually heighten the beauty of the view of both woods and lake from the house: at the same time it preserves the natural appearance of the lake shore and helps you obtain privacy and quiet. Such trees can help greatly by absorbing nutrients from the filter bed. Maine law requires that houses be built at least 75 feet from high water and that a well distributed strand of trees be retained along the shoreline.

c). If in doubt about cutting a tree, wait. You can always cut it later, but you can't put it back again. It only takes five minutes to cut down a tree that may have taken fifty years to grow. By preventing soil and bank erosion, trees help prevent contamination of lake water and the destruction of the bottom habitat.

d). Have a clear understanding with your builder and excavator about the trees that can be cut and cannot be cut. Cutting down all the trees make it easier for them to work but doesn't leave you with much afterwards.

f). Consider how you can make the exterior finish of your house harmonious with the lake and woods. Avoid a stain or paint that is too light. Its amazing what a difference the color of shingles can make. If they are too light, the house will not harmonize with the woods and the lake. Dark shingles of many varieties are available.

(2) See footnotes at end of section, pg. 21

7. <u>Farming Practices</u>

   a). Farmers should practice good manure management, as outlined in "Maine Guidelines for manure and manure sludge disposal on land", published by the Soil and Water Conservation Commission and the Life Sciences and Agricultural Experiment Station, University of Maine, Orono. It is preferable that manure be spread only during the growing season; don't spread manure on frozen fields. Locate storage areas where they are not exposed to runoff, for example, on hilltops and knolls or create diversions to funnel the runoff around the storage area, and preferably store manure in secure pits which have roofs.

   b). Run-off should be diverted so it does not flow through barn yards or feedlots.

   c). Livestock should be fenced out of streams and lakes.

8. <u>Waterfowl Feeding.</u>

   a). Don't feed the ducks! Concentrated use of the lake by waterfowl can add unwanted nutrients and micro-organisms to the lake. (1)

9. <u>Local Laws</u>

   a). Work with local officials on local laws such as Plumbing Code and Shoreland Zoning in order to inform both officials and citizens of the importance of these laws and to promote the enforcement of these laws.

   b). Encourage your Planning Board to carefully consider development plans. Call or write DEP for information concerning guidelines for reviewing developments in regards to lake water quality.

10. <u>Violations</u>

    Report violations of state water pollution laws to DEP. Sources will be kept confidential.

(1) See footnotes at end of section, pg. 21

By following the above guidelines and by using common sense, property owners will be taking an active role in preserving the water quality of their lake.

(1) Donna F. Seften and John R. Little, Volunteer Lake Monitoring, (Monitoring Unit, Planning Section, Division of Water Pollution Control, Illinois Environmental Protection Agency, 1982.)

(2) Frederick Peterson, editor Thompson Lake Observer (Thompson Lake Environmental Association, 1982, Issue #59).

Classification

Most Maine lakes were created by the last glacier. At that time, large amounts of nutrients from erosion were deposited in the lakes. Each lake, based on morphometry, reacted to the loading. As the watersheds became forested, water quality stabilized until man's appearance. Due to human activity, the water quality of some lakes has been adversely affected.

A lake can be classified as oligotrophic, mesotrophic, or eutrophic. At one end of the scale, oligotrophic lakes are unproductive, generally deep, clear lakes with deep Secchi disk readings, low phosphorus and chlorophyll levels, and little aquatic plant growth. At the other end of the scale, eutrophic lakes are productive with shallower Secchi disk readings, higher phosphorus and chlorophyll levels, and abundant aquatic plant growth. The mesotrophic classification fits into the scale between the oligotrophic and eutrophic classifications. Eutrophic lakes need not be considered dead; in fact, in terms of warm water fishing, they are often the best.

Section 314 of the 1972 Federal Water Pollution Control Act and the Maine Public Law 608 (the Great Ponds Research Program) require that the DEP classify all lakes based on trophic status. Trophic status can be defined as the ability of a water body to produce living organisms such as algae, aquatic plants, zooplankton, fish, etc. It is the most appropriate measure of water quality in lakes.

To avoid the ambiguity of the terms oligotrophic, mesotrophic, and eutrophic, the Trophic State Index (TSI) is expressed on a numerical scale. The scale is based on the range of Chlorophyll a occurring in lakes in Maine. Chlorophyll was chosen because it is a good estimator of algae, and high water color does not interfere with the analysis. High color does bias the Secchi disk and Total Phosphorus (TP) measurements. The lake with the lowest Chlorophyll a levels has a TSI near zero (0) representing very low productivity. A lake with very high Chlorophyll a levels would have a TSI of 100 or greater, since theoretically chlorophyll has no upper limit. The highest mean Chlorophyll a measured in Maine to date resulted in a TSI of 115. While it would be desirable to have all TSI's within the 0-100 range, doing so would compress the spread of the TSI's for the majority of lakes which have TSI's less than 60. Also lakes with TSI's greater than 60 are likely to have algal blooms and those over 100 may be considered extremely productive and in that respect not much different from each other. Correlations have been determined that allow us to calculate TSI's based on either Chlorophyll a, TP, or Secchi disk data. TSI equations and a chart of TSI numbers and corresponding Chlorophyll a, TP, and Secchi disk readings are given in Appendix C.

Although Chlorophyll a is the better estimator of water quality (transparency and total phosphorus are almost as good) the expense and logistical problems involved in Chlorophyll a determinations prevent their widespread use. In the place of Chlorophyll a, we often use transparency to determine water quality. Secchi disk readings are sufficent to calculate TSI values on uncolored lakes and can also be used to establish water quality trends within any particular lake, even a highly colored lake (as can TP.); however, neither transparency nor TP can be used to calculate TSI values for a highly colored lake . In order to determine TSI values for colored lakes and gain more information on productive lakes, the DEP has initiated a system for gathering Chlorophyll a data utilizing lay monitors. TSI's for the lakes studied are listed in Appendix D.

There are differences between the TSI and associated equations reported here and the TSI used in the 1977 report. The major change is a reversal of the scale. It was decided that since the TSI scale represented productivity, it made more sense to have lower numbers represent less productivity. The changes in equations are due to further analysis of our lake data resulting in new correlations. This revised TSI is also bound to be changed as more data becomes available. Limnology is still a young and inexact science and we have much to learn about our lakes. One should keep in mind that the scale is also inexact, and that a difference of a few points on the scale is probably insignificant. A difference of ten, however, could be considered significant.

Lakes in Maine are also classified by statute, a general water quality classification (Title 38, Chapter 3). Two standards exist. Class GP-A is the highest classification and of such quality that it can be used for recreational purposes and as public water supplies after disinfection. Transparency will not be less than 2.0m., total phosphorus will not exceed 15 parts per billion (ppb), Chlorophyll a will be less than 8 ppb, and fecal coliform bacteria will be fewer than 20 colonies per 100 milliliters. The second classification, GP-B, is also acceptable for recreational purposes, for potable water supplies after treatment, and for fish and wildlife habitat. The fecal coliform bacteria will not exceed 60 colonies per 100 milliliters, and total phosphorus will not exceed 50 ppb. All lakes not classified GP-B are considered GP-A. (A list of GP-B lakes are given in Appendix E.) These lakes are generally considered to support algal blooms. There will be no new discharges which are harmful to water quality or aquatic life to either GP-A or GP-B lakes.Existing licensed discharges will be allowed to continue until practical alternatives exist.

Answers to Most Frequently Asked Questions

1. Does foam on the shore of a lake indicate pollution from laundry detergents?

   Probably not. Most foam is a product of nature. Small trout streams often have pools of foam where fish will hide. Foam is created when the surface tension of water (attraction of surface molecules toward the center which give a drop of water its round shape) is reduced and air is mixed in causing bubbles. Many natural substances besides soap and detergents will reduce surface tension. Organic compounds act like soap and detergents. These compounds are released by decomposing aquatic organisms (such as algae or fish) or leached from the soil. American Indians were known to have used various natural materials, such as bark and plant roots, to cleanse items. In a lake, wind and currents mix air with the organic compounds present to produce foam. Large quantities of foam can be found on windward shores, coves, and in eddies. Natural foam has a somewhat earthy or fishy aroma. Detergent foam, in contrast, will have a noticeable perfumy smell from additives which give your wash that "rosegarden" or "lemon fresh"smell.

Detergent foam was a tremendous problem for a time. In the late 1950's and early 1960's many communities experienced foam problems in lakes, rivers, sewage treatment plants and even drinking water from contaminated wells. This foam was caused by the use of synthetic compounds which came on the market after World War II. These detergents were non biodegradable (cannot be broken down by bacteria). Virtually all detergents today are a biodegradable form which is easily broken down by bacteria. Foam alone is no longer an indicator of pollution.

2. What good are the aquatic weeds in front of my camp? I want to get rid of them.

Aquatic vegetation may appear to be a nuisance to some users of lakes, but in reality aquatic plants are extremely important to the lake's maintenance and stability. Plants act as a sediment stabilizer with various species of plants appearing in different types of sediments. They help trap sediment from erosion and cause these particles to settle out of the water near shore. Plants found in shallow water protect shores from erosion due to wave action.

Aquatic plants provide nesting materials and sites for various species of birds and fish. Weed beds are very important nursery areas for young game fish. Camouflage and protection are also important benefits of aquatic vegetation.

Most important to the lake ecosystem is the diverse food source plants provide. Submerged plant leaves and stems provide an ideal surface for the growth of microscopic attached plants, called periphyton. These small plants are grazed by small crustaceans and insects which in turn are an important food source for fish. Grasses such as wild rice are eaten by song birds and water-fowl. Aquatic plants are also eaten by deer, moose, beaver, muskrat and porcupines. Other minor benefits include the beauty added by the white water lily, Pickeral weed, and yellow pond lily. The bladderwort, as well as producing yellow or purple flowers, is carnivous. Small invertebrates are trapped in the bladders and digested providing supplemental food for the plant.

Plants are an essential part of a lake's stability: binding soils, breaking waves, providing food and shelter for song birds, waterfowl, game fish, fur bearers, and moose. If the aquatic plants in front of your camp still appear to be a nuisance, you can clear a small area in front of your camp for boating or swimming by raking, pulling or cutting the plants by hand; however, removing the weeds requires a Great Ponds Permit from D.E.P. For more details on the permit process, please see the following section, #3. "On lakes over 10 acres (the "Great Ponds"), state policies and regulations do not permit either chemical destruction or mechanized dredging. Chemicals able to kill aquatic plants in front of one cottage cannot be limited in their lethal effects, to that location and to those particular plants. Such treatment would have only a short-term effect anyway. The plants would be back in the following season. Mechanical dredging of muck and aquatic weeds churns up the water, messes up shorelands where the debris is dumped, and also has little lasting effects."(From: Sherman Hasbrouck "Maine's Prime Recreational Lakes", Land & Water Resources Center, University of Maine at Orono, 1981)".

Generally boating and swimming activities will keep the immediate area clear of plants. Often the sudden appearance of plants or thicker growth of plants in front of a camp are a direct result of the campowner's own activities such as septic system failure, increased soil erosion or creation of a protected area after construction of a pier or breakwater.

3. Why do I need permits to do work on my own shorefront property?

Lakes are fragile ecosystems in which the natural balance can be easily upset. Disturbing the natural balance sometimes leads to obnoxious algal blooms, lower water quality, elimination of desireable fish species, and lower property values. Every change has some effect, and the degree of impact will depend on the character of the individual lake. Even small changes must be taken into account because of the cumulative effect of many people making small alterations. Building one beach may not do any noticeable harm, but if all shoreowners made beaches, that could disrupt the entire balance of the lake.

Local, State and Federal statutes such as Shoreland Zoning, Plumbing Code, and the Great Ponds Act have been established to preserve lake water quality for the benefit of everyone. Great Ponds in Maine are ponds which in their natural state are greater than 10 acres or are manmade and greater than 30 acres with the shoreline owned by 2 or more persons. These ponds are considered State owned bodies of water. The responsibility for their protection has been given to various state agencies.

"The most important of the state and municipal laws relating to our lakes, The Great Ponds Act, deserves our thanks, our respect, and our best individual efforts to see that no one violates it. In essence The Great Ponds Act forbids anyone (including the state, the Towns, and the corporations) from putting anything into the lake or taking anything out without a permit from the Maine Department of Environmental Protection. That means we can't dredge, pull out big or little rocks, dump sand to make beaches, build walls to protect our shorefront, carve out little coves for our boats, build permanent jetties, piers, or docks, or in any way rearrange Mother Nature's landscaping of the Lake. Why not? Two excellent reasons: (1) we don't want to see Thompson Lake look like those lakes in Massachusetts and New Jersey (to mention only two) that are ringed with obstructive piers, and coves, so that it looks like a man-made lake, which it practically is, especially if you consider the dirty water, the all enroaching weeds, the smell, the sludge on the bottom, and the lack of fish. In Maine we want our lakes to look like God's lakes in all their natural beauty, cleanliness, and vitality. Reason No. 2: Mucking around the lake shore ruins fish and other aquatic and bird life habitat by covering spawning or nesting areas with sand or dirt and destroying the gravely bottom that our game fish love. Everyone on the lake owes it to himself and others to remind people not to be a Great Pond Destroyer. Let's all help!" (From Frederic Peterson, Thompson Lake Observer, Spring, 1982, Issue #60).

3a. What permits do I need to do work around my camp?

All towns have local Shoreland Zoning ordinances which may restrict the cutting of trees, placement of buildings, and building of roads within the shoreland zone. Before making changes, check with your town office to determine what that zone is. Unorganized townships have similar standards and you should check with the Land Use Regulation Commission,(LURC) State House, Augusta, Maine 04333 or call 289-2631. If you wish to convert your seasonal camp to year-round, check with your town office or LURC for the necessary permits which will include proving that your septic system meets the requirements of the present plumbing code and is adequate for year round use. Most towns require building permits for any new structure or additions to existing structures. Any new septic system requires a permit. Also, if your present system malfunctions, you must repair it such that it meets the present plumbing code. If you wish to make changes to the shoreline, you must apply to DEP for a Great Ponds Permit. In reviewing permits the DEP must take into consideration such things as aesthetics, erosion control, fish and wildlife habitat, and water quality. Examples of work that would need a permit include but are not limited to:

Dredging or filling in or near the water

Constructing piers or breakwaters

Repairing permanent structures below high water

Building beaches

Moving rocks in the water or removing aquatic plants

Installing water pipes

For more information write or call the Land Bureau, D.E.P., State House, Augusta, Maine 04333 or 1-800-452-1942 or 207-289-2111.

4. Is the lake water safe to drink?

No lake or river water should be considered safe to drink without treatment. Surface waters are open to contamination by people and animals, and there is always the possibility of a septic system malfunctioning. Disinfection can be achieved by:

(a) Boiling the water for a minimum of fifteen minutes to destroy the disease causing organisms.

(b) Chlorination using a household bleach containing 4 to 5 1/4% available chlorine.

Eight drops of a household bleach solution should be mixed with one gallon of water and allowed to stand for at least 15 minutes before drinking.

(c) Continuous chlorination

For continuous water disinfection, a small domestic hypo-chlorinator (sometimes coupled with activated charcoal filters) can be obtained from a local plumber or water equipment supplier.

5. Who is responsible for maintaining water levels?

Owners of the dam are responsible for maintaining water level; although, it is possible for lake shore owners to petition the state to set water levels. A public hearing may be held so that all concerned people can be heard; however, if the dam is being used for power generation there is no State Agency that has jurisdiction over the water levels.

Questions concerning water levels and dams should be directed to Esther Lacognata, Bureau of Agricultural & Rural Resources, Department of Agriculture, State House, Augusta, Maine 04333 or phone 289-3511.

6. Are Maine Lakes Affected by Acid Rain?

Maine lakes have been and are being affected by acid precipitation. The pH of rain and snow in Maine has been between 4.4

and 5.0 since the mid 1950's (normal pH of rainfall is about 5.6 with available CO_2). The low pH is due mostly to air transported industrial pollutants which include oxides of sulfur and nitrogen. Maine is downwind of major sources of air pollution, such as Illinois, Pennsylvania, Ohio and the Eastern Seaboard.

The impact of acid rain on rivers, streams, and lakes is largely determined by the chemical characteristics of the soils and bedrock of the surrounding areas. Certain types of rocks, such as limestone, which come in contact with rain buffer the influence of acid precipitation. Granite, on the other hand, provides very little buffering. The buffering capacity of a water body can be determined by measuring the amount of alkalinity in that water. Because most of Maine's soils are of granitic origin, they contain very little buffering capacity. As a result, Maine lakes, particularly those found in upland areas (2000 ft. above sea level) are susceptible to the adverse effects of acid precipitation. Work by Dr. Ronald Davis at the University of Maine, Orono, shows that in 1,368 Maine lakes, over an eight fold increase in acidity occurred between 1937 and 1974. About three quarters of the increase occurred between 1950 and 1960 which correlates with the postulated increase in the acidity of precipitation. Following are the Maine Lakes which have been found to have surface pH levels of less than 5.5: Ledge Pond (Sandy River), Jackson Pond (Berlin T6), Speck Pond, (Grafton), Crystal Pond (T40 MD), Unnamed Pond (T3ND), Tumbledown Pond (Berlin #6), East Chairback Pond (T7R9). All these lakes are over 2000 feet in elevation. (1)

(1) Stephen A. Norton, Davis, Brakke, "Responses of Northern New England Lakes to Atmospheric Impact of Acids and Heavy Metals". Land and Water Resources Center, University of Maine, Orono, July 1981.

In Maine, the increase has been moderate compared to changes elsewhere according to research work on fish now being conducted by Dr. Terry Haines, University of Maine. In Norway, the pH of lakes decreased from 7.2 in 1941 to 5.4 in 1975, a 63 fold increase in acidity and great damage to the fisheries has taken place. The lowest pH that fish can tolerate and maintain adequate reproduction is about 5.0. In the high altitude lakes of the Adirondack Mountains in N.Y., the pH fell from 6.5 to 4.8 between the 1930's and the 1970's. (1) Ninety percent of these lakes are now devoid of fish. The species of fish most sensitive to pH changes are trout, salmon, and smallmouth bass which are among the more popular sport fish.

Maine has been concerned about acid rain for some time; however, since our air quality is in part dependent on air transported pollutants produced in other states, the solution becomes very complicated. To address this problem, an equitable system of air quality controls needs to be established throughout the United States Towards this goal, Maine has joined with other northeastern states in court action involving the U.S. Environmental Protection Agency to insist on strong and equal air pollution control laws. The problem is deceptive; by the time the effects are noticeable, they may be severe and hard to reverse. The Maine D.E.P. has been working with the University of Maine to evaluate the impact in Maine. There are ongoing biological studies and four established air monitoring sites. Adequate data must be gathered in order to affect any change in the air pollution laws.

7. What can I do to protect my lake from the effects of acid rain?

Unfortunately there is not much an individual can do except

(1) Ronald B. Davis, Smith Bailey, Norton, "Acidification of Maine (USA) Lakes by Acidic Precipitation." In press, 1977.

support strong and equal air pollution control laws by writing your Congressmen. The Clean Air Act is due for renewal this year and there are strong political interests in relaxing standards. Conversion from oil to coal has complicated the issue and is increasing the sulfate problem.

8. Occasionally in midsummer, swimmers in some lakes get an itchy rash after coming out of the water. What causes it?

A precise diagnosis cannot be given until a careful investigation is made of each inquiry by a doctor, but such rash symptoms are often caused by an organism living in the water, known commonly as a fluke. Flukes are a parasite that must at different times locate and penetrate the tissue of two host organisms, a snail and a vertebrate, typically a duck or seagull in order to complete their life cycle. If, while searching for a vertebrate host, the fluke encounters a swimmer, it will partially penetrate the bather's skin. After the swimmer emerges from the water, a prickling sensation may occur. This is the body's natural defense system rejecting foreign particles. Red spots and swelling develop later and can last a week or longer. The reaction is similiar to the way mosquito bites effect some people. Because full penetration of the worm through a person's skin does not occur until one leaves the water, the easiest method to prevent excessive skin irritation is by rubbing one's body with a coarse towel before drying off completely. This effectively crushes the organism before it has gone completely through the skin. A shower or bath immediately after emerging from the water is also helpful.

9. What is the yellow green dust on my lake in the early summer? Is it an algal bloom?

No, from early June through the first part of July, the dust is likely to be pollen from nearby pine trees. The pollen might look similar to algae, but pollen is yellow-green and dustlike and floats mainly on the surface. An algal bloom is green to blue-green in color and may be soupy in appearance so that water transparency is reduced to less than six feet. Eventually the pollen will become water logged and sink from sight.

10. What is an algal bloom?

Algae are tiny microscopic plants that are natural components of lakes. An algal bloom occurs in a lake with very high nutrient concentrations when one species of algae out competes the other algae present to become so abundant that the water becomes murky.

Most blooms in Maine are either made up of diatoms or blue-green algae. Diatom blooms usually occur in the late spring or early summer and are less objectionable than blue-green blooms. Diatoms turn the water a bright green or brown, but do not create the scums and odors associated with blue-green algal blooms. Diatom blooms often occur without being noticed by lake users. Blue-green algal blooms create a greater problem for lake users because blue-greens are subject to concentration by wind action and to scum formation at the surface of the lake. This scum may be blown into the shallows and onto exposed rocks, making the shoreline appear to be covered with blue-green paint. When these algae die and decompose, the resulting odor can be very unpleasant.

11. Sometimes in mid-summer, along the shoreline there is a dark cloud in the water accompanied by an oily sheen. What causes it?

The cloud is probably insect cases left behind from a hatch of aquatic insects and is concentrated along the shore by wind. Insects hatch any time from ice-out to September. As the cases decompose, sometimes, an oily film is given off. Often some of the larger insect cases may appear fishlike and cause concern that there has been a fish kill. Close examination will reveal legs and other structures to distinguish these cases from young fish.

12. To whom do I report a fish kill?

Fish kills should be reported to the Department of Environmental Protection, Division of Environmental Evaluation and Lake Studies, (207) 289-3901 or in Maine Toll Free 1-800-452-1942.

The type of fish kill to report is one where numerous fish are killed in lakes or rivers. A few dead fish do not constitute a fish kill. Look for hook marks or other injury that might indicate the fish were left by fishermen.

The following information is useful in evaluating the fish kill.

1. Name, address and telephone number of person reporting fish kill.
2. Name of water body involved and precise location of fish kill.
3. Estimate the number and type of fish involved.
4. Distinct colors (in the water) or odors present in area of fish kill.
5. Time frame of fish kill, or whether it is still occurring.
6. Physical appearance of fish involved (i.e., external injuries).
7. Any information that may help identify the cause of the fish kill and, if possible, the party responsible.

Explanation of How Data is Presented in Report

The data from each lake that participated in the program is presented in tabular form on a Department of Inland Fisheries and Wildlife lake survey map.

Total Phosphorus (TP) and Chlorophyll a (Chla)

All results unless otherwise stated can be assumed to be aerobic, epilimnetic core samples. Some results may be from a single date in which case the season in which the sample was taken will be stated with the result. Samples which have "mean" next to them indicate that the reported value is the average of all the samples taken that year. Samples which have a number next to them: e.g. (4), indicate that the value is the average of samples taken over a period of 4 months.

The unit of measurement for TP is parts per billion (ppb) and the unit for Chlorophyll is micro-grams per liter (ug/l).

NA

Means that the data was not available, as in color, or that there was insufficient data to calculate a Trophic State Index (TSI). At least five months of data are considered necessary to calculate a TSI value. If color was not available, it was assumed to be less than 30 SPU and TSI was still calculated.

The TSI's are calculated based on the mean of the monthly means. The readings from each month are summed and averaged. The monthly averages are used to give the mean for the year. (See Appendix C. for the formulas used to calculate TSI).

Color and pH

The values reported are generally from epilimnetic core samples, or sometimes from surface samples. Usually the samples are from a single date that year, unless "mean" is written next to the value which indicates it is the average of all samples that year.

The unit of measurement for color is standard platinum units (SPU).

TSI (Trophic State Index) Range

The range results from having sufficient data on at least 2 out of 3 parameters (S.D., TP, and/or Chla) to calculate at least 2 TSI's. The range of the possible TSI values is given with the appropriate subscript: CHL (Chlorophyll a TSI), S.D. (Secchi disk TSI) and TP (Total Phosphorus TSI). When a range is reported, the single TSI given is the mean of all TSI values.

* Inadequate Sampling Season

Where there was not a full open water season (at least 5 months), the mean and minimum Secchi disk readings are still reported but should be interpreted with care. Lakes which had less than 5 months of data, have the number of months that did have Secchi disk readings marked in parenthesis besides the mean transparency. For example, a mean Secchi disk reading of 4.1* (3) indicates that the mean was 4.1 for 3 months of readings.

a-ft, or a ft

Means acre-feet which is a unit of volume, an acre of water one foot deep.

GLOSSARY OF TERMS

Aerobic epilimnetic core - is a vertical sample of the water column taken as deep into the epilimnion as there is oxygen. This is a procedure we use to collect phosphorus and chlorophyll samples.

Alkalinity - is a measure of the buffering capacity of water to prevent large scale pH changes.

^{o}C - Degree Celsius

Chlorophyll _a_ - is a plant pigment which occurs in all higher plants and algae and which functions as a receptor for light energy for photosynthesis. Chlorophyll _a_ values can be used to estimate algal populations.

CHL - Chlorophyll _a_

Color - There are two types of water color commonly measured, apparent and real. Apparent color is due to suspended and dissolved organic material in the lake and is the color that we measure. Real color is due to dissolved organic material. Color can vary from clear blue to green to brown. Very clear lakes have a color of zero. Moderate to high water color is common in lakes surrounded by boggy areas. As the water coming into these lakes filters through the bog, it becomes tea colored from humic and tannic acids. Color does not adversely affect water quality.

Conductivity - is a measure of the ability of water to carry an electrical current. In a lake, conductivity measures the dissolved ions (charged particles) present in water.

Core - is a vertical sample of water obtained by using flexible, plastic, usually 1/2" diameter tubing.

D.O. - Dissolved Oxygen - is oxygen dissolved in water. Cold water can hold more oxygen than warm water. The degree of dissolved oxygen depletion in the hypolimnion can be a clue to the health of the lake.

Drainage Area - is the total area which drains into a lake. Precipitation falling anywhere within this area which does not first evaporate or infiltrate into the ground finds its way to the lake.

Epilimnion - is the surface layer of warm water which is well mixed by wind action and convection currents.

Euphotic Zone - is the depth to which light will penetrate so that algae and rooted plants can grow; it usually extends 2 1/2 times the Secchi disk readings.

Eutrophic - describes a lake which contains a high concentration of nutrients especially phosphorus, and in which Secchi disk transparencies are shallow. A eutrophic lake abounds with life; (i.e., it is very productive in terms of aquatic plants, algae, and warm water fish).

Flushing Rate - is how often the entire lake water is renewed. The ratio of drainage area runoff volume to lake volume determines the flushing rate. A lake with a fast flushing rate is less sensitive to changes in its nutrient loading than one with a slow flushing rate.

GP-A - is the highest of two lake classifications. All lakes not classified GP-B are GP-A: For the criteria of establishing GP-A see pg 23.

GP-B - is the second of two lake classifications. These lakes are generally considered to support algal blooms. For the criteria for establishing GP-B, see page 23-24.

ha = hectare - 2.47 acres

Homothermous - all the same temperature.

Hypolimnion - is the deepest, most dense layer of water in a stratified lake.

Km^2- Square Kilometers = 0.39 square miles.

Limnology - is the study of the geological, chemical, and physical characteristics of lakes and ponds.

m - meter = 3.28 feet

Meromictic - describes a lake (usually extremely deep, or deep and well protected) which is permanently stratified and, therefore, does not circulate completely within the basin at any time during the year.

Mesotrophic - describes a classification of lakes which exhibit intermediate phosphorus and chlorophyll levels and Secchi disk transparencies as well as moderate amounts of algae and rooted aquatic plants.

umhos/cm - micro mhos/centimeter - is the unit used to express conductivity. A mho is the conductance between two points on a conductor such that 1 volt produces a current of one amp. Conductance is the reciprocal of resistance, whose unit of measure is ohm.

Morphometry - pertains to the size and shape of a lake basin such as mean depth, volume, drainage area, and flushing rate.

N/A or NA - not available.

Nonpoint Source - is a source of nutrients to a lake that is difficult to pinpoint. Examples are agricultural and urban runoff, malfunctioning septic tanks, forest activities, and poor land management practices.

Oligotrophic - describes a classification of lakes which exhibit low levels of phosphorus, few rooted aquatic plants and algae, deep transparency readings and high dissolved oxygen levels throughout the water column.

pH - describes the hydrogen ion, [H+] , concentration of a system, and pH is defined as the - log 10 [H+] . A solution of pH 0 to less than 7 is acid, 7 is neutral, and greater than 7 to 14 is alkaline.

Phosphorus - is an element which is essential for plant growth. It is the nutrient which limits the amount of phytoplankton production in most Maine lakes because it is the nutrient which is least abundant relative to the cell's requirements.

Phytoplankton - are floating or weakly mobile microscopic aquatic plants.

Point Sources - are direct discharges to lakes or streams that can be specifically identified such as industries, laundromats, and sewage outfalls.

ppb-parts per billion - using the expression 5 ppb to describe a solution of a particular concentration, such as phosphorus, is similar to using the expression 5 percent, which is parts per hundred, except 5 parts per billion is much more dilute; (i.e 5/100 vs. 5/1,000,000,000).

ppm-parts per million - 5/1,000,000- for an analogy see ppb.

S.D. - Secchi disk - is an 8" black and white colored disk which is used to measure water transparency. The disk is lowered into the water, and the depth at which the disk is no longer visible is noted. The disk is raised until just visible and the average of the two depths is the transparency.

SPU-Standard Platinum Unit - is the unit of measurement used for color determinations.

Stratification - is the arrangement of a lake during warm weather into two or more horizontal layers of water of differing characteristics, especially densities. The top layer, epilimnion, is the least dense. The bottom layer, hypolimnion, is the most dense. The thermocline is the layer of transition in the middle.

Thermocline - is the middle layer of water during stratification where the temperature drops at least a degree Celsius per meter of depth.

Thermogradient - is the change in temperature with increasing or decreasing depth.

TP-Total Phosphorus - includes all forms of phosphorus, soluable and insoluable phosphates and insoluable phosphorus, and in this report is used interchangeably with phosphorus.

TSI-Trophic State Index - is a numerical classification scale for expressing water quality of different lakes. It is meant to be an objective refinement of the oligotrophic, mesotrophic, eutrophic classification. A low TSI number indicates little aquatic productivity and a high number indicates more productivity.

Turnover - is a thorough mixing of lake water usually in the spring and fall, when temperatures become uniform throughout the lake.

Watershed - same as drainage area.

Zooplankton - are floating or weakly mobile microscopic aquatic animals.

APPENDIX A

Maximum and minimum open water surface values for lake parameters.

	MAXIMUM	MINIMUM	MEAN
pH	8.8	5.7	
Alkalinity (ppm)	171	3	
Conductivity (uhmo/cm)	247	10	
Color (SPU)	145	0	
Total phosphorus (ppb)	100	2	
Chlorophyll *a* (ug/l)	65	0.9	
Transparency (m) (for lakes with color <30 SPU)	12.9	0.6	5.6

APPENDIX B

PHOSPHATE CONTENT OF COMMON CLEANSERS

Powder Detergents	% phosphorus	grams/load	amt. used per load
Dash	8.7%	9.3-12.4g.	3/4-1c.
All	7.5%	8.3-11g.	3/4-1c.
Cheer	8.7%	8.4g	1¼c.
Punch	8.0%	8.0g.	1¼c.
Super Suds	8.0%	8.0g.	1¼c.
Cold Power	8.0%	8.0g.	1¼c.
Ajax	8.0%	8.0g	1¼c.
Dreft	8.7%	7.4g.	1¼c.
Oxydol	6.1%	7.0g.	1½c.
Duz	6.1%	6.5g.	1¼c.
Rinso	6.2%	5.8g.	1¼c.
Bold 3	6.1%	5.8g.	1¼c.
Gain	6.1%	5.8g.	1¼c.
Tide	6.1%	4.8g.	1¼c.
Topco	5.6%	4.3g.	1c.
Topco all purpose	5.6%	4.3g.	1c.
Ivory Snow	No P.	---	1½c.
Fab	No P.	---	1¼c.
Arm & Hammer	No P.	---	1c.
Purex	No P.	---	1¼c.
Topco Blue	No P.	---	1c.
Liquid Detergents			
All	4.8%	7g.	1/2c.
Wisk	3.5%	5.3g.	1/2c.
Yes	No P.	---	1/4c.
Dynamo	No P.	---	1/4c.
Staff	No P.	---	1/2c.
Era	No P.	---	1/3c.
Topco	No P.	---	1/2c.
Purex	No P.	---	1/4c.
Sweet Life	No P.	---	1/4c.
Woolite	No P.	---	1 cap./2qt of water
Handle w/care	No P.	---	1 cap./2 qt of water
Detergent Additives			
Spray & Wash	No P.	---	---
Shout	No P.	---	---
Grease relief	No P.	---	---
Topco	No P.	---	---
Calgon	8.7%	6.5g.	1/2c.
Axion	8.0%	4.8g.	1/2c.
Biz	8.7%	5.3g.	1/2c.
Diaper Pure	No P.	---	---
Snowy	No P.	---	---
Staff	No P.	---	---
Purex	No P.	---	---
Clorox 2	No P.	---	---
Borateen	No P.	---	---
20 Mule Team Borax	No P.	---	---

Automatic Dishwashing Soap

Finish	8.7%	2.6g	2 tbls.
Topco	8.7%	2.4g.	2 tbls.
All	8.7%	2.1g.	2 tbls.
Electra sol	7.1%	2.1 g.	2 tbls.
Cascade	8.7%	2.1 g.	2 tbls.
Staff	8.7%	2.1g.	2 tbls.
Calgonite	8.7%	1.9g.	2 tbls.
Staff Lemon	7.5%	1.6 g.	1 1/2 tbls.

Dishwashing liquid

All brands which were checked contained no or trace amounts of phosphorus.

Abrasive cleansers

Spic & Span	6.7%	6.6g.	1/2c.
Mr.Clean	2.4%	1.8g.	1/4c.
Top Job	2.6%	1.8g.	1/4c.
Ajax	-	.09g/10g.	---
Comet	2.5%	---	---
Bon Ami	No P.		

There is a nonphosphate diswashing detergent available from Shaklee Products with distributors in S. Hope, Damariscotta, and Casco. There may be more distributors; check the white pages of the phone book for details. Amway also offers limited phosphate and non phosphate detergent products.

This is by no means a complete list of detergents available on the market. Check the brand you buy for phosphorus content.

Appendix C

MAINE TROPHIC STATE INDEX, 1979

All Lakes

TSI_c = 70 log (mean Chlorophyll a + 0.71)

Lakes with color <30 SPU

TSI_p = 70 log (.33 mean total phosphorus + 0.7)

$$TSI_{sd} = 70 \log \frac{105}{\text{mean Secchi disk}^2} + 0.7)$$

Criteria for Calculating TSI

1. Samples are to be taken from open water.
2. 5 months of data are necessary; one reading per month is acceptable, but 2 readings per month are preferred.
3. Sampling must start by May.
4. It is not permissible to be missing any 2 consecutive months of data.
5. The mean shall be considered as the mean of the monthly means in order that all months be equally weighted in the calculation.
6. Integrated cores should be taken to a depth equal to that of the late summer epilimnion or 1.0 mg/l D.O. level, whichever is less.

TSI	Chlorophyll a (ppb)	Secchi disk (m)	Total Phosphorus (ppb)
0	0.3	18.7	0.9
10	0.7	12.3	2.1
20	1.2	9.2	3.1
30	2.0	7.3	6.0
40	3.0	5.9	9.2
50	4.5	4.8	13.6
60	6.5	4.0	19.7
70	9.3	3.4	28.2
80	13.2	2.8	40.
90	18.6	2.4	56.4
100	26.1	2.0	79.2

APPENDIX D 1981 TSI VALUES

Abrams Pond	NA	Embden Pond	16(1981)
Adams Pond	66	Estes Pond	80
Alamoosook Lake	59(1979)	Fairbanks Pond	78
Alford Lake	33	Fischer Pond	NA
Allen Pond	49	Flying Pond	54
Ambajejus Lake	54	Folsom Pond	76
Androscoggin Lake	53	Forest Lake	46(1976)
Attean Pond	Colored	Gardner Lake	Colored
Auburn Lake	27	Georges Pond	56
Azicohos Lake	47	Gould Pond	121
Balch Pond	42	Granger Pond	43
Basil Pond	NA	Great Pond	31
Bear Pond(Turner)	36	Green Lake	28(1976)
Beech Hill Pond	22	Halfmoon Pond	78
Big Bennett Pond	52	Hancock Pond	24(1980)
Big Indian Pond	52(1977)	Hayden Pond	39
Biscay Pond	47(1980)	Highland Lake(Bridgton)	30
Black Lake	63	Highland Lake(Falmouth)	32(1981)
Bradbury Lake	NA	Hobbs Pond	51
Branch Pond	59	Hogan Pond	NA
Brettuns Pond	52	Holbrook Pond	52
Brewer Pond	52	Howard Pond	36
Buker Pond	58(1976)	James Pond	60
Bunganut Pond	62(1980)	Kennebago Lake	42
Burnt Meadow	63	Kennebunk Lake	34
Canton Lake	44(1981)	Keoka Lake	50
Caribou Pond	48	Keyes Pond	40(1981)
Carlton Pond	103+	Kezar Lake	26
Cathance Lake	24	Kidney Pond	NA
Chickawaukie Pond	80	Killick Pond	NA
China Lake(West)	46	Knight Pond	NA
China Lake(East)	43(1978)	Little Ellis Pond	52
Clary Lake	71	Little Ossipee	36
Cobbosseecontee Lake	50	Little Purgatory Pond	NA
Cochnewagen Lake	51	Little Sebago (Basin1-2	44 1979)
Cochrane Lake	50	Little Sebago (Basin 4	49 1980)
Coffee Pond	32	Long Lake (St. Agatha)	72
Craig Pond	15(1980)	Long Lake (Naples)	42(1980)
Crawford Pond(Union)	44	Long Pond (Aurora)	NA
Crawford Pond(Crawford)	48(1981)	Long Pond (Mt. Desert)	28(1980)
Crocker Pond	NA	Long Pond (Lincoln)	45
Crooked Pond	Colored	Long Pond (Somerville)	Colored
Crystal Pond(Turner)	65	Long Pond (Belgrade)	30
Cupsuptic Lake	52	Long Pond (Livermore)	57
Damariscotta Lake	55	Loon Lake	45
David Pond	59(1981)	Lovejoy Pond (Albion)	90
Dyer Long Pond	NA	Lower Narrows Pond	30
Eagle Lake(Mt Desert)	NA	Lower Patten Pond	NA
East Pond	47	McGrath Pond	46
Echo Lake(Mt Desert)	NA	McWain Pond(Long Pond)	57
Echo Lake(Wayne)	37	Madawaska Lake	68
Egg Pond	32		
Egypt Pond	52		

Maranacook Lake	35
Marshall Pond	Colored
Mattawamkeag Lake	Colored
Meddybemps Lake	41(1980)
Meduxnekeag Lake	53
Megunticook Lake(North)	39
Megunticook Lake (So.)	43
Messalonskee Lake	42(1981)
Molasses Pond	35
Monson Pond	Colored
Montegail Pond	35
Moose Pond	42
Mooselookmeguntic Lake	38
Mousam Lake	39
North Pond (Buckfield)	33
North Pond (Norway)	78
North Pond (Woodstock)	50
Norton Pond	55
Notched Pond	44(1980+)
Onawa Lake	43
Panther Pond	37(1976)
Parker Pond	35
Parks Pond	53
Parlin Pond	NA
Pattee Pond	69
Pemaquid Pond	47(1978)
Pennesseewassee Lake	43
Pequawket Lake(Horne P)	28
Pequawket P.(Bownfield)	56(1978)
Pettingill Pond	54
Phillips Lake	25
Piper Pond	41
Pitcher Pond	49
Pleasant L.(Island Fall)	9(1981)
Pleasant Lake(Sumner)	76
Pleasant Lake (Casco)	25
Pleasant Pond(Caratunk)	11
Pleasant Pond(Turner)	48
Pocomoonshine Lake	41(1980)
Pocasset Lake	45+
Portage Lake	54(1976)
Porter Lake	38
Pushaw Lake	55(1976)
Quantabacook Pond	NA
Quimby Pond	Colored
Rangeley Lake	29
Raymond Pond	40(1981)
Ripley Pond	80
Round Pond	35
Sabbathday Lake	NA
St. George Lake	28
Sabattus Pond	83
Salmon Lake	47

Sand Pond (Baldwin)	63(1976)
Sand Pond(Denmark)	50
Sand Pond(Norway)	32
Saponic Pond	87
Schoodic Lake	38
Seal Cove Pond	NA
Sebago Lake	24
Sebasticook Lake	106
Sebec Lake	36
Senebec Pond	NA
Seven Tree Pond	60
Sewall Pond	101
Sheepscot Pond	34(1981)
Sibley Pond	Colored
Silver Lake(Sidney)	37
Sokokis Lake	39(1980)
Somes Pond	NA
Songo Pond	46
Spaulding Lake	56
Spednic Lake	NA
Spruce Mnt. Lake	42
Square Pond	NA
Stearns Pond	55
Swan Lake	30(1981)
Taylor Pond	55
Thompson Lake(South)	19(1981)
Threemile Pond	68
Togus Pond	47
Toothaker Pond	121
Torsey Pond	40
Trafton Lake	68(1980)
Trickey Pond	17
Tripp Pond	55
Tunk Lake	9
Turner Pond	Colored
Upper Cold Stream Pond	43
Upper Lead Mtn. Pond	33
Upper Narrows Pond	35
Upper Richardson Lake	38
Upper Shin Pond	37(1976)
Wadleigh-Roberts Pond	54
Walker Pond	41
Washington Pond	29
Watchic Lake	46
Webb Pond	47
Webber Pond(Sweden)	NA
Webber Pond(Bremen)	68
Webber Pond	75
Whitehead Pond	NA
Wilson Lake(Acton)	46
Wilson Lake(Wilton	45(1981)
Wilson Pond(Wayne)	42
Wood Pond(Bridgton)	63
Wood Pond(Jackman)	Colored
Woodbury Pond	40(1976)

+ Some readings hit bottom

APPENDIX E

CLASS GP-B PONDS

Annabessacook Lake, Winthrop

Cobbosseecontee Lake, Winthrop

Douglas Pond, Pittsfield

Estes Lake, Sanford

Little Cobbosseecontee Lake, Winthrop

Lovejoy Pond, Albion

Monson Pond, Fort Fairfield

Nubble Pond, Raymond

Pattee Pond, Winslow

Pleasant Pond, Litchfield

Sabattus Pond, Greene

Salmon Lake, Belgrade

Sebasticook Lake, Newport

Spaulding Pond, Lebanon

Togus Pond, Augusta

Webber Pond, Vassalboro

APPENDIX F

CONVERSION CHART

F°	C°	F°	C°	F°	C°	F°	C°	F°	C°	F°	C°
90.0	32.2	79.0	26.1	68.5	20.3	57.5	14.2	47.0	8.3	36.0	2.2
89.5	31.9	78.5	25.8	68.0	20.0	57.0	13.9	46.5	8.1	35.5	1.9
89.0	31.7	78.0	25.6	67.5	19.7	56.5	13.6	46.0	7.8	35.0	1.7
88.5	31.4	77.5	25.3	67.0	19.4	56.0	13.3	45.5	7.5	34.5	1.4
88.0	31.1	77.0	25.0	66.5	19.2	55.5	13.1	45.0	7.2	34.0	1.1
87.5	30.8	76.5	24.7	66.0	18.9	55.0	12.8	44.5	6.9	33.5	0.8
87.0	30.6	76.0	24.4	65.5	18.6	54.5	12.5	44.0	6.7	33.0	0.6
86.5	30.3	75.5	24.2	65.0	18.3	54.0	12.2	43.5	6.4	32.5	0.3
86.0	30.0	75.0	23.9	64.5	18.1	53.5	11.9	43.0	6.1	32.0	0.0
85.5	29.7	74.5	23.6	64.0	17.8	53.0	11.7	42.5	5.8	31.5	-0.3
85.0	29.4	74.0	23.3	63.5	17.5	52.5	11.4	42.0	5.6	31.0	-0.6
84.5	29.2	73.5	23.1	63.0	17.2	52.0	11.1	41.5	5.3	30.5	-0.8
84.0	28.9	73.0	22.8	62.5	16.9	51.5	10.8	41.0	5.0	30.0	-1.1
83.5	28.6	72.5	22.5	62.0	16.7	51.0	10.6	40.5	4.7	29.5	-1.4
83.0	28.3	72.0	22.2	61.5	16.4	50.5	10.3	40.0	4.4	29.0	-1.7
82.5	28.1	71.5	21.9	61.0	16.1	50.0	10.0	39.5	4.2	28.5	-1.9
82.0	27.8	71.0	21.7	60.5	15.8	49.5	9.7	39.0	3.9	28.0	-2.2
81.5	27.5	70.5	21.4	60.0	15.6	49.0	9.4	38.5	3.6	27.5	-2.5
81.0	27.2	70.0	21.1	59.5	15.3	48.5	9.2	38.0	3.3	27.0	-2.8
80.5	26.9	69.5	20.8	59.0	15.0	48.0	8.9	37.5	3.1	26.5	-3.1
80.0	26.7	69.0	20.6	58.5	14.7	47.5	8.6	37.0	2.8	26.0	-3.3
79.5	26.4			58.0	14.4			36.5	2.5		

Feet	Meters	Feet	Meters	Feet	Meters
1	0.30	17	5.18	31.5	9.60
2	0.61	17.5	5.33	32	9.75
3	0.91	18	5.49	32.5	9.91
3.5	1.07	18.5	5.64	33	10.06
4	1.22	19	5.79	33.5	10.21
4.5	1.37	19.5	5.94	34	10.36
5	1.52	20	6.10	34.5	10.52
5.5	1.68	20.5	6.25	35	10.67
6	1.83	21	6.40	35.5	10.82
6.5	1.98	21.5	6.55	36	10.97
7	2.13	22	6.71	36.5	11.13
7.5	2.29	22.5	6.86	37	11.28
8	2.44	23	7.01	37.5	11.43
8.5	2.59	23.5	7.16	38	11.58
9	2.74	24	7.32	38.5	11.73
10	3.05	24.5	7.47	39	11.89
10.5	3.20	25	7.62	39.5	12.04
11	3.35	25.5	7.77	40	12.19
11.5	3.51	26	7.92	45	13.72
12	3.66	26.5	8.08	50	15.24
12.5	3.81	27	8.23	55	16.76
13	3.96	27.5	8.38	60	18.29
13.5	4.11	28	8.53	65	19.89
14	4.27	28.5	8.69	70	21.34
14.5	4.42	29	8.84	75	22.86
15	4.57	29.5	8.99	80	24.38
15.5	4.72	30	9.14	85	25.91
16	4.88	30.5	9.30	90	27.43
16.5	5.03	31	9.45	95	28.96
				100	30.48

APPENDIX G

Ranges of Transparency, Chlorophyll *a*, and Total Phosphorus

Based on our experience, mean annual transparency readings, Chlorophyll *a* and total phosphorus values for uncolored lakes have been roughly grouped into approximate ranges to indicate the status of lake productivity.

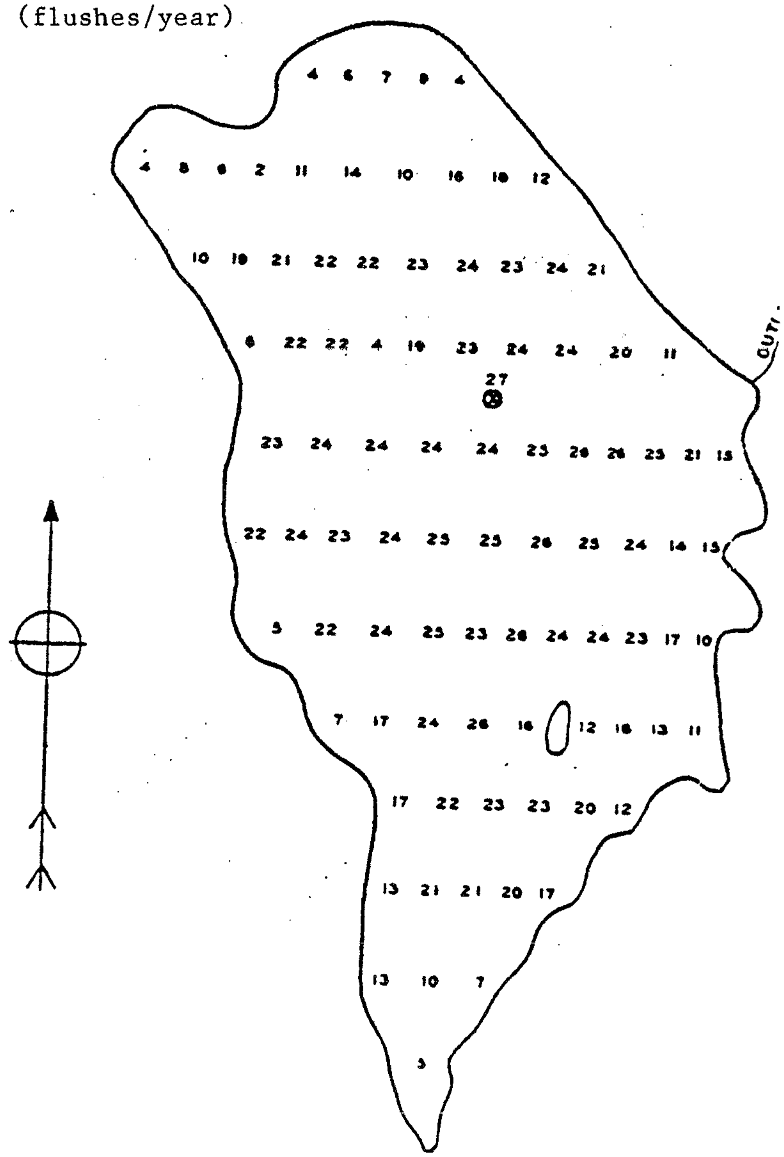
Transparency	
Productive	4 meters or less
Moderately Productive	4-7 meters
Unproductive	7 meters or more

Chlorophyll a	
Productive	7 ug/l or more
Moderately Productive	2-7 ug/l
Unproductive	2 ug/l or less

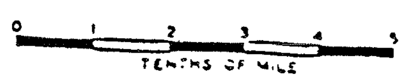
Total Phosphorus	
Productive	20 ppb or more
Moderately Productive	6-20 ppb
Unproductive	6 ppb or less

Abrams Pond #4444

Surface Area	172 ha (423 a)
Max Depth	8.1 m (27 ft)
Mean Depth	5.0 m (16.4 ft)
Volume	8.74 X $10^6 m^3$ (7114 acre-feet)
Drainage Area	6.22 Km^2 (2.4 mi^2)
Flushing rate	0.4 (flushes/year)



ABRAMS POND P1591
EASTBROOK AND FRANKLIN TWPS
IN HANCOCK CO.
ELEV. 167. FT.



Abrams Pond #4444

	1980	1981	1982
Mean Secchi (m)	3.9*(3)	5.2*(4)	6.7 *1
Min. Secchi (m)	3.7	4.0	
TSI	NA	NA	NA
Color (SPU)		10	
pH (Core)		6.7	
Chla (ug/l)		5.8(1s)	
TP (ppb)		11(1s)	

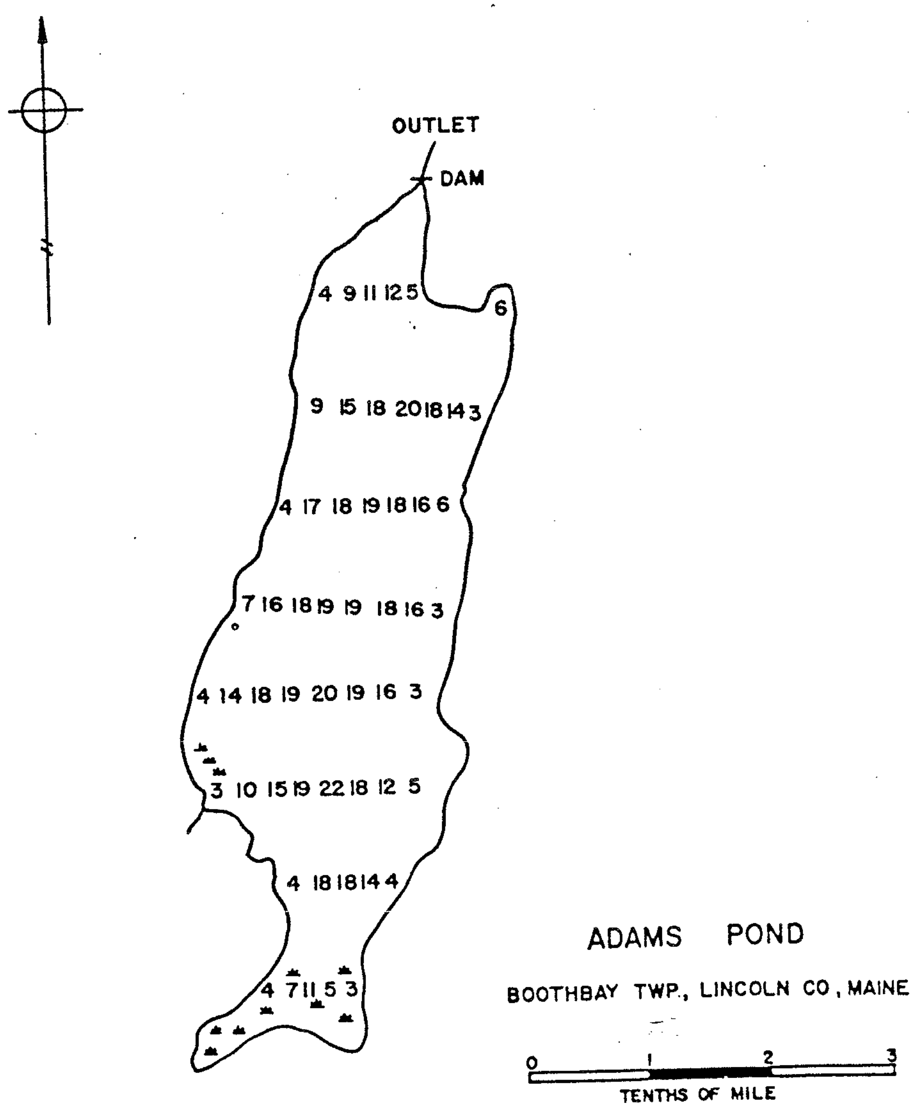
*inadequate sampling season
(1s) late summer

Abrams Pond is shallow and does not stratify. The pond is best suited to warm water fish species such as bass and perch, although some brook trout can be found.

The flushing rate of Abrams Pond is only 0.4 flushes per year which is considered slow. This condition may indicate that Abrams Pond is vulnerable to water quality degradation. The Chla and Tp values are moderate. Predicting water quality and water quality trends is difficult due to inadequate sampling seasons; however, no water quality problems have been documented.

Adams Pond #5366

Surface Area	29 ha(72a)
Max. Depth	6.7 m (22 ft)
Mean Depth	3.2 m (10 ft)
Drainage Area	3.83 km^2 (1.47 mi^2)
Volume	0.92 X 10^6 m^3 (720 acre-feet)
Flushing Rate	2.1 (flushes/year)



Adams Pond #5366

	1980	1981	1982
Mean Secchi (m)	2.0	2.6	3.4
Min. Secchi (m)	1.2	2.4	2.5
Mean TP (ppb)	33	28	27
Mean Chla(ug/l)	22.9	11.0	6.8
Color (SPU)	37	33	
TSI	96Chl	75Chl	66Chl

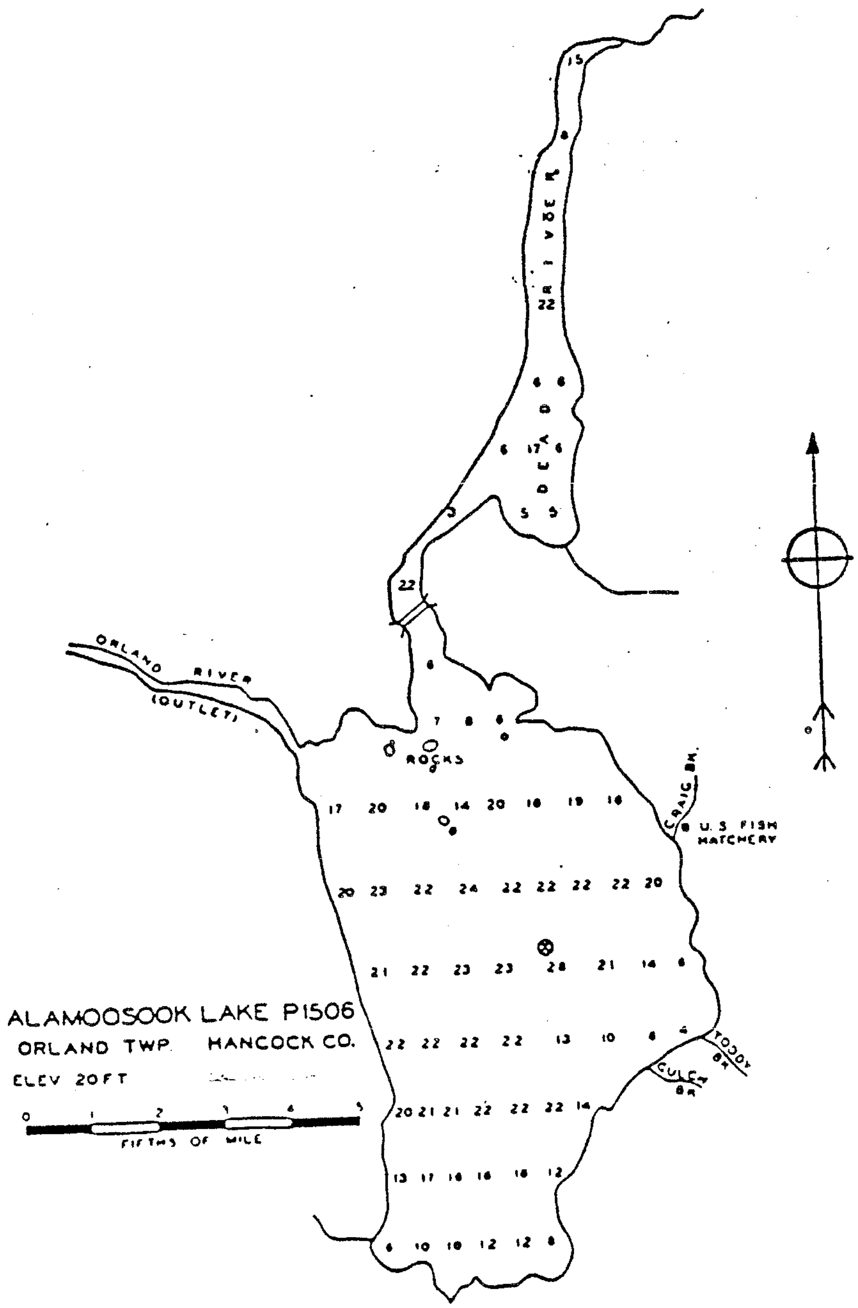
As part of a Step I Facilities Plan for Boothbay, which studies alternative methods of sewage disposal, a limited water quality survey conducted through 1980-81 by DEP showed Adams Pond to be highly productive with a bloom of blue-green algae in 1980. The major source of phosphorus to the lake appears to be a small tributary draining the developed area of Boothbay Center which contributes 44 percent of the phosphorus loading but represents only 19 percent of the drainage area. Phosphorus export from this area is typical of urban areas. Monitoring of the tributary is continuing in order to pinpoint sources within this drainage and determine need and methods of improved sewage treatment. Fecal coliform (FC) and fecal streptococcus(FS) bacteria counts for the surface of the center of the lake were often high for lake stations (>20/100 mls) but always below the Maine Dept. of Human Services guideline (200/100mls).

Chl<u>a</u> and TP levels are high and indicate that Adams Pond is a highly productive lake. Transparency is low even considering the moderate water color.

Water quality has improve slightly over the last 3 years. Secchi disk transparency is deeper and TP and Chl<u>a</u> values have lessened but are still considered high.

Alamoosook Lake # 4336

Surface Area	459 ha (1133 a)
Max. Depth	8.5 m (28 ft)
Mean Depth	4.7 m (15.4 ft)
Volume	19.0 X 10^6 m^3 (15447 acre-feet)
Drainage Area	210.57 Km^2 (81.3 mi^2)
Flushing Rate	6.2 (flushes/year)



Alamoosook Lake #4336

	1977	1978	1979	1980	1981	1982
Mean Secchi(m)	3.9	4.2	4.1	4.2*(2)	4.1*(4)	4.5*(4)
Min. Secchi(m)	3.0	3.0	2.9	4.0	3.5	3.2
TSI	63	58	59	NA	NA	NA
Color(SPU)		15(S)			35	
pH (core)		7.0(S)			7.0	
Chla (ug/l)		3.0(1s)			5.2(1s)	
TP (ppb)		11(1s)	10(spring)		14(1s)	

* inadequate sampling season
(1s) late summer
(S) surface

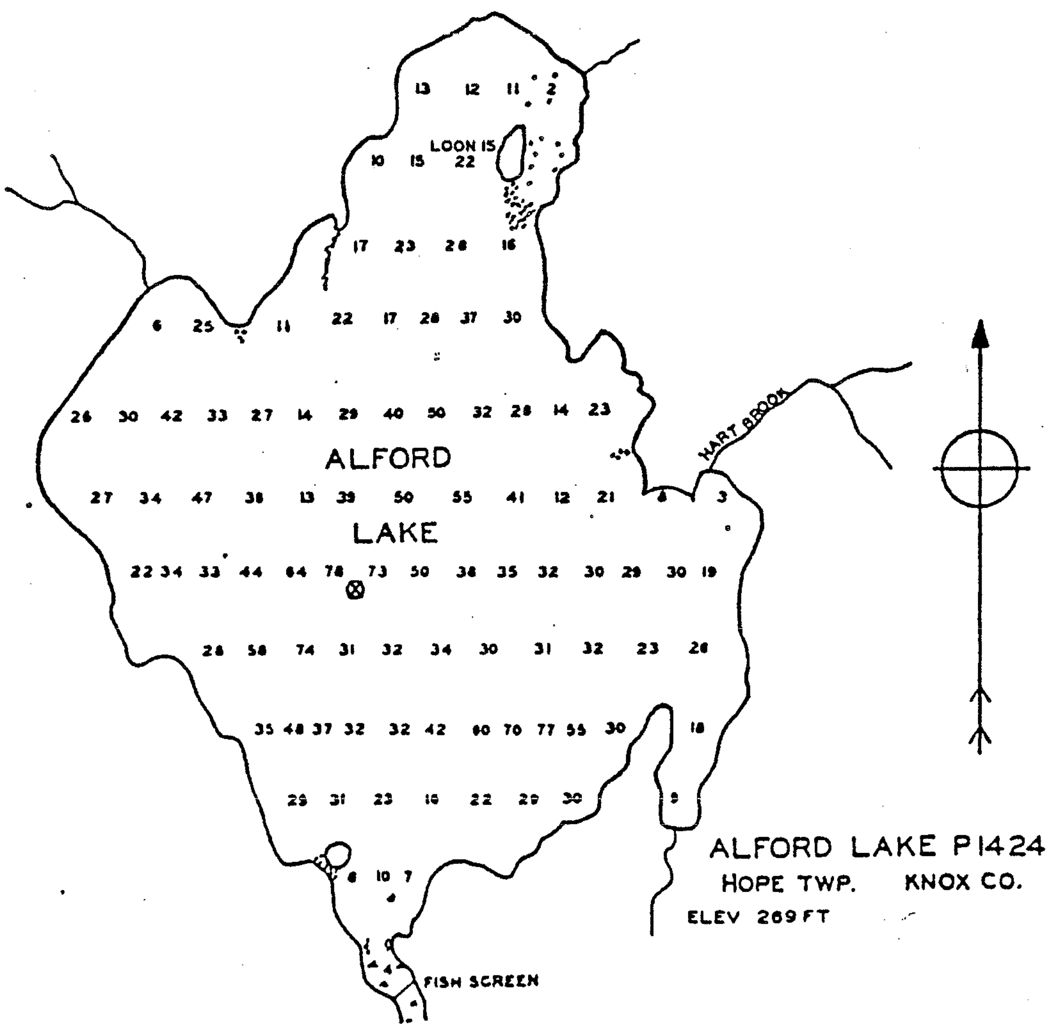
The lake is shallow and does not stratify. Alamoosook is managed for smallmouth bass, white perch, and alewives. Salmon and brook trout are rare.

Because the basin is large, shallow, and open to the wind, transparency is interfered with on windy days by resuspended silt.

Water quality appears stable judging by transparency readings; however, the last three years of data are incomplete which makes the predictions less certain. Both Chlorophyll*a* and TP were higher in 1981 than in 1978. Continued monitoring of Alamoosook *is* necessary to keep track of future water quality.

Alford Lake #4798

Surface Area	219.3 ha (542 a)
Max. Depth	23.8 m (78 ft)
Mean Depth	9.3 m (30.4 ft)
Volume	20.3×10^6 m^3 (16488 acre-feet)
Drainage Area	18.8 Km^2 (7.28 mi^2)
Flushing Rate	0.56 (flushes/year)



Alford Lake # 4798

	1981	1982
Mean Secchi(m)	6.9*(4)	6.8
Min. Secchi(m)	6.0	5.5
TSI	NA	33
Color (SPU)		8
Chla (ug/l)		1.6(ls)
TP (ppb)		5(ls)(c)
		11(ls)(b)

* Inadequate sampling season

(b) bottom, (ls) late summer, (c) core

"Alford Lake contains a large amount of water suitable for coldwater fishes. The dissolved oxygen in the deep, cold water is satisfactory for salmon and trout, but there are few areas available for coldwater fish to spawn successfully."

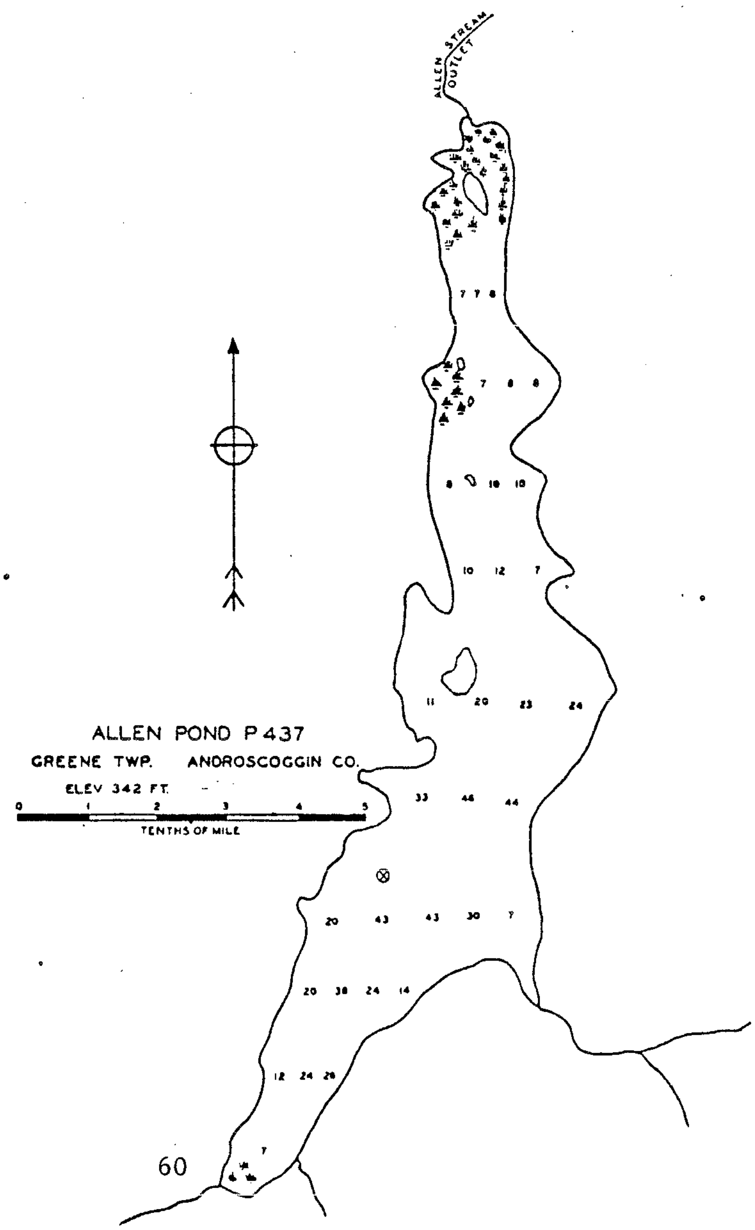
"Alford Lake was stocked frequently with salmon prior to 1953. Occasional stockings of brook trout were also undertaken. Then, unfortunately, brown trout were stocked in 1953 and for several years thereafter. Salmon and brook trout populations dwindled. Fishermen soon became dissatisfied with the poor returns from brown trout stocking. An experimental program of salmon stocking was begun in an attempt to restore salmon fishing. Brown trout compete severely with salmon, and attempts to restore salmon fishing at other lakes containing brown trout have been disappointing. It is recommended that the Department continue the experimental salmon stocking program. Further studies are necessary before accurate conclusions can be made concerning the success of salmon restoration in this body of water." 1

Alford Lake has good to excellent water quality. Secchi disk transparency is above average for lakes in Maine. Chl*a* and TP values are low. Some oxygen depletion (i.e. less than 5 ppm) does occur below 15m but anoxic conditions (ie less than 1 ppm) do not exist at this time.

1. Taken from Inland Fisheries and Wildlife Survey

Allen Pond #3788

Surface Area	76 ha (190 a)
Max. Depth	13.8m (46 ft)
Mean Depth	5.2m (16 ft)
Drainage Area	7.51 km^2 (2.90 mi^2)
Volume	3.92 X $10^6 m^3$ (3178 acre-feet)
Flushing Rate	1.0 (flushes/year)



Allen Pond #3788

	1978	1979	1980	1981	1982
Mean Secchi (m)	4.9*(4)	4.8*(4)	5.7*(1)	4.9*(4)	4.9
Min. Secchi (m)	4.2	3.8		4.2	3.7
TSI	NA	NA	NA	NA	49
Color (SPU)	15		20		
Chl*a* (ug/l)			2.2 (ls)		
TP (ppb)	8 (ls)		9 (ls)		
pH (core)			6.2		

* inadequate sampling season

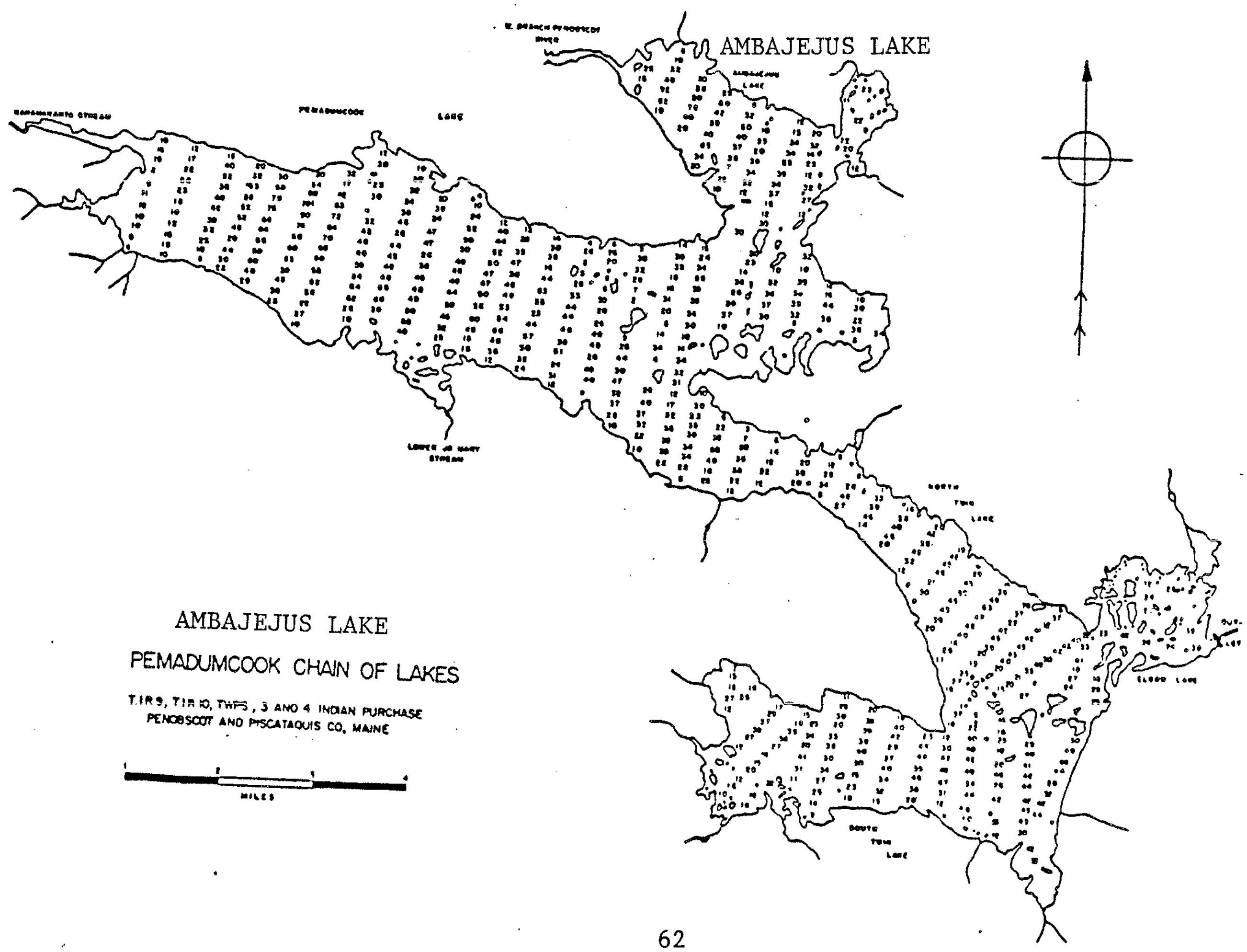
(ls) late summer

Allen Pond has average water quality for Maine lakes. The Chl*a* and TP values are low to moderate. Inadequate sampling seasons prevent an accurate prediction of water quality trends but the lake appears to be stable.

An oxygen deficiency exists below 6m (ie less than 5 ppm). This lack of oxygen as well as competition from warm water fish limit the cold water fisheries in the pond.

Ambajejus Lake #0982

Surface Area	
Max. Depth	28.0 m (92 ft)



Ambajejus Lake #0982

	1981	1982
Mean Secchi (m)	4.5	4.5*(4)
Min. Secchi (m)	3.5	3.8
TSI	54	NA
Color(SPU)		42
pH		
Chl*a* (ug/l)		2.3 (ls)
TP (ppb)		8 (ls)

* Inadequate sampling season.

(ls) late summer

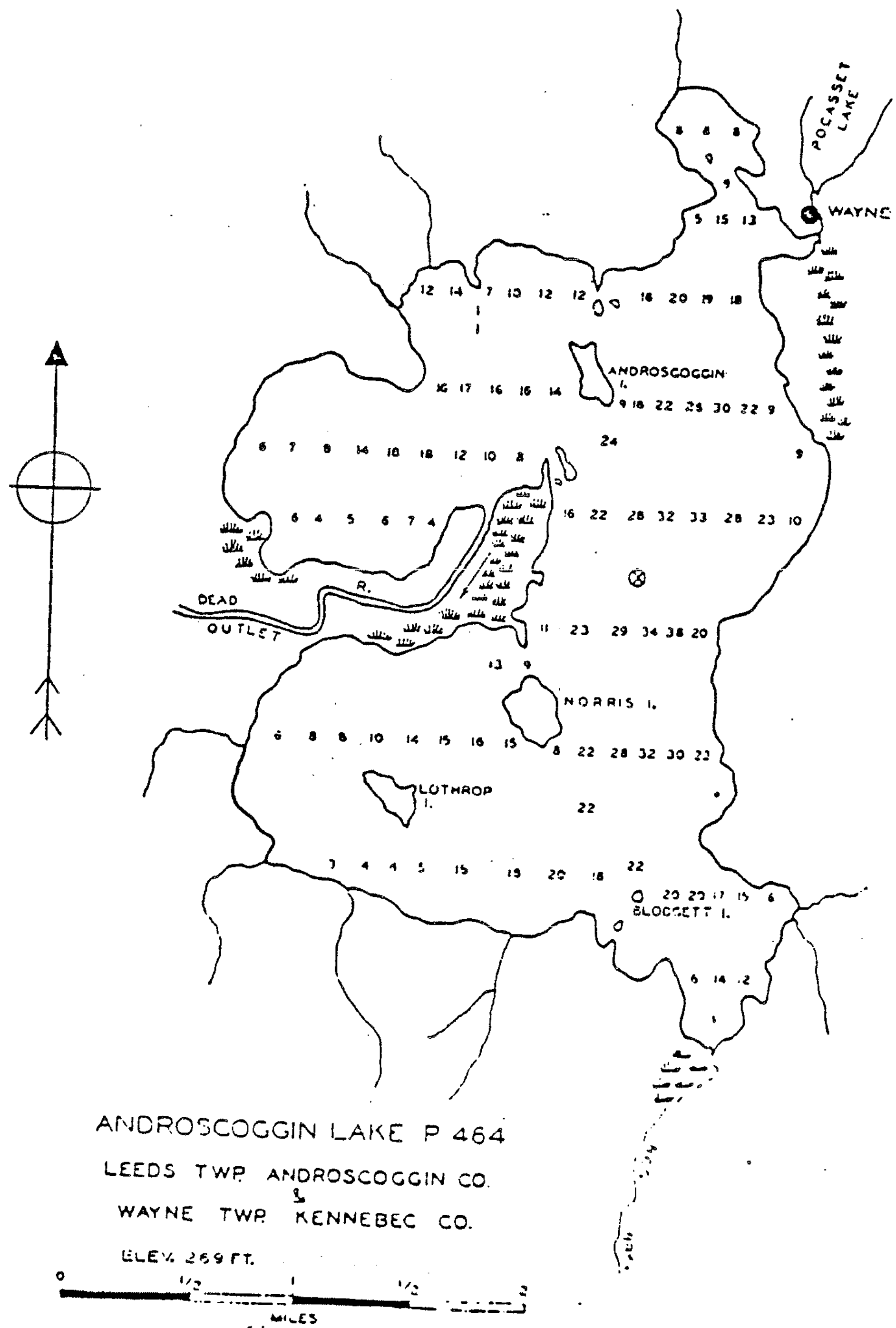
Ambajejus Lake is best suited for warm water fish. Principal fishes are white perch and pickerel.

Transparency is slightly below average for Maine lakes, probably due to color. Chl*a* and TP values are low to moderate.

Ambajejus is part of the Pamadumcook Chain of Lakes.

Androscoggin Lake #3836

Surface Area	1563 ha (3826 a)
Max. Depth	11.4 m (38 ft)
Mean Depth	4.2 m (13.8 ft)
Volume	69.0 X 10^6 m^3 (56098 acre-feet)
Drainage Area	215 km^2 (83 mi^2)
Flushing Rate	1.6 (flushes/year)



Androscoggin Lake # 3836

	+ 1976	1978-79	1980	1981	1982
Mean Secchi(m)	4.5	4.1	4.5	4.3	4.5
Min. Secchi(m)	4.0	2.5	3.2	3.5	3.2
Chla(ug/l)	3.6(mean)	2.9(ls)	2.7(f)	3.0(mean)	
TP (ppb)	13.5(mean)	13(ls)		13(ls)	
TSI	49	59	54	48	53
TSI Range	44-54 CHL-SD			40-56 CHL-SD	
Color (SPU)		20	20	20	
pH		6.9	6.9	6.8	

* Inadequate sampling season
(ls) late summer.

+ limited data from 1971-1973 show low TP values and transparency ranging from 4.3m to 7.3m.

The lake is shallow and does not stratify. It is managed for warm water fishes, although occaisionally brown trout have been stocked. The Department of Inland Fisheries and Wildlife is considering annual stocking of brown trout.

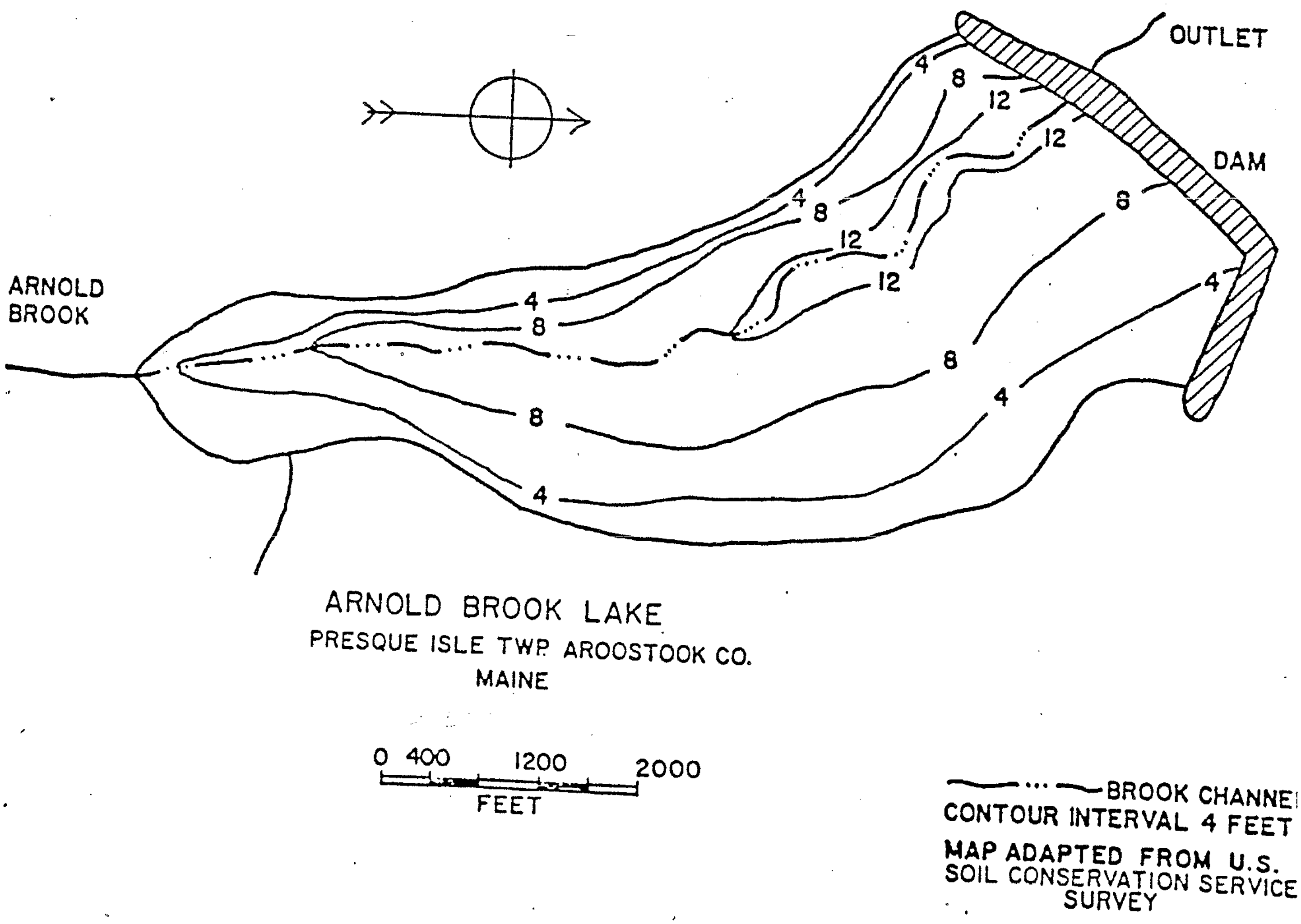
Androscoggin Lake has a limited capacity to assimilate nutrients and recovery time from degradation is moderate.

In 1979 transparency was markedly shallower than in other years. The monitors felt that the decline might have been due to the fact that the Androscoggin River overflowed the dam and ran into the lake that year. The flooding of the Androscoggin River into the lake may explain the decline, but we are not sure; the Androscoggin has flowed into the lake other years. Testing done in 1976 when the Androscoggin was flowing into the lake indicated that the river was not affecting the lake at that time. We cannot be sure why transparency declined in 1979. Transparency has again stabilized around 4.5m. Although this is slightly below average for lakes in Maine, it is considered good water quality.

Chlorophylla and TP levels for the lake appear stable between 1976 and 1981. Chlorophyll levels are low to moderate and total phosphorus values are moderate.

Arnold Brook Lake #0409

Surface Area	194 ha (485 a)
Max Depth	4.5 m (15 ft)
Mean Depth	2.0 m (6.6 ft)
Volume Area	3.87×10^6 m^3 (3160 acre-feet)
Drainage Area	15.28 Km^2 (5.9 mi^2)
Flushing Rate	1.8 (flushes/year)



Arnold Brook Lake # 0409

	1979	1981
Mean Secchi (m)	0.4*(2)	1.3*(4)
Min. Secchi (m)	0.3	1.1
Mean Chl*a*		20.2*(4)
Mean TP		49*(4)
TSI	NA	NA
Color	60	
pH	7.1	8.2

* Inadequate sampling season

"Arnold Brook Lake is a man-made impoundment created in 1971 through cooperation of the U.S. Soil Conservation Service and the city of Presque Isle. This is one of a series of multiple purpose flood control and recreational impoundments planned and completed for the Presque Isle Stream watershed under Public Law 566".

"Much of the lake has a swampy shoreline of spruce, fir and cedar. Trees and brush were cut and burned within the impoundment prior to flooding but boaters should watch for numerous remaining submerged stumps. Cattails are spreading over much of the shallow area. Other floating and submerged aquatic plants are becoming established and should provide good waterfowl habitat".

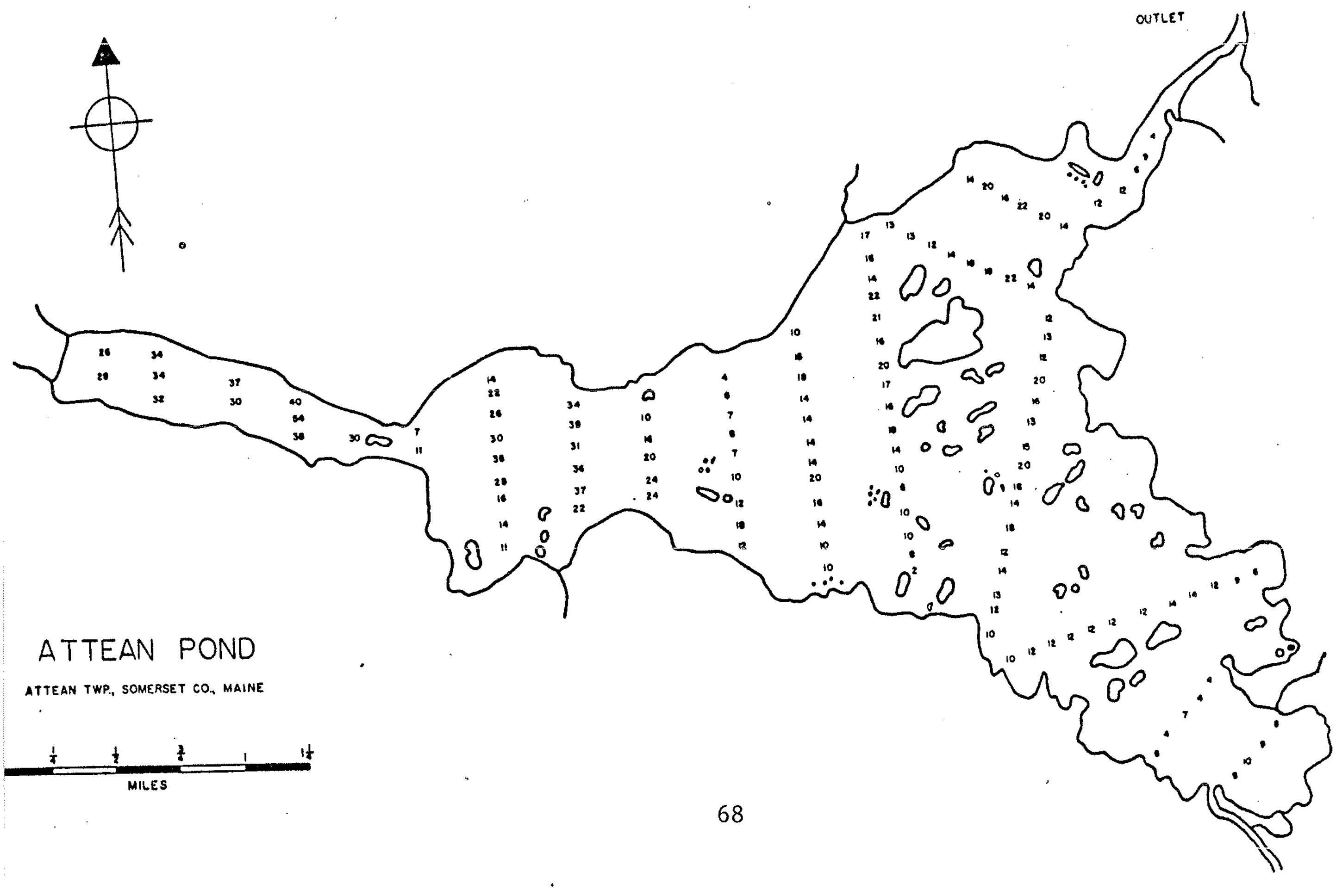
"Water quality in Arnold Brook Lake is not well-suited for coldwater gamefish. Vegetation and organic material left after clearing the impoundment is now decomposing and resulting in an oxygen deficiency in the deeper, cooler water. The extensive areas of shallow water created by the impoundment have permitted proliferation of non-game fish which compete with brook trout".(1)

Arnold Brook Lake is very productive; it has dense algal blooms each year. Part of the productivity may be due to its being such a young lake. It may take many years before the lake comes to equilibrium.

(1) Taken from Department of Inland Fisheries and Wildlife Survey.

Attean Pond # 2682

Surface Area	1089 ha (2722 a)
Max. Depth	16.2 m (54 ft)
Mean Depth	4.2 m (13.9 ft)
Volume	45.7 X $10^6 m^3$ (37,044 acre-feet)
Drainage Area	689.7 km^2 (266.3 mi^2)
Flushing Rate	6.2 (flushes/year)



Attean Pond # 2682

	1982
Mean Secchi(m)	3.0
Min. Secchi(m)	2.6
TSI	colored
Color (SPU)	40
Chl*a* (ug/l)	3.1 (ls)
TP (ppb)	11 (ls)(c)
	12(ls)(b)
pH (core)	6.8

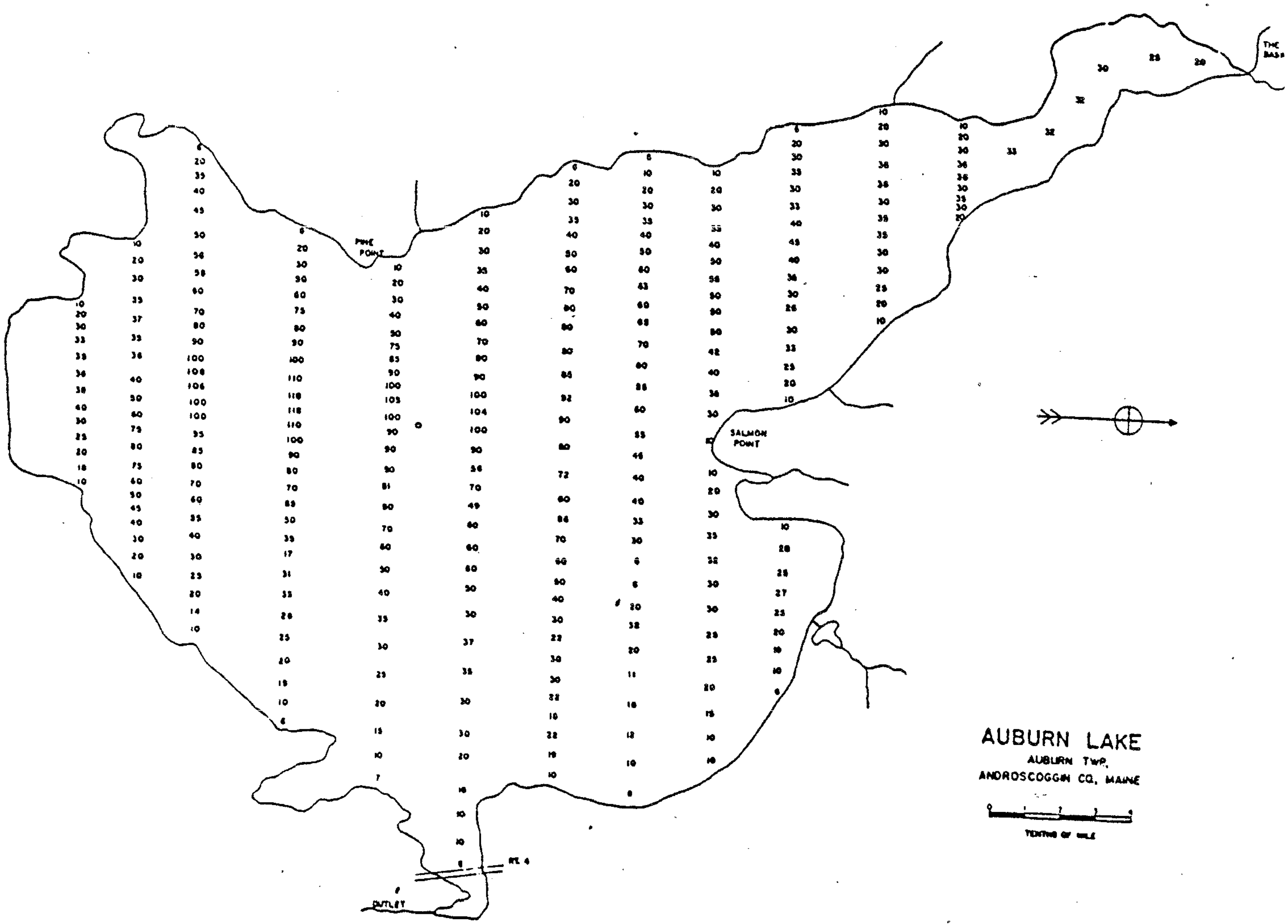
(ls) late summer, (b) bottom, (c) core

Attean Pond has good water quality. Brown water color which is caused by natural tannins and lignins dissolving from aquatic vegetation is interferring with the Secchi disk transparency. Color causes the Secchi disk TSI (76) to be over estimated which is why we do not calculate TSI based on Secchi disk on colored lakes. The Chl*a* and TP values are moderate.

The Department of Inland Fisheries and Wildlife manages the pond for cold water game fish such as salmon and brook trout. Lake trout are also found in the pond. Yellow perch have become well established in the pond and are adversely affecting the cold water fishery.

Auburn Lake #3748

Surface Area	897 ha (2217 a)
Max. Depth	35.4 m (116 ft)
Mean Depth	12.2 m (40 ft)
Volume	1.1 X 10^8 m^3 (89431 acre-feet)
Drainage Area	47.4 Km^2 (18.3 mi^2)
Flushing Rate	0.2 (flushes/year)



Auburn Lake # 3748

	1978	1979	1980	1981	1982
Mean Secchi (m)	6.1*(1)	6.9*(2)	6.1*(1)	7.0*(3)	7.8
Min. Secchi (m)		6.7		5.6	6.1
TSI	NA	NA	NA	NA	27
Color(SPU)			10		
pH(core)			6.9		
Chla(ug/l)			3.6		
TP(ppb)			18(b)		
			7(c)		

* Inadequate sampling season
(c) core, (b) bottom

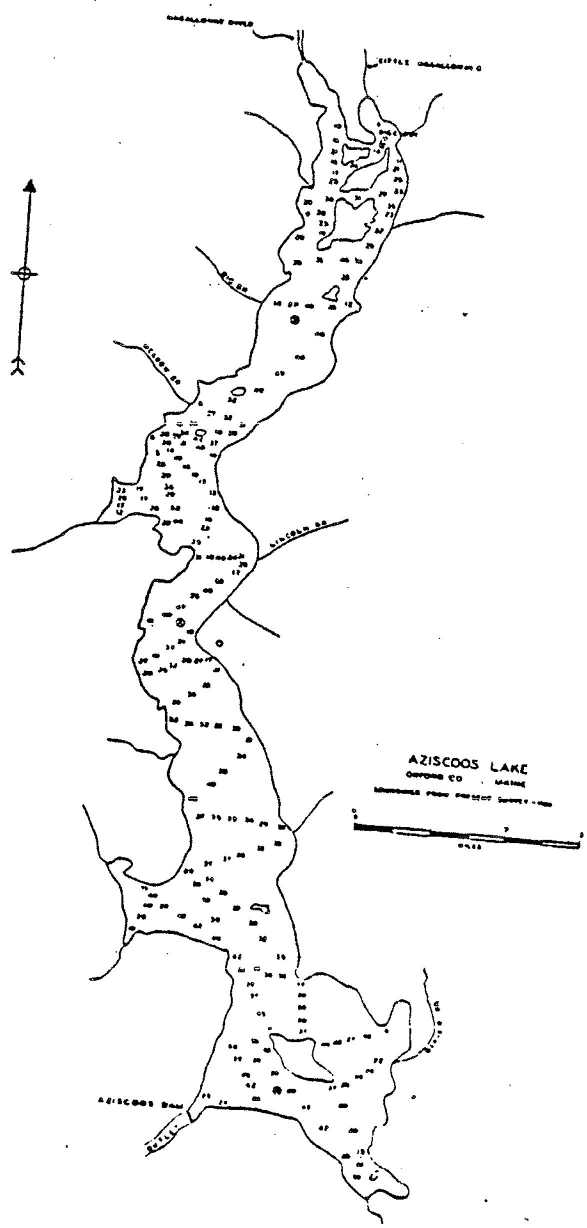
The lake is the water supply for Auburn.

The hypolimnion has a large volume of well oxygenated water providing excellent habitat for coldwater fishes.

It is hard to predict water quality trends due to inadequate sampling seasons. Present water quality is good to excellent. The 1982 transparency readings exceed the average transparency values for lakes in Maine by two meters.

Aziscohos Lake (Aziscoos Lake or Sawyer Lake) #3290

Surface Area 2711 ha (6700 a)
Max depth 18.3 m (60 ft)
Drainage Area 554.4 km^2 (214.0 mi^2)



Aziscohos Lake #3290

	1981	1982
Mean Secchi (m)	5.2	5.1
Min. Secchi (m)	4.8	3.6
TSI	46	47
Color(SPU)		23
Chl*a* (ug/l)		2.6 (ls)

(ls) Late summer

"Aziscohos Lake is an artificial impoundment caused by damming the Magalloway River near Wilson's Mills. The lake has a maximum depth of 60 feet. The surface water becomes relatively warm during the summer and water below approximately 30 feet becomes low in dissolved oxygen. Aziscohos Lake thus offers fair but not excellent water quality for trout and salmon". (1)

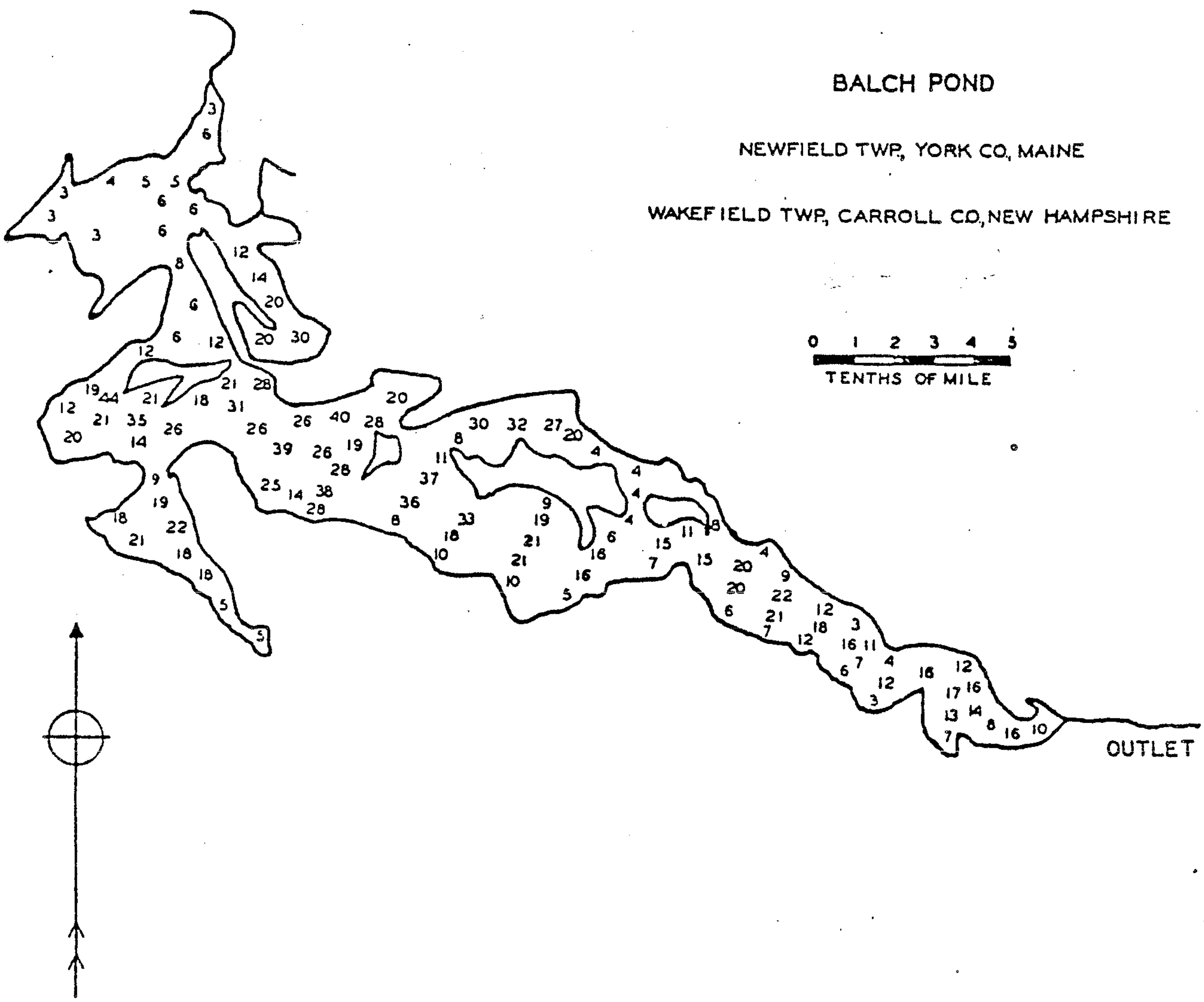
Aziscohos Lake has good water quality. Transparencies are average for lakes in Maine. Chl*a* values are considered low.

There is a discrepency between pH readings obtained by the monitor and DEP. The monitor has been getting values of 5.5 but this Department's sampling of Aziscohos Lake showed a pH value of 6.7. It is unknown at this time what is causing this wide difference in pH readings; it may be a difference in sampling techniques. DEP will be studying the problem in 1983. A standard technique is being developed so that pH readings taken by monitors and this Department's staff will be consistent.

(1) Taken from Department of Inland Fisheries and Wildlife Survey

Balch Pond #3898

Surface Area	210.0 ha (519 a)
Max. Depth	13.2 m (43.3 ft)
Mean Depth	3.9 m (12.8 ft)
Volume	8.1 X 10^6 m^3 (6585 acre-feet)
Drainage Area	37.04 Km^2 (14.3 mi^2)
Flushing Rate	2.7 (flushes/year)



Balch Pond #3898

	1978	1979	1980	1981	1982
Mean Secchi (m)	4.8	5.3	5.7	5.6	5.6
Min. Secchi (m)	4.0	5.0	5.5	5.0	5.0
TSI	50	45	42	43	42
Color(SPU)			20		
pH(core)			6.3		
Chl<u>a</u>(ug/l)			2.6(ls)		
TP(ppb)			8(ls)		

(ls) late summer

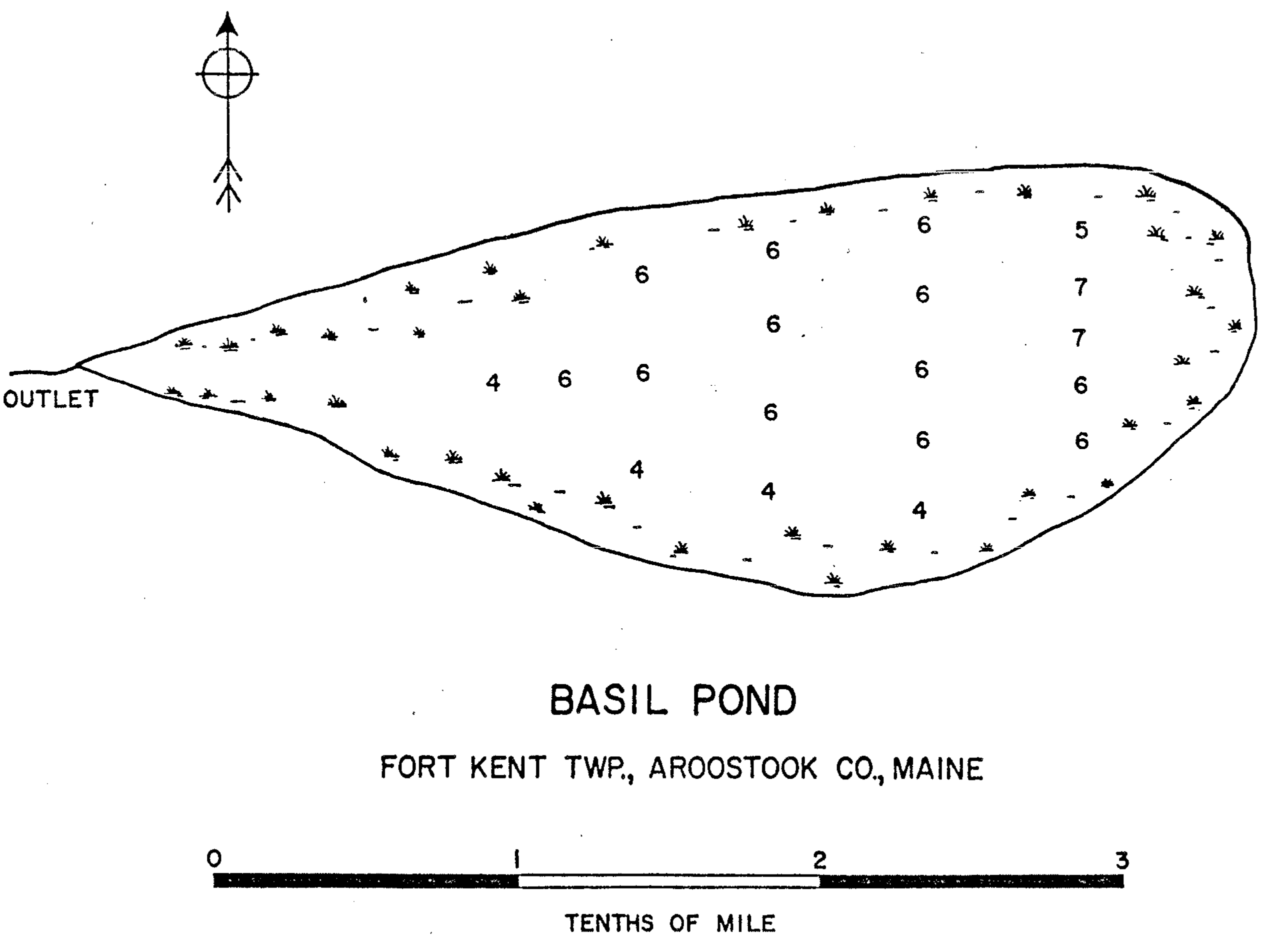
Lake shore residents are concerned about the aquatic plants and filamentous algae in the coves. These types of plants prefer shallow, quiet waters and muddy shores. The coves provide this type of habitat. The causeways to the different islands have reduced the flushing rate to these coves. Large culverts were added to the causeways in 1980 to aid flushing and should help relieve water quality and aquatic plant problems. The aquatic plants can be removed by raking or cutting provided a Great Ponds Permit is acquired.

Transparency readings indicate good, stable water quality. Chl<u>a</u> and TP values were slightly higher in 1980 than 1977, but do not indicate any problems. Transparency readings have improved since 1978 and appeared to have stabilized.

The Department of Inland Fisheries and Wildlife is currently managing the pond for warmwater game fish such as smallmouth bass, largemouth bass, and black crappie.

Basil Pond #0417

Surface Area	5.0 ha (12.5 a)
Max. Depth	2.1 m (7 ft)
Mean Depth	1.1 m (3.6 ft)
Volume	$5.7 \times 10^4 m^3$ (46 acre-feet)
Drainage Area	2.05 km^2 (0.79 mi^2)
Flushing Rate	18.2 (flushes/year)



Basil Pond # 0417

	1982
Mean Secchi (m)	1.7+*(3)
Min. Secchi (m)	1.5+
TSI	NA

+ Secchi disk hit bottom
* inadequate sampling season

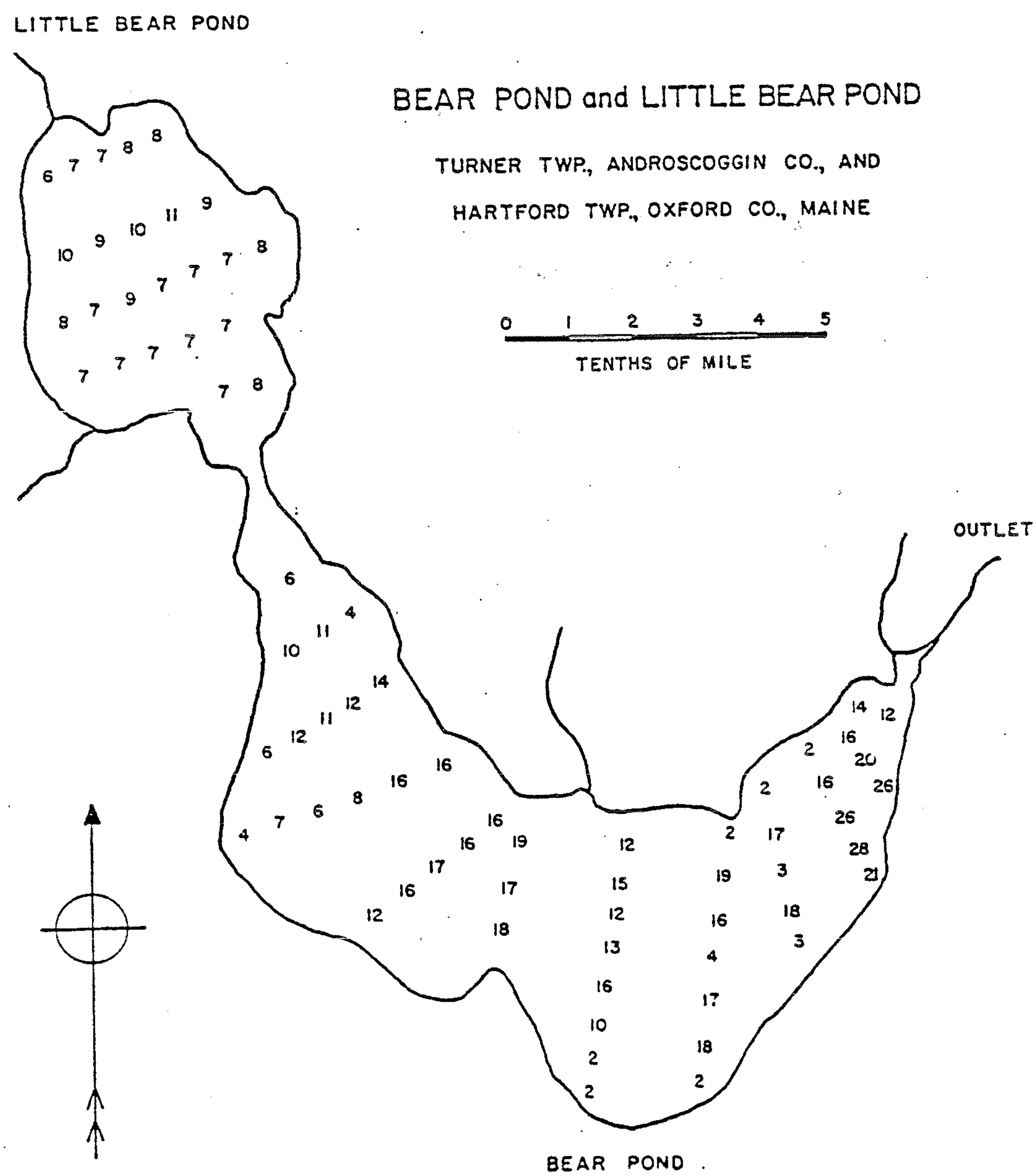
Basil Pond is very shallow and does not stratify. It is surrounded by a border of floating heath bog partly broken away from shore.

The pond is managed for brook trout.

Due to the shallow depth of the pond, the Secchi disk transparencies are not a good indicator of water quality, since the readings are limited to the depth of the pond.

Bear Pond (Big Bear Pond) #3624

Surface Area	128 ha (316 a)
Max Depth	8.5 m (28 ft)
Mean Depth	3.2 m (10.5 ft)
Volume	4.2 X 10^6 m^3 (3415 acre-feet)
Drainage Area	19.4 Km^2 (7.5 mi^2)
Flushing Rate	2.6 (flushes/year)



Bear Pond (Big Bear Pond) #3624

	1977-78	1979	1980	1981	1982
Mean Secchi (m)	6.2*	5.6+	5.9+	6.2+	6.4
Min. Secchi (m)	5.0	5.2	5.0	5.5	5.5
TSI	NA	42+	39+	37+	36
Color(SPU)	10		15		
pH(core)			6.8		
Chl*a*(ug/l)	2.1(1s)		3.2(1s)		
TP(ppb)	10(1s)		10(1s)		

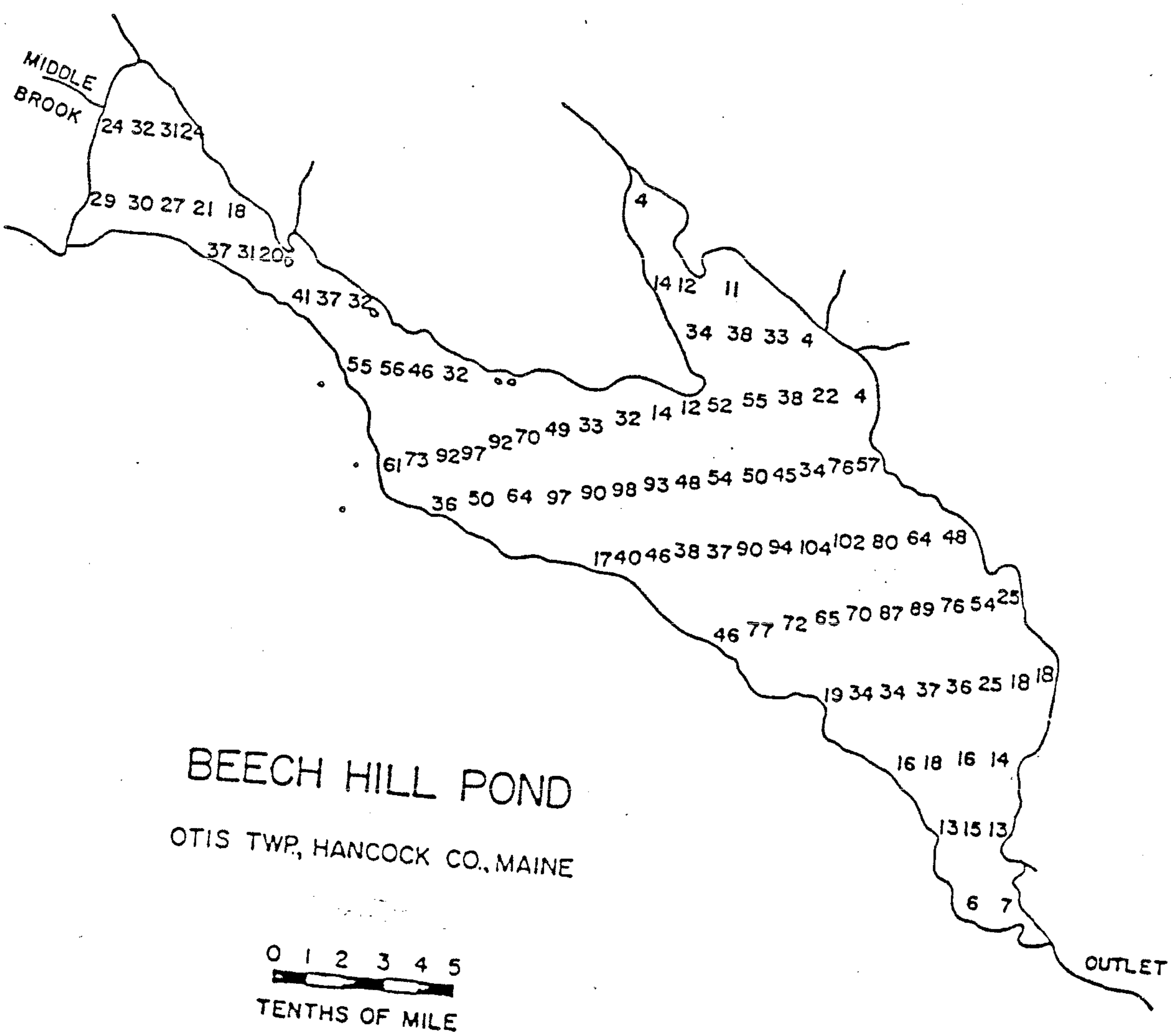
* Inadequate sampling season
+Secchi disk hit bottom underestimating water quality
(1s) late summer

The water quality of Bear Pond is underestimated because the Secchi disk readings are more a reflection of the depth of the lake than water quality. If the pond were deeper, the transparency would be greater. The fact that one can see bottom at 6 to 7m. does indicate unusually good water quality. Chl*a* and TP values are low to moderate with little change between 1978 and 1980.

Bear Pond is shallow and does not stratify; it is managed for smallmouth bass.

Beech Hill Pond #4352

Surface Area	547 ha (1351 a)
Max. Depth	31.7 m (104 ft)
Mean Depth	11.6 m (38 ft)
Volume	6.41×10^7 m^3 (52,000 acre-feet)
Drainage Area	24.6 Km^2 (9.5 mi^2)
Flushing Rate	0.2 (flushes/year)



Beech Hill Pond #4352

	1974-76(X)	1977-79	1980	1981	1982
Mean Secchi(m)	9.0	7.7*	9.3*(4)	9.4	8.7
Min. Secchi (m)	7.3	6.0	8.5	9.1	7.9
Chla (ug/l)	1.5 (mean)		1.2(ls)		
TP (ppb)	6.1 (mean)		5(ls)		
TSI	24	NA	NA	19	22
TSI Range	21-32 SD-TP				
Color(SPU)	15		15		
pH(core)	6.8		6.4		

* Inadequate sampling season
(ls) late summer

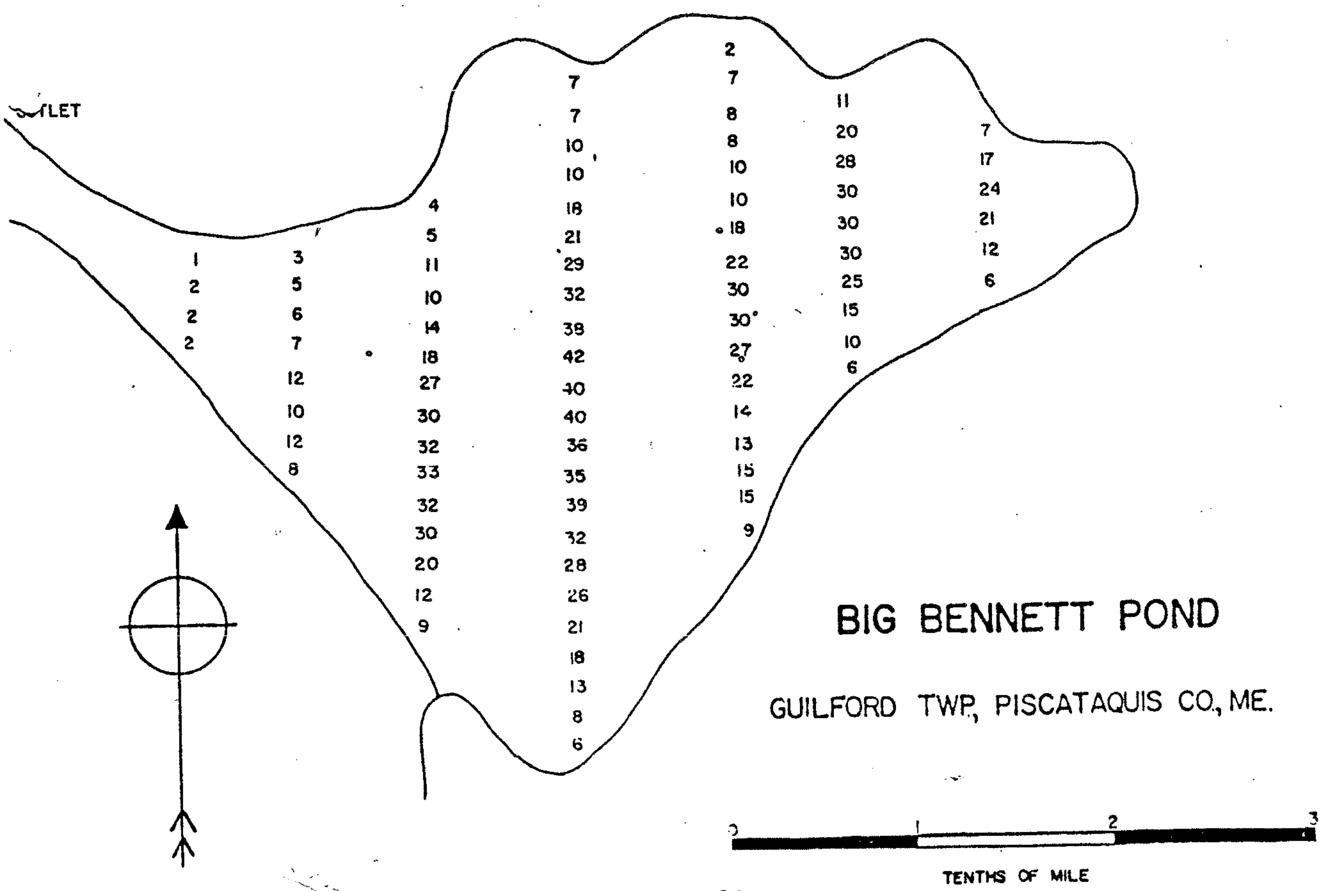
(x) Data was collected from 1974-1976 as part of a cooperative project between DEP and the U.S. Geological Survey.

The hypolimnion is well oxygenated and supports an excellent cold water fishery. The lake is managed for its natural togue population and stocking of salmon has been reinstated by the Department of Inland Fisheries and Wildlife.

Beech Hill Pond continues to have excellent water quality; transparencies are far above average for Maine lakes. Chla and TP values are low.Such high water quality is a rare natural resource and should be carefully protected and maintained. The lake has a slow flushing rate but its large volume of water keep the pond from being extremely vulnerable to water quality degradation.

Big Bennett #0844

Surface Area	25 ha (61a)
Max. Depth	12.8m (42 ft)
Drainage Area	5.85 km^2 (2.26 mi^2)



Big Bennett #0844

	1981	1982
Mean Secchi (m)	3.1	4.7
Min. Secchi (m)	1.8	3.0
TSI	75	52
Color(SPU)		20
Chl*a* (ug/l)		1.5 (ls)
TP (ppb)		5 (ls)(c)
		17(b)(ls)
pH(core)		7.1

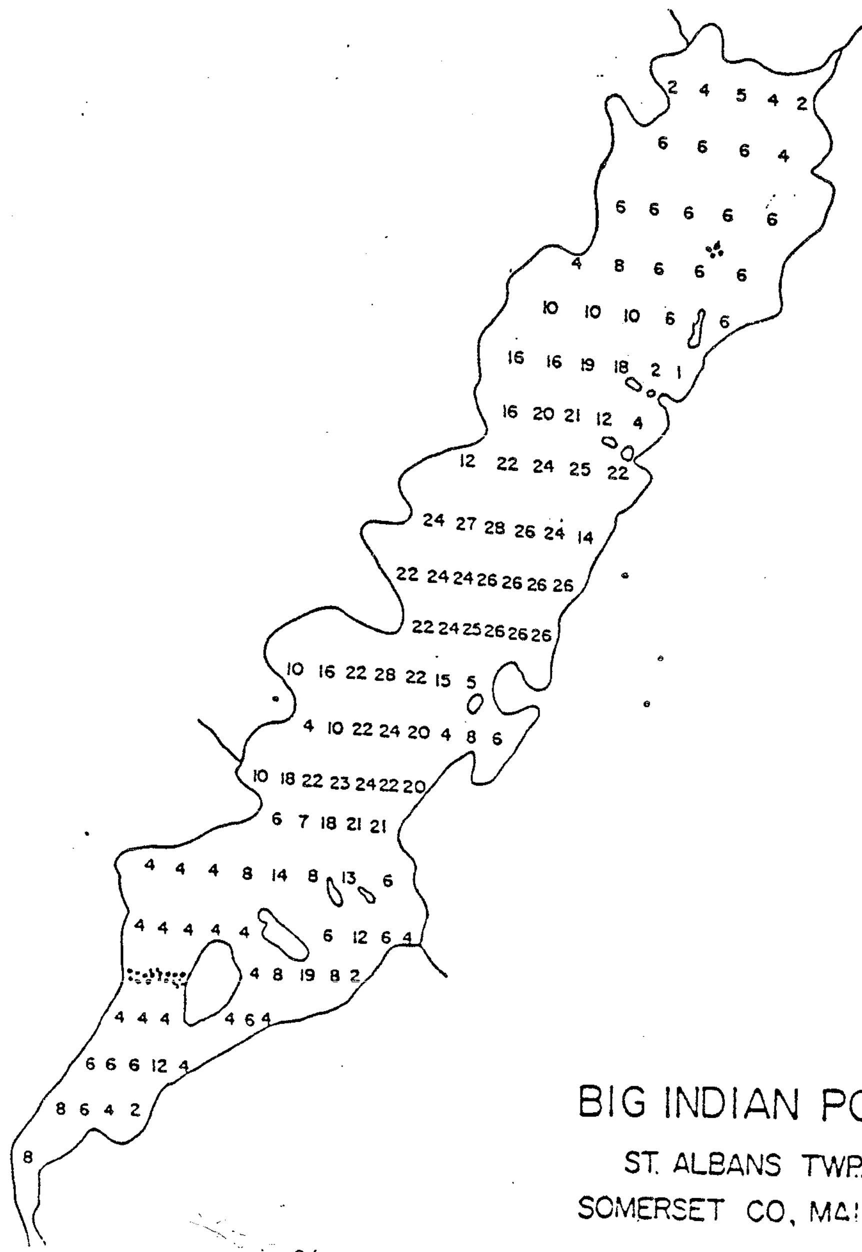
(c) core, (ls) late summer, (b) bottom

Big Bennett Pond is a small pond with a sizeable volume of water of suitable quality for coldwater game fishes, although there is an oxygen deficiency below thirty feet. The pond is stocked annually with brook trout. Salmon and smelt have also been found in the pond.

Transparencies are below average. The reasons for this reduced clarity are not completely understood at this time but will be investigated during the 1983 sampling season. Chl*a* and TP values are low indicating water quality is better than the Secchi disk TSI indicates.

Big Indian Pond #5464

Surface Area	408 ha (1009 a)
Max. Depth	8.5 m (28 ft)
Mean Depth	3.0 m (9.8 ft)
Volume	1.2×10^7 m^3 (9756 acre-feet)
Drainage Area	77.5 Km^2 (29.8 mi^2)
Flushing Rate	3.2 (flushes/year)



BIG INDIAN POND

ST. ALBANS TWP,

SOMERSET CO, MAINE

Big Indian Pond #5464

	1977-78	1979	1980	1981	1982
Mean Secchi (m)	4.6	4.0*(2)	5.1*(1)	5.2*(2)	6.8*(1)
Min Secchi (m)	1.5	3.7		4.0*	
TSI	52	NA	NA	NA	NA
Color(SPU)		20		15	20
pH(core)		7.2			7.2
Chla(ug/l)		4.1(ls)			1.8(ls)
TP(ppb)	9(spr)	9(ls)			9(ls)

* Inadequate sampling season
(ls) late summer, (spr) spring, (c) core

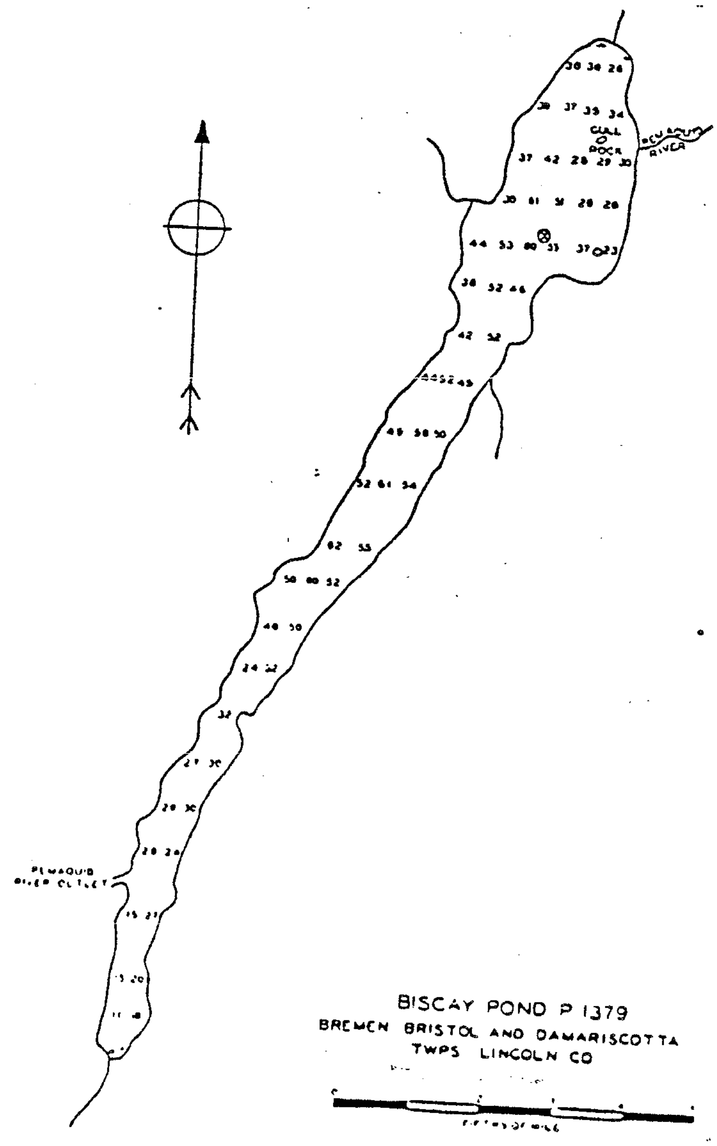
Indian Pond is shallow and does not stratify.

The pond is well suited for warmwater fish; perch, pickerel, and smallmouth bass inhabit the pond. The pond is also managed for brown trout.

Inadequate sampling seasons prevent accurate prediction of water quality, but it appears to be average for lakes in Maine. Chla levels are low to moderate and TP values are moderate.

Biscay Pond #5710

Surface Area	145 ha (358 a)
Max. Depth	18.6 m (61 ft)
Mean Depth	9.8m (32 ft)
Volume	14.2×10^6 m^3 (11,511 acre-feet)
Drainage Area	72.4 km^2 (28.0 mi^2)
Flushing Rate	3.1 (flushes/year)



Biscay Pond #5710

	1974-76	1979	1980	1981	1982
Mean Secchi (m)	4.5*	5.9*(4)	5.1	5.1*(4)	5.7*(4)
Min. Secchi (m)	3.8*	4.5	4.2	4.5	4.6
TSI	NA	NA	47	NA	NA
Color(SPU)	20	40		30	
pH	6.4(s)			6.6(c)	
Chla(ug/l)	4.3(ls)			3.9(ls)	
TP(ppb)	7(c)(ls)			9(c)(ls)	
	27(b)(ls)			17(b)(ls)	

*Inadequate sampling season
(ls) late summer, (b) bottom, (c) core, (s) surface

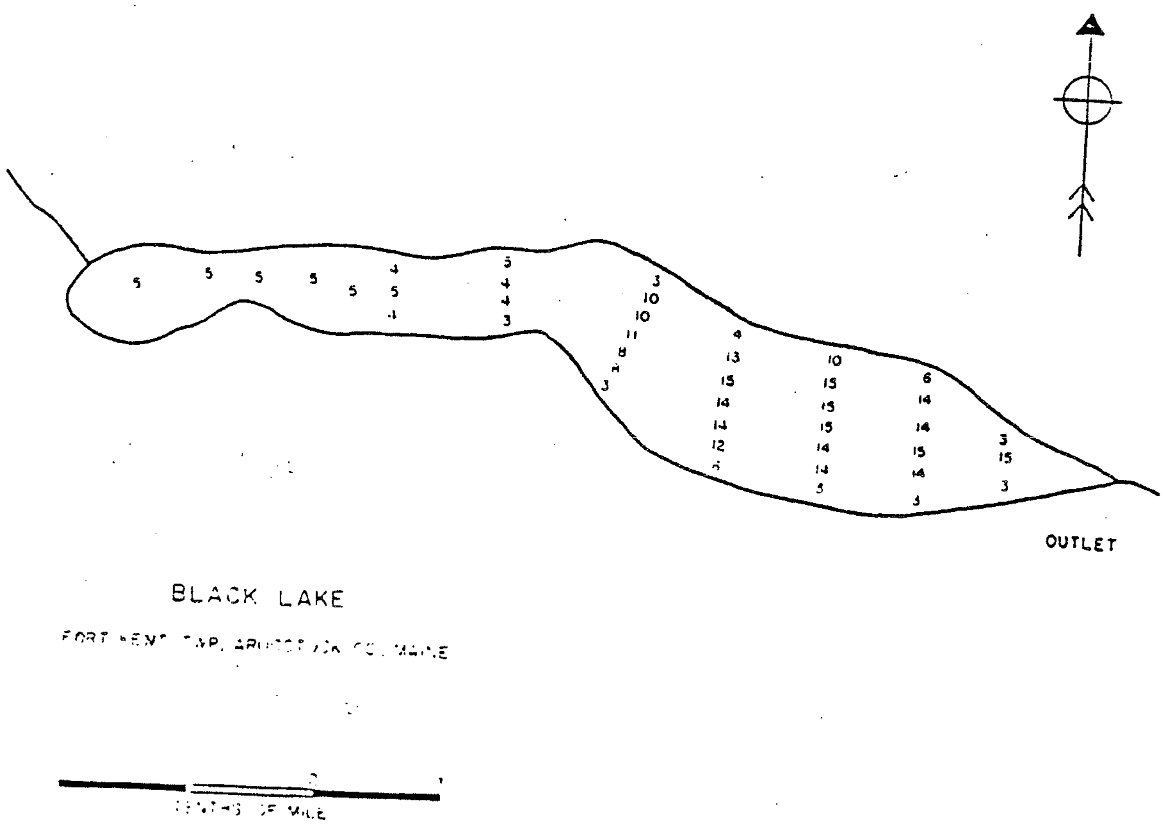
Water quality appears to be stable; although, predictions are somewhat uncertain due to short sampling seasons. There is a slight difference between Chla and TP values in 1976 and 1981 but is not significant. Chla and TP values are moderate and. Water quality is good.

The shoreline of the lake drops off very steeply which is unusual; most lakes have a gradual drop-off. The hypolimnion is largely depleted of oxygen (2ppm or less) by late summer.

The fishery consists primarily of smallmouth bass, brown trout, and alewives.

Black Lake #1666

Surface Area	20.6 ha (51 a)
Max Depth	4.6 m (15 ft)
Mean Depth	2.1 m (6.9 ft)
Volume	3.8×10^5 m^3 (309 acre-feet)
Drainage Area	2.9 Km^2 (1.12 mi^2)
Flushing Rate	3.9 (flushes/year)



Black Pond #1666

	1977	1980	1981	1982
Mean Secchi(m)	4.1* (1)+	2.9+	3.3	3.8+
Min. Secchi (m)		2.1	2.3	1.5
TSI	NA	78	71	63
Color(SPU)		25		
pH(core)	7.2	7.7		6.5
Chla(ug/l)	6.3(ls)			12.1 (ls)
TP(ppb)	27(ls)(s) 55(b)(ls)	27(f)		49(ls)

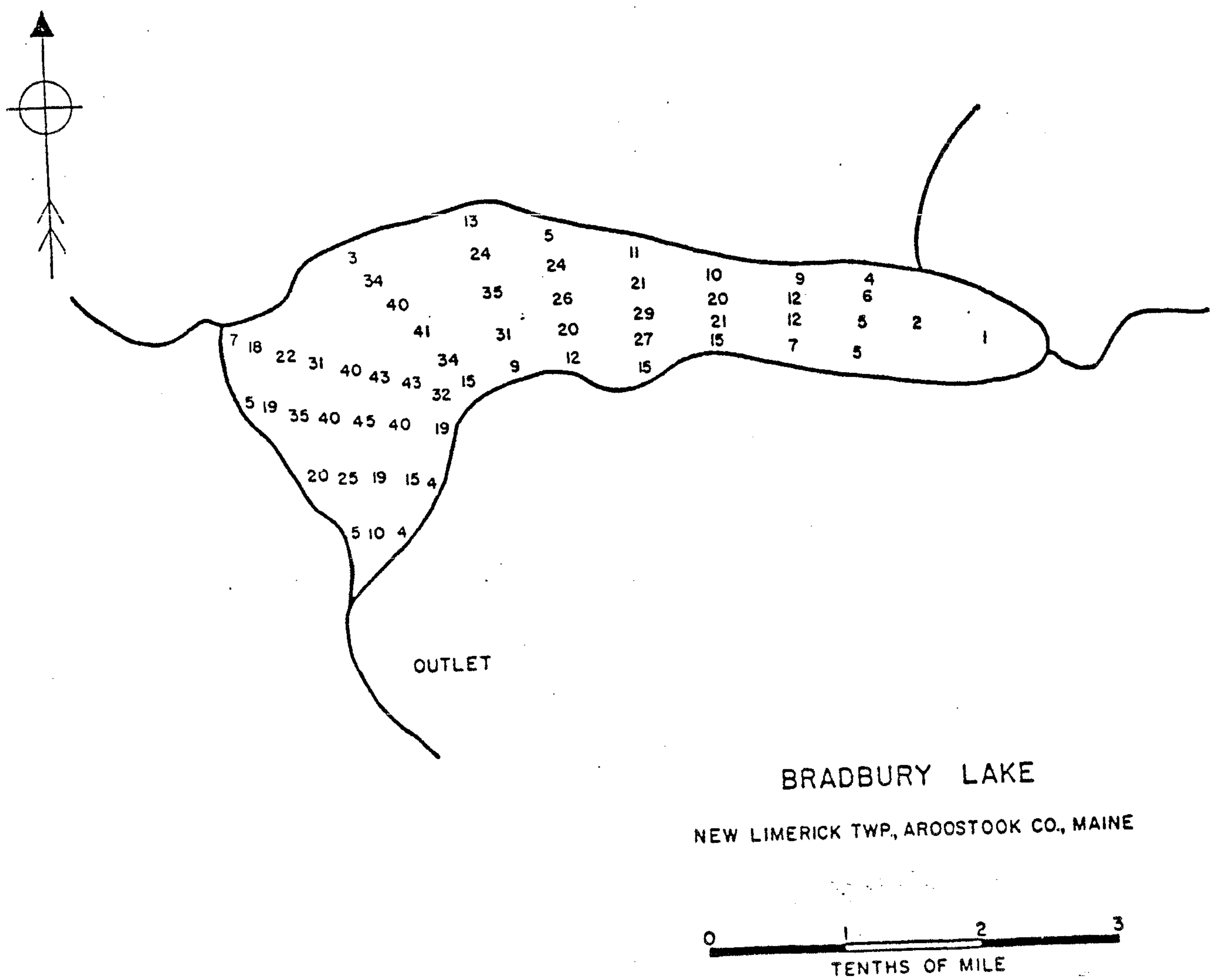
* Inadequate sampling season
\+ Secchi disk hit bottom and so underestimates water quality
(ls) late summer, (b) bottom, (f) fall, (s) surface

Black Lake has experienced algal blooms at least since 1956. The algal blooms are probably the result of phosphorus rich agricultural runoff. Phosphorus levels are high; generally levels of 15 ppb phosphorus are considered sufficient to support algal blooms. Farmers in the drainage area should try to reduce the amount of phosphorus rich runoff from their farms.

Black Lake is shallow and does not stratify. The pond was chemically reclaimed in 1968 to remove competing species of fish and to allow intensive management for brook trout.

Bradbury Lake (Barker Lake) #9763

Surface Area	16.0 ha (40 a)
Max Depth	13.5 m (45 ft)
Mean Depth	5.6 m (18.4 ft)
Volume	8.9 X 10^5 m^3 (724 acre-feet)
Drainage Area	1.04 Km^2 (0.4 mi^2)
Flushing Rate	0.6 (flushes/year)



Bradbury Lake (Barker Lake) #9763

	1981	1982
Mean Secchi (m)	8.0*(3)	6.8*(4)
Min. Secchi (m)	6.4	5.5
TSI	NA	NA
Color(SPU)		30

* Inadequate sampling season

Transparency readings indicate above average water quality. Such high water quality is a rare natural resource which should be carefully protected and maintained. This caution is particularly necessary in the case of Bradbury lake because of its slow flushing rate, and small volume which may indicate that it is vulnerable to water quality degradation. Incomplete sampling seasons prevent accurate prediction of water quality trends; continued monitoring with complete seasons is necessary.

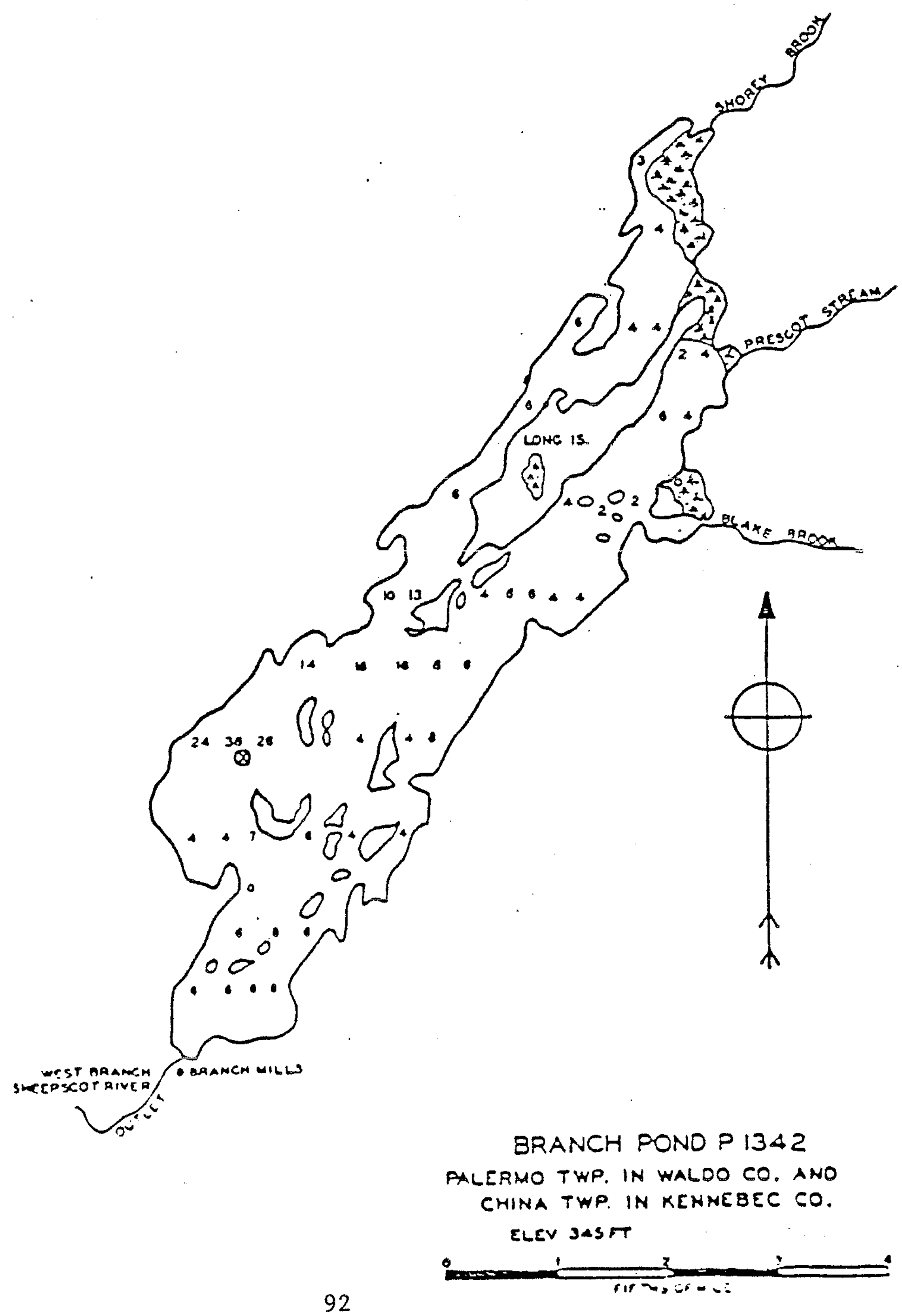
"Bradbury Lake contains cold, well-oxygenated water in its depths that is potentially suitable coldwater game fish habitat. However, abundant populations of warmwater fishes dictate management primarily for chain pickerel and white perch at the present time. A limited coldwater fishery may be sustained by migration of salmon and trout from connecting waters"

"Mill wastes introduced in the lake in past years are very much in evidence as deposits on the bottom of the lake in the shallow water".(1)

(1) Taken from Department of Inland Fisheries and Wildlife Survey

Branch Pond #5754

Surface Area	130.3 ha (322 a)
Max Depth	11.6 m (38 ft)
Mean Depth	1.8 m (5.9 ft)
Volume	2.2 X 10^6 m^3 (1789 acre-feet)
Drainage Area	23.2 Km^2 (8.95 mi^2)
Flushing Rate	5.5 (flushes/year)



Branch Pond #5754

	1980	1981	1982
Mean Secchi (m)	3.7	3.8	4.1
Min. Secchi (m)	2.3	3.1	3.2
TSI	64	63	59
Color(SPU)		30	32
pH(core)			7.2
Chla (ug/l)			4.7(ls)
TP(ppb)			14(c)(ls) 24(b)(ls)

(c) core, (ls) late summer, (b) bottom

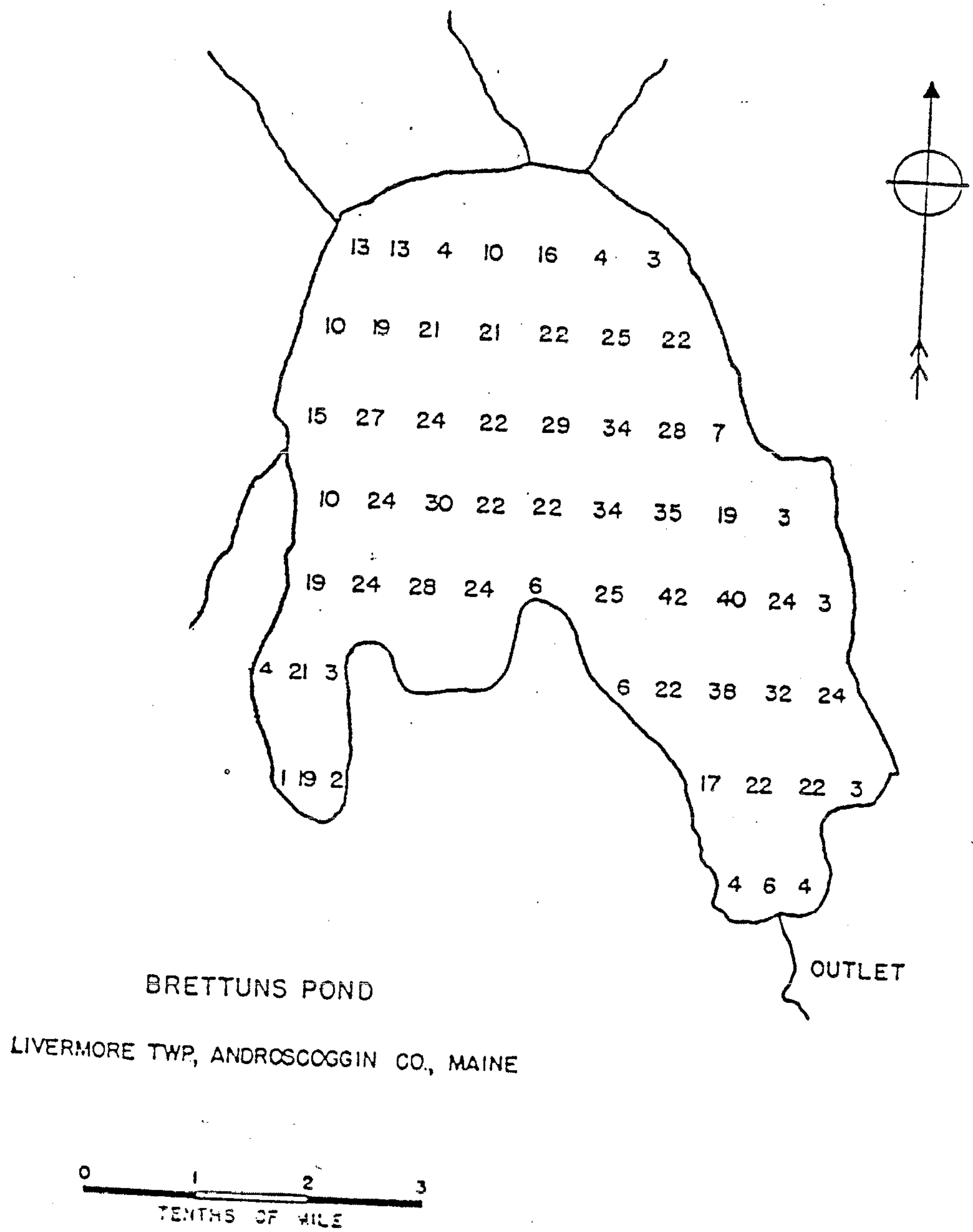
Branch Pond is a shallow pond with one small deep hole. The pond supports a warmwater fishery of perch and pickerel, and brown trout are stocked occasionally.

Water quality is good and appears to be stable according to Secchi disk readings. Transparency is somewhat reduced due to moderate water color; however, color does not affect water quality.

Chla and TP values are moderate. Oxygen depletion (i.e. less than 5 ppm) occurrs below 4 meters.

Brettuns Pond #3608

Surface Area	62 ha (154 a)
Max. Depth	12.8 m (42 ft)
Mean Depth	5.5 m (18 ft)
Volume	3.3×10^6 m^3 (2,700 acre-feet)
Drainage Area	10.6 Km^2 (4.1 mi^2)
Flushing Rate	1.8 (flushes/year)



Brettuns Pond #3608

	1974-76(x)	1977-79	1980	1981	1982
Mean Secchi (m)	4.5	4.4	4.6	4.6	4.7
Min. Secchi (m)	3.2	2.5	3.5	3.5	4.0
Chla (ug/l)	5.7mean	4.4(1s)		5.0(1s)	
TP (ppb)	10.7mean			7(1s)	
TSI	51mean	57	53	53	52
TSI Range	44-56 TP-Chl				
Color(SPU)	30	15		25	
pH	6.2	6.4		7.0(core)	

(+) There is limited data available from 1973 which documents an algal bloom.
(x) Data collected from 1974-76 as part of a cooperative project between DEP and U.S. Geological Survey
(1s) late summer

In 1973, the DEP investigated an algal bloom on the pond and found that the runoff from a poultry operation was a large source of nutrients to the pond. Clean up of the poultry operation greatly reduced the nutrient load and the lake began to recover quickly. In 1978 a truck accident, involving the same poultry operation accidently dumped manure into a tributary to the lake giving the lake another load of nutrients. In 1981 the same company was involved again in an incident where manure runoff got into the lake. The company has moved its manure piles to prevent future impact to the pond. Litigation involving financial penalties is still pending..

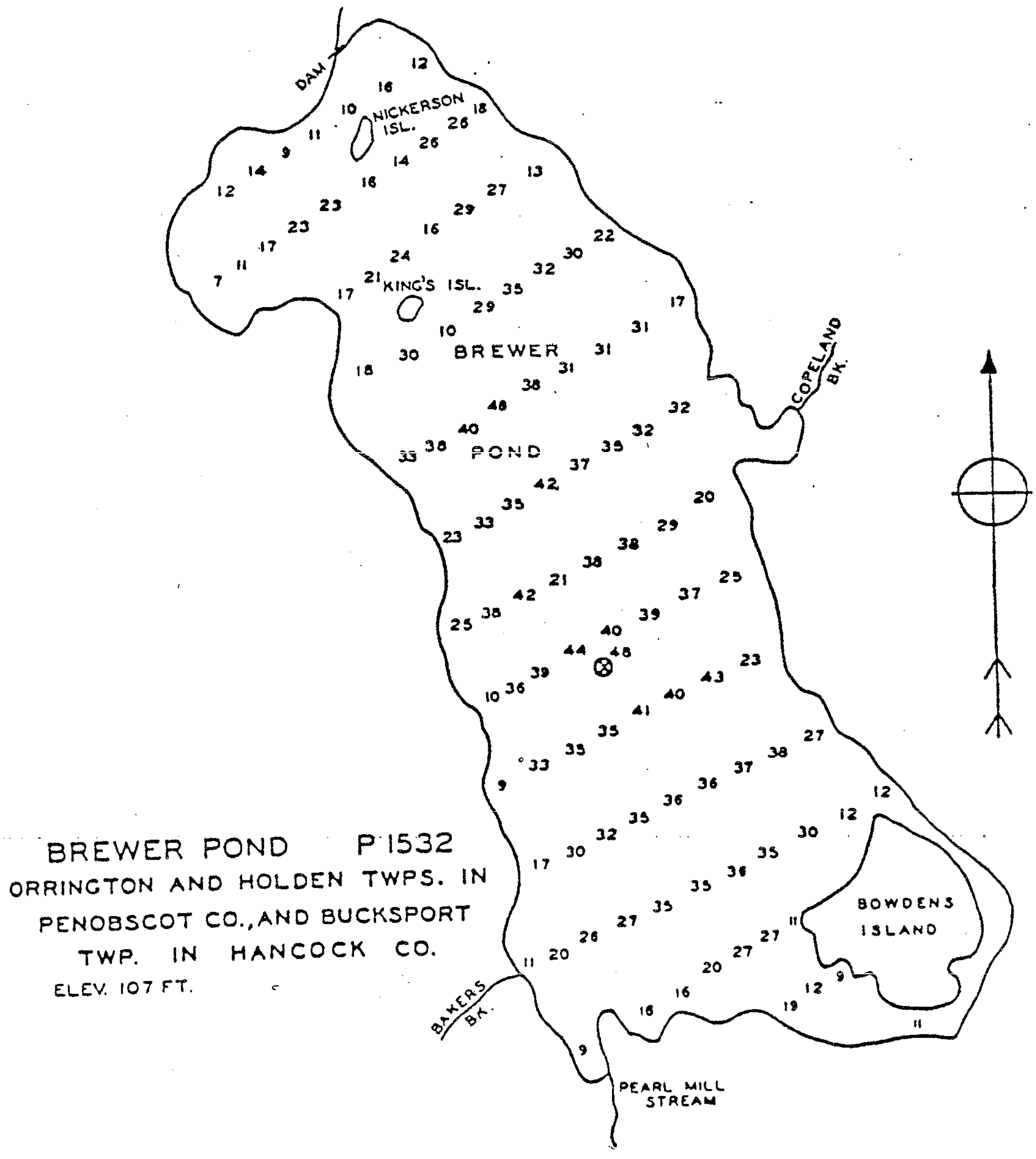
The situation at Brettuns Pond is a dramatic example of the effect excess nutrient loading has on a lake and that the reduction of that loading will allow the lake to improve. In most lakes the process is more subtle. The loading is increased gradually and with time the deleterious effects become apparent. Slowly the point and/or nonpoint sources are removed and gradually the lake recovers. On a larger scale this process can be seen in the histories of Annabessacook, Cobbossee, Sabattus, and many more.

The hypolimnion has little dissolved oxygen (less than 1ppm), by late summer. The pond is managed as a warmwater fishery. Brown trout are also stocked to improve the cold water fisheries.

Water quality is good and appears to be stable. The minimum Secchi disk reading has improved since the low in 1978. Chlorophyll and total phosphorus levels are moderate.

Brewer Pond #4284

Surface Area	357 ha (881 a)
Max. Depth	14.6 m (48 ft)
Mean Depth	7.0 m (23 ft)
Volume	2.47 X 10^7 m^3 (20,000 acre-feet)
Drainage Area	31.1 Km^2 (12.0 mi^2)
Flushing Rate	0.6 (flushes/year)



Brewer Pond #4284

	1974-76(x)	1977-79	1980	1981	1982
Mean Secchi(m)	4.4	4.6	4.4	4.7	4.5*(3)
Min. Secchi(m)	3.1	3.0	3.0	2.5	3.0
Chla (ug/l)	4.7mean			2.9(ls)	
TP (ppb)	10.7mean			12 (ls)	
TSI	51	56	54	52	NA
TSI Range	36 - 59 Chl SD				
Color(SPU)	10			20	
pH	6.9(s)			6.5(c)	

*Inadequate sampling season
(X) Data collected from 1974-76 as part of a cooperative project between DEP and the U.S. Geological Survey.
(ls) late summer, (s) surface, (c) core

The only documented algal bloom occurred in November, 1975, but the cause was never identified. Heavy development has taken place along part of the shoreline and erosion was quite severe from one development.

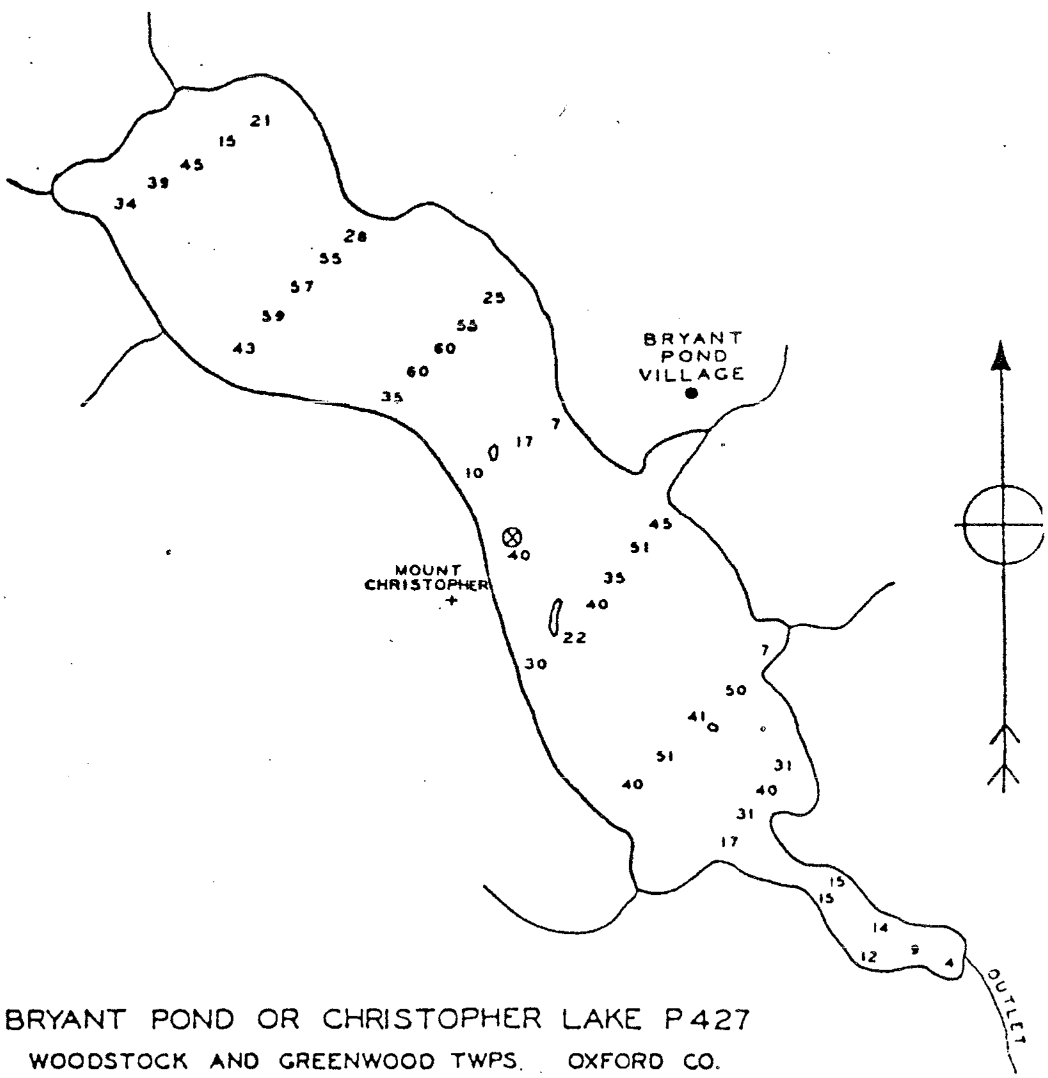
Because of the bloom in 1975, Brewer was downgraded to water quality class GP-B. No problems have been noted since that bloom so in 1979 Brewer was upgraded to GP-A (see section on classification in the Introduction).

The small hypolimnion is low in dissolved oxygen by late summer. The pond is managed as a warmwater fishery.

Water quality appears stable. Transparency fluctuates very little. Chlorophyll and total phosphorus values are moderate. The trophic state of the pond based on chlorophyll appears to be less productive than based on transparency, and the TP TSI (44) falls right in the middle of the other two parameters. The reason for the difference is not known, but, generally, chlorophyll is considered a more accurate measurement of trophic state.

Bryant Pond (Christopher Lake) # 3464

Surface Area	113 ha (278a)
Max. Depth	18.8m (60 ft)
Mean Depth	10.1 m (33.3 ft)
Volume	11.3 X 10^6 m^3 (9160 acre-feet)
Drainage Area	10.1 km^2 (3.9 mi^2)
Flushing Rate	0.5 (flushes/year)



BRYANT POND OR CHRISTOPHER LAKE P427

WOODSTOCK AND GREENWOOD TWPS. OXFORD CO.

ELEV. 694 FT

0 1 2 3 4 5

TENTHS OF MILE

Bryant Pond (Christopher Lake) #3464

	1977	1978	1979	1981
Mean Secchi (m)	4.2*(2)		4.5	6.8*(3)
Min. Secchi (m)	4.0		3.0	3.5
Chla	3.6(ls)	3.9(spr)	7.5mean	
TP	7(spr) 10(ls)(surf)		9(surf)	
TSI	NA	NA	59	NA
TSI Range			54-64 SD-CHL	
Color			24	
pH	6.7		7.0	

* Inadequate sampling season
(ls) late summer (spr) spring, (surf) surface

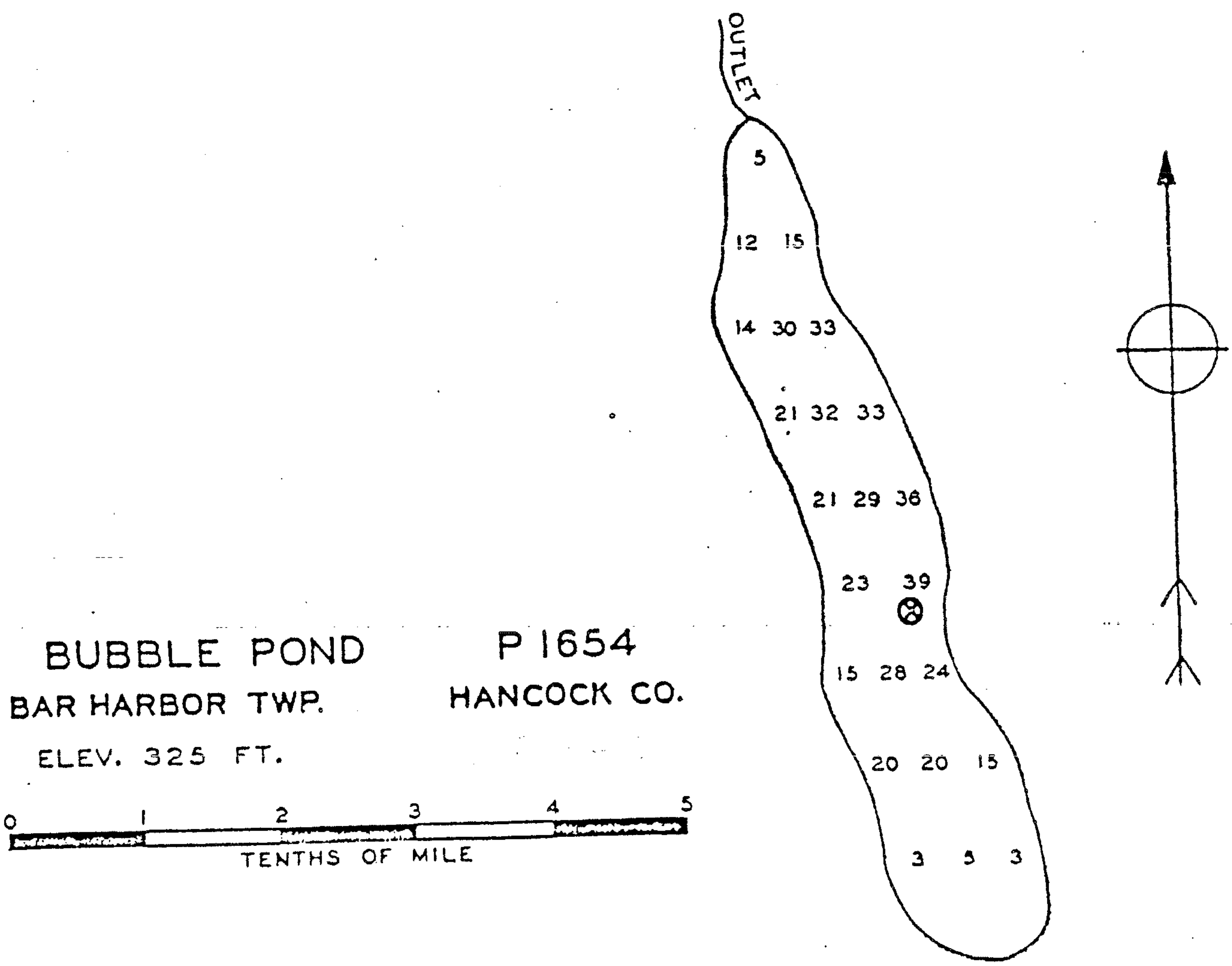
Tributary data showed that the two streams running through town had the highest TP concentrations. The tributary by the Fire Station (Trib-B) had a mean TP of 21.4 ppb and the tributary south of trib B (Trib A) had a mean TP of 34.6 ppb. Bacteria samples taken at these tribs suggest faulty sewage disposal may be the cause of the high TP. Bacteria and TP data also indicate that a potential problem may exist at the outlet of a small pond in Tributary A.

Originally the Town of Bryant Pond was on the DEP priority list to receive federal funding to help clean up the wastewater problem; however, it was determined that the most cost effective solution was to have the Town take care of the problem by insuring that homeowners build proper subsurface disposal systems.

It is difficult to detemine water quality trends due to short sampling seasons. Chla and TP values are moderate.

Bubble Pond #4452

Surface Area	13.0 ha (32 a)
Max. Depth	11.7 m (38.4 ft)
Mean Depth	4.9 m (16.0 ft)
Volume	6.4×10^5 m^3 (520 acre-feet)
Drainage Area	1.81 Km^2 (.7 mi^2)
Flushing Rate	1.8 (flushes/year)



Bubble Pond #4452

	1981
Mean Secchi(m)	8.5*(2)
Min. Secchi (m)	7.5
TSI	NA
Color	NA

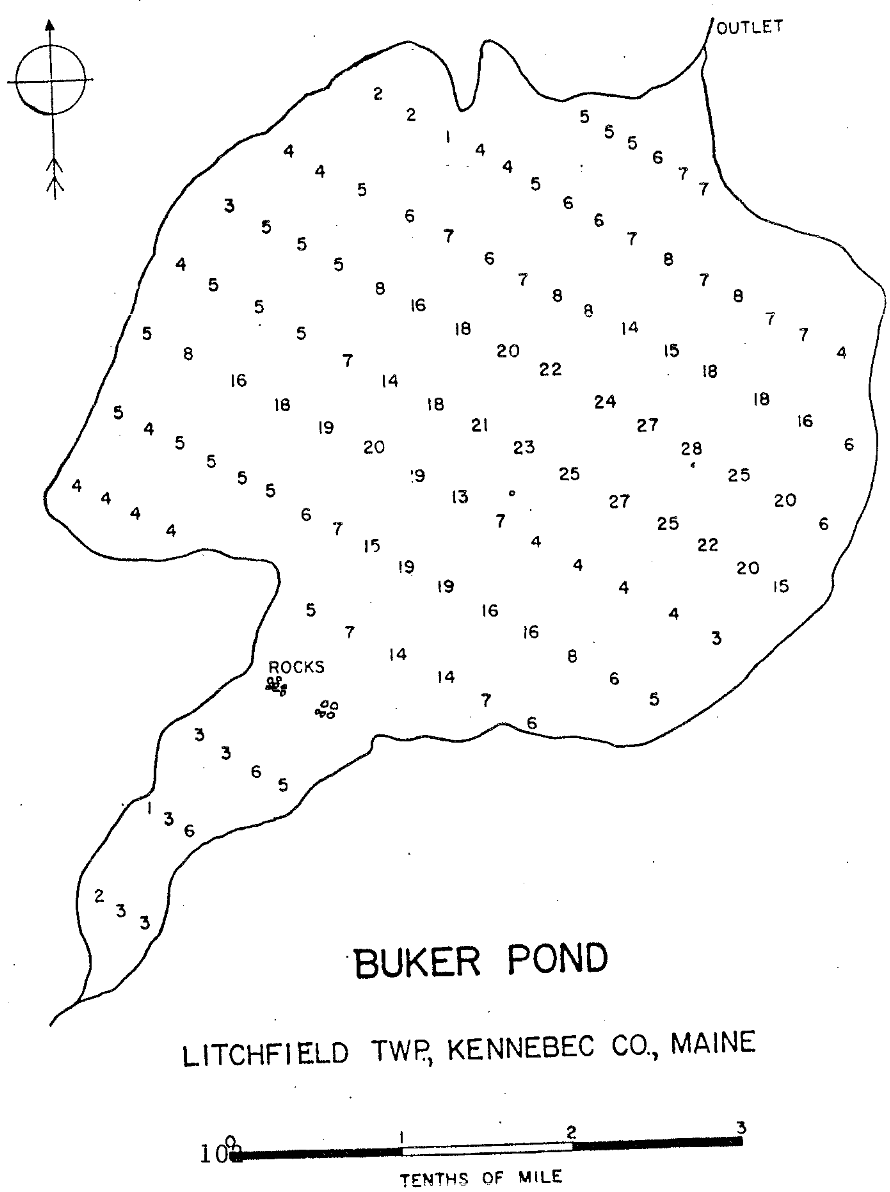
* Inadequate Sampling Season

Secchi disk readings indicate excellent water quality. Such water quality is a rare natural resource which should be protected. Since Bubble Pond is within the boundaries of Acadia National Park, ample protection probably is insured.

The pond is managed for brook trout.

Buker Pond # 5242

Surface Area	31 ha (77 a)
Max. Depth	8.5m (28 ft)
Mean Depth	2.8 m (9.2 ft)
Volume	8.6 X 10^5 m^3 (697 acre-feet)
Drainage Area	23.8 km^2 (9.2 mi^2)
Flushing Rate	14.1 (flushes/year)



Buker Pond #5242

	1976	1979	1982
Mean Secchi (m)	4.0	4.3*(4)	4.2
Min. Secchi (m)	3.7	2.4	3.2
TSI	58	NA	NA
TSI Range			
Color(SPU)	NA	NA	15
pH		6.8(mo)	
Chla(ug/l)	5.7		
TP(ppb)			

* inadequate sampling season
(mo) monitor

Buker Pond is one of several ponds in the Tacoma Lakes chain. It is managed for warm water fish such as bass, perch, and pickeral. Largemouth bass will be added to the fishery in future years.

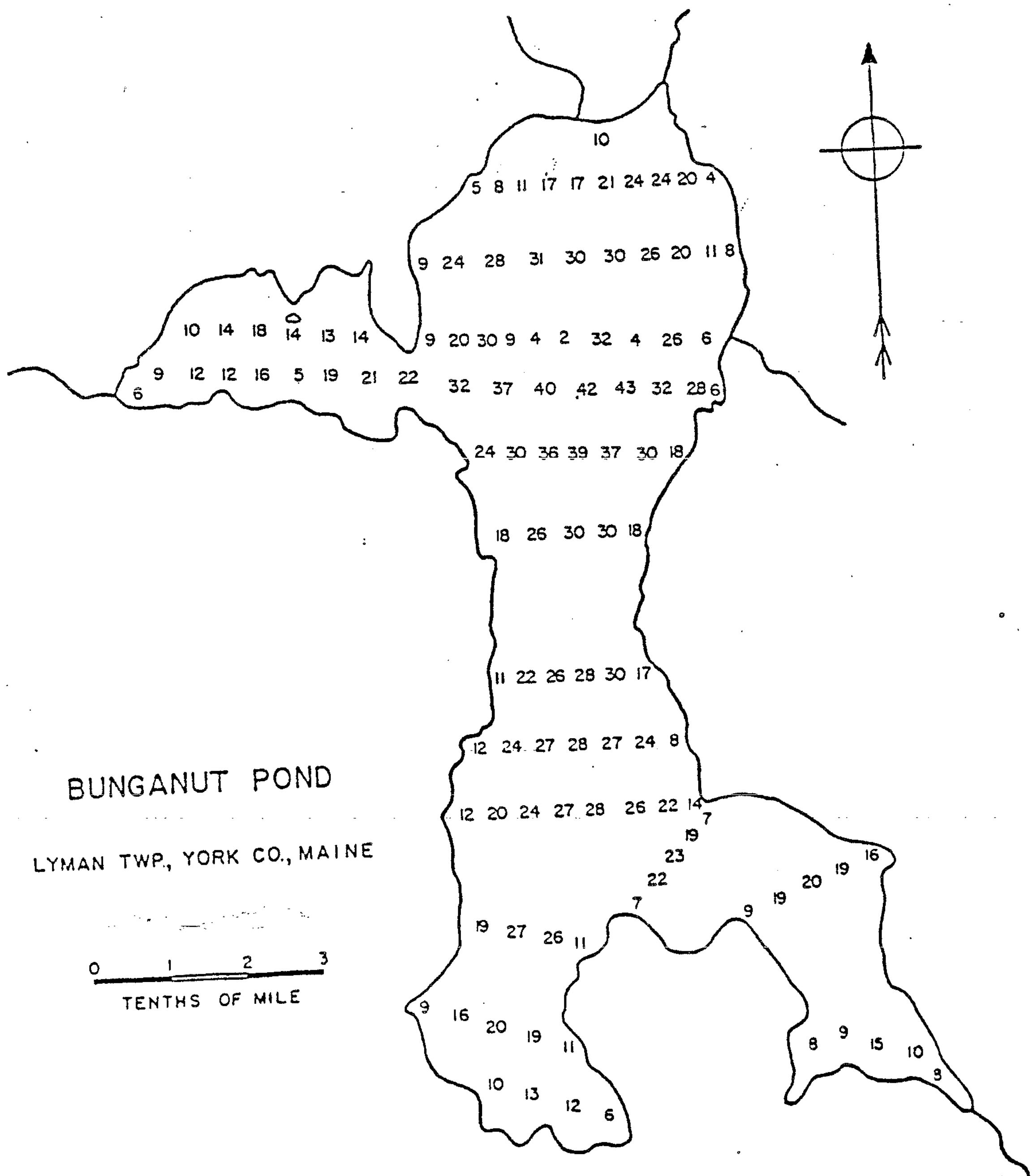
Water quality is considered good. Secchi disk transparencies are slightly below average for lakes and ponds in Maine. Chla values taken in 1976 and 1979 are moderate.

An oxygen depletion (less than 1 ppm) occurs in the summer time below 5 meters.

Water quality trends are difficult to predict because of inadequate sampling seasons.

Bunganut Pond #3980

Surface Area	133 ha (325 a)
Max. Depth	12.9 m (43 ft)
Mean Depth	5.6 m (18.4 ft)
Volume	6.5 X 10^6 m^3 (5285 acre-feet)
Drainage Area	7.5 Km^2 (2.9 mi^2)
Flushing Rate	0.7 (flushes/year)



Bunganut Pond #3980

	1974-76	1977-79	1980	1981	1982
Mean Secchi(m)	3.5*(+)	4.1*	3.9	3.8*(4)	3.5*(4)
Min. Secchi (m)	3.1	3.9	3.4	2.7	3.0
Chla	10(1s)		4.7(1s)	5.2*(4)	
TSI	NA	59	62	NA	NA
Color	25		30		
pH	6.4		6.3		
TP	7(s)(1s)		10 (c)(1s)		
	15(b)(1s)		73(b)(1s)		

+ no water scope
* Inadequate sampling season
(1s) late summer, (c) core, (b) bottom, (s) surface

Bunganut Pond experiences a severe oxygen depletion in the hypolimnion during summer stratification. By mid-August less than 4ppm of oxygen exist below 8m. A forest fire in October, 1947, destroyed the vegetation and cottages along the shoreline. This fire may have added a large amount of organic matter that could still be decomposing and depleting the hypolimnetic dissolved oxygen. Very high water color values in the hypolimnion indicate this may indeed be the case.

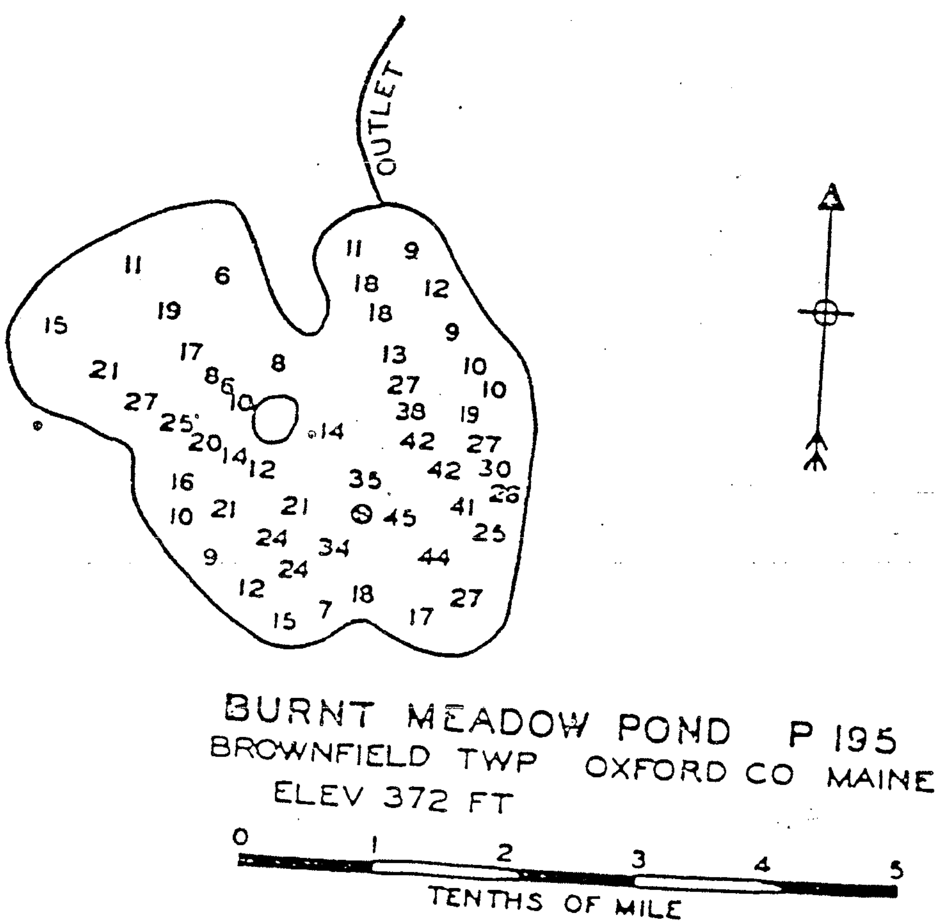
Each fall, the dam is opened and the lake level is lowered. This practice shoud be continued as it flushes the lake and drains off nutrients. Water quality appears stable; Chla and TP levels are moderate.

The Department of Inland Fisheries and Wildlife has been managing the pond as a warm water fisheries for bass, perch and pickeral. It is currently changing its management to a cold water fishery by stocking brown trout. There is no public access to the pond.

In 1981, the monitors of Bunganut took part in the chlorophyll program which was established in 1980 to gather additional data on colored lakes, lakes that showed a decline in water quality, or lakes with problems.

Burnt Meadow #5572

Surface Area	28 ha (69 a)
Max. Depth	13.7 m (45 ft)
Mean Depth	5.1 m (16.7 ft)
Volume	1.4 X 10^6 m^3 (1138 acre-feet)
Drainage Area	10.0 Km^2 (3.85 mi^2)
Flushing Rate	4.6 (flushes/year)



Burnt Meadow Pond #5572

	1977-78	1979	1980	1981	1982
Mean Secchi (m)	3.8	3.8	4.0	3.7	3.8
Min. Secchi (m)	3.0	3.0	3.2	3.0	2.5
TSI	63	63	61	65	63
Color(SPU)		15			23
pH(core)		6.5			6.9
Chla(ug/l)		2.3(ls)			1.4(s)
TP(ppb)		7(ls)			4(c)(ls) 14(b)(ls)

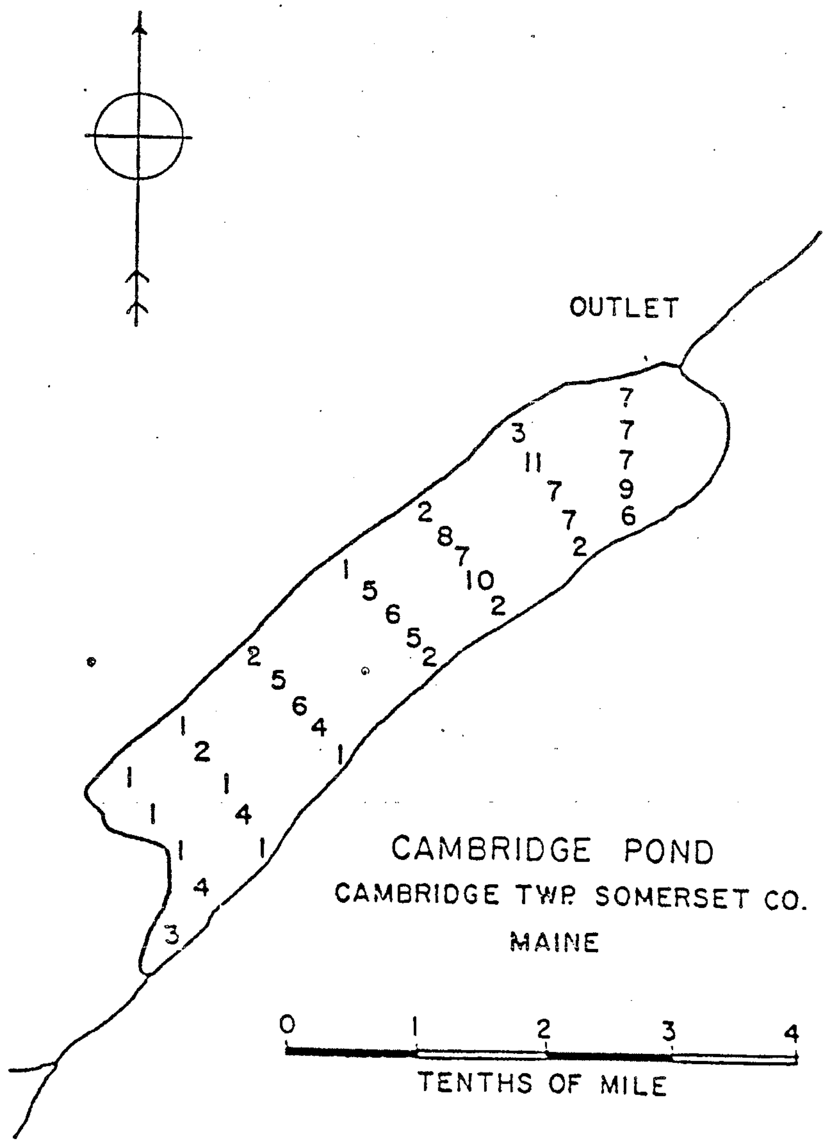
* Inadequate sampling season
(ls) late summer, (s) surface, (c) core, (b) bottom

Occasionally, the hypolimnion experiences an oxygen deficiency below 25 feet. The pond has been stocked with salmon, brown trout and brook trout. Currently the pond is being managed for brook trout and brown trout.

Water quality appears stable according to Secchi disk readings. Chlorophyll and TP levels are low indicating low productivity, but transparency readings are less than average for Maine lakes and indicate moderate productivity. Color may be interfering with the Secchi disk readings even though the color is not considered high. No other explanation is known at this time.

Cambridge Pond #0748

Surface Area	17.0 ha (42.5 a)
Max. Depth	3.3 m (11 ft)
Mean Depth	1.2 m (39 ft)
Volume	2.04 X 10^5 m^3 (166 acre-feet)
Drainage Area	39.0 Km^2 (15.1 mi^2)
Flushing Rate	97.3 (flushes/year)



Cambridge Pond #0748

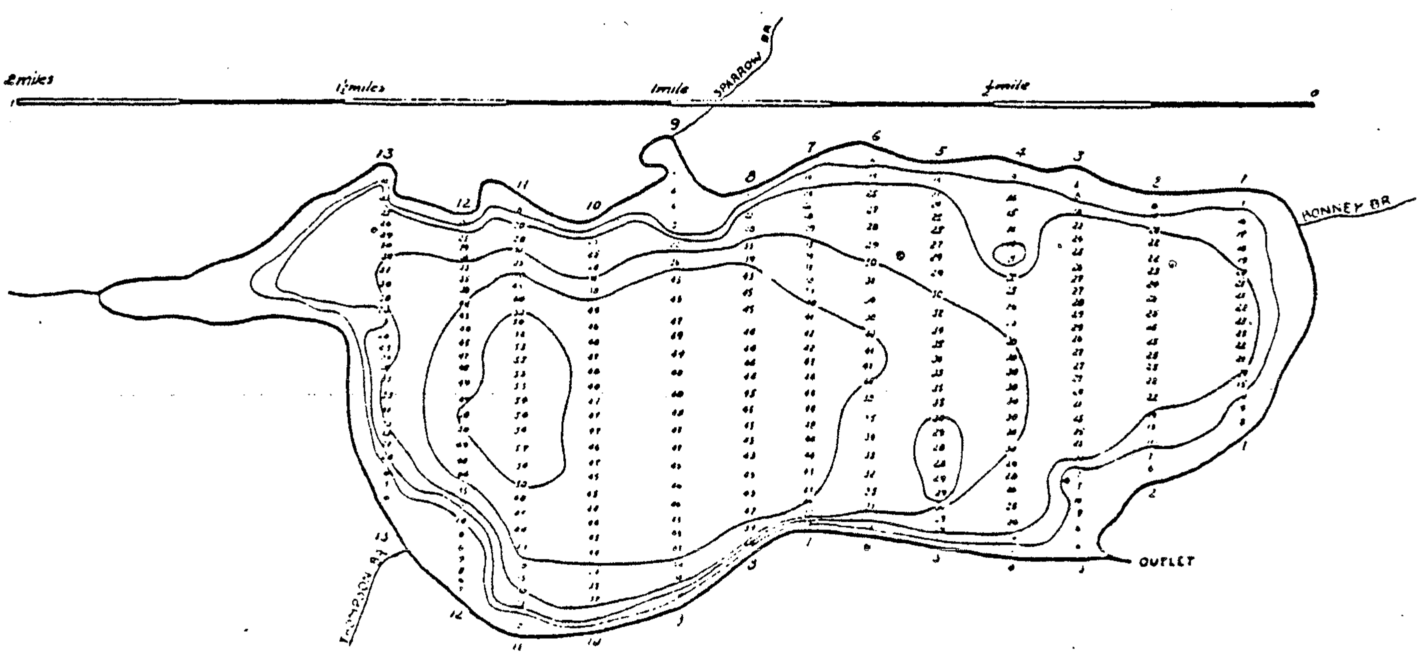
	1981
Mean Secchi (m)	3.0
Min. Secchi (m)	2.7
TSI	76
Color	NA

Transparency readings are probably reduced due to high water color and as a result the TSI is probably inaccurate.

Cambridge is a small, shallow pond best suited for its warmwater fisheries.

Canton Lake (Anasagunticook Lake) #3604

Surface Area	229.9 ha (568 a)
Max. Depth	16.4 m (54 ft)
Mean Depth	8.4 m (27.6 ft)
Volume	2.0 X 10^7 m^3 (16260 acre-feet)
Drainiage Area	38.8 Km^2 (15.0 mi^2)
Flushing Rate	1.1 (flushes/year)



Bottom Contours. Lake Anasagunticook P 497
Canton, Maine

Canton Lake (Anasaqunticook Lake) #3604

	1980	1981	1982
Mean Secchi (m)	3.7	3.2	3.2
Min. Secchi (m)	1.7	2.5	2.5
Chla(ug/l)	8.1(f)	3.6mean	
TP(ppb)	14(c)(f)	11(c)(ls)	
	36(b)(f)	10(b)(ls)	
TSI	Colored	44Chl	colored
Color(SPU)	40		
pH(core)	NA		

(c) core, (f) fall, (ls) late summer

The lake experienced an algal bloom in 1980 that was of short duration. Chla levels were moderate in spring, and high in the fall. Fall TP levels are of concern; 15 ppb TP is considered sufficient to support algal blooms. Residents and farmers who live in the watershed of Canton Lake should be particularly cautious of land-use practices in order to protect the lake water quality. The lake did not experience any problems in 1981 or 1982 that we know of; however, the history of Canton shows that algal blooms do occur sporatically. These blooms are an indication that the lake is sensitive to phosphorus input and that water quality is being adversely affected.

An oxygen depletion (i.e. less than 5 ppm) occurs in the bottom 4 meters of the lake.

The pond is managed as a warm water fishery by the Department of Inland Fisheries and Wildlife although some natural reproduction of salmon and brook trout does occur.

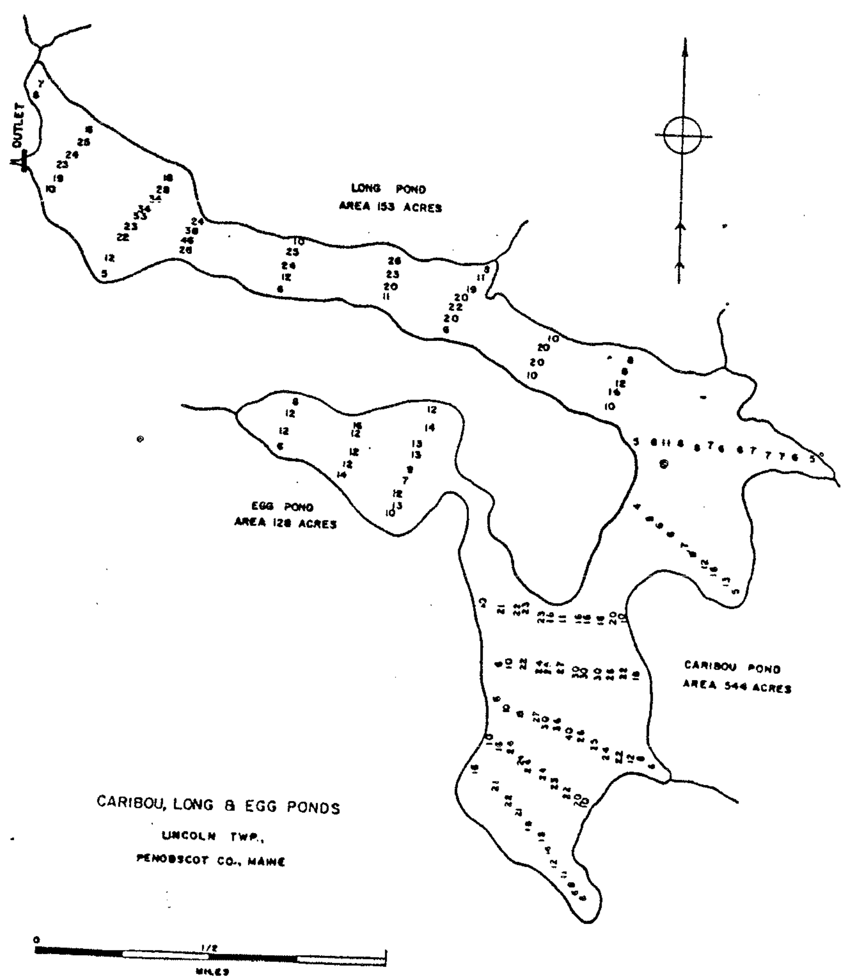
The fact that the 1981 and 1982 transparencies are less than the 1980 average may be an indication of present water quality problems. One positive aspect, however, is the minimum Secchi disk readings in 81 and 82 are above the 1980 minimum. 1981 Chlorophylla & TP levels are moderate.

Caribou Pond #2216

Surface Area	220 ha (544 a)
Max. Depth	12.1 m (40 ft)

Caribou, Egg, and Long Pond

Mean Depth	4.3 m (14 ft)
Volume Area	1.42 X 10^7 m^3 (11554 acre-feet)
Drainage Area	30.2 Km^2 (11.7 mi^2)
Flushing Rate	1.03 (flushes/year)



Caribou Pond #2216 Basin #2

	1973-74	1975	1976	1981	1982
Mean Secchi(m)	5.6*	6.2*(2)	6.3*(2)	3.9*(4)	4.9
Min. Secchi (m)	4.4	5.6	6.1	3.2	4.6
TSI	NA	NA	NA	NA	48
TSI Range					48 - 49
					CHL SD
Color(SPU)				45	20
pH(core)				6.5	6.4
Chl<u>a</u>(ug/l)				2.7(ls)	4.1mean
TP(ppb)				13 (c)(ls)	16(c)(ls)
				17 (b)(ls)	24(b)(ls)

*Inadequate sampling season
(ls) late summer, (c) core, (b) bottom

Caribou Pond is managed as a warmwater fishery. The hypolimnion has little dissolved oxygen by late summer.

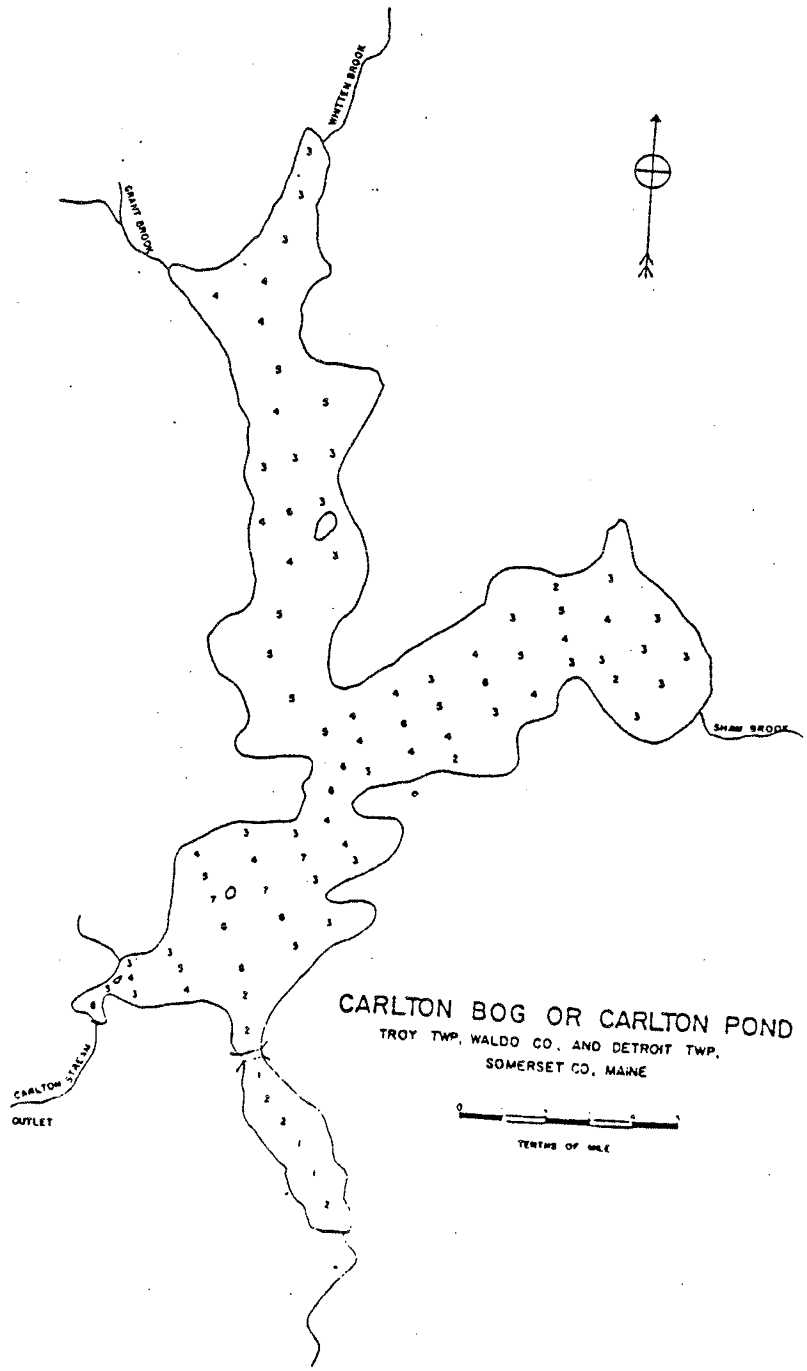
Transparency readings for 1981 and 1982 are far shallower than for previous years; however, care must be taken in making predictions as none of the previous years has a complete season. The reason for the difference is not known; it may be due to weather, change in monitors, or an impact to the lake. Continued monitoring with complete sampling seasons will be necessary to determine water quality trends.

Chlorophyll levels in 1981 and 1982 were moderate. TP values are moderate to high. Color may be affecting TP values but it does not appear to be affecting transparency because calculating the TSI from S.D. and Chla gives essentially the same result.

The monitor of Caribou Pond participated in the chlorophyll program in 1982. The program was established in 1980 to collect additional data on colored lakes, lakes that had declining water quality, or lakes that had problems.

Carlton Bog Pond #0041

Surface Area	167 ha (417 a)
Max. Depth	2.4 m (8 ft)
Mean Depth	0.9 m (3 ft)
Volume	1.48 X 10^6 m^3 (1203 acre-feet)
Drainage Area	62.9 Km^2 (24.3 mi^2)
Flushing Rate	21.6 (flushes/year)



Carlton Pond (Carlton Bog) #0041

	1981	1982
Mean Secchi(m)	1.7+	1.9+
Min. Secchi (m)	1.5	1.5
TSI	110+	103+
Color(SPU)	NA	NA

+ most Secchi disk readings hit bottom which causes the water quality to be underestimated.

The TSI is not an accurate estimate of water quality because the pond is so shallow that the Secchi disk readings hit bottom. High water color also adversely affects the transparency. Carlton Bog will be on the list of lakes in 1983 for additional work.

The flushing rate is very fast, 22 flushes per year. The pond does not stratify.

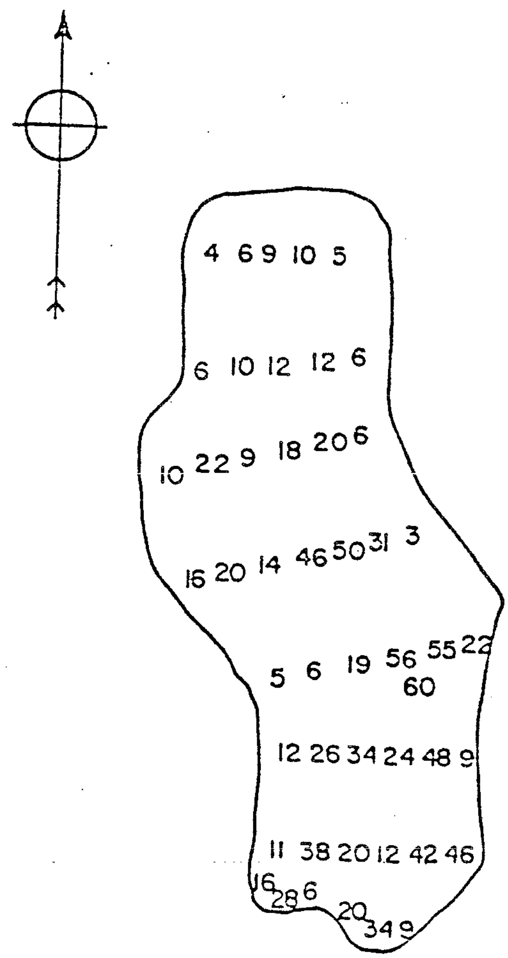
"Carlton Bog is correctly named for it's quite shallow and it contains profuse growth of aquatic plants. The pond produces good hornpout and pickerel fishing particularly when the pond is full. Carlton Bog is an excellent waterfowl producing area". Largemouth bass were introduced in the 1970's to improve the warm water fishery.

"At the time of the survey the water level was down at least 3 feet. Existing fish populations in the lake will benefit by repair of the dam on the outlet and the stabilization of water levels".(1)

(1) Taken from the Department of Inland Fisheries and Wildlife Survey

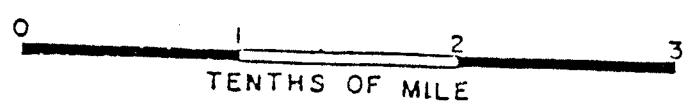
Carry Lake #1050

Surface Area	9.0 ha (22.5 a)
Max Depth	18.0 m (60 ft)
Mean Depth	5.9 m (19.4 ft)
Volume	5.3 X 10^5 m^3 (431 acre-feet)
Drainage Area	1.29 Km^2 (.5 mi^2)
Flushing Rate	1.2 (flushes/year)



CARRY LAKE

LITTLETON TWP., AROOSTOOK CO., MAINE



Carry Lake #1050

	1981
Mean Secchi (m)	6.7
Min. Secchi (m)	4.0
TSI	34
Color	N/A

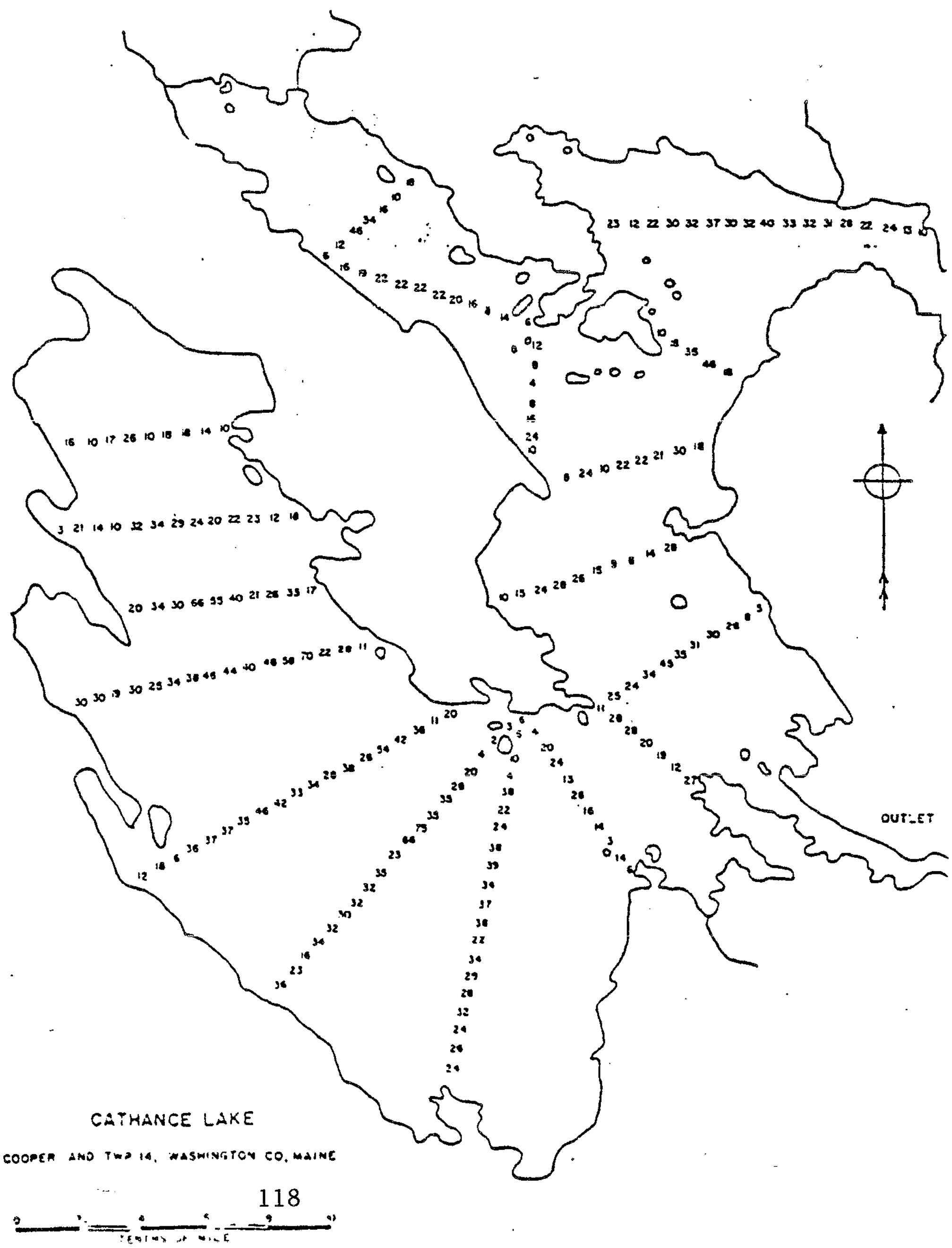
The pond is managed for brook trout.

Transparency readings are above average for Maine lakes indicating high water quality. Continued monitoring will supply the information needed to predict water quality trends.

Carry Lake may be vulnerable to water quality degradation due to its small volume and slow flushing rate. Drainage area residents should exercise care to protect the high water quality of the lake.

Cathance Lake #9661

Surface Area	1176 ha (2905 a)
Max Depth	22.9 m (75 ft)
Mean Depth	7.2 m (23.6 ft)
Volume	9.1×10^7 m^3 (73984 acre-feet)
Drainage Area	55.6 Km^2 (21.46 mi^2)
Flushing Rate	0.4 (flushes/year)



Cathance Lake #9661

	1977-8	1979	1980	1981	1982
South Basin(1)					
Mean Secchi (m)	8.4	8.1	7.8	8.8*(3)	
Min. Secchi (m)	7.0	7.0	7.0	8.0	
TSI	24	25	27	NA	
pH(core)					6.8
Color(SPU)		20			10
Chla(ug/l)		2.6(ls)			1.9(ls)(c)
TP(ppb)	10(sp)	5(sp)			3(ls)(c)
		4(ls)(c)			8(ls)(b)
North Basin(2)					
Mean Secchi (m)	9.8*	8.2		8.0	8.3
Min. Secchi (m)	9.5	7.0		7.0	7.0
TSI	NA	25		26	24

* Inadequate sampling season

(ls) late summer, (sp) spring, (b) bottom, (c) core

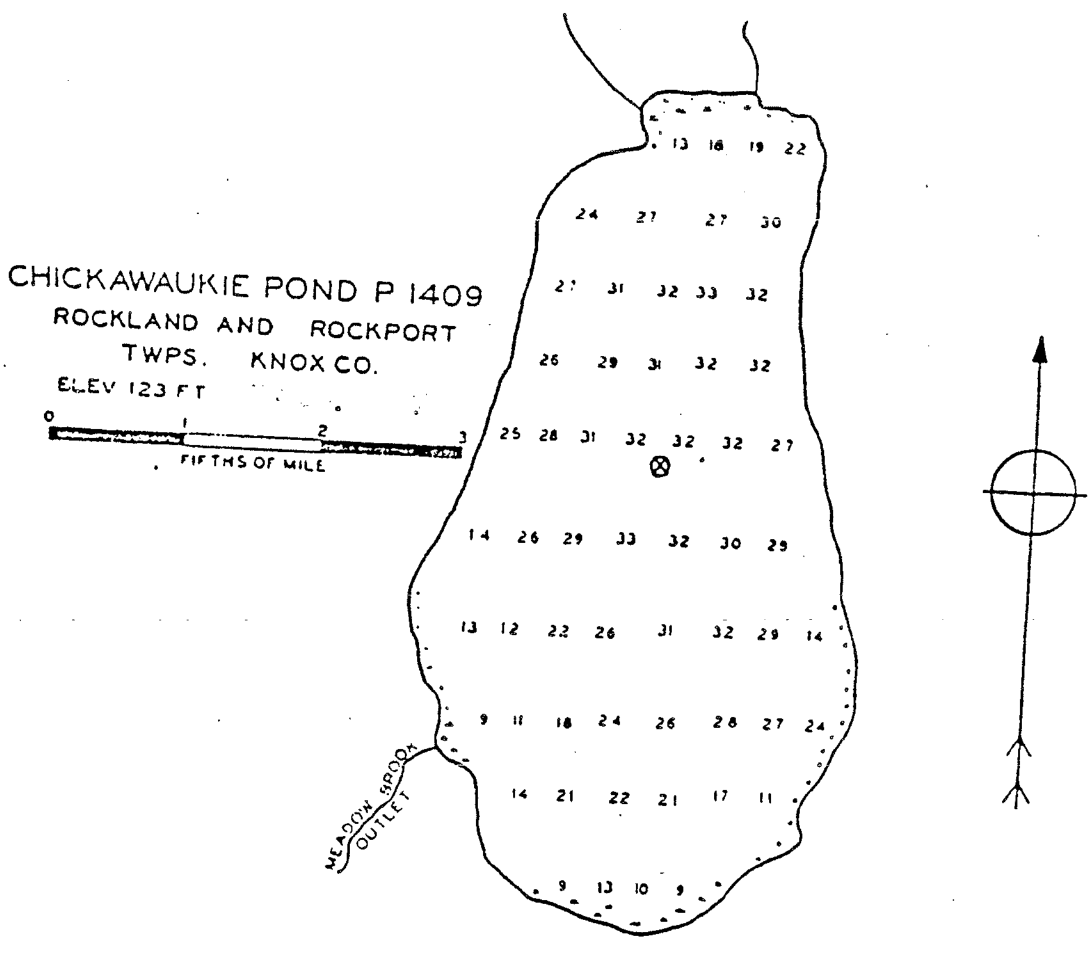
The lake remains well oxygenated to the bottom throughout the summer. An excellent salmon and brook trout fishery exist.

Transparency readings are variable between years but the cause is uncertain. It does not appear to be an artifact of sampling; the season is adequate and the monitor is consistent. No trend is visible.

Transparencies are far above average for Maine lakes. Chlorophyll and TP levels are low. Such high water quality is a rare natural resource which should be carefully protected and maintained. Protection is particularly necessary on Cathance because of a slow flushing rate, 0.4 flushes/year, which may indicate that the pond is vulnerable to water quality degradation.

Chickawaukie Pond #4822

Surface Area	139 ha (343 a)
Max. Depth	10.1 m (33 ft)
Mean Depth	6.2m (20.5 ft)
Volume	8.4 X 10^6 m^3 (6854 acre-feet)
Drainage Area	10.6 km^2 (4.1 mi^2)
Flushing Rate	0.8 (flushes/year)



Chickawaukie Pond #4822

	1974	1978	1981	1982
Mean Secchi (m)	4.6*(2)	4.7*(3)	4.6*(3)	2.8
Min. Secchi (m)	4.3	4.3	2.4	0.9
TSI	NA	NA	NA	80
Color(SPU)		22	7	10
pH(core)			7.1	
Chla(ug/l)			5.6*(2)	21(x)mean

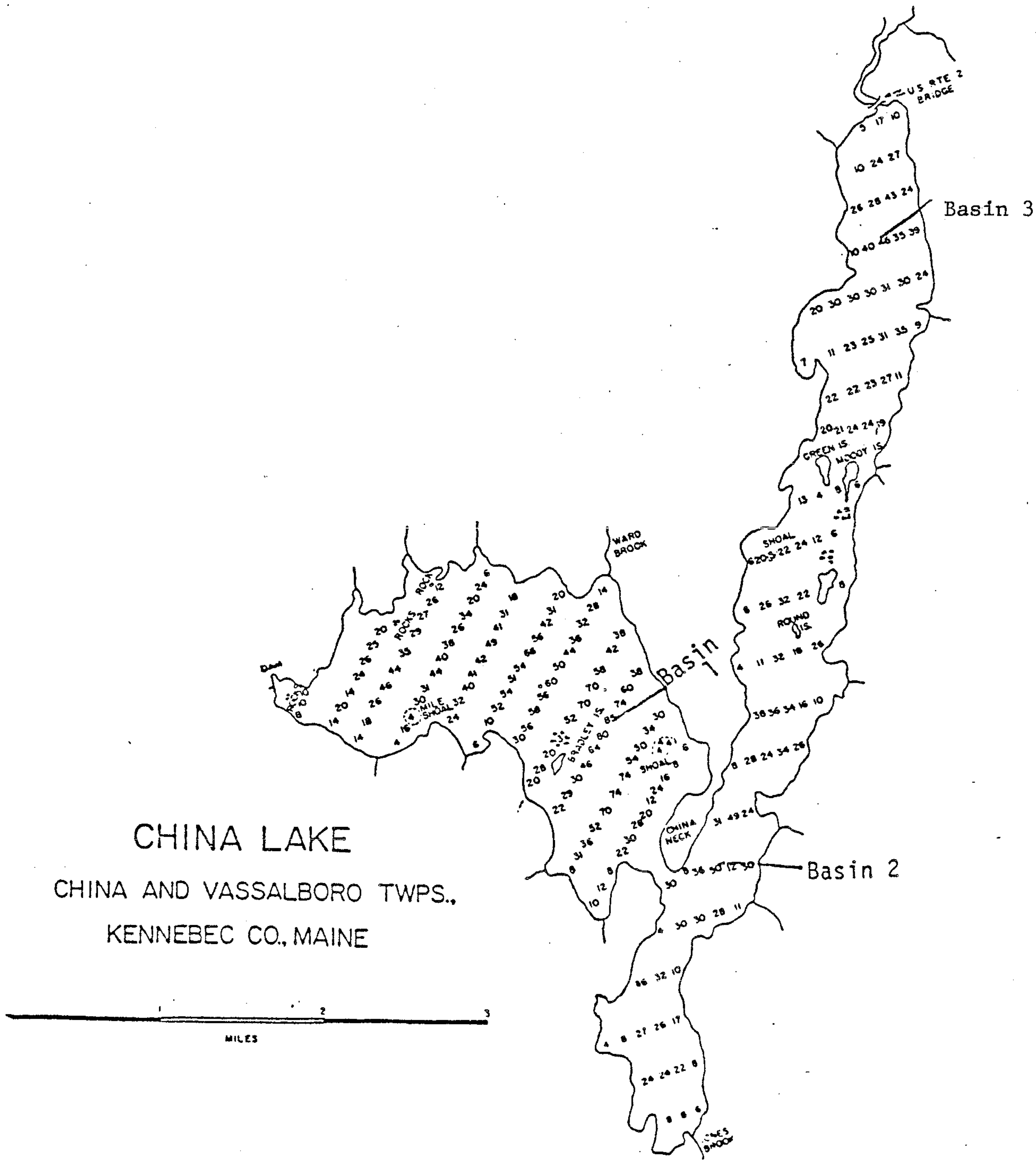
* Inadequate sampling season
(x) analysis by the Camden Rockland Water Company.

There is little dissolved oxygen in the hypolimnion by late summer. The pond is managed for bass, perch, picherel, and brown trout.

Chickawaukie Pond developed a serious algal bloom in late August which lasted through November of 1982. The pond also bloomed in the fall of 1981. Since the pond is a secondary water supply for the town of Rockport, the Camden-Rockland Water Company is conducting a study in cooperation with DEP to pinpoint the sources of nutrients to the lake. Extensive sampling of the watershed will be done in 1983.

China Lake #5448

Surface Area	1558 ha (3922 a)
Max. Depth	25.9 m (85 ft)
Mean Depth	7.5 m (24.6 ft)
Volume	1.2×10^8 m^3 (97561 acre-feet)
Drainage Area	82 Km^2 (31.8 mi^2)
Flushing Rate	0.4 (flushes/year)



China Lake #5448

	1971-72(x)	1977-78	1980	1981	1982
East Basin(2+3)					
Mean Secchi (m)	5.6	5.8*	6.8*(4)	6.6*(3)	6.9*(4)
Min. Secchi (m)	4.7	5.0	5.0	5.5	6.1
TSI	42	43	NA	NA	NA
pH(core)		7.1			7.2
Color(SPU)		10			20
Chla(ug/l)		2.9(ls)	2.8*(3)		3.1(ls)
TP(ppb)		10(ls)	20*(2)		15(ls)
					14(b)
West Basin (1)					
Mean Secchi (m)	6.7	5.2	6.1	5.2	5.2
Min. Secchi (m)	4.7	46	4.9	3.2	3.5
TSI	34	46	38	46	46
Chla(ug/l)		2.9(ls)			4.2(ls)
TP(ppb)		9(ls)			12(ls)
					10(b)(ls)
Color(SPU)					20
pH(core)					7.2

* Inadequate sampling season, (ls) late summer (b) bottom)
(x) Data collected from 1971-1973 during a cooperative project between DEP and University of Maine at Orono, Descriptive and Comparative Studies of Maine Lakes. Ronald Davis, Bailey, Scott, Hunt, and Norton, 1978.

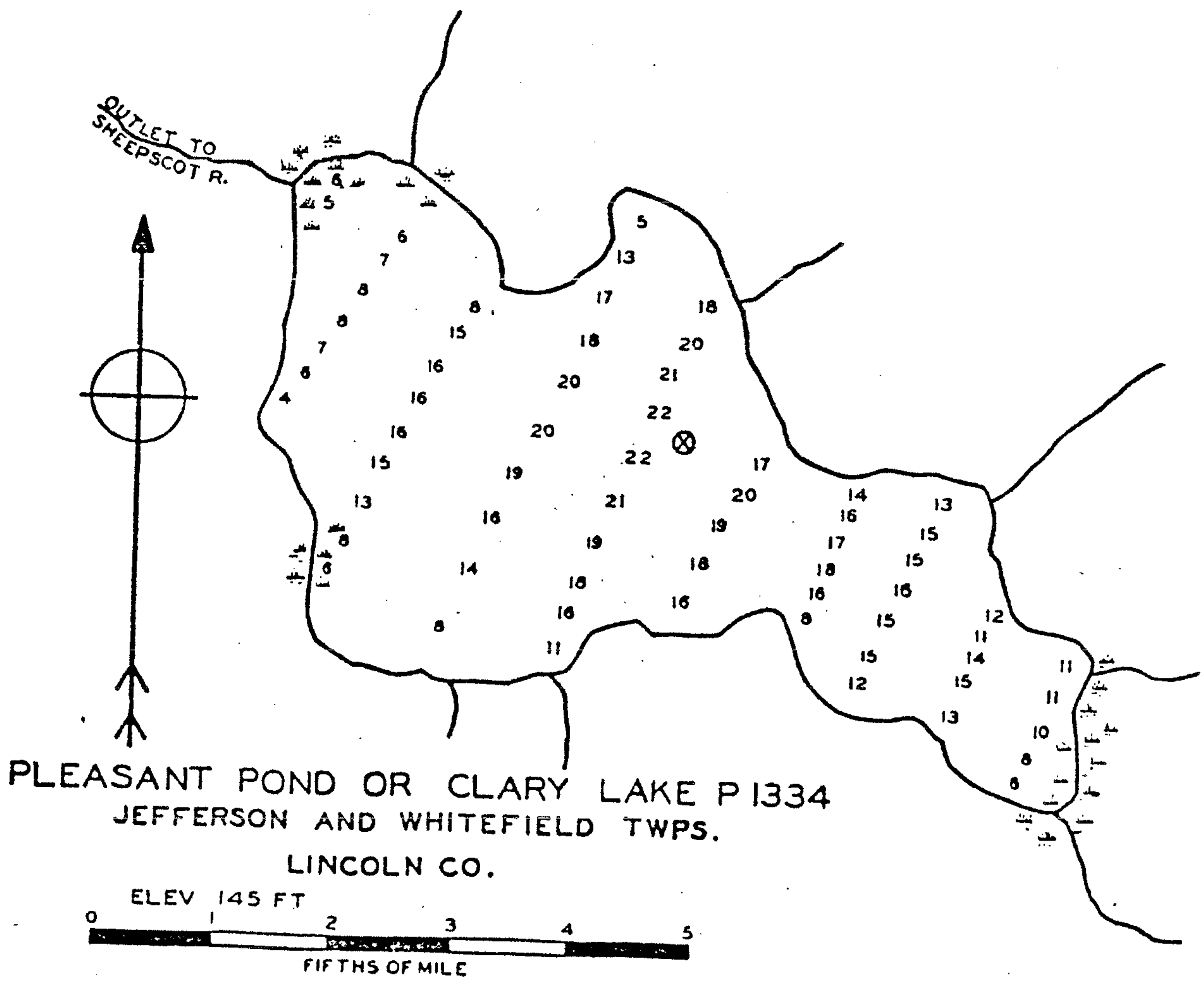
China Lake has a large volume of cold well oxygenated water which has the potential to support a large cold water fishery. Presently, the lake supports brown trout, perch, bass, pickerel and natural populations of togue and salmon.

The west basin is the water supply for Waterville and Vassalboro. There is little development along the shoreline of the west basin. Water quality in the west basin is largely dependent on the east basin's watershed, since 70% of the west basin's water first passes through the east basin. The shoreline and watershed of the east basin are more heavily developed.

Although the lake has remained only moderately productive, with Secchi disks of 5m to 7m, there are indications, especially in the east basin, that development in the watershed is adversely affecting water quality. An oxygen deficit exists in the hypolimnion by late summer. Complaints were received and verified in the summer of 1980 that filamentous algae was abundant in shallow areas around the east basin. The local Planning Board and Town Manager have been informed that future development around China Lake should be strictly controlled to prevent further impact. This caution should be carefully observed since TP levels of 15ppb and more were found in 1980 and 1982; TP levels of 15 ppb are sufficient to support algae blooms. The slow flushing rate of 0.4 flushes per year also indicates that China may be vulnerable to water quality degradation. This information suggest that China Lake may be fast approaching a point where rapid increases in productivity, even algal blooms, could occur. Residents of the watershed should try to minimize any phosphorus input to the lake. See the section on Protection in the Introduction.

Clary Lake (Pleasant Pond) #5382

Surface Area	189 ha (467 a)
Max Depth	6.7 m (22 ft)
Mean Depth	2.9 m ((9.6 ft)
Drainage Area	24.8 km^2 (9.6 mi^2)
Volume	7.8 X 10^6 m^3 (6323 acre-feet)
Flushing Rate	1.8 (flushes/year)



Clary Lake (Pleasant Pond)   #5382

	1975-78	1979	1980	1981	1982
Mean Secchi (m)	3.8*	3.6	3.9*(3)	3.3	3.5*(3)
Min. Secchi (m)	2.7	3.0	3.7	2.7	2.7
TSI	NA	66	NA	71	NA
Color(SPU)	35			30	28
pH(core)	6.4			6.4	6.7
Chla(ug/l)	6.0 (ls)			6.4(ls)	6.9(ls)
TP(ppb)	21(s)(ls)			15(ls)	12(ls)
	13(b)(ls)				
	14(sp)				

* Inadequate sampling season
(s) surface, (ls) late summer, (sp) spring, (b) bottom

Clary Lake is shallow and does not stratify. It is managed as a warmwater fishery.

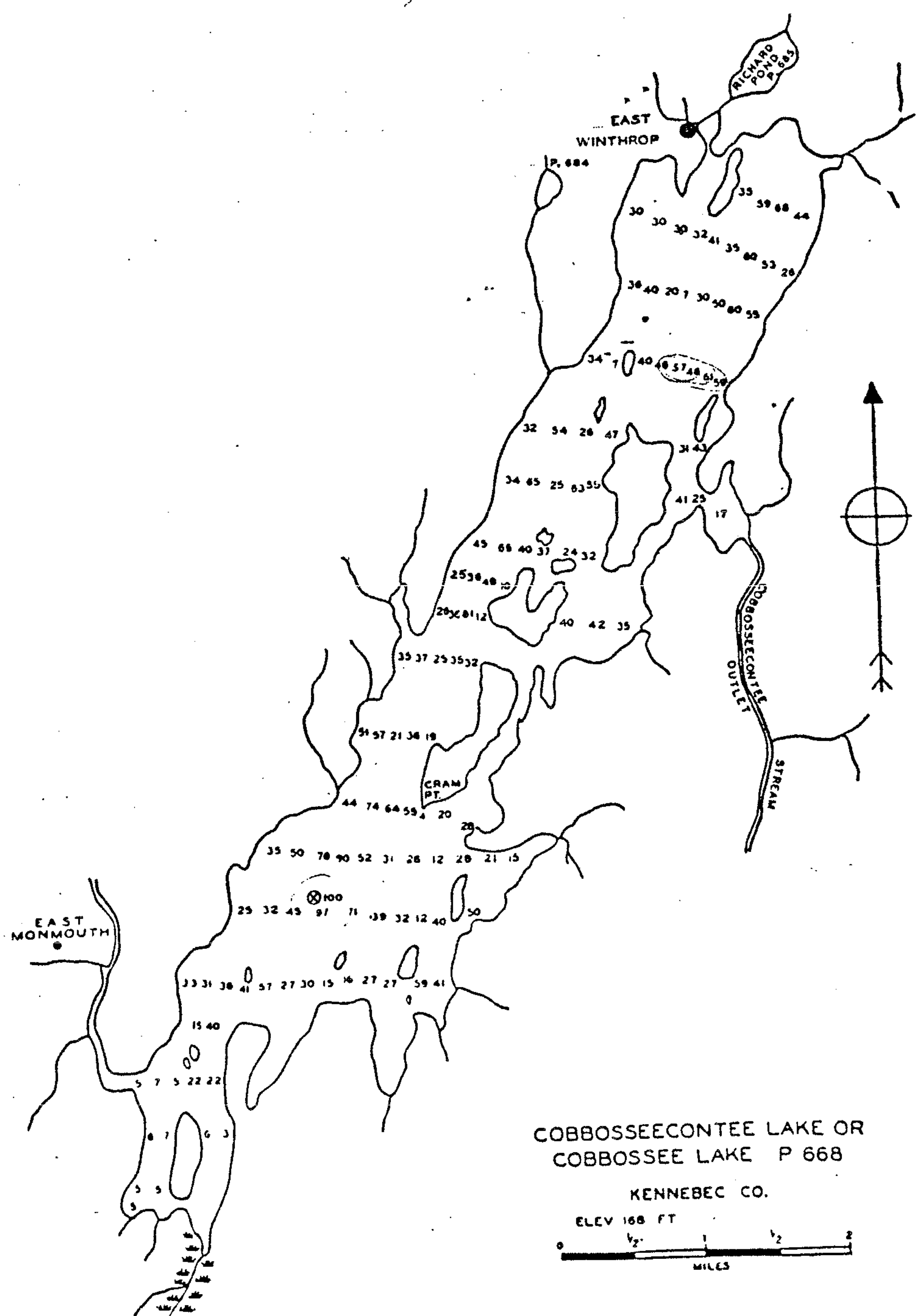
This lake had nuisance algal blooms in August of 1972 and 1973. The August, 1973, bloom was investigated by DEP and found to be quite severe with a Secchi disk reading of less than one meter. Much of the watershed is farm land and is probably contributing nutrients to the lake, either by direct runoff or from poor manure disposal practices. A large portion of the lake near the outlet is marsh. This marsh provides ideal habitat for fish and waterfowl and ties up nutrients during the growing season; it should be preserved.

TP levels are high, levels of 15 ppb TP are considered sufficient to support algal blooms, but Secchi disk readings do not indicate any blooms. Water quality appears stable. Lake shore residents and residents in the rest of the drainage should exercise care not to add any additional phosphorus to the lake and should try to reduce present inputs. See the section on Protection in the Introduction.

Since 1973 water quality appears stable; no algal blooms have been documented since that time. Chl*a* and TP values remain moderate to high suggesting a bloom could occur again if nutrients loading to the lake were to increase.

Cobbosseecontee Lake # 5236

Surface Area	2,147 ha (5,305a)
Max. Depth	30.5m (100 ft)
Mean Depth	8.0m (26.2 ft)
Volume	1.71×10^8 m^3 (139,051 acre-feet)
Drainage Area	341.1 km^2 (131.7 mi^2)
Flushing Rate	1.2 (flushes/year)



Cobbosseecontee Lake # 5236

	1975-78	1979	1980	1981	1982
Mean Secchi (m)	3.8	3.9	4.3	3.6	4.4
Min. Secchi (m)	1.6	1.1	1.1	1.0	3.6
Chla(ug/l)	8.3	9.7	9.4	7.8	4.9
TP(ppb)	17	16	18	17	12
TSI	63	66	61	63	50
TSI Range	52-65 TP-CHL	55-71 TP-CHL	56-70 SD-CHL	56-65 TP-CHL	47 - 54 TP - SD
Color(SPU)	15				
pH(core)		7.2			

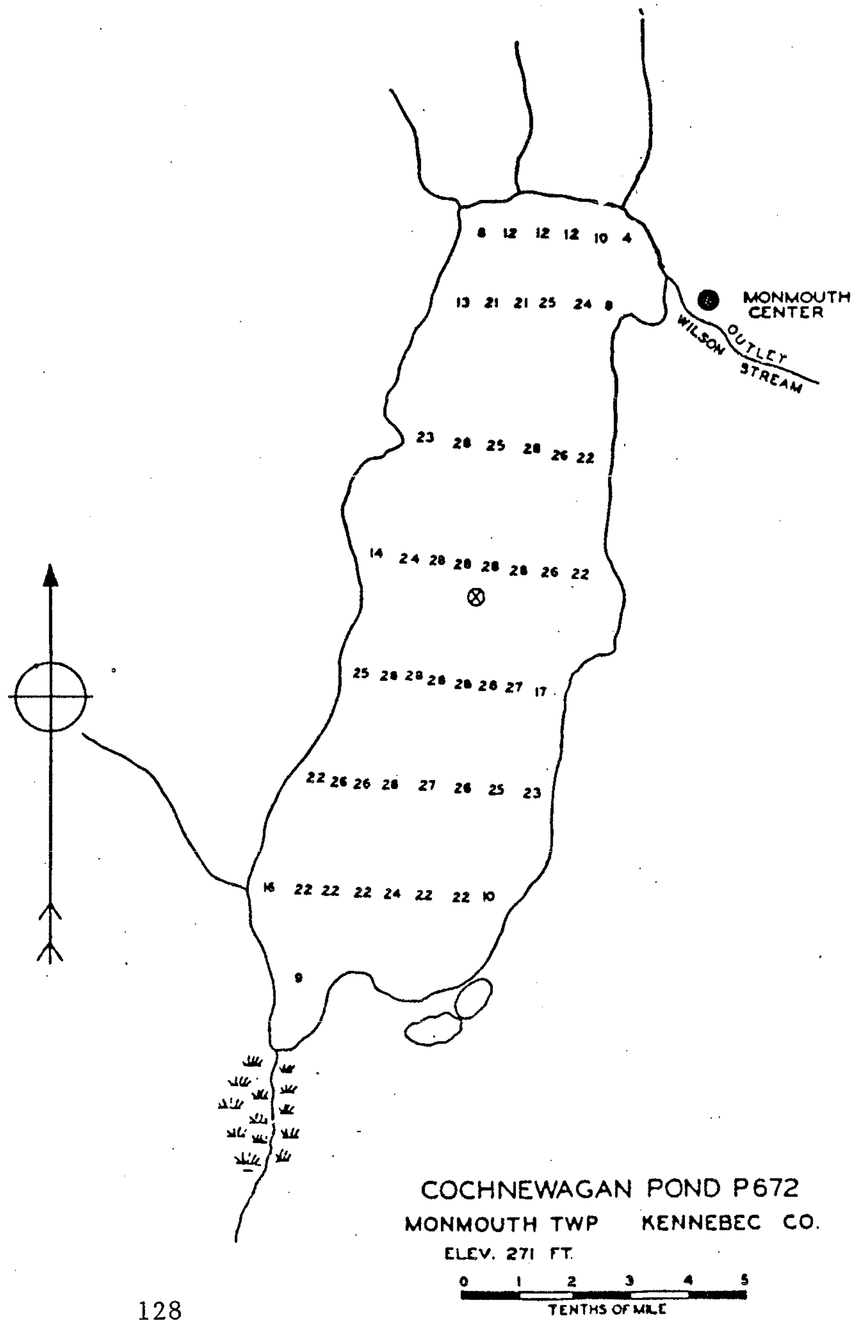
1982 proved to be the best year for Cobbossee Lake water quality since monitoring began in 1973. Both the north and south basins of the lake were sampled by volunteers and the Cobbossee Watershed District. The absence of any algal bloom was a noteworthy feature of 1982, given the severe late summer algal blooms in the past several years. The degraded water quality is a result of the input of nutrient-rich water from Annabessacook Lake which is immediately upstream as well as poor agricultural practices within its own watershed. The Cobbossee Watershed District received a 314 lake restoration grant in 1977 for restoration of Annabessacook and Cobbossee Lakes as well as Pleasant Pond. Annabessacook was treated with aluminum compounds in hopes of sealing the lake bottom sediments to reduce the diffusion of nutrients from the sediments into the overlying water and eventually into Cobbossee.

The project also included the construction of manure storage facilities by farmers within the three watersheds. These facilities will alleviate the need for the farmers to spread manure on frozen fields through the winter months. Elimination of this practice will greatly reduce the nutrient content of spring run-off, and thus reduce the nutrient loading to the lake.

Due to reduced phosphorus loading coming from Annabessacook Lake and improved agricultural practices within the watershed it is hoped that water quality in Cobbossee Lake will continue to show significant improvement. Phosphorus loading from these and other sources continues, however, and additional reductions may be needed to insure that the water quality improvement seen in 1982 continues in the future.

Cochnewagon Lake #3814

Surface Area	156 ha (385 a)
Max. Depth	8.5 m (28 ft)
Mean Depth	5.7 m (18.8 ft)
Volume	8.9 X 10^6 m^3 (7214 acre-feet)
Drainage Area	8.1 km^2 (3.1 mi^2)
Flushing Rate	0.5 (flushes/year)



Cochnewagon Lake #3814

	1976	1978-79	1980	1981	1982
Mean Secchi (m)	5.7	5.0*	4.9	4.2	5.4
Min. Secchi (m)	4.2	4.1	0.8	1.6	3.6
TSI	45	NA	72	58	51
TSI Range	42 - 48		49 - 96	58 - 74	44 - 61
	SD CHL		SD CHL	SD CHL	SD TP
Color(SPU)					13
pH		7.1(mo)mean			
Chla(ug/l)	4.2 mean	4.3 mean	23 mean	10.7mean	4.3 mean
TP(ppb)			25 mean*	19 mean	20 mean

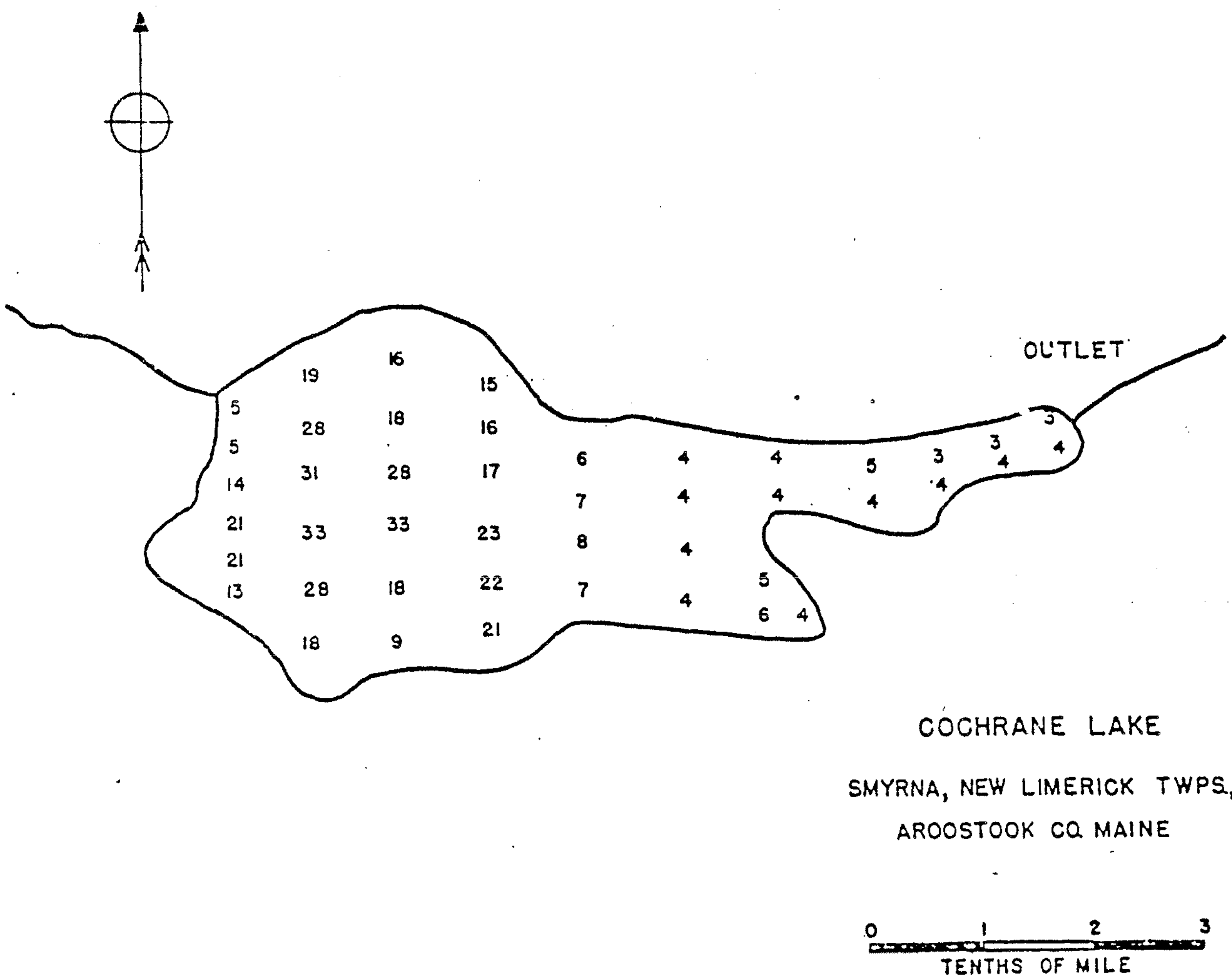
* inadequate sampling season
(mo) monitor

While Cochnewagon Lake experiences periods of excellent visibility, including Secchi disk observations which extend to the lake bottom, an intense algal bloom developed in August of 1980 and again in the fall of 1981. Increased monitoring by the Cobbossee Watershed District in conjunction with DEP has yielded information on the phosphorus content in the lake. During most of the year, phosphorus is at or above a concentration of 15 ppb, considered a critical nutrient level capable of supporting algal blooms, and, occasionally, concentrations twice the critical level have been measured. With such phosphorus concentrations, algae blooms are likely to occur, if other conditions are favorable. In 1982, however, there was no algae bloom and both good visibility and moderate chlorophyll levels were exhibited throughout the year. Phosphorus levels were high in 1982, but late summer and fall values were lower than in 1980 and 1981; continued monitoring will be necessary to determine if this is normal annual variation or if the phosphorus content will continue to decline below critical levels.

The Cobbossee Watershed District has provided assistance to farmers in the lake drainage area; they cooperated in improving waste management and erosion control practices to reduce phosphorus loading to the lake. Cochnewagon Lake has a slow flushing rate, requiring nearly two years to replace its water volume. This renders the lake quite susceptible to phosphorus inputs from the surrounding land area. It is critical that this lake be protected from any increased phosphorus loading from development or any land use in its watershed. Algal blooms will be a recurring problem if high phosphorus levels persist in the lake.

Cochrane Lake #1744

Surface Area	35.0 ha (87.5 a)
Max. Depth	9.9 m (33 ft)
Mean Depth	3.8 m (12.5 ft)
Volume	1.34 X 10^6 m^3 (1089 acre-feet)
Drainage Area	29.5 Km^2 (11.4 mi^2)
Flushing Rate	11.2 (flushes/year)



Cochrane Lake #1744

	1981	1982
Mean Secchi (m)	3.8*(4)	4.8
Min. Secchi (m)	3.0	3.5
TSI	NA	50
Color(SPU)	25	20
pH		7.5
Chla (ug/l)		1.9(ls)
TP (ppb)		7(ls)

(ls) late summer
* inadequate sampling season

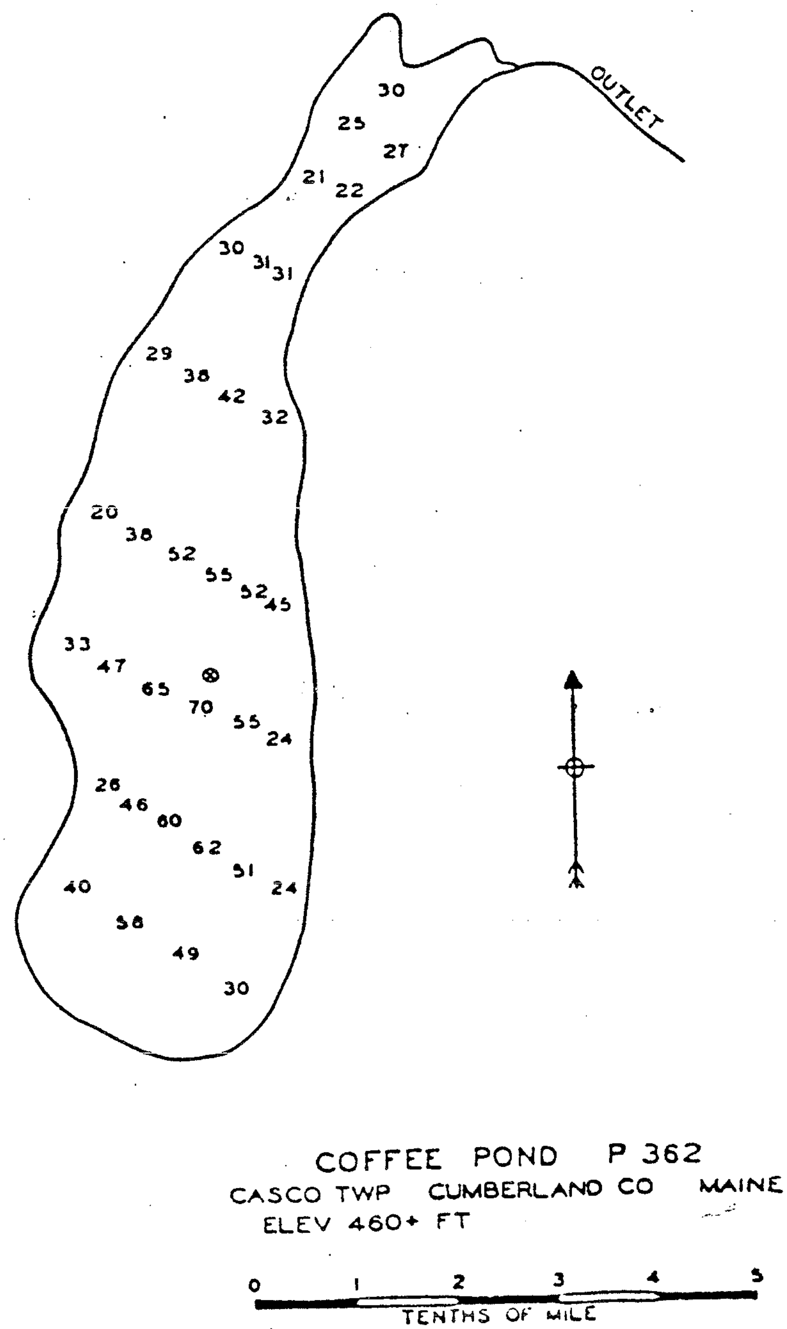
"Cochrane is an unusual lake to be supporting a salmon population, although the population is apparently quite small. Salmon must overcome tremendous odds to exist because of critically low oxygen levels in the deeper water in late summer and the abundance of warm water competitor species." 1 Cochrane Lake is being managed for pickerel, perch, salmon and brook trout.

Transparencies are somewhat below average for Maine lakes; moderate water color may be a factor. Chla and TP are low indicating low productivity and good water quality.

1 Taken from the Department of Inland Fisheries and Wildlife Survey.

Coffee Pond #3390

Surface Area	56 ha (137 a)
Max. Depth	21 m (70 ft)
Mean Depth	10 m (33 ft)
Volume	5.5 X 10^6 m^3 (4,500 acre-feet)
Drainage Area	2.6 Km^2 (1.0 mi^2)
Flushing Rate	0.2 (flushes/year)



Coffee Pond #3390

	1974-76X	1978-79	1980	1981	1982
Mean Secchi (m)	8.1	7.0	7.4	6.9	6.9
Min. Secchi (m)		6.5	5.7	5.0	5.8
Chla (ug/l)	2.2(mean)		1.3(mean)		
TP (ppb)	6.9(mean)	5(c)(ls) 24(b)(ls)	7.5*(4)		
TSI	30	31	25	32	32
TSI Range	23-37 SD-Chl		21-29 Chl-SD		
pH	6.8	6.8			
Color(SPU)	7	20			

* Inadequate sampling season
(c) core, (ls) late summer, (b) bottom
(x) Data collected as part of a cooperative project between DEP and U.S. Geological Survey.

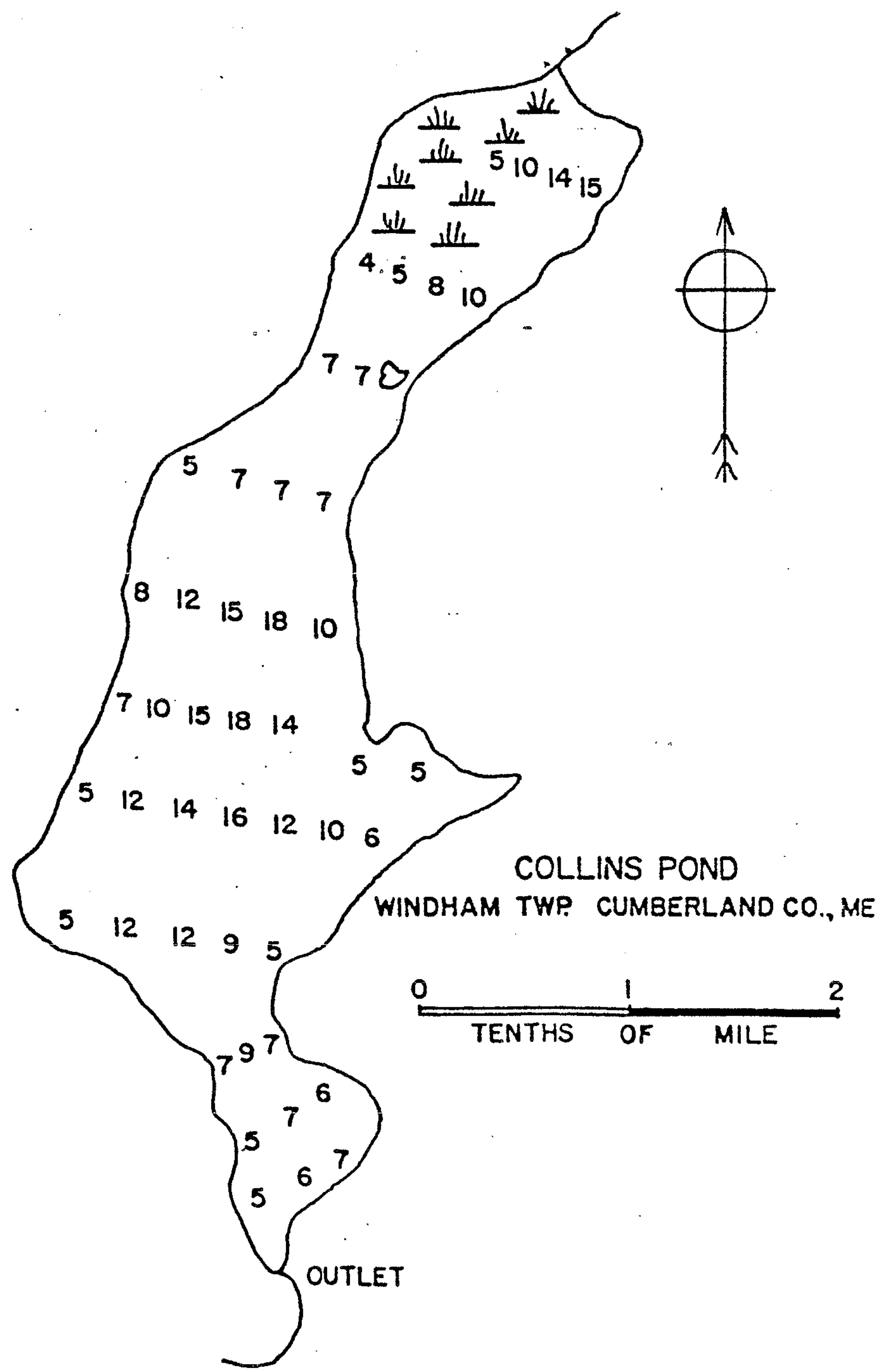
The lake supports a cold water fishery of brook trout and rare sunapee trout. Smallmouth bass are also present. There is some depletion of oxygen in the bottom few meters by late summer.

Concern has been voiced by local residents that the water quality of Coffee Pond is deteriorating. That concern was increased when it was seen that the transparency of the lake had dropped from 8.6m (1974), 8.2m (1975), 7.4m(1976) to 6.9m (1978). We did find out one fact that indicates that the situation is not as bad at the statistics made it look. Apparently the monitor who took over the lake sampling in 1978 has different eyesight than the DEP staff. When we compared Secchi disk readings of the monitor to one of our biologists, we found the monitor was reading 1 1/2 meters shorter. This explains some of the decline in transparency after 1976, and we now know to add a meter or so to the monitor's Secchi disk readings. (No adjustment has been made in the statistics presented in the chart). Another reassuring fact is the chlorophyll and TP samples taken by the monitor in 1980 are at comparable levels to what was found 1974-1976. Despite the reassurance given above, it is possible that the water quality of Coffee Pond has slowly deteriorated over the last 50 years. Two facts that support that possibility are the flushing rate is slow, 0.2 flushes per year, and the pond is heavily developed on steep slopes. A slow flushing rate indicates that a lake may be sensitive to water quality deteriation from increased amounts of phosphorus and heavy development on steep slopes may be adding significant amounts of phosphorus to the pond.

Present water quality of Coffee Pond is above average for Maine Lakes. Such high water quality is a rare natural resource that deserves careful protection and maintainance. Residents of the drainage should exercise caution to reduce any phosphorus inputs to the lake. See the section on Protection in the Introduction.

Collins Pond #3728

Surface Area	18.2 ha (45 a)
Max. Depth	5.5 m (18 ft)



Collins Pond # 3728

	1975	1976	1977	1979	1981
Mean Secchi(m)	4.6*(1)	4.1*(2)	4.7*(1)	3.8*(1)	4.5*(1)
Min. Secchi (m)		3.7			
TSI	NA	NA	NA	NA	NA
Color				30	
pH	7.4				
Chl<u>a</u>		8.8*(2)			
TP		7 spring		10 spring	

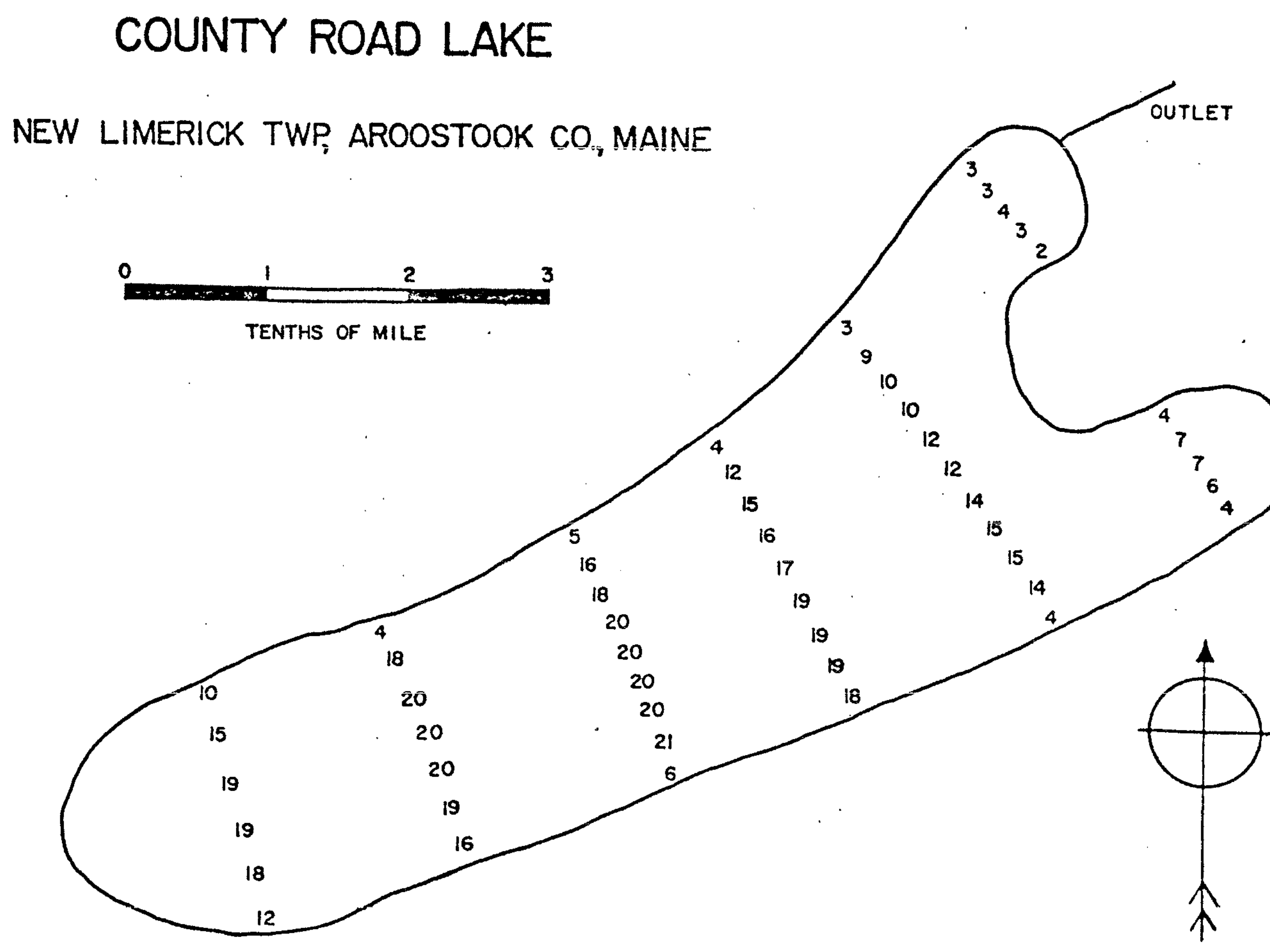
* Inadequate sampling season

The pond is shallow and does not stratify. It is managed for warmwater fish.

Transparencies are below average for Maine lakes and ponds. Chl<u>a</u> levels in 1976 were high. TP levels are moderate. Inadequate sampling seasons make it difficult to predict water quality or water quality trends.

County Road Pond # 1742

Surface Area	10 ha (25 a)
Max. Depth	6.1m (21 ft)



County Road Lake # 1742

	1981
Mean Secchi (m)	4.0*(1)
Min. Secchi (m)	
TSI	NA
Color	NA

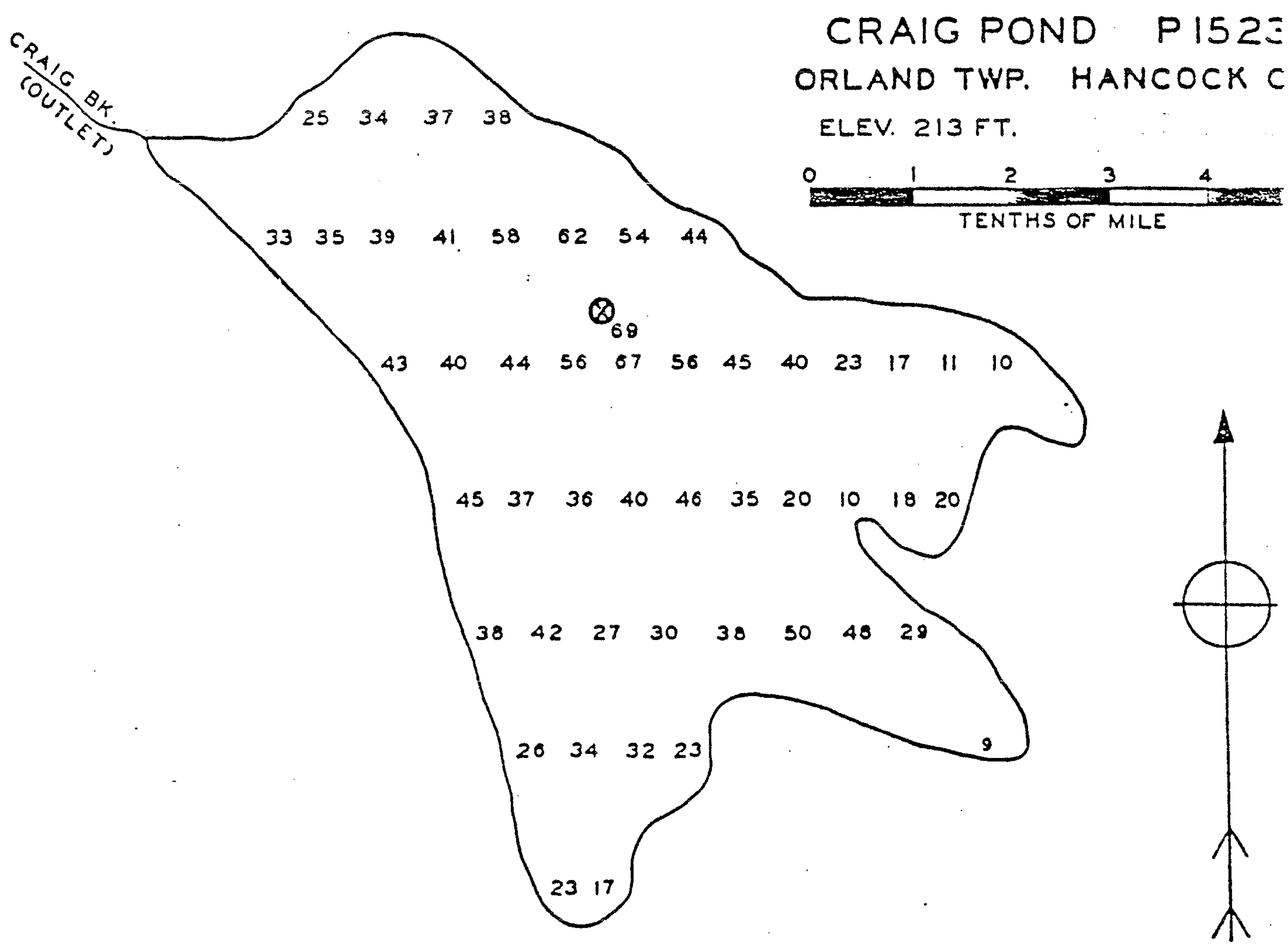
* Inadequate sampling season

The pond is shallow and does not stratify. It is managed for warmwater fish.

The one transparency reading is below average for Maine lakes.

Craig Pond #4332

Surface Area	88 ha (218 a)
Max. Depth	21 m (69 ft)
Mean Depth	10.1 m (33 ft)
Volume	9.1 X 10^6 m^3 (7398 acre-feet)
Drainage Area	3.11 Km^2 (1.20 mi^2)
Flushing Rate	0.2 (flushes/year)



Craig Pond #4332

	1977-78	1979	1980	1981	1982
Mean Secchi	11.4*	9.5*(4)	11.0*(3)	10.6	11.3*(2)
Min. Secchi (m)	11.0	6.5	10.5	8.3	10.0
TSI	NA	NA	NA	15	NA
Color(SPU)	0			5	
pH(core)	6.4			6.7	
Chla(ug/l)	1.2(ls)			1.2(ls)	
TP(ppb)	4(c)(ls)			7(c)(ls)	
	14(b)(ls)			12(b)(ls)	

* Inadequate sampling season
(ls) late summer, (c) core, (b) bottom

The pond provides ideal habitat for coldwater gamefish as oxygen is abundant even in the deepest water. The pond is managed for hatchery and native lake trout. The brook trout stocking has been discontinued.

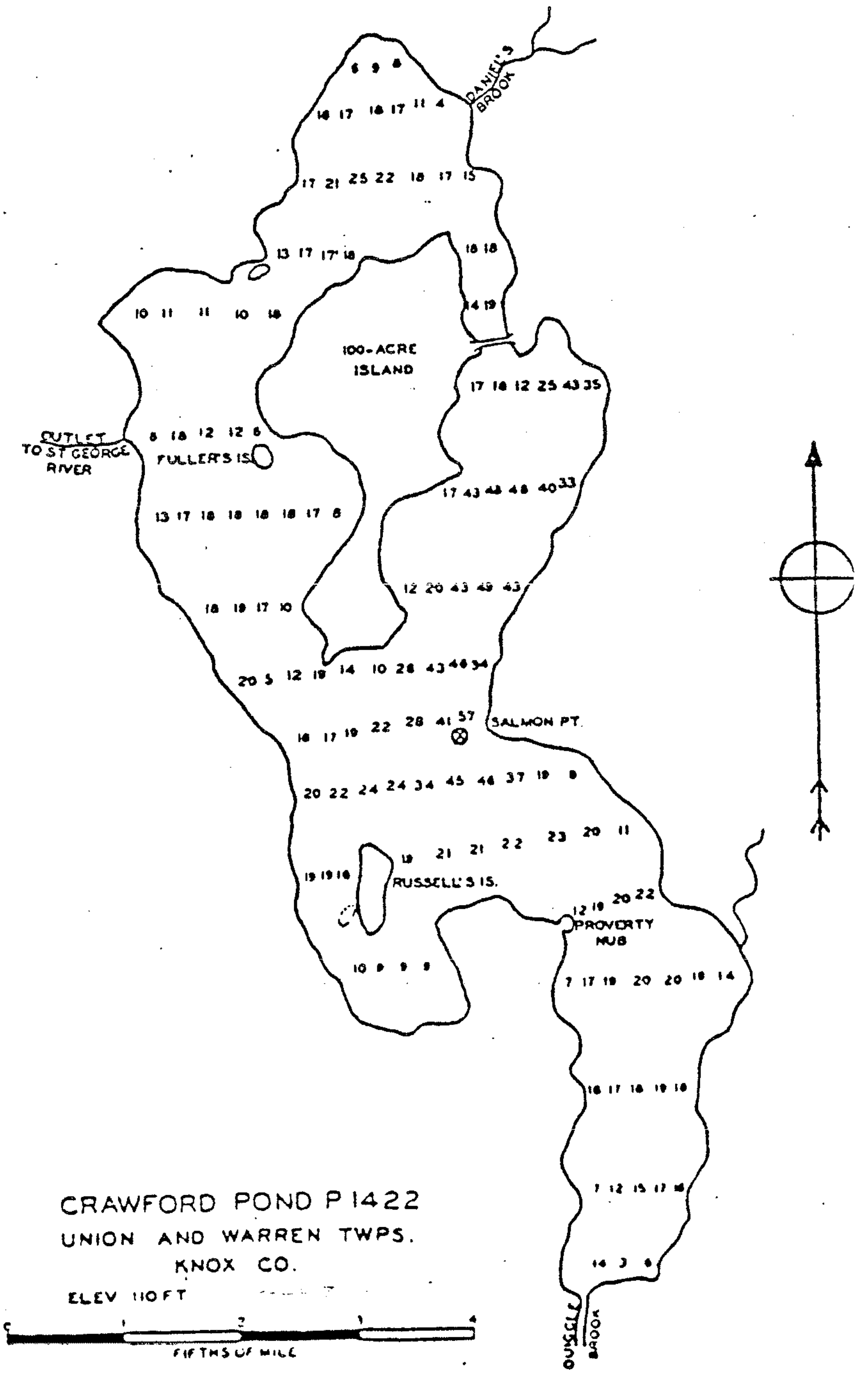
There is very little development around the lake.

Secchi disk readings are far above average for Maine lakes. Chla and TP values are low.Such high water quality is a rare natural resource which should be carefully protected and maintained. Protection is particularly necessary because of the slow flushing rate, 0.2 flushes/year, which may indicate that the pond is sensitive to water quality degradation.

The pond is the water supply for the Craig Brook National Fish Hatchery.

Crawford Pond (Union) #4810

Surface Area	237 ha (585 a)
Max. Depth	17.1 m (57 ft)
Mean Depth	5.2 m (17.2 ft)
Volume	11.9 X 10^6 m^3 (9646 acre-feet)
Drainage Area	70.5 km^2 (27.2 mi^2)
Flushing Rate	3.7 (flushes/year)



Crawford Pond (Union) # 4810

	197475	1976	1980	1981	1982
Mean Secchi(m)	5.3*	5.2*(1)	5.8*(4)	6.1	5.2
Min. Secchi (m)	3.9		4.0	5.3	4.5
TSI	NA	NA	NA	38	44
TSI Range					44 - 46 CHL SD
Color(SPU)	35			27	27
pH	6.6			6.8(c)	6.8
Chla(ug/l)				3.0(ls)	3.2mean
TP(ppb)				11 (c))ls) 23 (b)(ls)	11(c)(ls) 15(b)(ls)

* inadequate sampling season
(b) bottom, (ls) late summer, (c) core

Crawford Pond is ideally suited to warm water fish although there is some marginal habitat for salmon and trout. The pond is managed for warmwater fish. There is an oxygen deficiency in the hypolimnion by late summer.

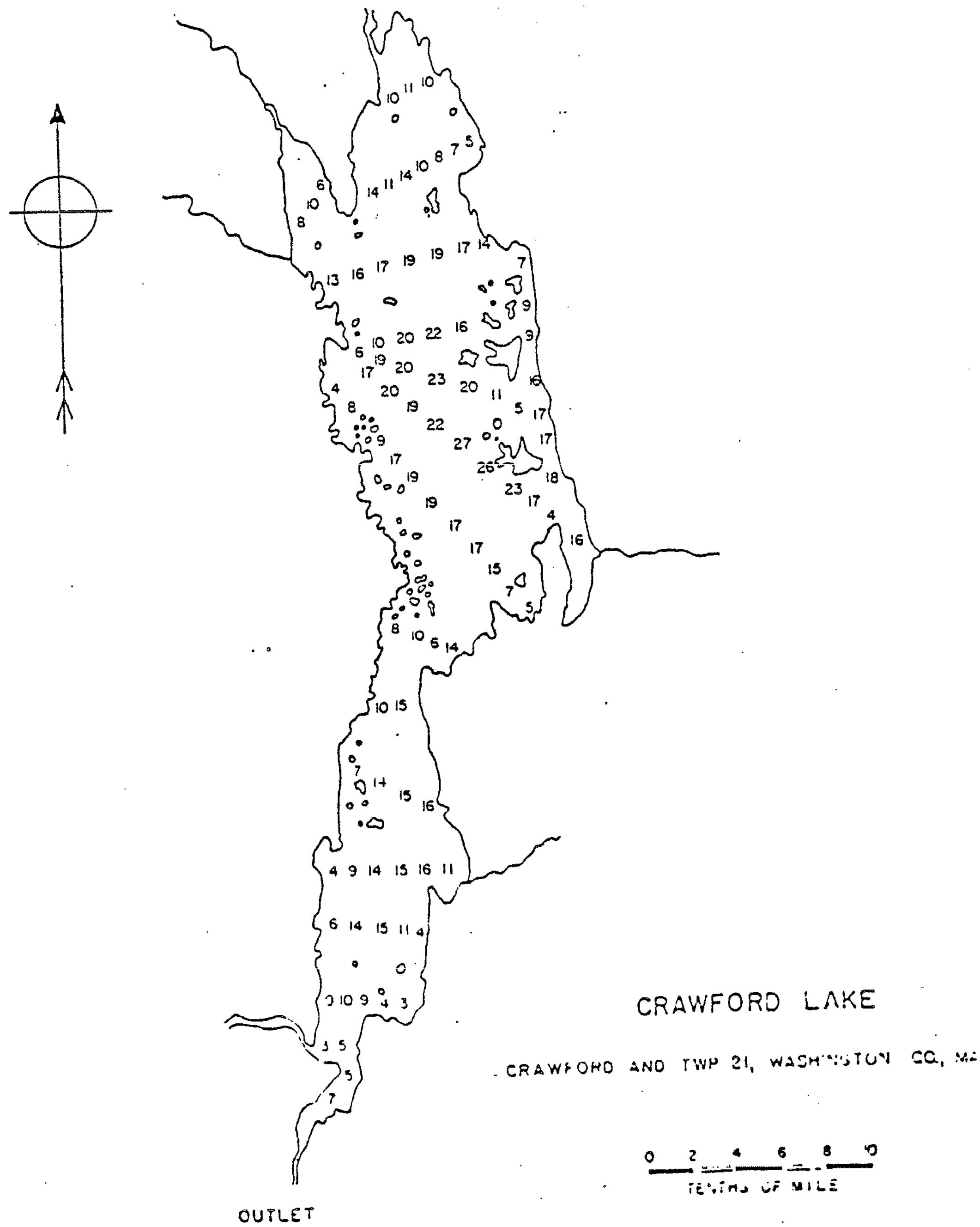
Crawford Pond continues to have good water quality. In the past, members of the Crawford Pond Association have been concerned that domestic sewage may be reaching the pond. The pond is heavily developed, so cottage owners should take measures to ensure that septic systems are properly maintained. See section on Protection in the Introduction.

Transparency is average for Maine lakes and chlorophyll and total phosphorus levels are moderate.

In 1982, the monitors of Crawford participated in the chlorophyll program which was established in 1980 to collect additional data on colored lakes, lakes with declining water quality, or lakes with unexplained problems.

Crawford Pond (Crawford) #1302

Surface Area	685 ha (1677 a)
Max. Depth	8.2 m (27 ft)
Mean Depth	3.2 m (10.5 ft)
Volume	2.3 X 10^7 m^3 (18699 acre-feet)
Drainage Area	198 Km^2 (76.4 mi^2)
Flushing Rate	5.4 (flushes/year)



Crawford Pond (Crawford) #1302

	1979	1980	1981	1982
Mean Secchi (m)	2.6*(4)	3.1	3.0	3.5
Min. Secchi (m)	2.0	2.5	2.6	3.1
Chla(ug/l)			3.3mean	
TP(ppb)	21(Sp.)		13(ls)	
TSI	NA	colored	48 CHL	colored
Color(SPU)	70		50	
pH			6.0	

* Inadequate sampling season
(ls) Late summer
(Sp.) Spring

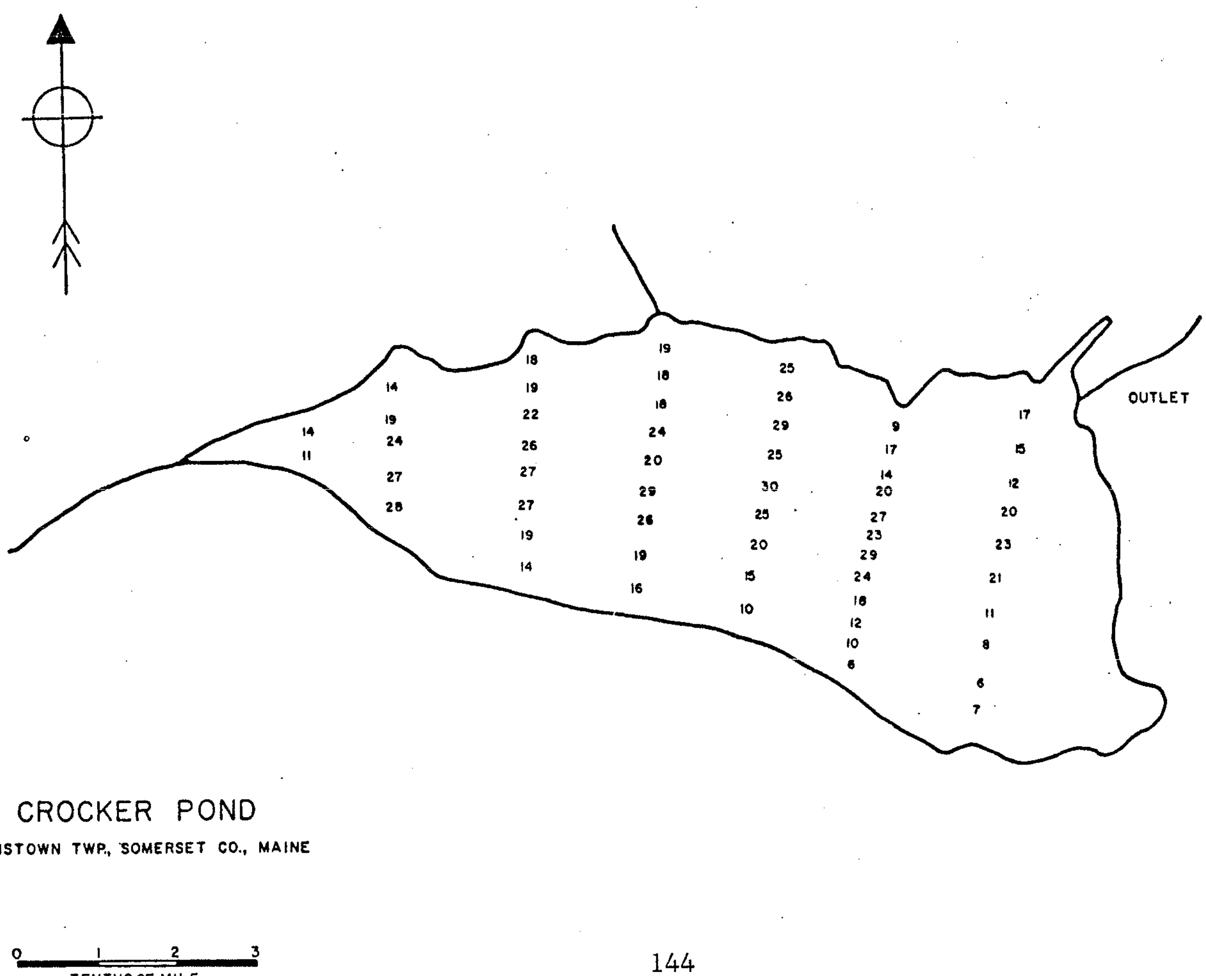
The lake is shallow and does not stratify. It is managed for warm water fish.

Chlorophyll levels of 3.3 ug/l indicate that the lake is moderately productive. The TSI calculated based on Chla is 48; if the TSI were calculated based on transparency, it would be 76. 48 indicates a moderately productive lake but 76 indicates a highly productive lake. It is examples like this that are the reason why we do not use transparency to calculate TSI on a highly colored lake. Color reduces transparency but does not affect water quality. Secchi disk transparency is still a useful tool. It can be used in determining water quality trends within a particular lake even though it cannot be used to compare colored lakes to clear lakes or even other colored lakes.

Water quality appears slightly improved since 1979.

Crocker Pond # 2626

Surface Area	95 ha (238a)
Max. Depth	9.0 m (30 ft)
Mean Depth	4.7 m (15.5 ft)
Volume	4.4×10^6 m^3 (3567 acre-feet)
Drainage Area	8.2 km^2 (3.2 mi^2)
Flushing Rate	1.0 (flushes/year)



Crocker Pond #2626

	1982
Mean Secchi(m)	4.2*(3)
Min. Secchi (m)	3.6
TSI	NA
Color(SPU)	23
Chla (ug/l)	5.0 (ls)
TP (ppb)	8 (ls)
pH(core)	6.7

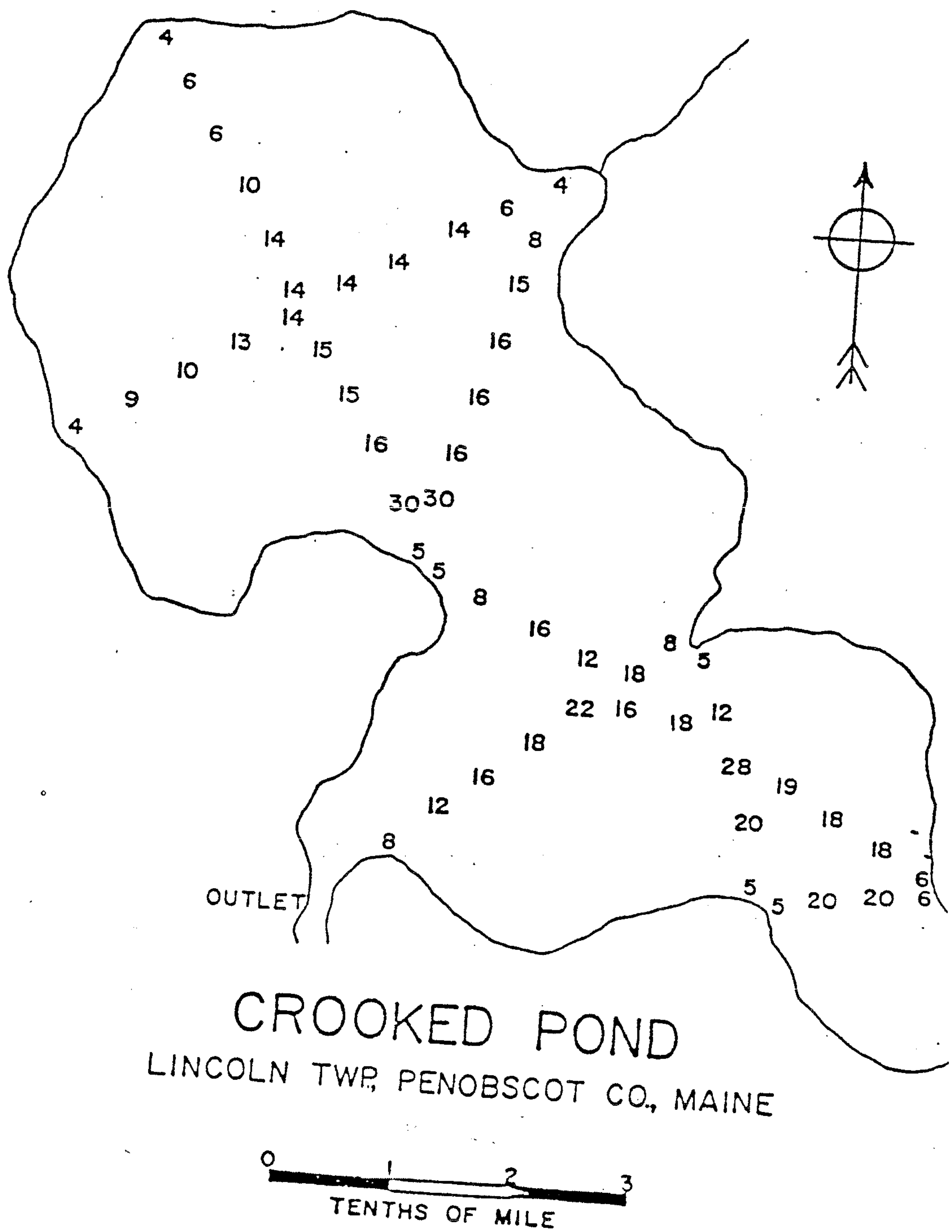
* inadequate sampling season
(ls) late summer

Crocker Pond is a shallow pond which does not stratify. It has good water quality. Chla and TP values indicate that it is a moderately productive pond. Transparencies are slightly below average for a Maine lake, but moderate color may be interfering.

The Department of Inland Fisheries and Wildlife manages the pond for brook trout. Annual stocking has been done since 1959, because there is insufficient natural spawning areas for brook trout.

Crooked Pond #2220

Surface Area	89.1 ha (220 a)
Max Depth	9.1 m (30 ft)
Mean Depth	3.1 m (10 ft)
Volume	2.75 X 10^6 m^3 (2230 acre-feet)
Drainage Area	5.83 Km^2 (2.26 mi^2)
Flushing Rate	1.1 (flushes/year)



Crooked Pond #2220

	1973-74	1975	1976	1981	1982
Mean Secchi(m)	5.0	5.6*(3)	5.1*(2)	4.0*(3)	4.4
Min. Secchi (m)	3.4	4.7	4.9	3.8	2.4
TSI	NA	NA	NA	NA	colored
Color(SPU)				50	
pH(core)	6.2				6.8
Chla(ug/l)				4.1(ls)	
TP(ppb)				11(ls)	

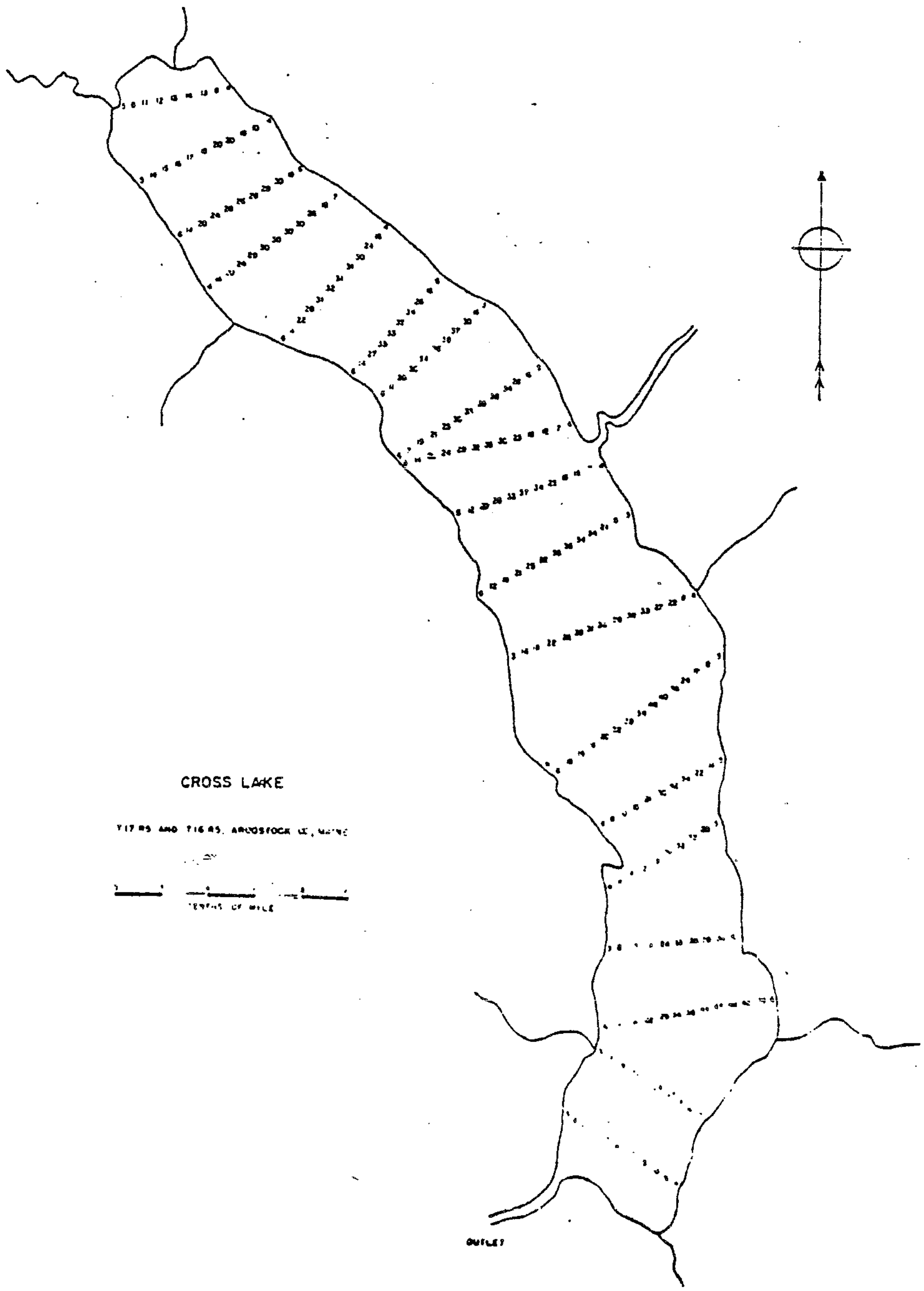
* Inadequate sampling season
(ls) late summer

Crooked Pond is best suited for warmwater game fish. Smallmouth bass, perch, pickerel and hornpout are established species. The deep hole is small and low in dissolved oxygen.

It is difficult to predict water quality trends due to short sampling seasons. Secchi disk readings are slightly below average for a Maine lake, but this fact is due to high water color and not water quality. Considering the high water color, the transparencies indicate that Crooked Pond has good water quality. Chla and TP values are moderate.

Cross Lake #1674

Surface Area	1027 ha (2568 a)
Max Depth	14 m (46 ft)
Mean Depth	6.3 m (20.7 ft)
Volume	6.45 X 10^7 m^3 (52414 acre-feet)
Drainage Area	425 Km^2 (164.1 mi^2)
Flushing Rate	3.3 (flushes/year)



Cross Lake #1674

	1981
Mean Secchi(m)	3.8
Min. Secchi (m)	2.0
TSI	Colored
Color	40
pH	7.1
Chl*a*	9.3(ls)
TP	19(ls)

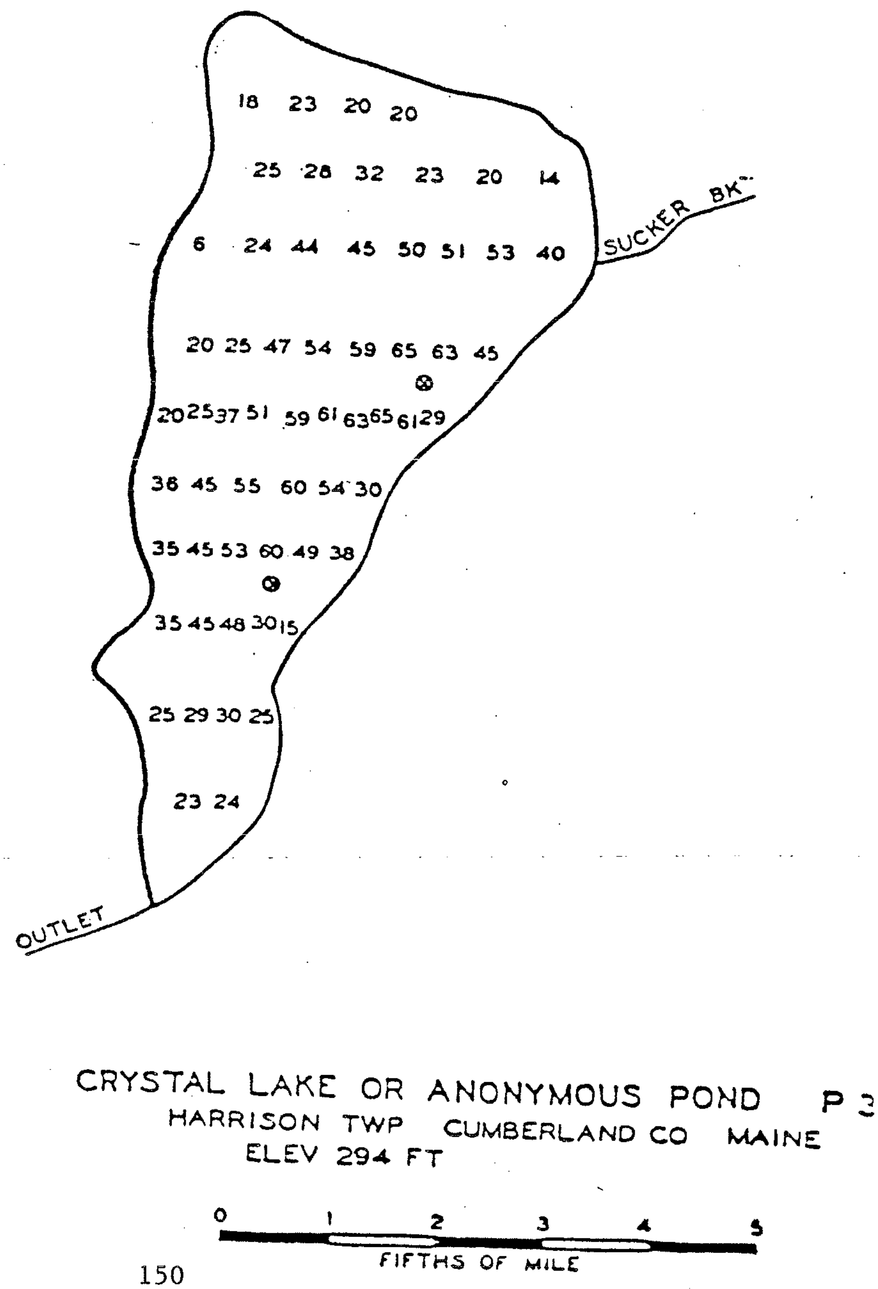
(ls) late summer

Cross Lake is managed for landlocked salmon. Suitable temperature and oxygen levels were present at all depths during the summer of 1953 and 1981. Stratification did not occur. The lack of stratification is unusual in a lake 46 feet deep.

Transparencies are reduced due to high water color. Chlorophyll *a* and TP levels are high. Additional study should be undertaken but we have no monitor for 1982.

Crystal Lake (Anonymous Pond)(Harrison) #3452

Surface Area	187 ha (461 a)
Max. Depth	19.8 m (65 ft)
Mean Depth	11 m (36 ft)
Drainage Area	22.6 Km^2 (8.7 mi^2)
Flushing Rate	0.7 (flushes/year)



Crystal Pond (Anonymous Pond) #3452

	1976-77	1978	1979	1980	1981
Mean Secchi(m)	5.4*	5.5*(1)	5.2	4.5	4.8
Min. Secchi(m)	4.4		5.0	3.5	4.0
TSI	NA	NA	46	54	50
Color	20				20
pH	6.7				6.8
Chl*a*	2.0*(3)				2.2(ls)
TP	8(sp)(2)				9 (c)(ls)
	14(b)(ls)				38(b)(ls)
	4 (sur)(ls)				

* Inadequate sampling season
(ls) late summer, (b) bottom, (c) core, (sur) surface, (sp) spring

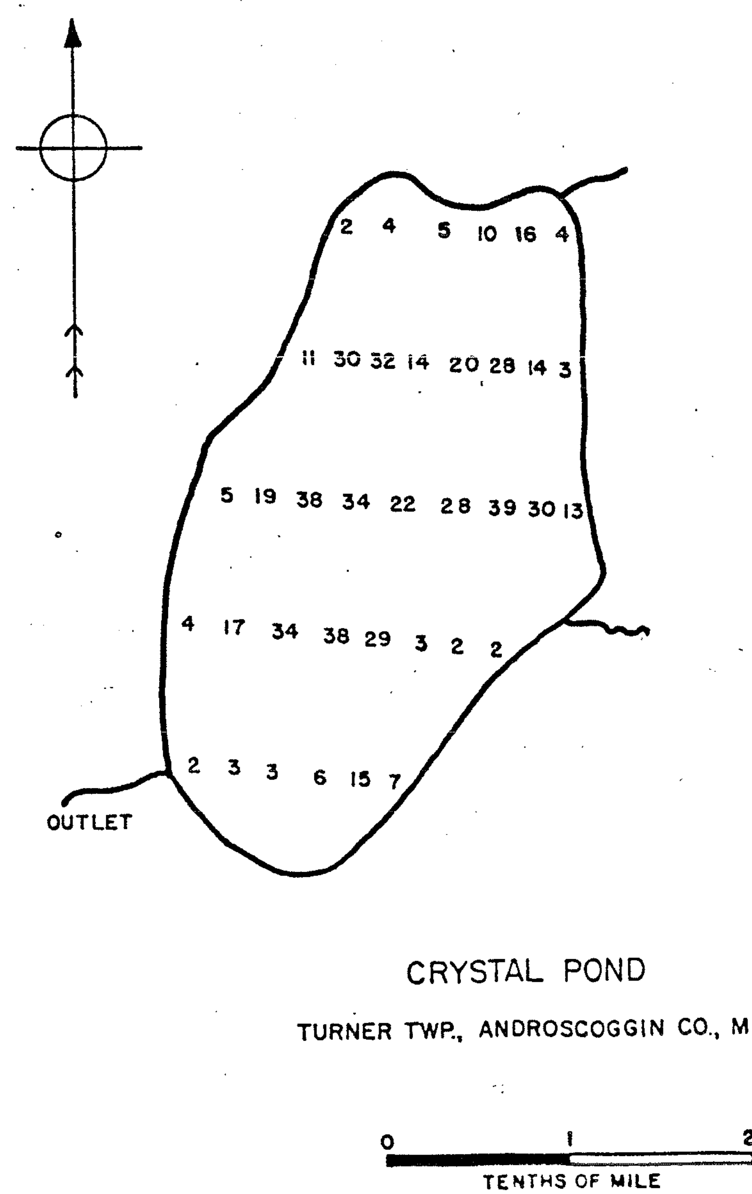
---

The lake supports a cold water fishery even though an oxygen deficiency (less than 5 ppm) exists in the hypolimnion by late summer. The lake is managed for smallmouth bass and togue.

There is some fluctuation in the transparency readings but no trend is evident. Continued monitoring is necessary in order to determine any water quality trend. Chlorophyll levels are low and phosphorus is moderate.

Crystal Pond (Beals Pond) (Turner) #3626

Surface Area	14. ha (35. a)
Max. Depth	11.7 m (39.ft)
Mean Depth	4.6 m (15 ft)
Volume	6.41 X 10^5 m^3 (521 acre-feet)
Drainage Area	1.29 Km^2 (.5 mi^2)
Flushing Rate	1.1 (flushes/year)



CRYSTAL POND

TURNER TWP., ANDROSCOGGIN CO., MAINE

Crystal Pond (Beals Pond) # 3626

	1981	1982
Mean Secchi (m)	4.2*(3)	3.7
Min. Secchi (m)	3.4	2.5
TSI	NA	65
Color(SPU)	15	25
pH(core)	7.6	7.5
Chla(ug/l)	3.5(ls)	7.8*mean
TP(ppb)	27 (ls)	10(c)(ls)
	17 (b)(ls)	60(ls)(b)

* Inadequate sampling season
(ls) late summer, (b) bottom, (C) core

The pond is managed for warm water fish and brown trout are stocked. There is a lack of oxygen (less than 1ppm) in the hypolimnion by late summer.

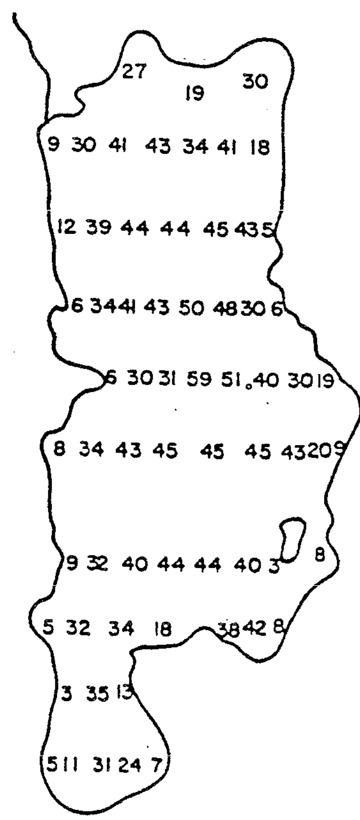
Transparency is slightly below average for Maine lakes; Chlorophyll a is moderate and TP levels are moderate to high. Generally, 15 ppb TP is considered sufficient to support algal blooms. Residents of the drainage should exercise care to avoid adding phosphorus to the lake. See the section on Protection in the Introduction.

Lakeshore residents are concerned by a black scum which has washed up from time to time over the past 2 years on the south shore of the lake. The DEP with help from the local residents will continue to try to identify the substance which so far has alluded our efforts.

In 1982, the monitors of Crystal Pond participated in the chlorophyll program which was established to collect additional data on colored lakes, lakes with declining water quality, or lakes with unexplained problems.

Crystal Lake (Gray)   #3708

Surface Area	77 ha (189 a)
Max. Depth	15.2 m (50 ft)
Volume	6.7 X 10^6 m^3 (5500 acre-feet)
Drainage Area	4.9 Km^2 (1.9 mi^2)
Flushing Rate	0.4 (flushes/year)



CRYSTAL LAKE

GRAY TWP., CUMBERLAND CO, MAINE

0 1 2 3 4 5

TENTHS OF MILE

Crystal Lake (Dry Pond) #3708

	1974(x)	1975(x)	1976(x)@	1977	1978
Mean Secchi (m)	5.6	6.7	5.6	5.2*(1)	7.8*(4)
Min. Secchi (m)	4.3	5.5	3.3		7.5
Chla	4.5	3.8	4.5		
TP	6 (m-s)	7 (m-s)	9 mean		
TSI	41	38	44		NA
TSI Range	30-50	33-46	40-50		
	TP-CHL	TP-CHL	TP-CHL		
Color		30			
pH		6.6			

* Inadequate sampling season

(m-s) mean surface,

(x) Data collected as part of a cooperative project between DEP and U.S. Geological Survey.

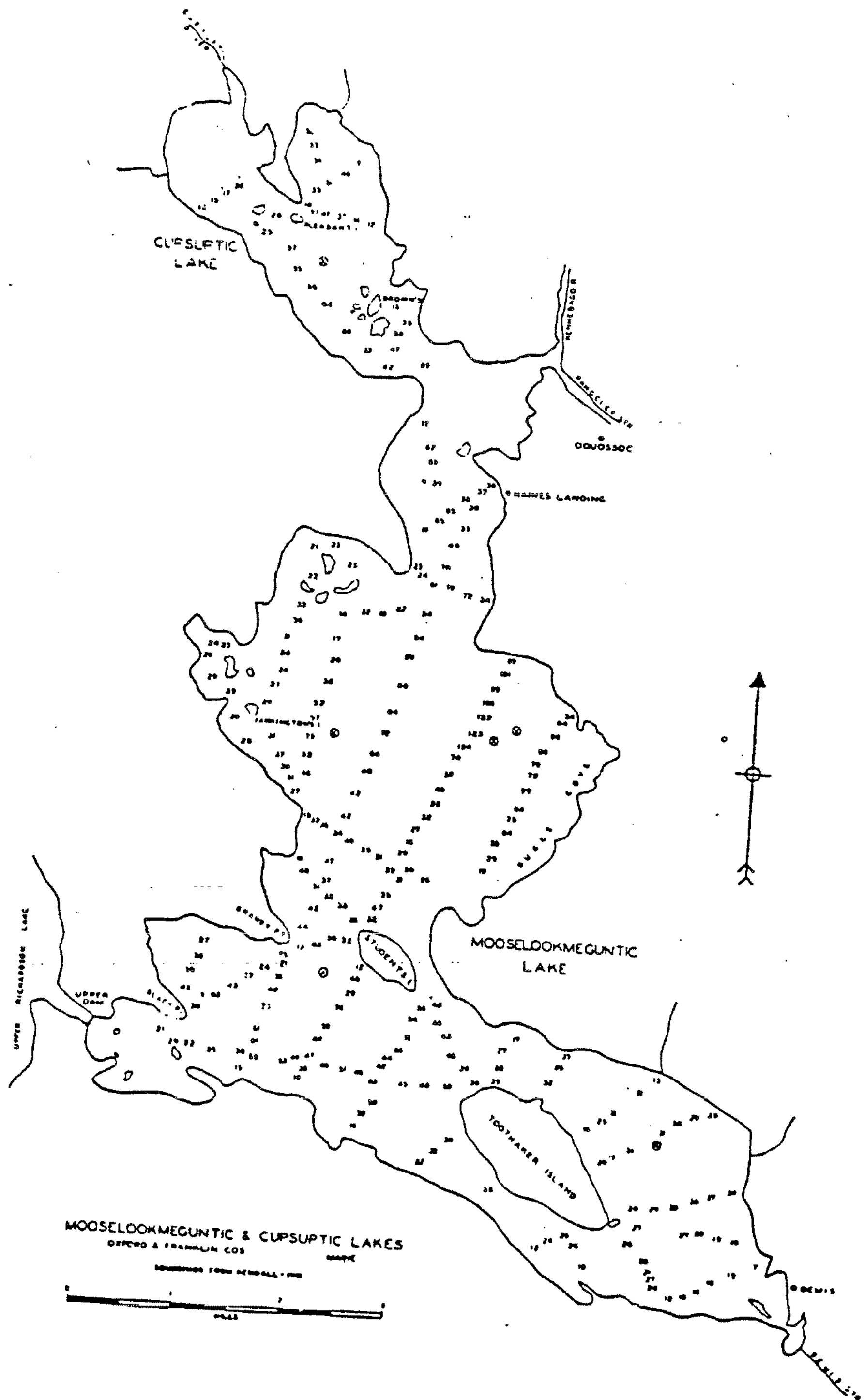
@ Some data collected by Greater Portland's Council of Governments monitoring program.

There is a deficiency of dissolved oxygen (less than 2 ppm) in the hypolimnion by late summer. The lake is managed for brown trout.

There is some fluctuation in the transparency readings but no trend is evident. Continued monitoring with full seasons of data is necessary in order to determine any water quality trends. Chlorophyll levels are moderate and TP levels are low to moderate.

Cupsuptic Lake #7726

Surface Area	(Cupsuptic and Mooselookmeguntic) 6601 ha (16300a)
Max. Depth	19.5 m (64 ft)



Cupsuptic Lake # 3302

Basin #2

	1981	1982
Mean Secchi (m)	4.9	4.7
Min. Secchi (m)	4.0	3.4
TSI	49	52
Color(SPU)		23
pH		6.6
Chla (ug/l)		2.9(1s)
TP(ppb)		10(1s)(c)
		5(b)(1s)

"Mooselookmeguntic and Cupsuptic Lakes are seperate bodies of water that have been joined to make one lake by raising the water level of Mooselookmeguntic lake by some 14 feet. This water level is maintained by a 20 foot dam at Upper Dam, the outlet of Mooselookmeguntic lake. The two basins will be considered together in this report and the name Mooselookmeguntic will refer to both lakes."

"Mooselookmeguntic lake, as with all Rangeley lakes, except Aziscohos, provides excellent temperatures, dissolved oxygen levels, and general water quality characteristics for cold water fishes. These conditions, provide a habitat that produces salmon and trout fishing."[1] Small numbers of salmon are stocked annually in Rangeley Stream and brook trout are stocked occasionally.

Chla and TP values for 1982 are low to moderate indicating good water quality. Transparencies are slightly average for Maine lakes.

There is a discrepency between pH readings obtained by the monitor and D.E.P. The monitor has been getting values of 5.4 but this department's sampling of Cupsuptic Lake showed a value of 6.6. It is unknown at this time what is causing this wide difference in pH readings, it may be a difference in sampling techniques. DEP will be studying the problem in 1983. A standard technique is being developed so that pH readings taken by monitors and this Department will be consistent.

1. Taken from Inland Fisheries and Wildlife Survey

Curtis Pond # 3850

The pond has not been surveyed by the Department of Inland Fisheries and Wildlife. Morphometric information courtesy of the Department of Environmental Protection.

Surface Area	4.4 ha (10.9 a)
Max. Depth	6.7 m (22 ft)
Mean Depth	4.6 m (15.1 ft)
Volume	2.03×10^5 m^3 (165 acre-feet)
Drainage Area	0.18 Km^2 (.07 mi^2)
Flushing Rate	0.6 flushes/year

Curtis Pond # 3850

	1979	1981
Mean Secchi(m)	2.6*(4)	1.8*(4)
Min. Secchi (m)	2.3	1.7
TSI	NA	NA
Color	55	
pH	5.3	
Chl*a*	5.3*(4)	
TP	16*(4)(c)	
	41*(3)(b)	

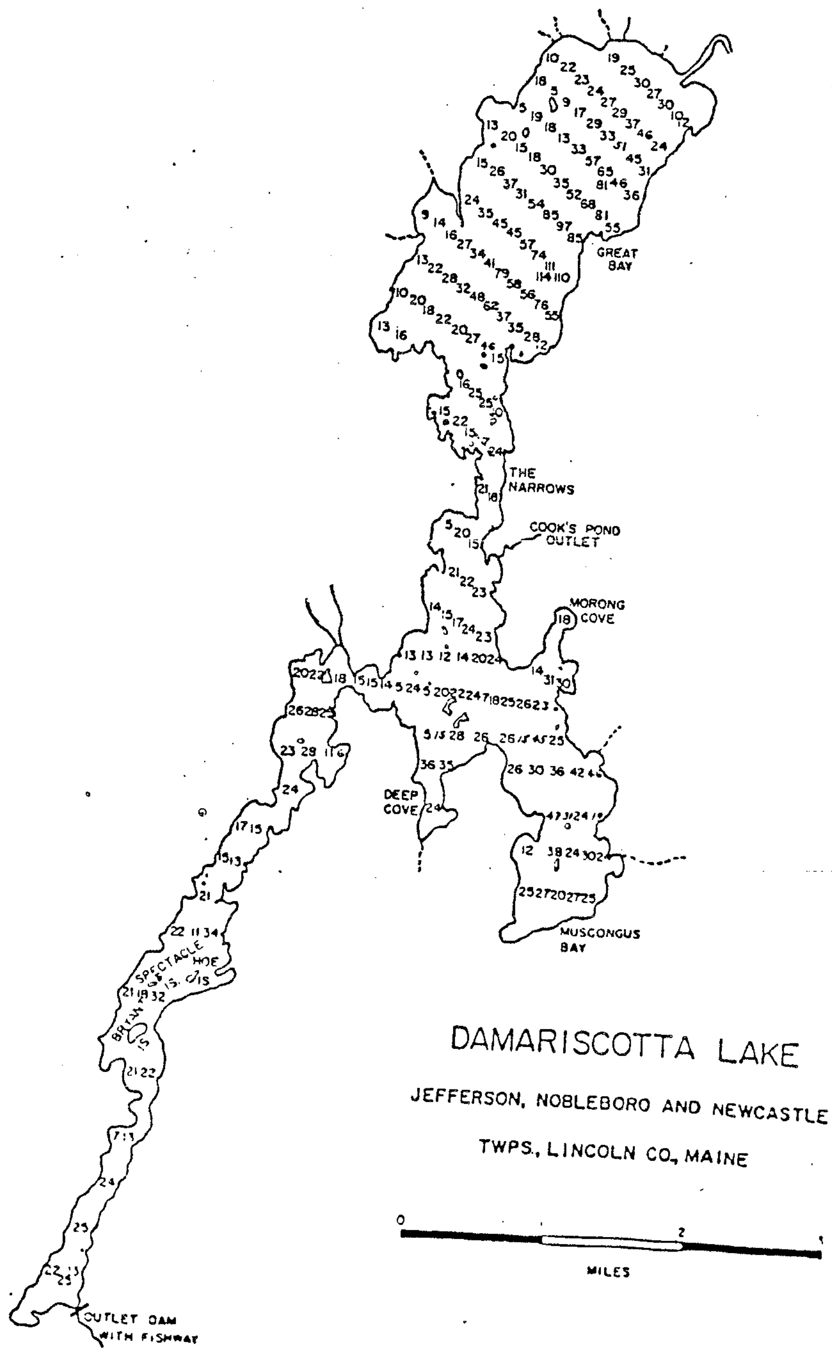
* inadequate sampling season
(c) core, (b) bottom

Transparency readings are reduced due to high water color, and phosphorus levels are also adversely affected by the color. Chlorophyll is not affected by color and the levels indicate a moderately productive lake.

The pond is small and shallow.

Damariscotta Lake #5400

Surface Area	1872 ha (4625 a)
Max Depth	34.8 m (114 ft)
Drainage Area	147.1 km^2 (56.8 mi^2)



Damariscotta Lake #5400

North Basin	1977	1979	1980	1981	1982
Mean Secchi(m)	4.1*(3)	4.8*(4)		4.9*(2)	5.3*(3)
Min. Secchi (m)	4.0	3.8		4.3	4.7
TSI	NA	NA		NA	NA
Color(SPU)		30			24
pH		6.8			6.9
Chla(ug/l)		3.8(ls)			5.5(ls)
TP(ppb)	8 (spr)	10 (c)(ls)			11(c)(ls)
		16 (b) (ls)			6(b)(ls)

Middle Basin	1977-78	1979	1980
Mean Secchi(m)	4.8	4.5	3.9
Min. Secchi (m)	4.0	3.0	3.2
TSI	49	54	62

South Basin	1977-78	1981	1982
Mean Secchi (m)	5.4*	4.4*(1)	4.4
Min. Secchi (m)	4.8		3.8
TSI	NA	NA	55

* Inadequate sampling season
(ls) late summer, (c) core, (b) bottom, (spr) spring.

Damariscotta is a large lake with a significant portion of the shoreline undeveloped. Recently, however, more development has begun in the area. Hopefully the development will progress in a manner which preserves water quality. Rumors of algal blooms have circulated but have not been verified.

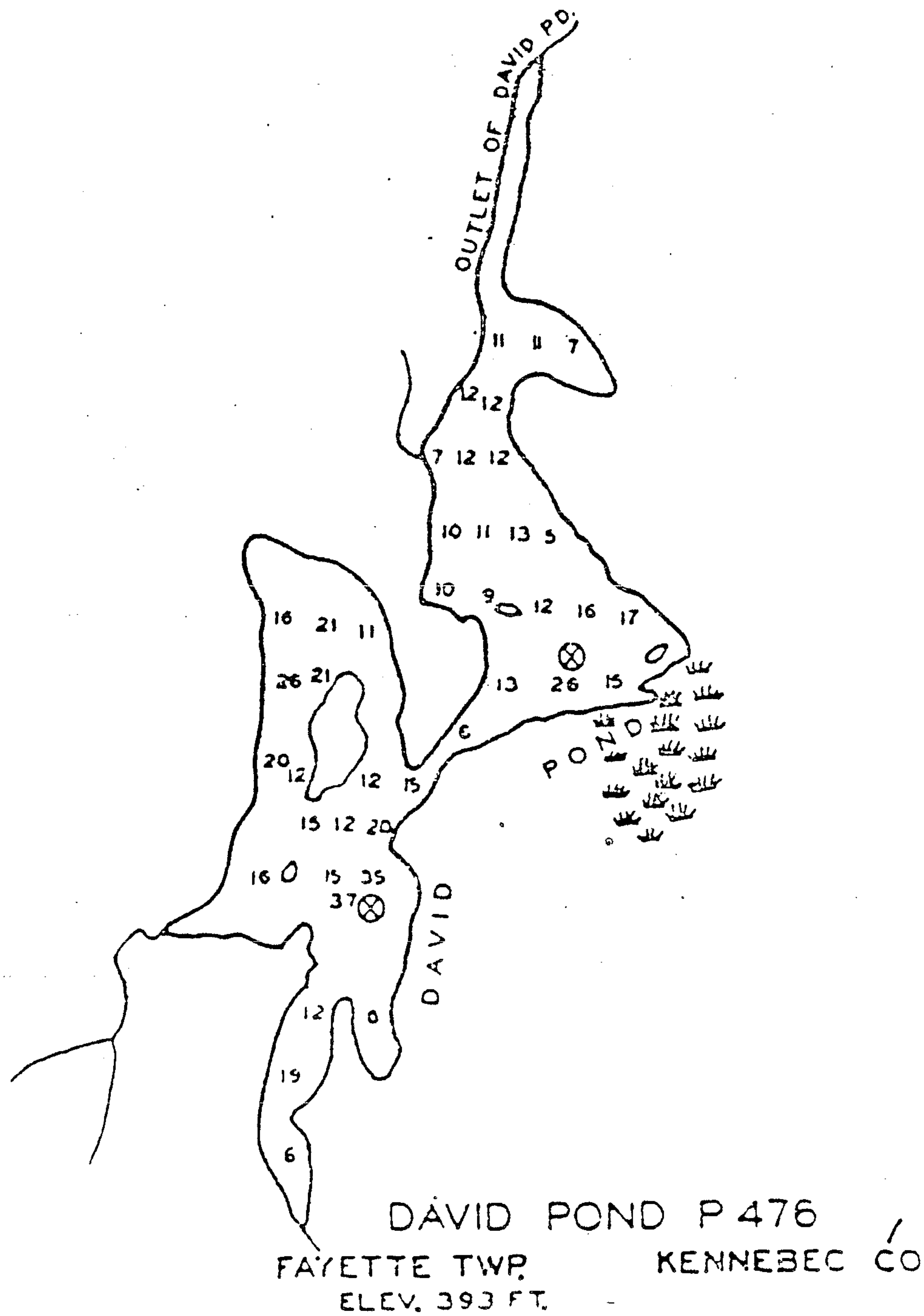
The lake association in conjunction with DEP took bacteria and TP samples at different spots around the lake several times in 1978 to check for sources of pollution. Some manure piles were found to be sources of phosphorus and bacteria. It is hoped that farmers will remedy the situation.

Transparency readings from the middle basin (the only basin with full seasons from 1977-1980) show a decline in water quality. Continued monitoring with full sampling seasons is necessary in order to determine any water quality trends. Chla and TP taken in 1979 and 1982 show little change. These values are considered to be in the moderate range.

The lake is managed as a cold water fisheries, especially for salmon and togue, and some brook trout stocking does occur.

David Pond #5666

Surface Area	115 ha (284 a)
Max. Depth	11.3 m (37 ft)
Mean Depth	3.1 m (10.2 ft)
Volume	3.5×10^6 m^3 (2837 acre-feet)
Drainage Area	13.4 km^2 (5.2 mi^2)
Flushing Rate	2.0 (flushes/year)



David Pond # 5666

	1981	1982
Mean Secchi(m)	4.1	4.6*(4)
Min. Secchi(m)	3.9	3.7
TSI	59	NA
Color(SPU)		10
pH		6.8
Chla (ug/l)		3.2(ls)
TP(ppb)		6(c)(ls)
		25(b)(ls)

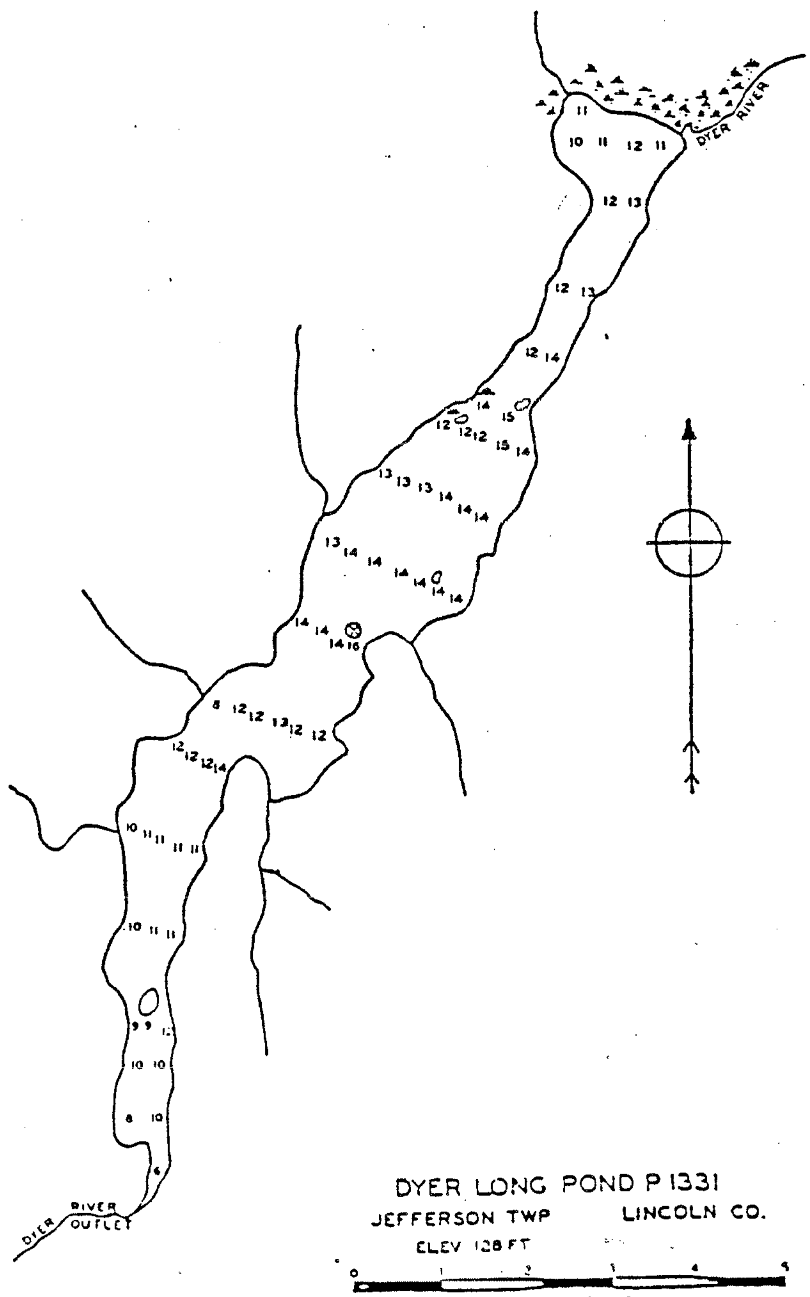
* inadequate sampling season
(ls) late summer, (b) bottom, (c) core.

David Pond is managed for warmwater fish. Largemouth and smallmouth bass, perch, pickerel and hornpout are the established species. An oxygen deficiency exists in the hypolimnion by late summer.

Transparencies are slightly below average. Chla values are considered moderate and Tp values are low to moderate indicating good water quality.

Dyer Long Pond #5386

Surface Area	159 ha (392 a)
Max Depth	4.9 m (16 ft)
Mean Depth	2.8 m (9.2 ft)
Volume	3.96×10^6 m^3 (3210 acre-feet)
Drainage Area	45.4 km^2 (17.5 mi^2)
Flushing Rate	6.6 (flushes/year)



Dyer Long Pond # 5386

	1981	1982
Mean Secchi (m)	2.0*(4)	2.4*(3)
Min. Secchi (m)	2.0	2.0
TSI	NA	NA
Color(SPU)		47
pH		6.7
Chla(ug/l)		4.7(ls)
TP(ppb)		13(ls)

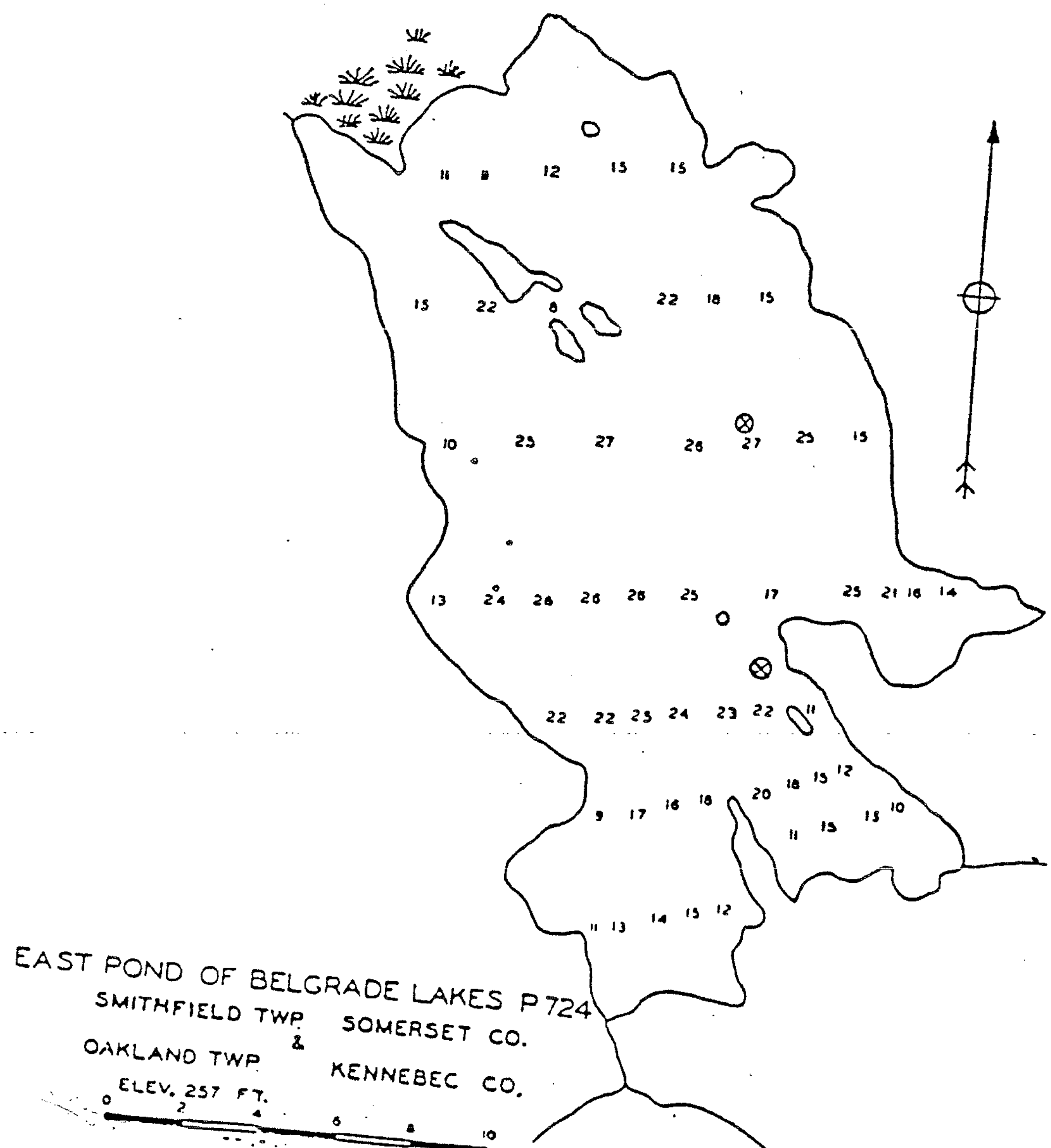
* Inadequate sampling season
(ls) late summer

The pond is managed for warm water fish.

The pond is shallow and does not stratify. Chla and TP values are moderate. Transparency is below average for a Maine Pond, but high water color adversely affects transparency but does not affect water quality. The shallowness of the pond probably also affects transparency because bottom sediments are easily stirred up into the upper portion of the lake where the Secchi disk test is taken. Considering all these factors, the water quality of Dyer Long Pond is good.

Eagle Lake #4606

Surface Area	177 ha (437 a)
Max. Depth	33 m (108 ft)
Mean Depth	12.7 m (42 ft)
Volume	2.2 X 10^7 m^3 (17886 acre-feet)
Drainage Area	9.84 Km^2 (3.8 mi^2)
Flushing Rate	0.3 (flushes/year)



Eagle Lake #4606

	1971(©)	1972(©)	1973(©)	1981
Mean Secchi(m)	10.3*(1)	10.6(1)	10.0*(1)	11.0*(4)
Min. Secchi (m)				8.8
TSI	NA	NA	NA	NA
Color	NA	NA	NA	NA
pH				6.5
Chla				1.8(ls)
TP	<5(ls)			4 (c) 7(b)(ls)

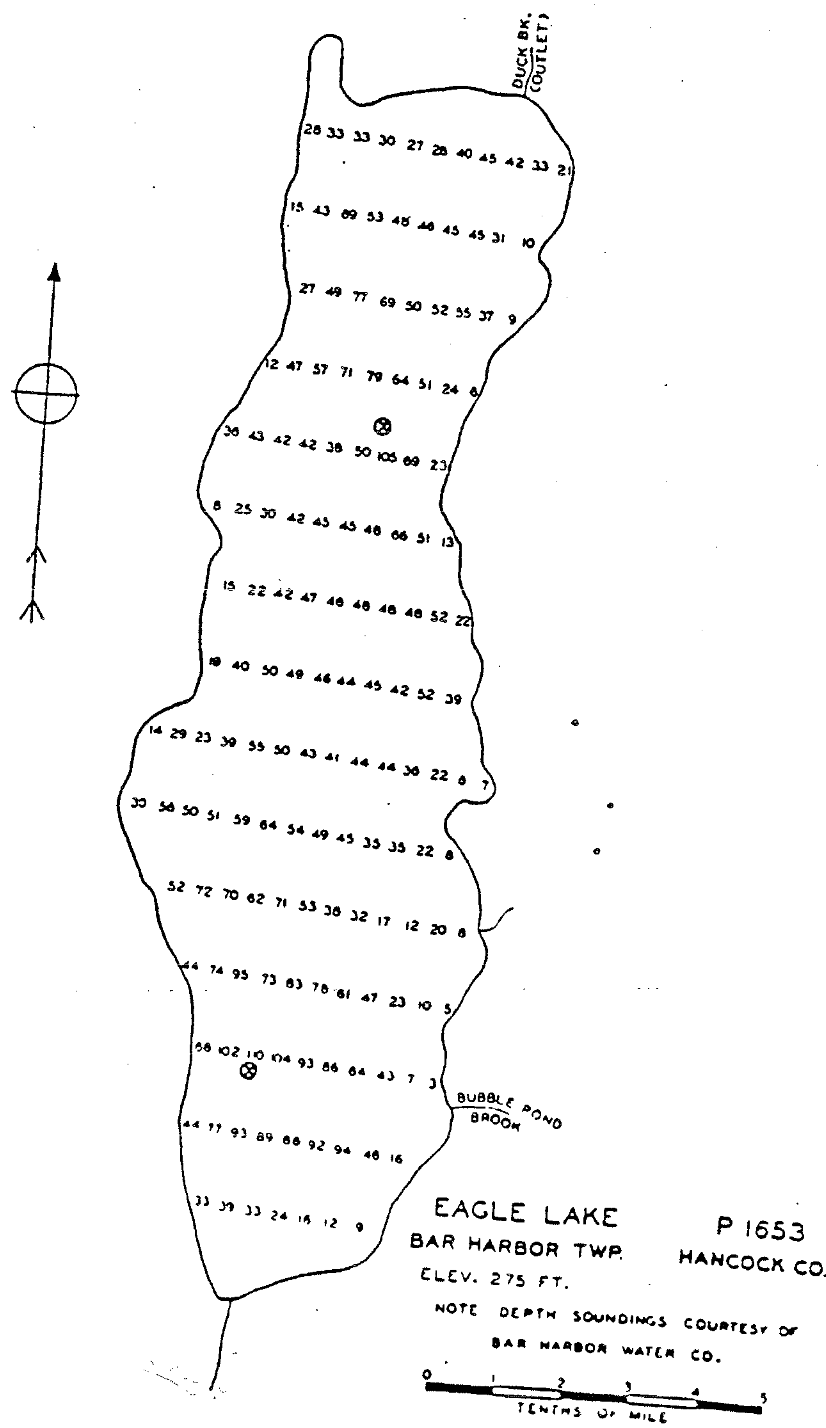
* Inadequate sampling season
(©) Data gathered during cooperative project between DEP and University of Maine, Orono.
(c) core, (ls) late summer (b) bottom

The principal fishery is salmon, brook trout and lake trout. There is a dissolved oxygen deficiency (3-4ppm) below 75 feet by late summer.

Transparencies are far above average for Maine Lakes, and Chla and TP levels are low. Such high water quality is a rare natural resource which should be carefully protected and maintained. Protection may be particularly necessary for Eagle Lake because of its slow flushing rate, 0.3 flushes per year, may make it more vulnerable to water quality degradation. Since the lake lies within the boundaries of the National Park System protection probably is adequate. It should be noted that the flushing rate of the lake is slow, 0.3 flushes per year.

East Pond #5349

Surface Area	690 ha (1705 a)
Max. Depth	8.2 m (27 ft)
Drainage Area	17.4 Km^2 (6.72 mi^2)



East Pond # 5349

	1975-78	1979	1980	1981	1982
Mean Secchi (m)	4.9	5.1*(4)	4.7	4.6	5.1
Min. Secchi (m)	4.1	4.3	4.2	3.0	4.0
TSI	50	NA	51	53	47
Color(SPU)	5		15		
pH	6.7mean				
Chl*a* (ug/l)	3.1(ls)		3.0(ls)		
TP(ppb)	12(ls)		15(ls)		

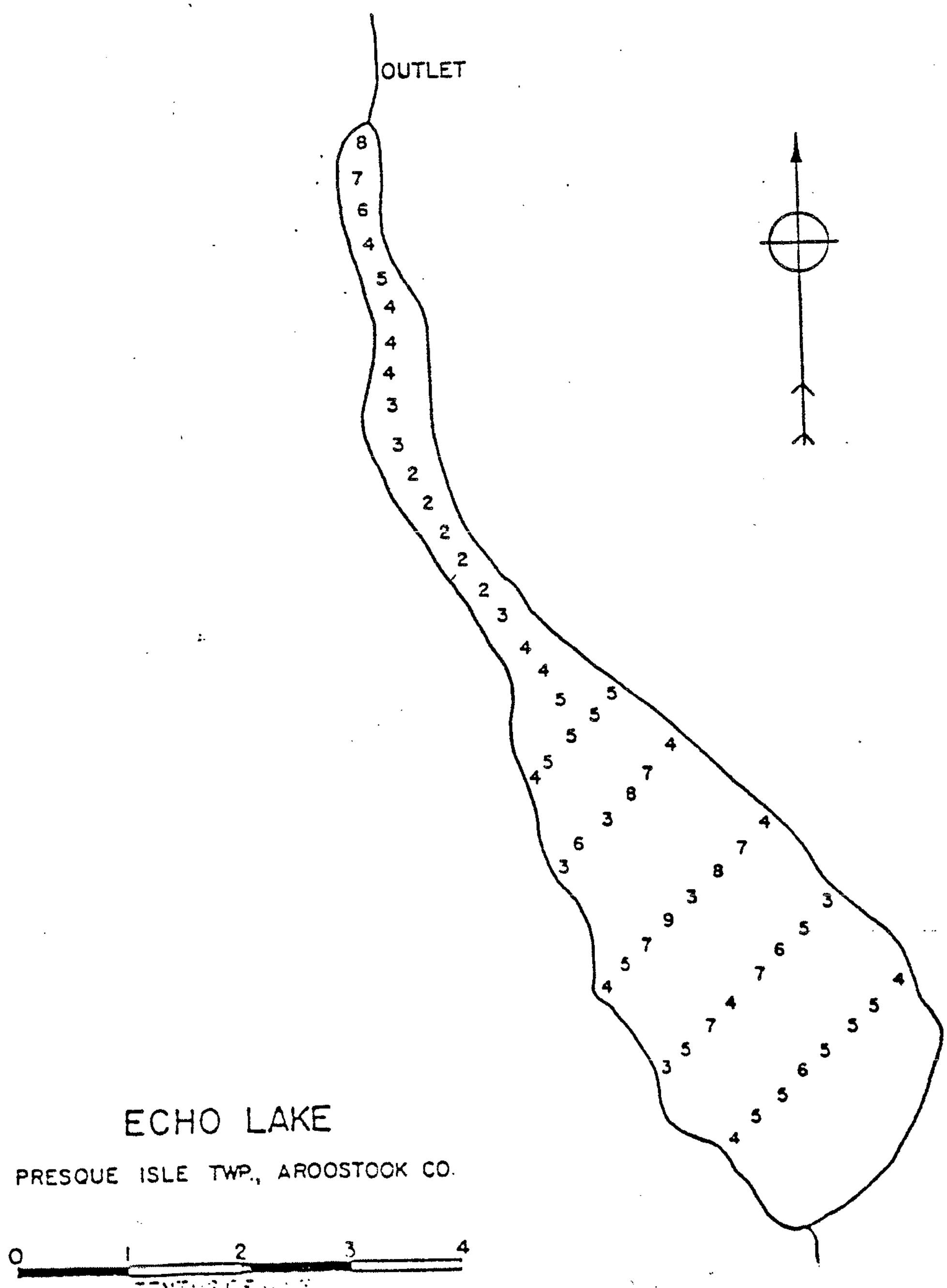
* Inadequate sampling season
(ls) late summer

The pond is shallow and does not stratify; it is managed for warm water fish, and also stocked with brown trout.

Transparency readings are stable and about average for Maine lakes except for 1980 and 1981 which are slightly below average. Chlorophyll levels are moderate and phosphorus is moderate to high and show little change from 1976 to 1980. Generally, 15 ppb TP is considered sufficient to support algal blooms; however, the transparency readings do not reflect such problems. Care should be exercised by lake shore residents and other residents of the watershed to avoid adding any additional phosphorus to the lake, and attempts should be made by individuals to reduce their input. See the section on Protection in the Introduction.

Echo Lake (Presque Isle) #1776

Surface Area	36 ha (90 a)
Max. Depth	2.7 m (9 ft)
Mean Depth	1.3 m (4.3 ft)
Volume	4.6×10^5 m^3 (374 acre-feet)
Drainage Area	4.4 Km^2 (1.7 mi^2)
Flushing Rate	4.6 (flushes/year)



Echo Lake # 1776 Presque Isle

	1976	1977	1978	1980	1981
Mean Secchi (m)	1.7*(3)	1.4*(3)	1.5*(4)	1.9	1.9*(4)
Min. Secchi (m)	1.5	1.0	1.2	1.8	1.5
TSI	NA	NA	NA	103	NA
Color(SPU)			20	20	
pH	7.6	7.7			
Chla(ug/l)		5.5*(3)	9.5(sum)		6.3*(4)
TP(ppb)	19*(3)(sur)	20*(2)		13(f)	21*(3)

* Inadequate sampling season
(sum) summer, (f) fall (sur) surface

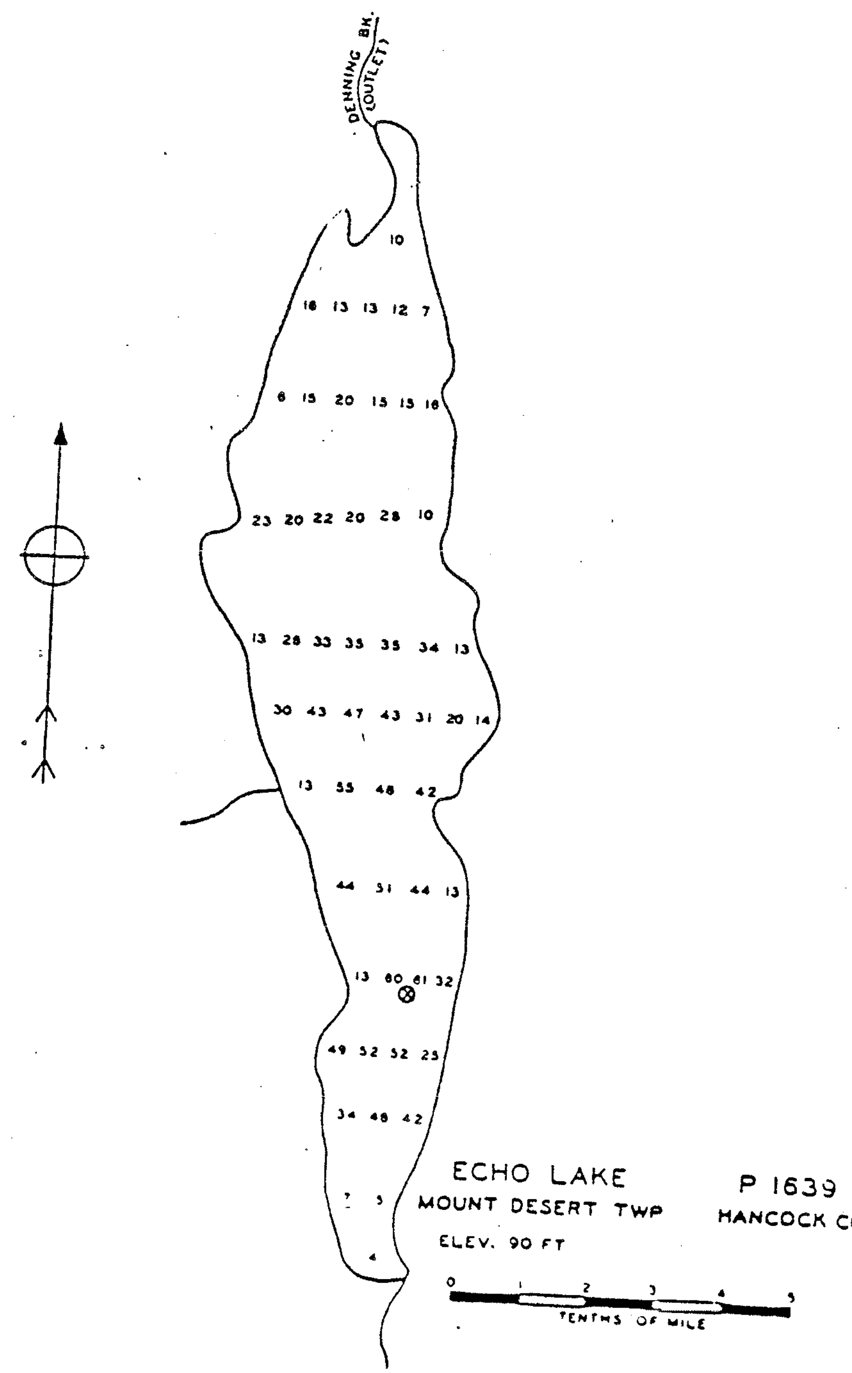
The lake is shallow and does not stratify. It is managed for brook trout. There is a small State Park on the lake.

During the summer the lake experiences annual algal blooms and occasional fish kills. The lake receives agricultural runoff from fields near the eastern shore and may receive seepage from septic tanks, especially on the south shore. In 1977, a water diversion system was constructed which should lessen agricultural runoff and reduce siltation and nutrient loading.

Intensive watershed and lake sampling will be conducted in 1983 to determine the sources of phosphorus and possible water quality improvement techniques.

Echo Lake (Mt. Desert) #4624

Surface Area	92 ha (227 a)
Max. Depth	19.8 m (65 ft)
Mean Depth	6.9 m (22.3 ft)
Volume	6.25 X 10^6 m^3 (5081 acre-feet)
Drainage Area	5.96 Km^2 (2.3 mi^2)
Flushing Rate	0.6 (flushes/year)



Echo Lake (Mt. Desert) # 4624

	1976	1977	1981	1982
Mean Secchi (m)	7.6*(1)	8.0*(1)	7.5*(4)	7.1*(3)
Min. Secchi (m)			7.0	6.0
TSI	NA	NA	NA	NA
Color(SPU)			10	
pH(core)			6.5	
Chla(ug/l)	3.0(sum)	4.3(sum)	2.2 (ls)	
TP(ppb)			6 (c)(ls) 10(b)(ls)	

* Inadequate sampling season
(sum) summer, (ls) late summer (c) core (b) bottom

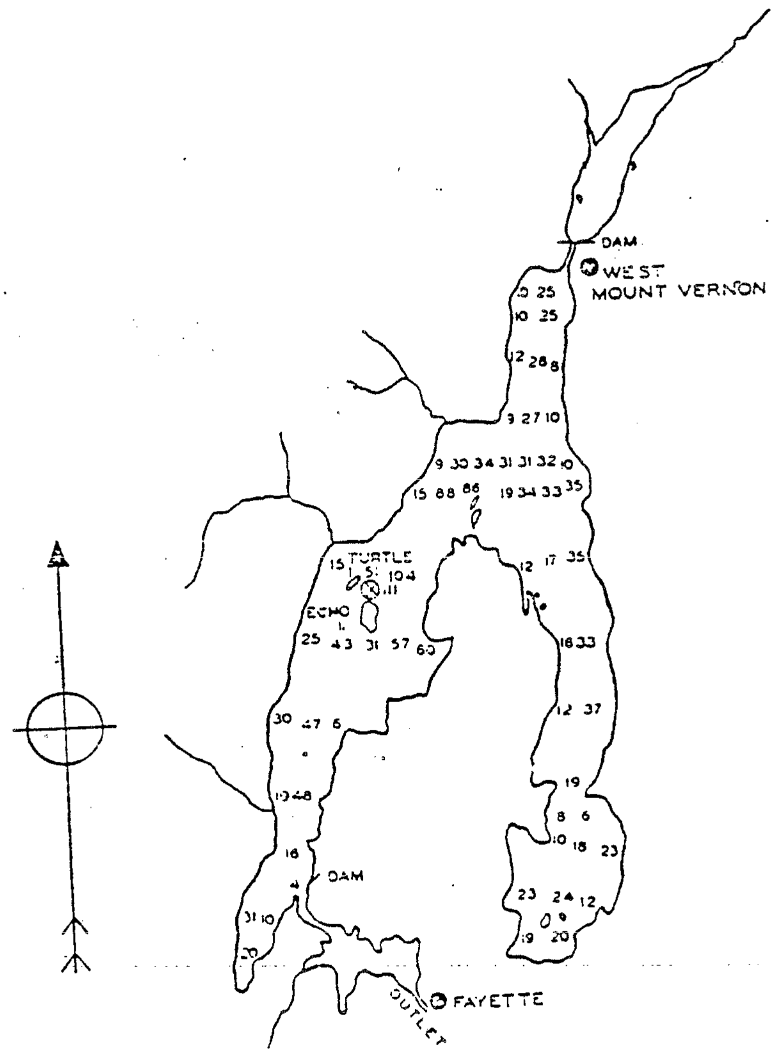
Echo Lake is managed for salmon and natural populations of brook trout. There is an oxygen deficiency (3ppm or less) below 14 meters.

Transparency readings are above average for Maine lakes indicating high water quality. Such quality is a rare natural resource which should be carefully protected and maintained. Protection is particularly important to Echo since the flushing rate is slow, 0.6 flushes/year. A slow flushing rate indicates that Echo may be sensitive to water quality degradation. Echo lies within the boundaries of Acadia National Park which should insure ample protection.

Chla values are low to moderate, TP levels are low, and Secchi disk readings are deep indicating excellent water quality.

Echo Lake (Crotched Pond) (Wayne) #5814

Surface Area	434 ha (1061 a)
Max. Depth	33.3 m (111 ft)
Mean Depth	6.8 m (33.8 ft)
Drainage Area	107.3 Km^2 (41.9 mi^2)
Volume	28.5 X 10^6 m^3 (23,102 acre-feet)
Flushing Rate	1.9 (flushes/year)



ECHO LAKE OR CROTCHED POND
P472

FAYETTE, MOUNT VERNON AND READFIELD TWPS
KENNEBEC CO.

ELEV. 318 FT.

0 1/2 1 1/2 2

MILES

Echo Lake (Crotched Pond) Wayne #5814

	1976	1978-79	1980	1981	1982
Mean Secchi (m)	6.3	5.4	6.2*(4)	6.1	6.2
Min Secchi (m)	5.8	4.5	6.0	5.5	5.5
TSI	37	44	NA	38	37
TSI Range	36-38 TP-CHL				
Color(SPU)	15	10			15
pH(core)		6.8			6.5
Chla(ug/l)	3.0(mean)	1.9(ls)			2.8(ls)
TP(ppb)	7.8(mean)	4(ls)			6(c)(ls) 7(b)(ls)

* Inadequate sampling season
(ls) late summer, (c) core, (b) bottom

Echo Lake supports populations of lake trout and salmon; brook trout are stocked occasionally. The hypolimnion remains well oxygenated throughout the summer.

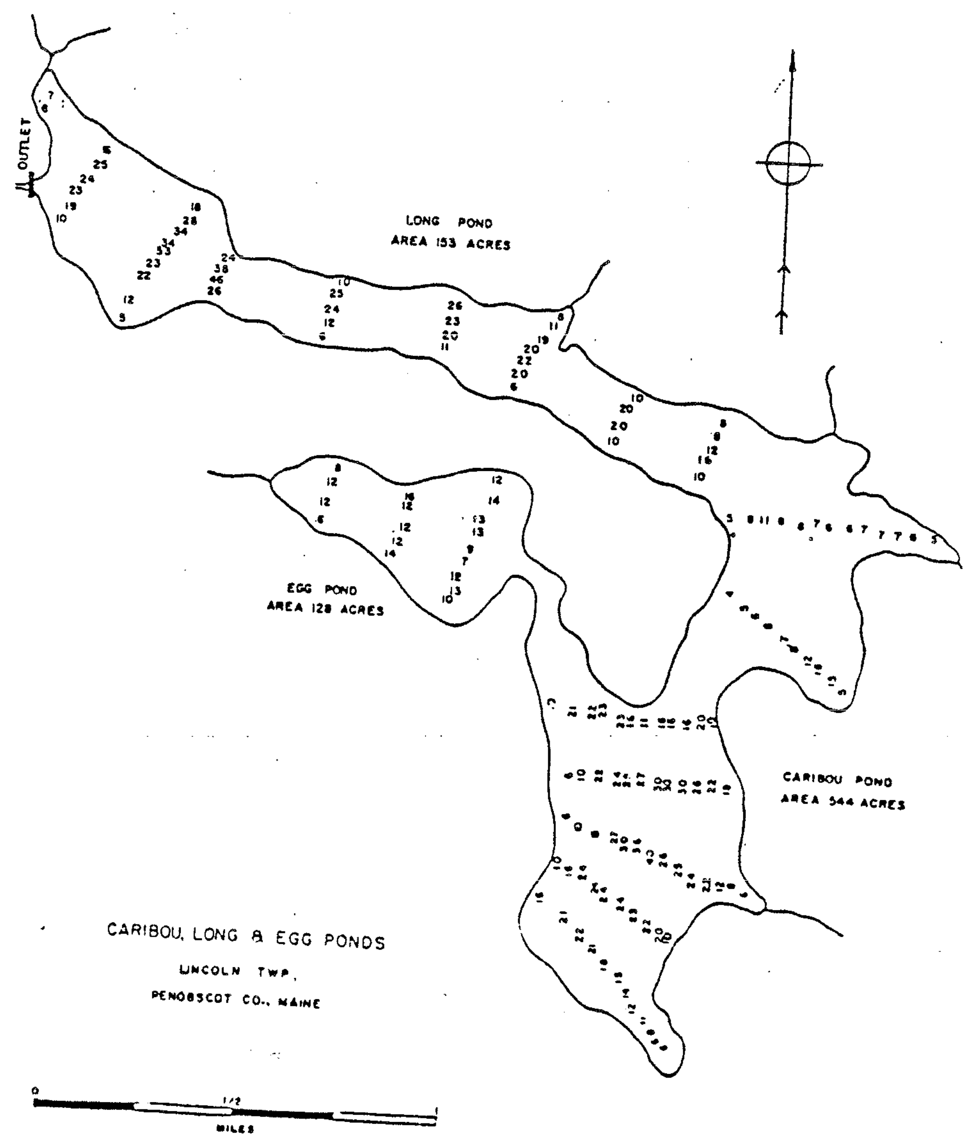
Transparency readings fluctuate but no trend is evident. Secchi disk readings are slightly above average for Maine lakes. Chlorophyll and TP levels are low to moderate indicating good to excellent water quality.

Egg Pond #2216

Surface Area 52 ha (128 a)
Max. Depth 4.9 m (16 ft)

Caribou, Egg and Long

Mean Depth 4.3 m (14 ft)
Volume Area 1.42 X 10^7 m^3 (11,554 acre-feet)
Drainage Area 30.2 Km^2 (11.7 mi^2)
Flushing Rate 1.03 (flushes/year)



Egg Pond # 2216

	1973-74	1975	1976	1981	1982
Mean Secchi (m)	4.6*(3)+	4.6*(2)+	4.1*(2)+	3.1+	4.1+
Min. Secchi (m)	4.6	4.6	4.1	3.0	3.7+
TSI	NA	NA	NA	74	32
TSI Range					32 - 59
					CHL SD
Color(SPU)				25	15
pH				6.4	6.6
Chl*a*(ug/l)				4.9(ls)	2.2mean
TP(ppb)				9 (ls)	12(ls)

* Inadequate sampling season
\+ Most Secchi disk readings hit bottom which causes the water quality to be underestimated.
(ls) late summer

Egg Pond is managed as a warmwater fishery.

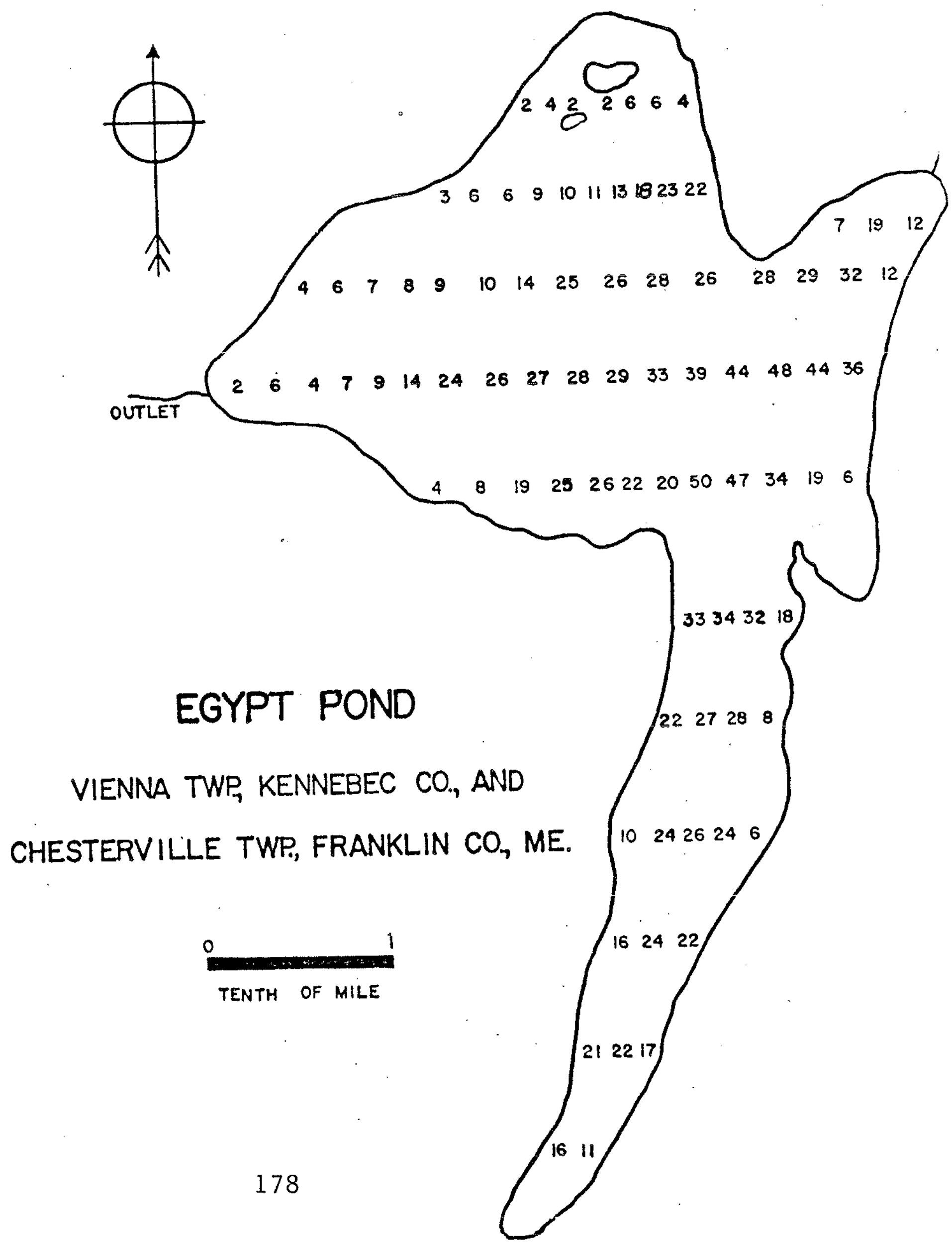
Transparency readings are lower in 1981 than previous years; however, care must be taken when making predictions because previous years had incomplete seasons and because most readings hit bottom. Since the lake is shallow and most Secchi disk readings hit the bottom of the lake, estimating water quality by Secchi disk is inaccurated as can be seen by the 1982 comparison of TSI values by Secchi disk transparency (59) and Chl*a* (32). Chl*a* is considered to be the most accurate measurement of trophic state.

Water quality is good. The chlorophyll average in 1982 is considered low indicating low productivity. TP values are moderate.

The monitor of Egg Pond participated in the chlorophyll program in 1982. The program was established in 1980 to collect additional data on colored lakes, lakes that had declining water quality, lakes that had problems, or shallow lakes.

Egypt Pond #5218

Surface Area	19.0 ha (46.9 a)
Max. Depth	15.2 m (50 ft)
Mean Depth	5.6 m (18.5 ft)
Volume	1.1 X 10^6 m^3 (892 acre-feet)
Drainage Area	2.0 km^2 (0.8 mi^2)
Flushing Rate	1.0 (flushes/year)



Egypt Pond #5218

	1982
Mean Secchi (m)	4.7
Min. Secchi (m)	4.3
TSI	52
Color(SPU)	17
pH	7.1mean+

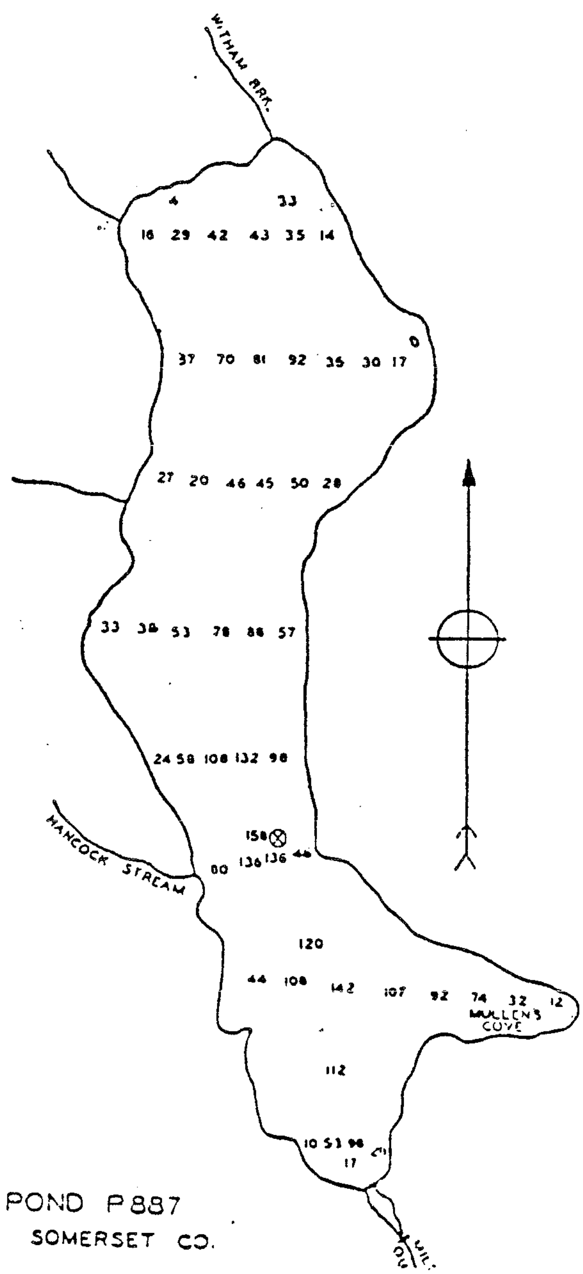
+pH readings taken by monitor

Egypt Pond is managed as a cold water fishery by the Department of Inland Fisheries and Wildlife. Brown trout and splake are stocked in this lake. Splake are a genetic cross between a lake trout and brook trout. They do no reproduce naturally but can augment the cold water fisheries through stocking.

An oxygen deficiency exists (i.e. less than 5ppm) below 6 meters. Water quality appears good even through transparencies are slightly below average for lakes in Maine.

Embden Pond #0078

Surface Area	635 ha (1568 a)
Max. Depth	48 m (158 ft)
Mean Depth	18.0 m (59 ft)
Volume	1.1 X 10^8 m^3 (89431 acre-feet)
Drainage Area	58.0 Km^2 (22.4 mi^2)
Flushing Rate	0.3 (flushes/year)



EMBDEN POND P887
EMBDEN TWP. SOMERSET CO.

Embden Lake # 0078

	1971-78	1979	1980	1981	1982
Mean Secchi(m)	9.6	9.4	9.9	10.2	10.5*(3)
Min. Secchi (m)	8.5	6.4	8.8	7.6	10.4
TSI	19	19	17	16	NA
Chla(ug/l)	2.3(sum)		1.0(ls)		
TP(ppb)	9(sum)		6(ls)(c) 10(b)(ls)		
Color(SPU)	15		25		
pH(core)			6.2		

(ls) late summer, (sum) summer, (c) core (b) bottom

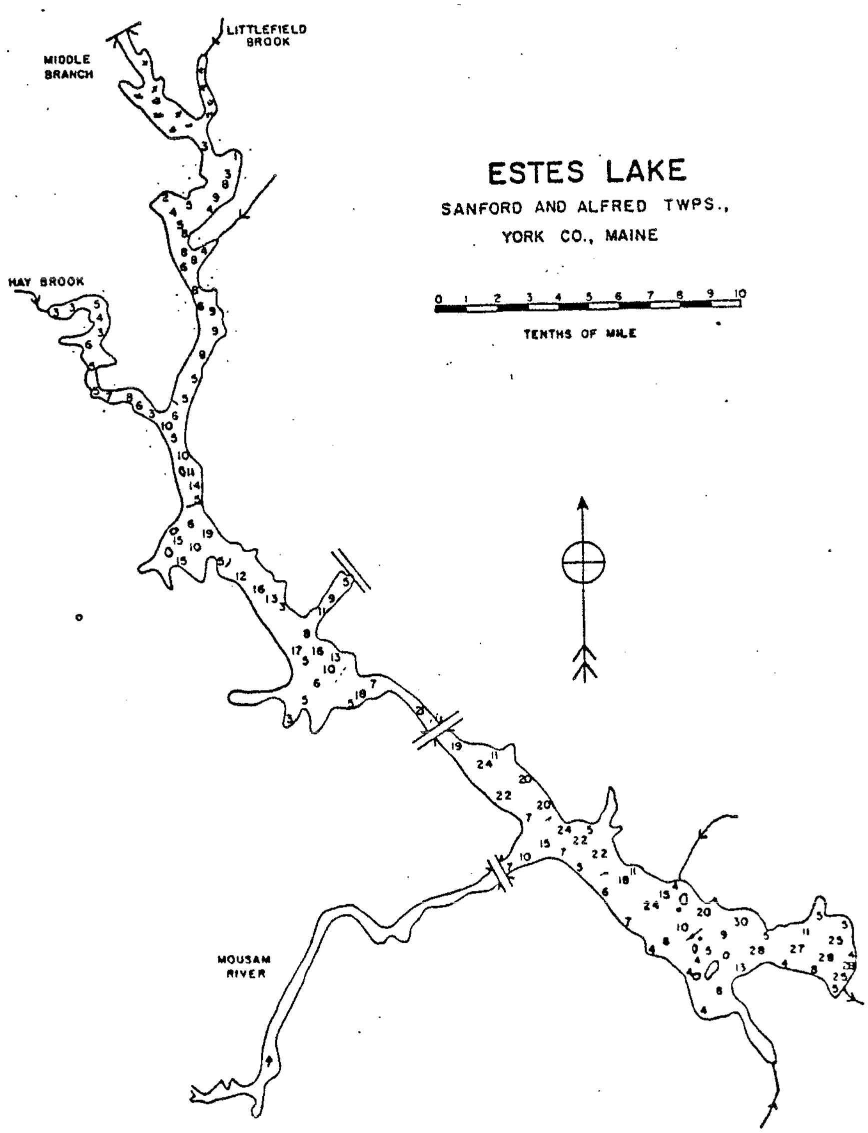
Embden Pond is managed for salmon, brook trout, and lake trout. The hypolimnion remains well oxygenated throughout the summer. The lake is the water supply for the Elna Fish Hatchery.

The lake continues to have excellent water quality; transparencies are far above average for Maine lakes. Such high water quality is a rare natural resource and should be carefully protected and maintained. Chla and TP values are low.

The lake was studied from 1971-1973 by Department of Environmental Protection and University of Maine at Orono, Descriptive and Comparative Studies of Maine Lakes, Ronald Davis, Bailey, Scott, Hunt and Norton, 1979.

Estes Lake # 0007

Surface Area	143 ha (353 a)
Max. Depth	9.1 m (30 ft)
Mean Depth	2.8 m (9 ft)
Volume	3.94×10^6 m^3 (3193 acre-feet)
Drainage Area	254 km^2 (97.8 mi^2)
Flushing Rate	41 (flushes/years)



Estes Lake # 0007

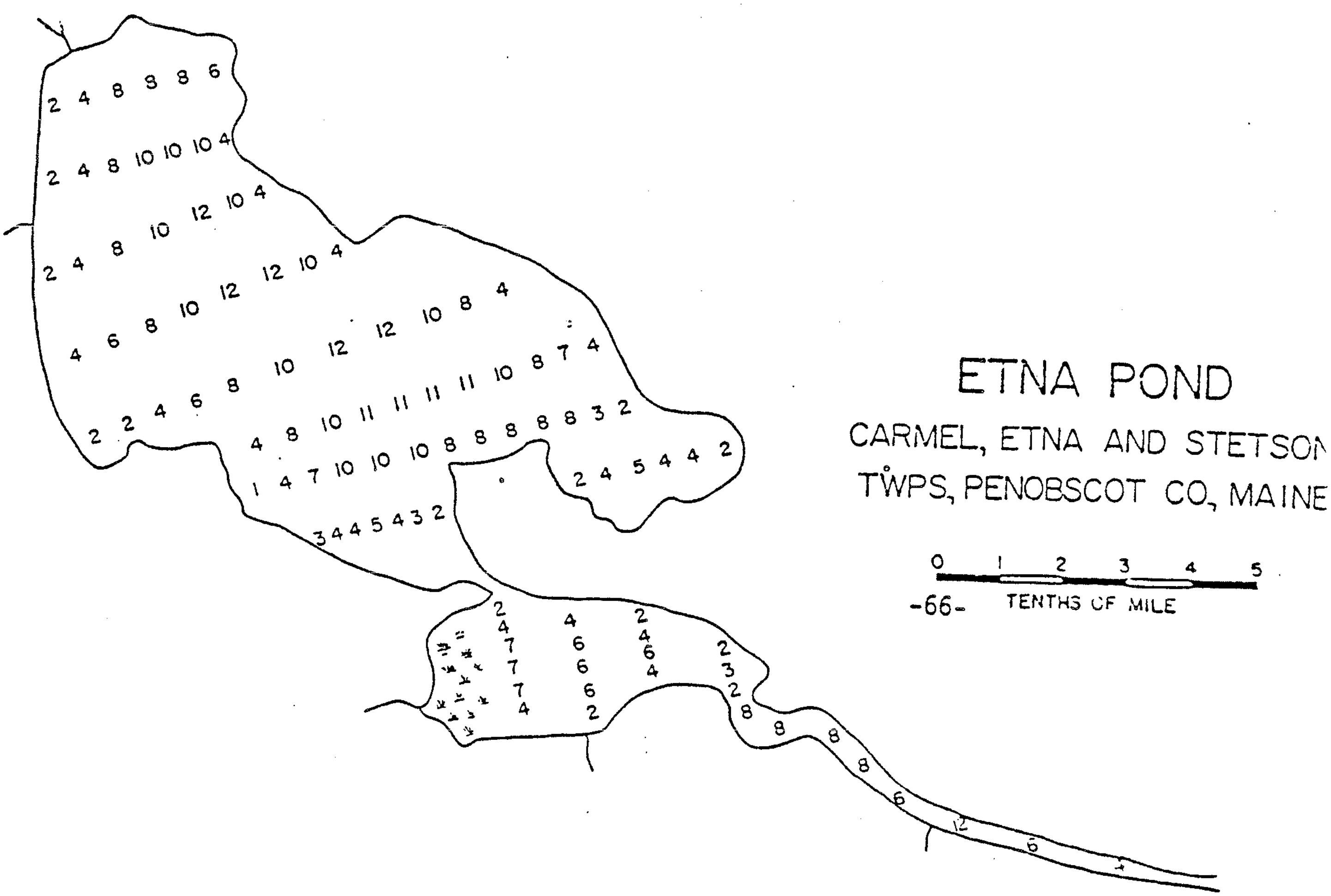
	1978	1979	1980	1982
Southern Basin(01)				
Mean Secchi (m)	1.1	1.3	1.1*(3)	2.3
Min. Secchi (m)	0.4	0.4	0.3	1.5
Mean Chla (ug/l)	40	25.5	16.3*(3)	10.9
Mean TP (ug/l)	119	83	163	34
TSI	120	109	NA	80
TSI Range	112-136	99-126		74-92
	TP SD	CHL SD		CHL SD
Northern Basin(02)				
Mean Secchi (m)	1.4	1.3	1.5*(3)	2.3
Min. Secchi (m)	0.5	0.5	0.5	1.4
Mean Chla(ug/l)	27.2	28.3	4.6*(3)	7.7
Mean TP (ug/l)	49	44	51*(3)	26
TSI	103	104	NA	75
TSI Range	86-121	83-126	NA	65-92
	TP SD	TP SD		CHL SD

Results of a study conducted from 1978 to 1980 by DEP in cooperation with the Estes Lake Association and Sanford Sewerage District, showed the Sanford Sewage Treatment Plant was the major source, accounting for 81 percent, of the total phosphorus load to the lake.

In response to beginning of advanced waste water treatment in January 1982, lake water quality improved to the extent that in 1982 there were no major algal blooms for the first time in many years. Minimum Secchi disk transparency equalled or exceeded the minimums of previous years and mean Secchi disk nearly doubled the average transparency of previous years. Chlorophyll a and total phosphorus concentrations decreased significantly resulting in a lower TSI. Although the lake is still classified GP-B, improvement, if continued, should result in more acceptable water quality.

Etna Pond #2274

Surface Area	146.1 ha (361 a)
Max. Depth	3.6 m (12 ft)
Mean Depth	1.8 m (5.4 ft)
Volume	2.56×10^6 m^3 (20780 acre-feet)
Drainage Area	51.3 Km^2 (19.9 mi^2)
Flushes Rate	10.1 (flushes/year)



Etna Pond #2274

	1980	1981
Mean Secchi (m)	1.8	2.5
Min. Secchi (m)	0.9	2.1
Mean Chla(ug/l)		4.1
Mean TP(ppb)	3.5(©)	18
TSI	colored	48Chl
pH		6.9
Color(SPU)		110

(©) TP samples taken near bottom so results probably higher than core would be.

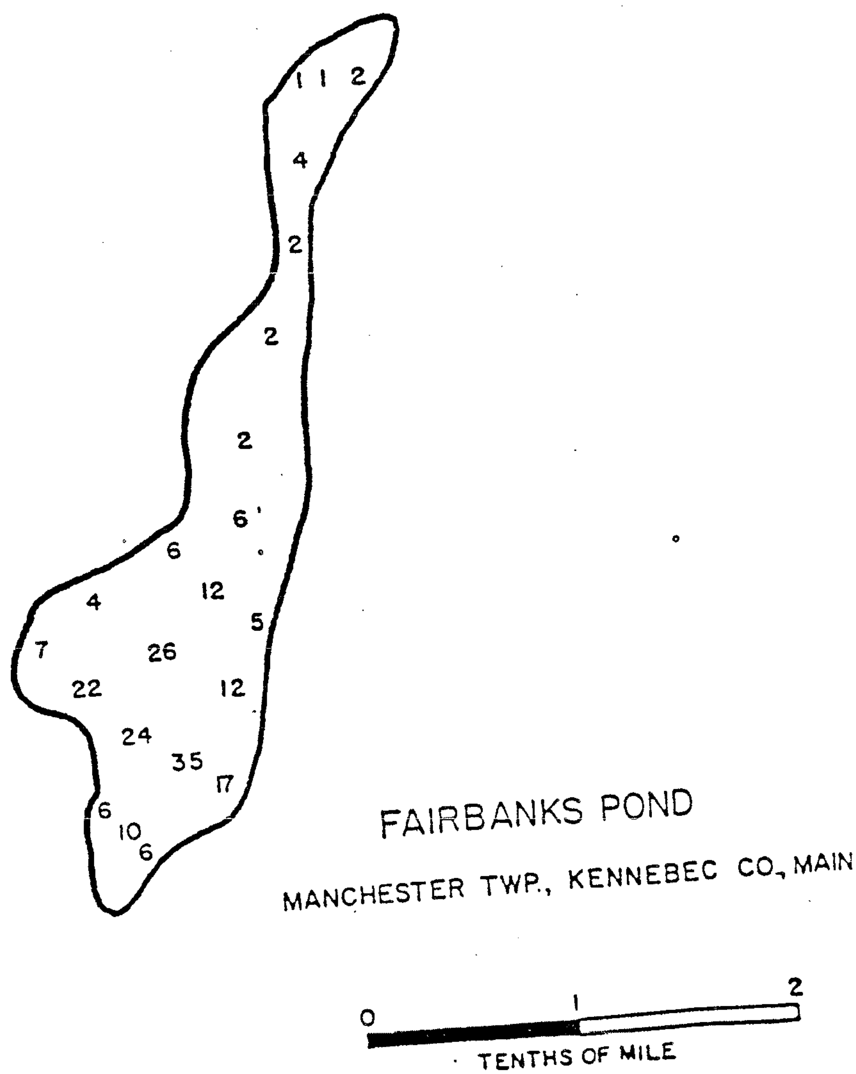
Etna Pond is known for its excellent pickerel fishing and white perch are present in large numbers.

Transparency and TP values are adversely affected by high water color and do not accurately reflect water quality. Chlorophyll levels, which are not affected by water color, are moderate.

Etna Pond was one of seven lakes studied by Penobscot Valley Regional Planning Commission in 1980 and 1981. Etna Pond drains into Sebasticook Lake whose water quality has been degraded over the years by direct and indirect discharges. As part of the restoration of Sebasticook's water quality, the Soil Conservation Service is helping area farmers control nutrient rich run-off from their farms. Data gathered on Etna will be used to establish the efficiency of watershed controls.

Fairbanks Pond # 5296

Surface Area	5.7 ha (14a)
Max. Depth	10.5 m (35 ft)
Mean Depth	2.5 m (8.2 ft)
Volume	1.5 X $10^5 m^3$ (122 acre-feet)
Drainage Area	0.62 km^2 (.24 mi^2)
Flushing Rate	2.1 (flushes/year)



Fairbanks Pond # 5296

	1975-78	1979	1980	1981	1982
Mean Secchi(m)	2.3*	2.9	3.9	3.1	2.9
Min. Secchi (m)	1.8	2.3	2.9	2.0	2.3
Mean Chla(ug/l)		13.	10.6	15.9*(2)	
Mean TP(ppb)		15	15	15*(4)	
TSI	NA	78	62	74	78
TSI Range		53-80 TP-CHL	53-74 TP-CHL		
Color(SPU)				10	
pH	6.8	6.0	5.8		

* Inadequate sampling season

Fairbanks Pond is surrounded by very permeable sand and gravel deposits. There are no inlets or outlets. Groundwater plays an important role in its water budget.

The north end of Fairbanks Pond is heavily developed.

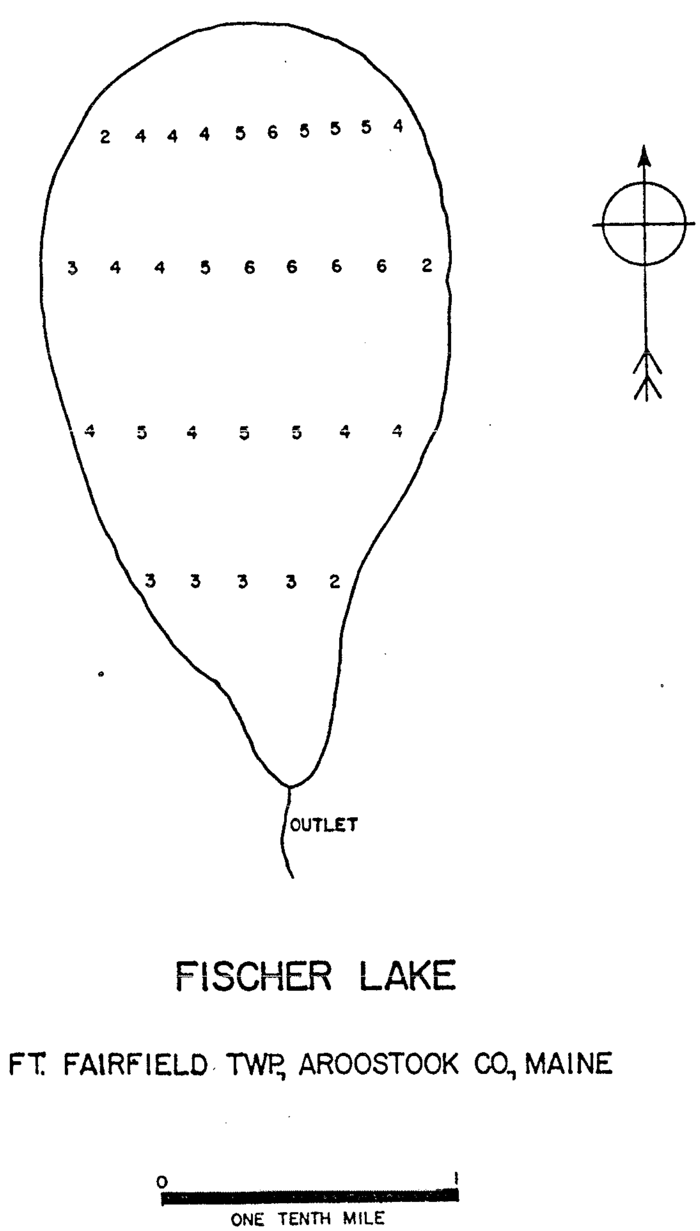
An oxygen depletion exists (0-2ppm) below 6m. Thermal stratification sets up so quickly that very little aeration takes place below 6m, even during spring turnover. A bloom occurred in 1977 but the trend since seems to be toward better water quality. No blooms have been verified since 1977. It appears that the 1977 bloom was probably an isolated incident; however, Fairbanks Pond must be considered very vulnerable due to its small volume and limited flushing. Intelligent land use in the watershed will be necessary to prevent recurrence of the algal bloom.

Transparency is well below average for Maine lakes, TP is moderate, and Chla us high. Estimates of Trophic State vary widely depending on the parameter which is used; in 1979 the Chl TSI was 80, SD TSI was 78, and TP TSI was 53. The reason for the difference is not known

The Department of Inland Fisheries and Wildlife manages the pond as a brown trout fishery.

Fischer Lake # 1808

Surface Area	2.0 ha (5.0 a)
Max. Depth	1.8 m (6.0 ft)
Mean Depth	0.7 m (2.3 ft)
Drainage Area	1.55 km^2 (90.6 mi^2)
Volume	1.5 X 10^4 m^3 (12.2 acre-feet)
Flushing Rate	52.6 (flushes/year)



Fischer Lake # 1808

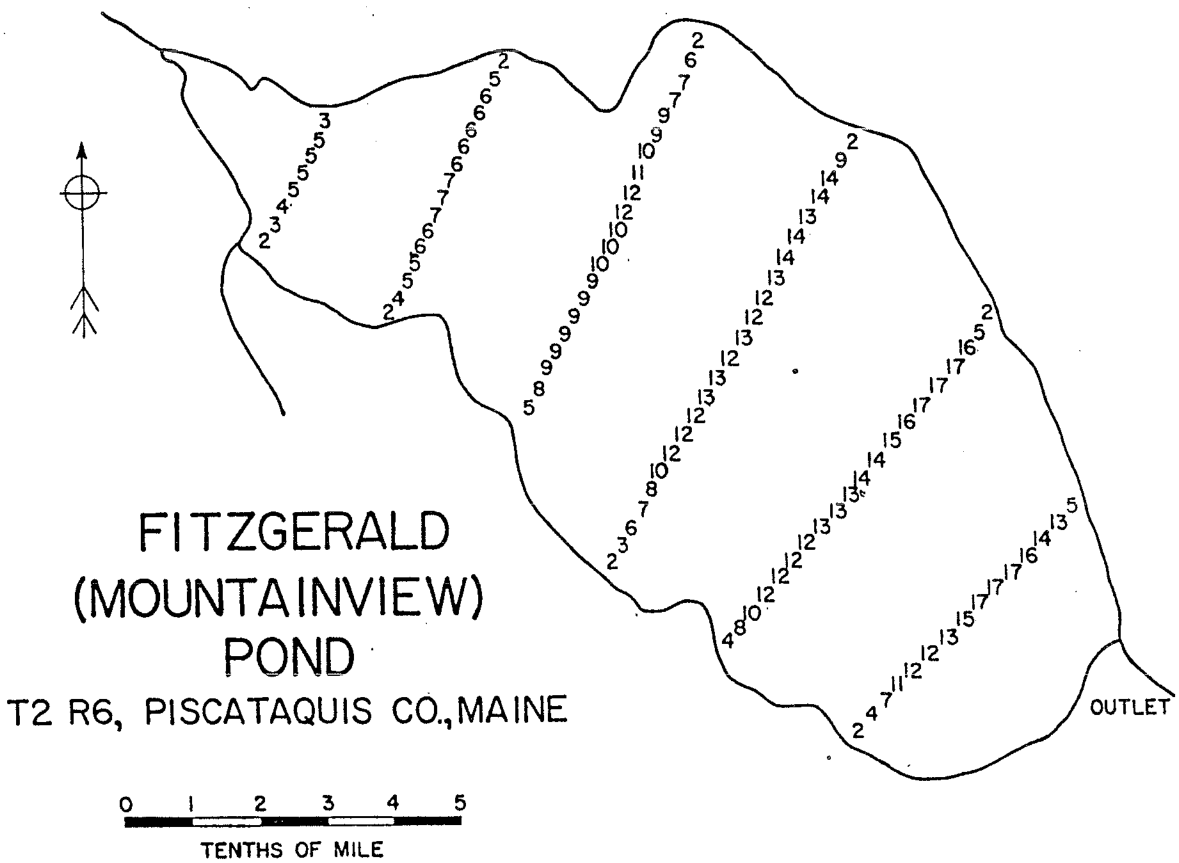
	1982
Mean Secchi (m)	0.7 *(2)
Min. Secchi (m)	0.5
TSI	NA

Fischer Lake is a small shallow lake which does not stratify. It has an extremely fast flushing rate (52.6 flushes/year). Water quality is underestimated because the pond is limited by its depth rather than the transparency. Shallow lakes can have transparencies reduced because silt and bottom sediments can be resuspended by winds.

In 1958, the Department of Inalnd Fisheries and Wildlife tried to chemically reclaim the pond in an attempt to re-establish a brook trout fishery. This reclaimation was unsuccessful and the pond is now managed for baitfish.

Fitzgerald Pond #0269

Surface Area	223 ha (550 a)
Max. Depth	5.2 m (11 ft)
Mean Depth	2.7 m (8 ft)
Drainage Area	15.0 km^2 (5.78 mi^2)
Volume	5.6 X 10^6 m^3 (4900 acre-feet)
Flushing Rate	1.4 (flushes/year)



Fitzgerald Pond 0269

	1977	1978	1979	1980	1982
Mean Secchi (m)	1.5*	1.6	1.8*	1.8	1.5*(1)
Min. Secchi (m)		1.2	1.1	1.2	
Chla (ug/1)		7.3mean	4.4mean	6.9mean	7.4(1s)
TP(ppb)	16mean	16mean	19.6mean	18.5mean	21(1s)
TSI	NA	63	NA	62	NA
pH	6.8		6.4	6.5	6.6
Color(SPU)	40				40

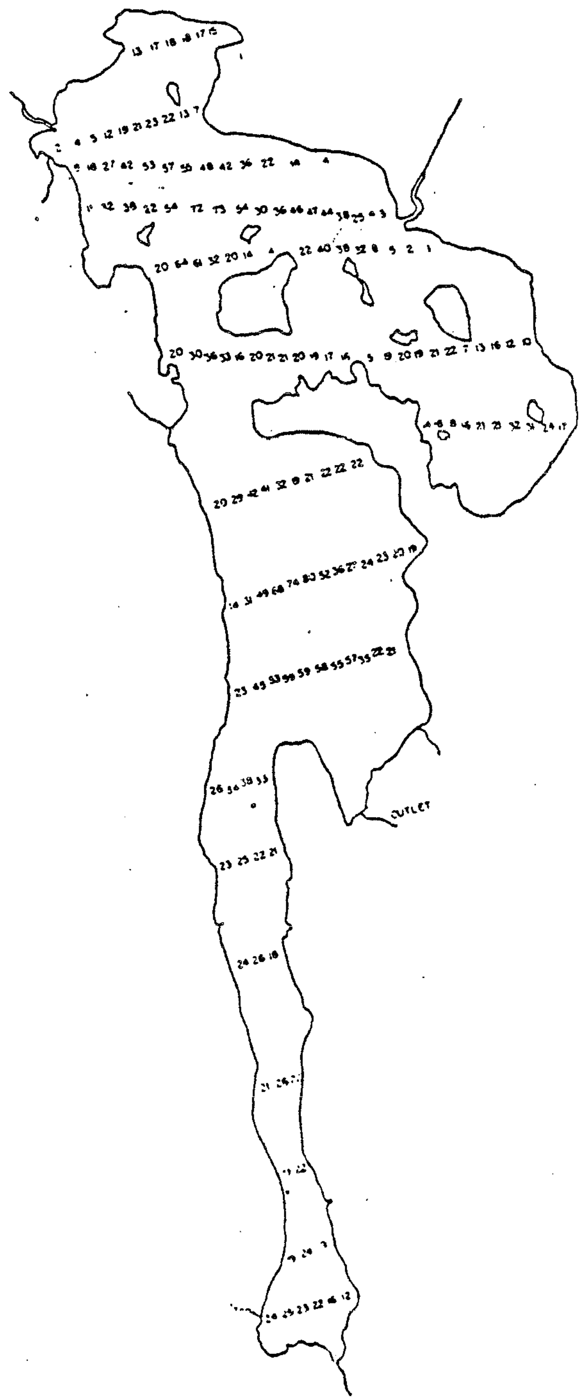
* inadequate sampling season
(1s) late summer

Fitzgerald Pond is moderately productive. The pond has bloomed every year since 1976. The blooms, however, have not been composed of obnoxious blue-green, but rather green algae. The pond is shallow and does not stratify during the summer. There is evidence that strong winds are causing part of the problem of nutrient enrichment by constantly mixing bottom sediments throughout the lake.

In the past, the Squaw Mountain Ski Lodge caused excess loading to the lake by not properly containing their wastes. Breaks in the holding lagoon and pipelines to the spray irrigation areas allowed sewage to enter the lake via the tributaries. Monitoring of the tributaries from 1978-1980 indicates they spray irrigation is no longer a threat to the lake as long as it is properly maintained.

Flying Pond #5182

Surface Area	147 ha (360 a)
Max. Depth	24 m (80 ft)
Mean Depth	5.1 m (17 ft)
Volume	7.49 X 10^6 m^3 (6074 acre-feet)
Drainage Area	38.6 km^2 (14.9 mi^2)
Flushing Rate	3.5 (flushes/year)



FLYING POND

VIENNA and MOUNT VERNON TWPS.,

KENNEBEC CO., MAINE

0 1 2 3 4

TENTHS of MILE

Flying Pond #5182

	1976	1979	1980	1981	1982
Mean Secchi (m)	4.7	4.4	4.4	3.8	4.5
Min. Secchi (m)	4.0	3.3	3.2	3.1	3.4
TSI	42	55	55	53	54
TSI Range	37-52 CHL,TP-SD			44-63 CHL-SD	
Color(SPU)	35		25	28	
pH(core)				7.1	
Chla(ug/l)	2.7(mean)		3.5(ls)	3.5(mean)	
TP(ppb)	8(mean)		9(ls)	7(c) 17(b)(ls)	

(ls) late summer, (c) core, (b) bottom

The lake is managed for cold water fish, even though an oxygen deficiency (less than 5 ppm) exists in the hypolimnion by late summer. Brown trout and brook trout are the species currently being managed, in this lake.

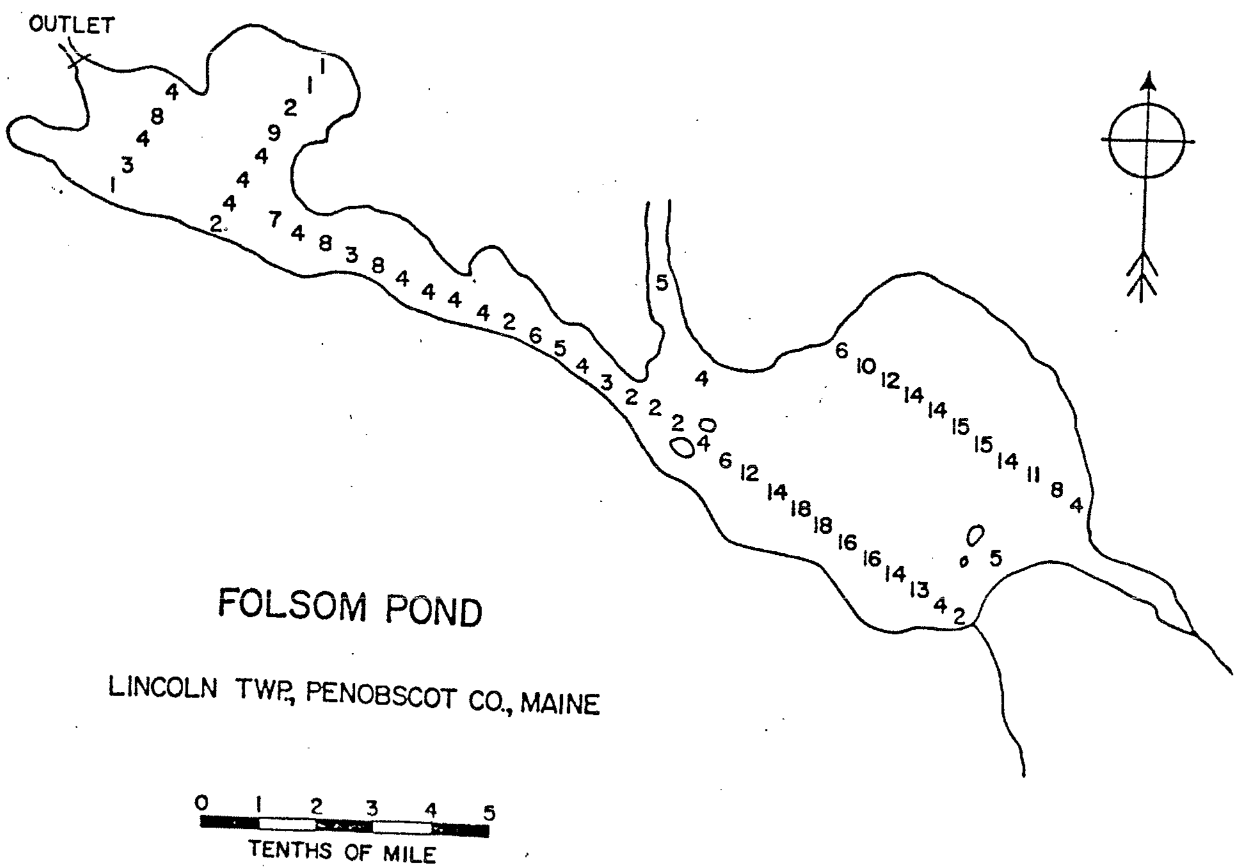
Judging by the large differences in TSI calculated by Secchi disk versus chlorophyll, water color is apparently reducing transparency. Water quality is probably most accurately reflected by the TSI based on chlorophyll.

A decline in water quality was apparent in the 1981 data. Transparency was less than previous years and mean chlorophyll levels were higher than in 1976; however, in 1982, transparencies returned to near 1976 levels suggesting that the decline in water quality may have been a natural fluctuation. Continued monitoring will be important to document future trends or fluctuations.

In 1981, the monitor of Flying Pond took part in the chlorophyll program. The program was begun in 1980 to gather additional data on colored lakes, lakes with declining water quality, and lakes which had problems.

Folsom Pond #2222

Surface Area	114 ha (282 a)
Max. Depth	5.5 m (18 ft)
Mean Depth	2 m (6.5 ft)
Volume	2.24 X 10^6 m^3 (1819 acre-feet)
Drainage Area	36.1 Km^2 (14. mi^2)
Flushing Rate	7.96 (flushes/year)



Folsom Pond # 2222

	1973-74	1975	1976	1981	1982
Mean Secchi (m)	3.4*	4.1*(3)	4.0*(2)	3.2*(3)	3.0
Min. Secchi (m)	1.9	4.0	4.0	3.0	2.0
TSI	NA	NA	NA	NA	76
Color(SPU)				60	
pH(core)	6.2(mon.)	6.3(mon.)	6.2(mon.)	6.5	
Chla(ug/l)				6.7(ls)	
TP(ppb)				19(ls)	

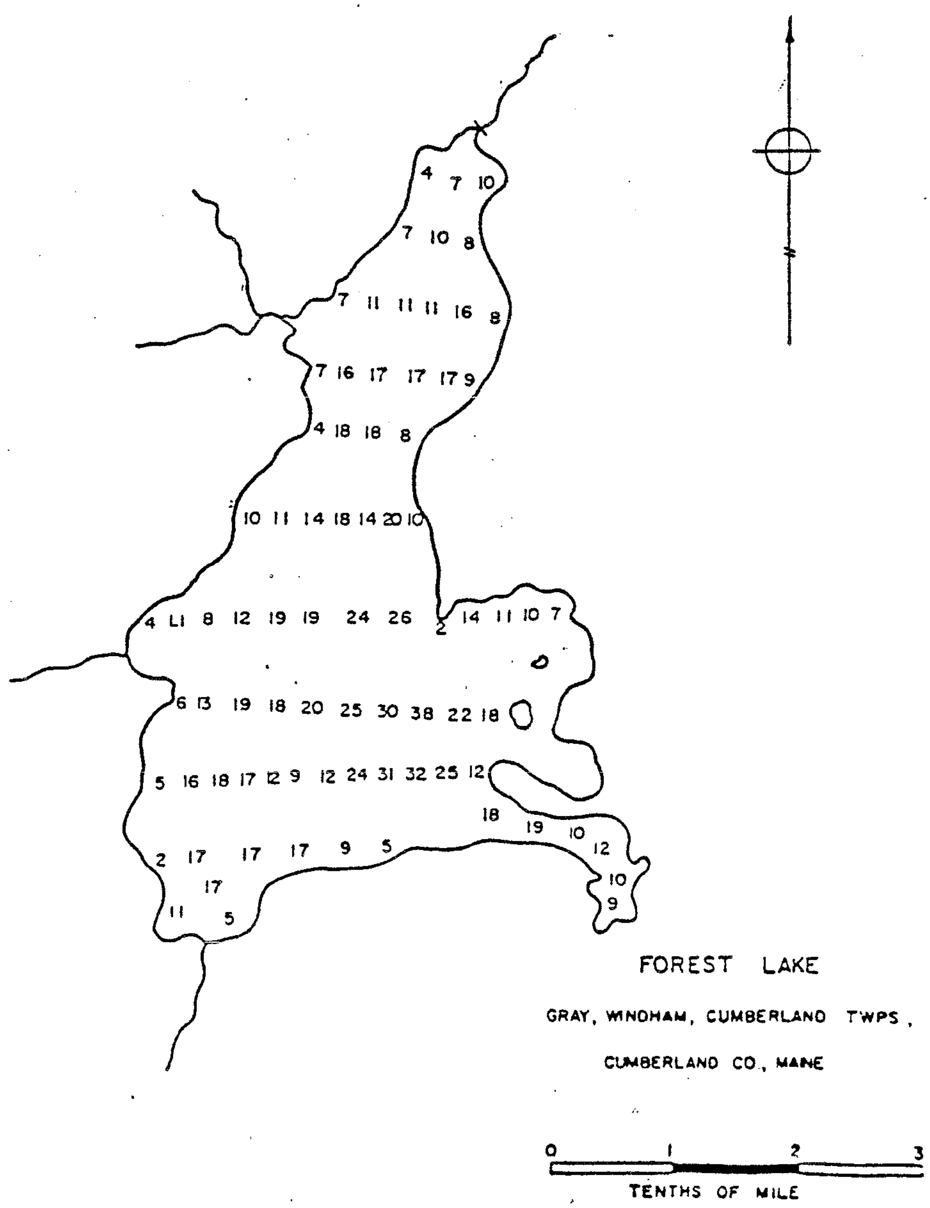
* Inadequate sampling season
(ls) late summer, (mon.) monitor

The pond is managed for warm water fish.

It is difficult to accurately predict water quality trends due to the short sampling seasons. Transparencies are below average for a Maine Pond. Transparencies are probably reduce because of the high water color;color reduces transparency but does not effect water quality. Chlorophyll a levels are moderate. TP levels are high, but may be affected by high water color.

Forest Lake #3712

Surface Area	80.1 ha (198 a)
Max. Depth	11.6 m (38 ft)
Mean Depth	4.0 m (13 ft)
Volume	$3.2 \times 10^5 m^3$ (2,600 acre-ft)
Drainage Area	8.5 km^2 (3.3 mi^2)
Flushing Rate	1.6 flushes per year (approx.)



Forest Lake #3712

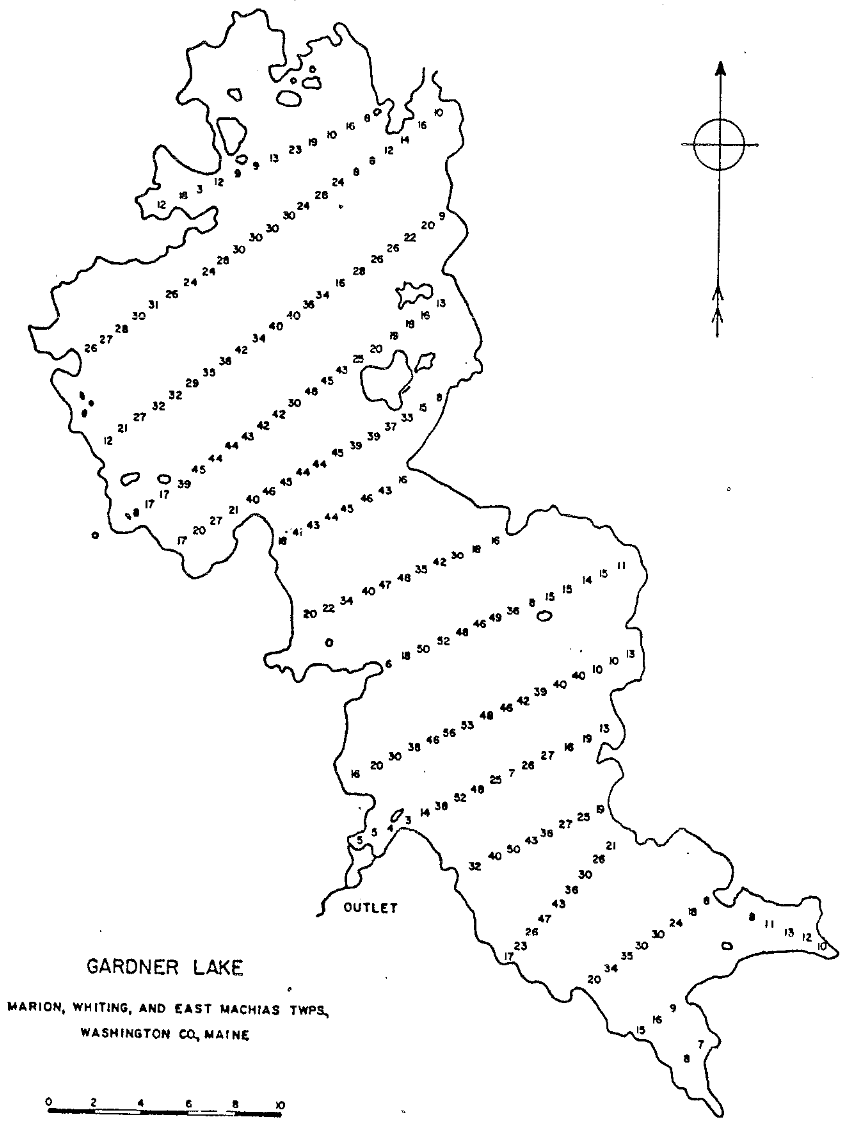
	1974-75 X	1976	1977	1980	1981
Mean Secchi (m)	5.2	5.2	6.0*(3)	4.0*(4)	4.2*(4)
Min. Secchi (m)	3.4	4.0	4.9*	2.6*	2.9*
Chla	4.9(mean)	3.9*mean			4.0(1s)
TP	8(sm)	9*mean			9(c) 34(b)(1s)
TSI	45	46	NA	NA	NA
TSI Range	36-52 TP-CHL				
pH	5.9				6.2
Color	22,45				15

* Inadequate sampling season
(sm) surface mean, (c) core, (1s) late summer, (b) bottom

X The 1974 through 1976 data were collected through a cooperative project between DEP and the U.S Geological Survey.

Forest lake is best suited for smallmouth bass. A limited brown trout fishery also exists. An oxygen deficiency (less than 1 ppm) exists below 9 meters.

Transparency readings in 1974-1976 indicate average water quality. Chlorophyll and TP levels are moderate. The short sampling seasons of 1977, 1980, and 1981 make it difficult to determine any water quality trends. Continued sampling with full seasons of data is necessary to determine water quality trends.



198

Gardner Lake #1358

Surface Area	1573 ha (3886a)
Max. Depth	17.1m (56 ft)
Mean Depth	7.3m (24 ft)
Drainage Area	128.6 km^2 (49.6 mi^2)
Volume	103.9 X 10^6 m^3 (958,500 acre feet)
Flushing Rate	0.8 (flushes/year)

Gardner Lake # 1358

	1977	1978	1979	1980	1982
Mean Secchi (m)	4.3*	4.2	4.3	4.5	3.3*(1)
Min. Secchi (m)	3.0	3.5	4.0	3.8	
TSI	NA	colored	colored	colored	NA
Color (SPU)			50		
pH			6.5		
Chl<u>a</u> (ug/l)			4.9(ls)		2.4(sp)
TP (ppb)			24(ls)		

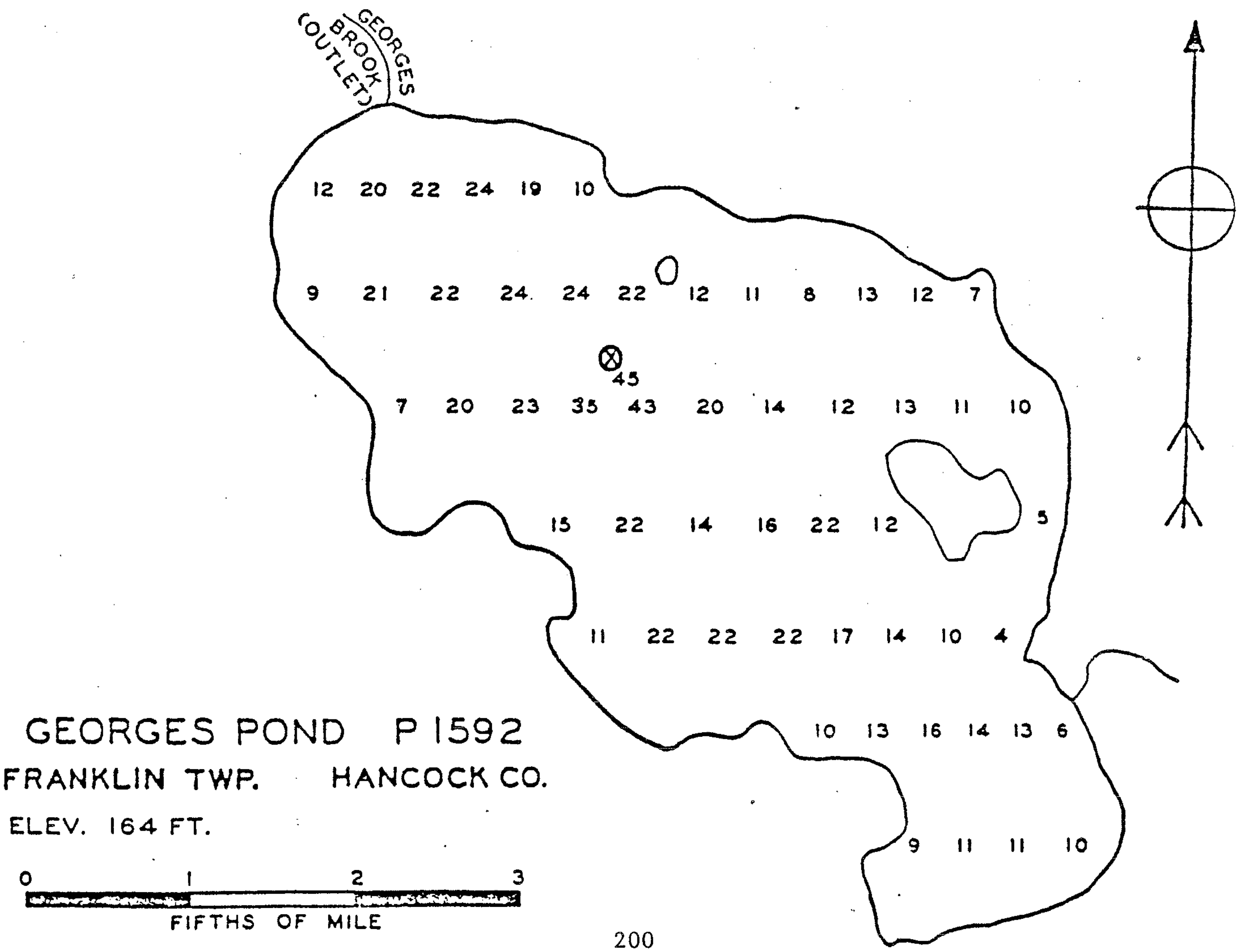
* inadequate sampling season
(ls) late summer, (sp) spring

Transparency has remained consistent from 1977 to 1980. A short sampling season in 1982 prevents accurate prediction that transparency is still stable. Gardner Lake has good water quality. Chla levels are low to moderate; TP values are high but no problems are indicated at this time. Transparency is reduced because of high color and color also adversely affects TP.

A moderate cold water fishery exists even though the hypolimnion is small and suffers a depletion of oxygen (i.e. less than 5ppm) during late summer.

Georges Pond #4406

Surface Area	147 ha (363 a)
Max. Depth	13.5 m (44.3 ft)
Mean Depth	4.2 m (13.8 ft)
Volume	6.1 X $10^6 m^3$ (4959 acre-feet)
Drainage Area	4.4 Km^2 (1.70 mi^2)
Flushing Rate	0.4 (flushes/year)



Georges Pond # 4406

	1977	1978	1981	1982
Mean Secchi (m)	5.3*(2)	5.0*(1)	4.3	4.3
Min. Secchi (m)	5.0		3.2	3.5
TSI	NA	NA	56	56
Color(SPU)		20		10
pH		6.8		6.6
Chla(ug/l)		4.5(ls)		2.8(ls)
TP(ppb)		13(c)(ls)		15(c)(ls)
		34(b)(ls)		12(b)(ls)

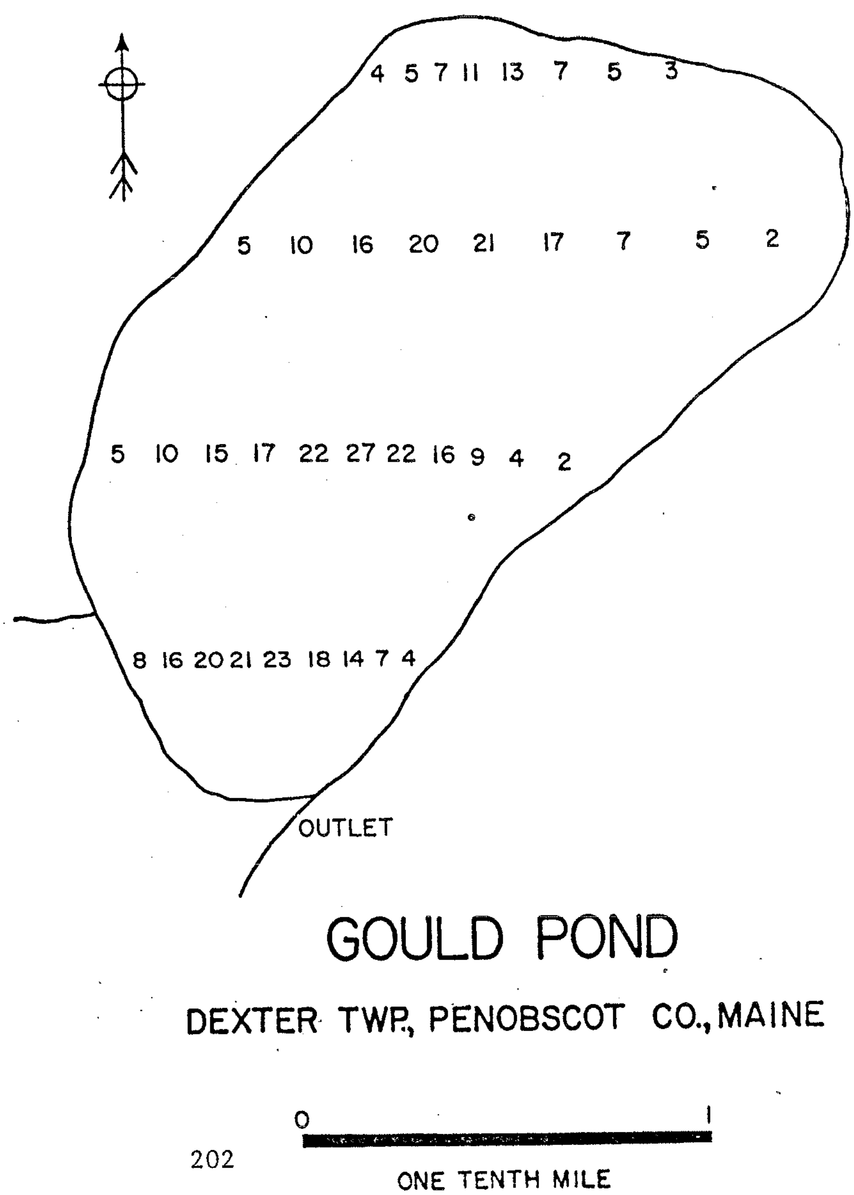
* Inadequate sampling season
(ls) late summer, (c) core, (b) bottom.

Georges Pond is managed for smallmouth bass and white perch. There is an oxygen deficiency (1ppm or less) in the hypolimnion by late summer.

Transparency readings for 1981 and 1982 are slightly below average for Maine Ponds. Chlorophyll levels are moderate and TP levels are high for 1979. Samples taken in 1982 for Chla are low to moderate and TP values are moderate. Generally, 15ppb TP is considered sufficient to support algal blooms. Residents of the drainage should exercise care not to increase the phosphorus to the lake.

Gould Pond # 5474

Surface Area	3.2 ha (8 a)
Max. Depth	8.1m (27 ft)



Gould Pond # 5474

	1982
Mean Secchi (m)	1.4
Min. Secchi (m)	1.2
TSI	121
Color(SPU)	25
pH	7.6
Chl*a* (ug/l)	17.7(ls)
TP(ppb)	3(c)(ls)
	20(b)(ls)

(ls) late summer, (b) bottom, (c) core

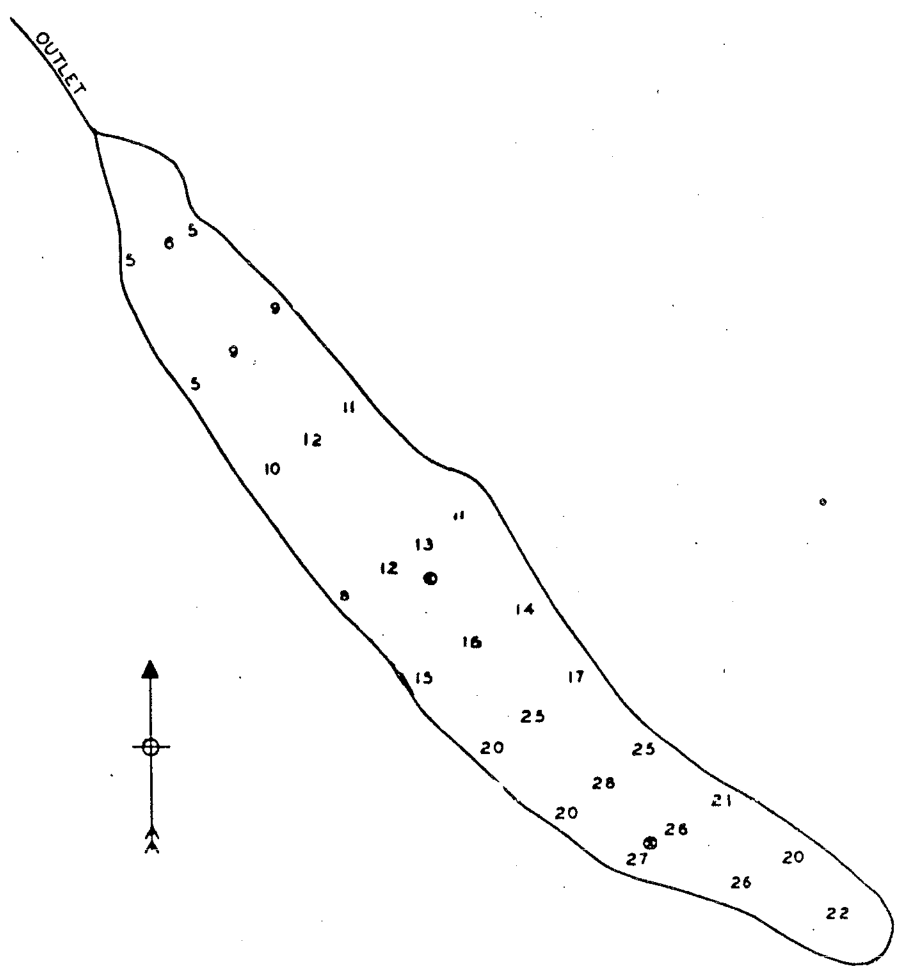
Gould Pond is a small pond which is extremely productive. The pond has less than a 2 meter Secchi disk all summer long. Chl*a* values and TP values are considered high. Generally 15 ppb TP is considered sufficient to support algal blooms. The cause of this extremely productive pond is unknown at this time.

"Gould Pond provides a small fishery for pickeral and hornpout. An acute oxygen deficiency (i.e. less than lppm) in the summer months at depths below 15 ft. makes the pond not suitable for coldwater species".[1]

(1) Taken from Maine Department of Inland Fisheries and Wildlife Survey 1961.

Granger Pond #3126

Surface Area	51.0 ha (127.5a)
Max. Depth	8.4 m (28.0 ft)
Mean Depth	3.9 m (12.9 ft)
Volume	2.0 X 10^6 m^3 (1621 acre-feet)
Drainage Area	3.11 km^2 (1.20 mi^2)
Flushing Rate	0.9 (flushes/year)



GRANGER POND P 180
DENMARK TWP OXFORD CO MAINE
ELEV 525 FT

0 1 2 3 4 5
TENTHS OF MILE

204

Granger Pond # 3126

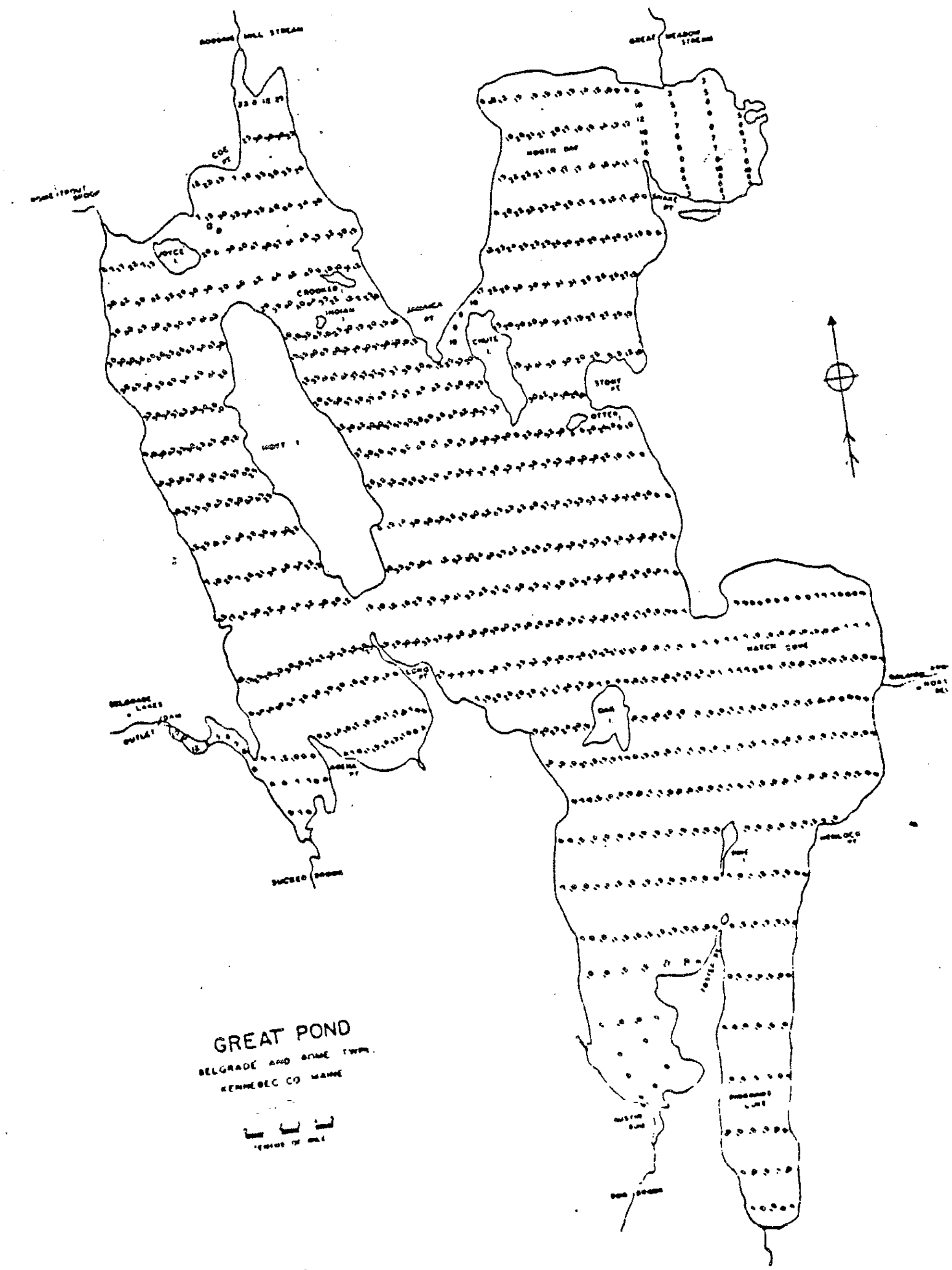
	1982
Mean Secchi (m)	5.5
Min. Secchi (m)	5.4
TSI	43
Color(SPU)	NA

Transparencies are about average for lakes in Maine and indicate good water quality.

Granger Pond is managed as a warm water fishery. Largemouth bass have become so prolific in this lake that the growth rate has been reduced causing large populations of stunted bass.

Great Pond #5274

Surface Area	3337 ha (8,239 a)
Max. Depth	20.7 m (69 ft)
Mean Depth	7.3 m (24 ft)
Volume	2.4 X 10^8 m^3 (195,122 acre-feet)
Drainage Area	215.5 Km^2 (82.9 mi^2)
Flushing Rate	0.4 (flushes/year)



Great Pond # 5274

	1976-78[x]	1979	1980	1981	1982
Mean Secchi (m)	6.7	7.1*(4)	7.2	7.3	7.1
Min. Secchi (m)	5.8	6.9	6.0	5.8	5.9
TSI	34	NA	30	30	31
Color(SPU)			15		
pH	6.6				
Chla(ug/l)	2.9(ls)		3.5(sum)		7.1(sur)
TP(ppb)	5 spring		11 (sum)		

* Inadequate sampling season
x Additional data available for 1970-1975
(ls) late summer, (sum) summer, (sur) surface grab

The principal fishery at Great Pond is salmon, brook trout, smallmouth bass, white perch, and pickerel.

"Oxygen in the deeper water of the lake in the summertime has decreased in the last few years. Nutrients in the water are undoubtedly increasing with the development of shore property around Great Pond and its tributaries. This is responsible for greater amounts of organic matter in the lake. Oxygen in turn is consumed in the decomposition of this organic matter. Coldwater fisheries require plenty of oxygen for maximum production and a deterioration of water quality may eventually limit our ability to manage trout and salmon in Great Pond" (1).

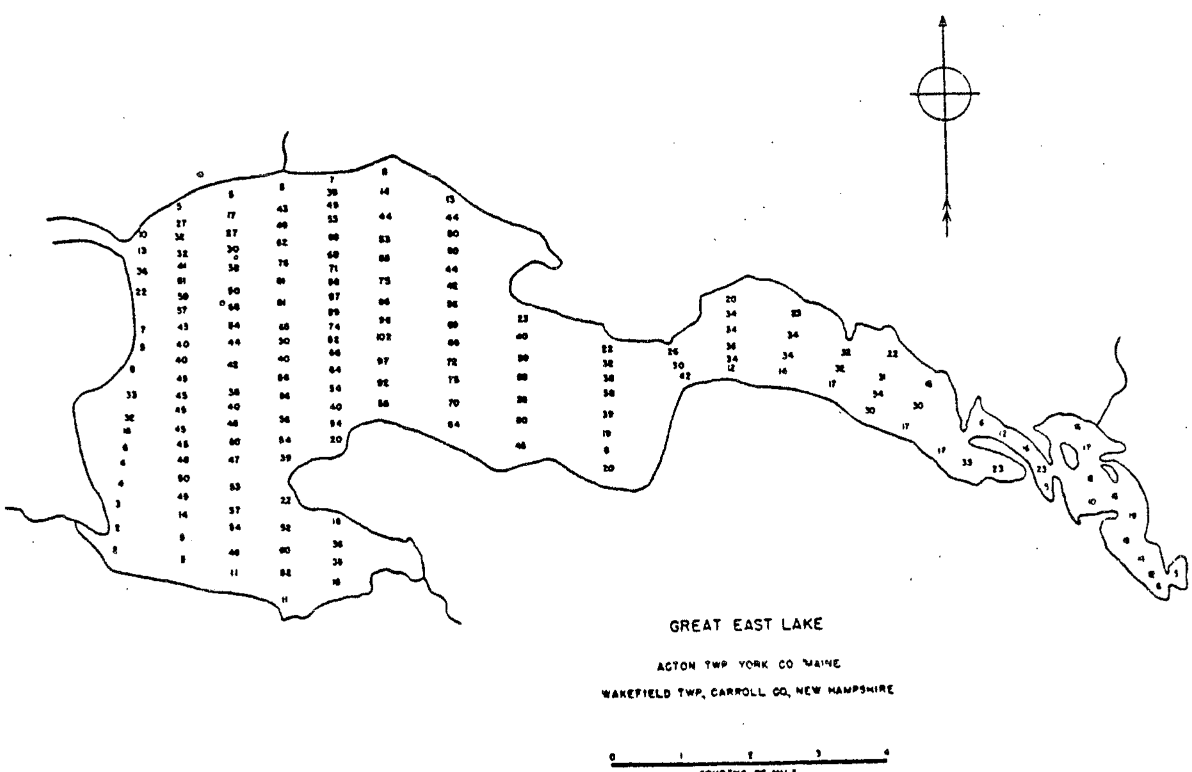
Great Pond receives drainage from Salmon Lake (Ellis Pond), a lake that in recent years has shown a severe decline in water quality. This inflowing water is high in nutrients. Currently the DEP is studying the sources of nutrients to Salmon lake and has received a Federal Grant to aid the restoration program for Salmon Lake. Implementation of the restoration measures has already started and should be completed in 1983. Hopefully, Great Pond will not suffer any ill effects due to Salmon lake.

Transparencies are above average for Maine lakes. Although the readings have fluctuated over the past 11 years, no trend is apparent. Water quality remains high. Chlorophyll levels are moderate and the TP level of 1980 is also moderate.

(1) Taken from The Department of Inland Fisheries and Wildlife Summary

Great East Lake # 3922

Surface Area	715 ha (1768 a)
Max. Depth	31.1 m (102 ft)



Great East Lake # 3922

	1974^x	1975^x	1976^x	1978	1981
Mean Secchi(m)	10.7*(1)	10.9*(1)	7.8*(1)	10.0+	8.0*(3)
Min. Secchi (m)				10.0+	
TSI	NA	NA	NA	17+	NA
Color(SPU)	10	3	10		10
pH	6.6	6.9	6.8		6.7
Chla(ug/l)	1.5(ls)	1.3(ls)	1.4(ls)		3.6(ls)
TP(ppb)	5(s)(ls)	9(s)(ls)	12(c)(ls)		7(c)(ls) 8(b)(ls)

* Inadequate sampling season

\+ Secchi disk readings always exceeded the 10 m length of rope, so the water quality is underestimated.

(ls) late summer, (c) core, (b) bottom, (s) surface

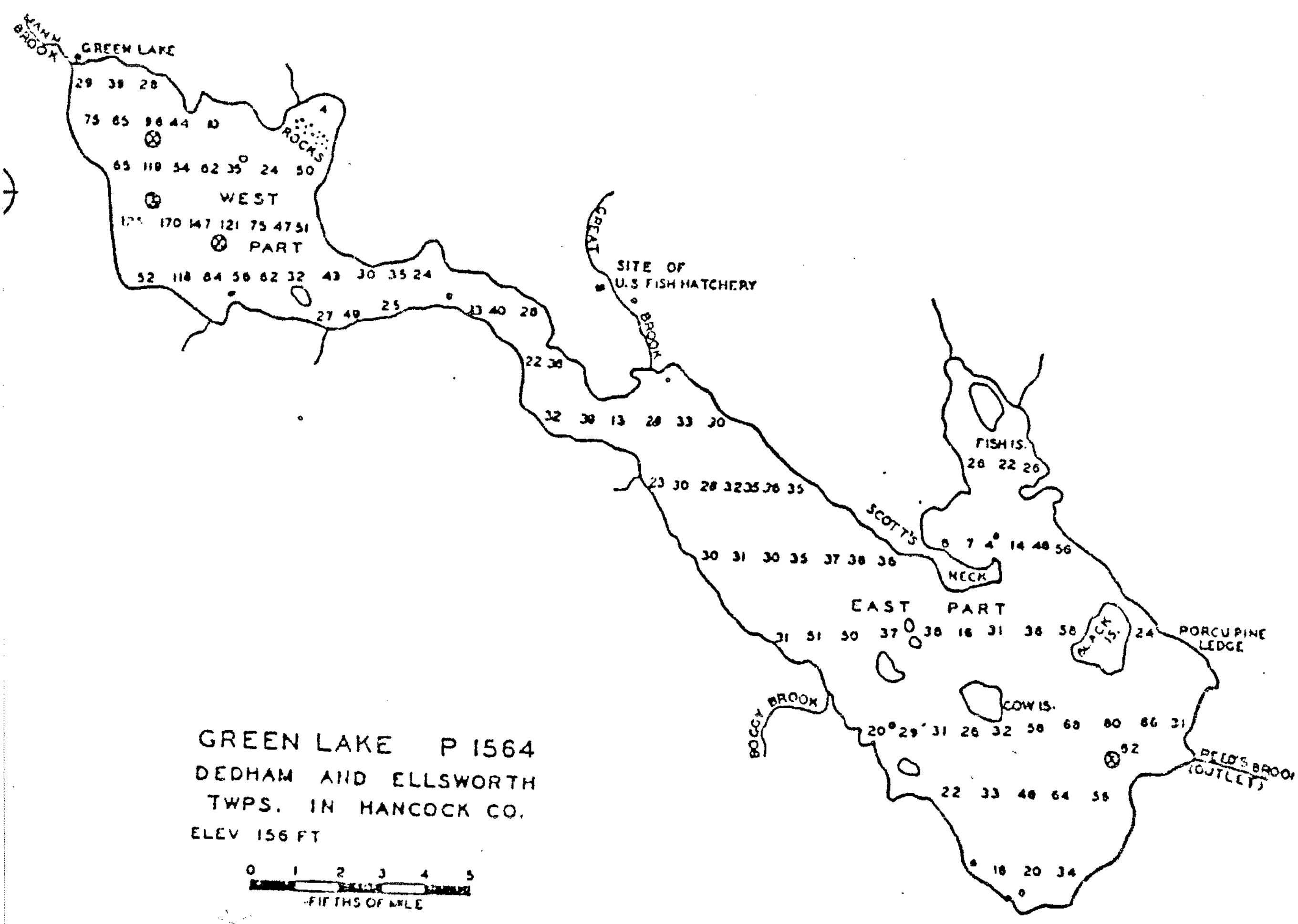
The 1974 through 1976 data were collected in a cooperative project between the D.E.P. and the U.S. Geological Survey.

It is difficult to determine water quality trends due to the short sampling seasons. Secchi disk readings are well above average for Maine lakes. Chlorophyll levels are low except the 1981 level which is moderate. TP values are low to moderate.

There is an oxygen deficiency (less than 5ppm) below 16 m by late summer. The principal fishery is lake trout, salmon, brown trout, bass and pickerel.

Green Lake #4294

Surface Area	1210 ha (2989 a)
Max. Depth	51.8 m (170 ft)
Mean Depth	11.0 m (36.3 ft)
Drainage Area	148.9 km^2 (57.5 mi^2)
Volume	136.0 X $10^6 m^3$ (110,24 acre-feet)
Flushing Rate	0.6 (flushes/year)



Green Lake # 4294

	1974(©)	1975(©)	1976(©)	1981	1982
Mean Secchi (m)	6.7	6.9	7.3	6.5*(2)	5.9*(3)
Min. Secchi (m)	6.0	6.0	5.9	6.0	5.6
TSI	28	28	28	NA	NA
TSI Range	21-34	24-32	23-30		
	CHL-SD	CHL-SD	TP,CHL-SD		
Color(SPU)			5	10	
pH(core)			6.7	6.6	
Chla(ug/l)	1.3mean	1.5mean	1.4mean	1.7(ls)	
TP(ppb)	4(sm)	7(sm)	6mean	4 (c)(ls)	
				6(b)(ls)	

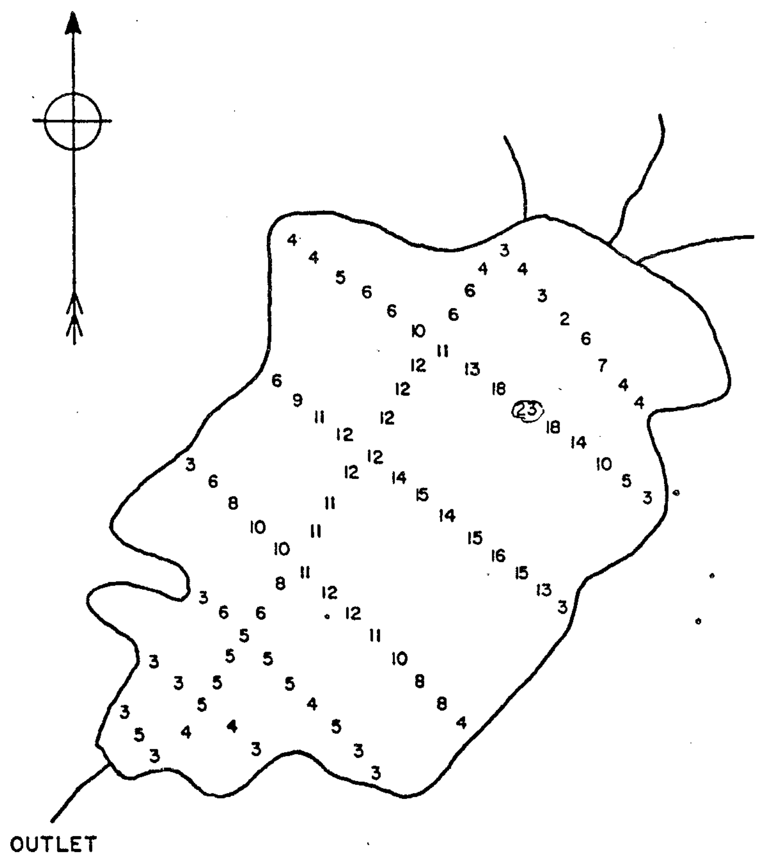
* Inadequate sampling season
(©) Data collected during a cooperative project between DEP and U.S. Geological Survey.
(sm) surface mean, (ls) late summer (c) core (b) bottom

The hypolimnion remains well oxygenated to the bottom. The principal fishery is lake trout, salmon, and smallmouth bass.

Transparencies are slightly above average for Maine lakes. Chlorophyll and TP levels are low. Due to the short sampling season in 1981 and 1982, it is difficult to make any judgement on water quality trends. Present water quality is good to excellent.

Haley Pond # 3534

Surface Area	69 ha (172.5 a)
Max. Depth	6.9 m (23 ft)
Mean Depth	2.2m (7.3 ft)
Drainage Areea	25.9 km^2 (10 mi^2)
Volume	1.55 X 10^6 m^3 (1256 acre-feet)
Flushing Rate	8.3 (flushes/year)



HALEY POND

RANGELEY AND DALLAS (T2 R2), FRANKLIN CO., MAINE

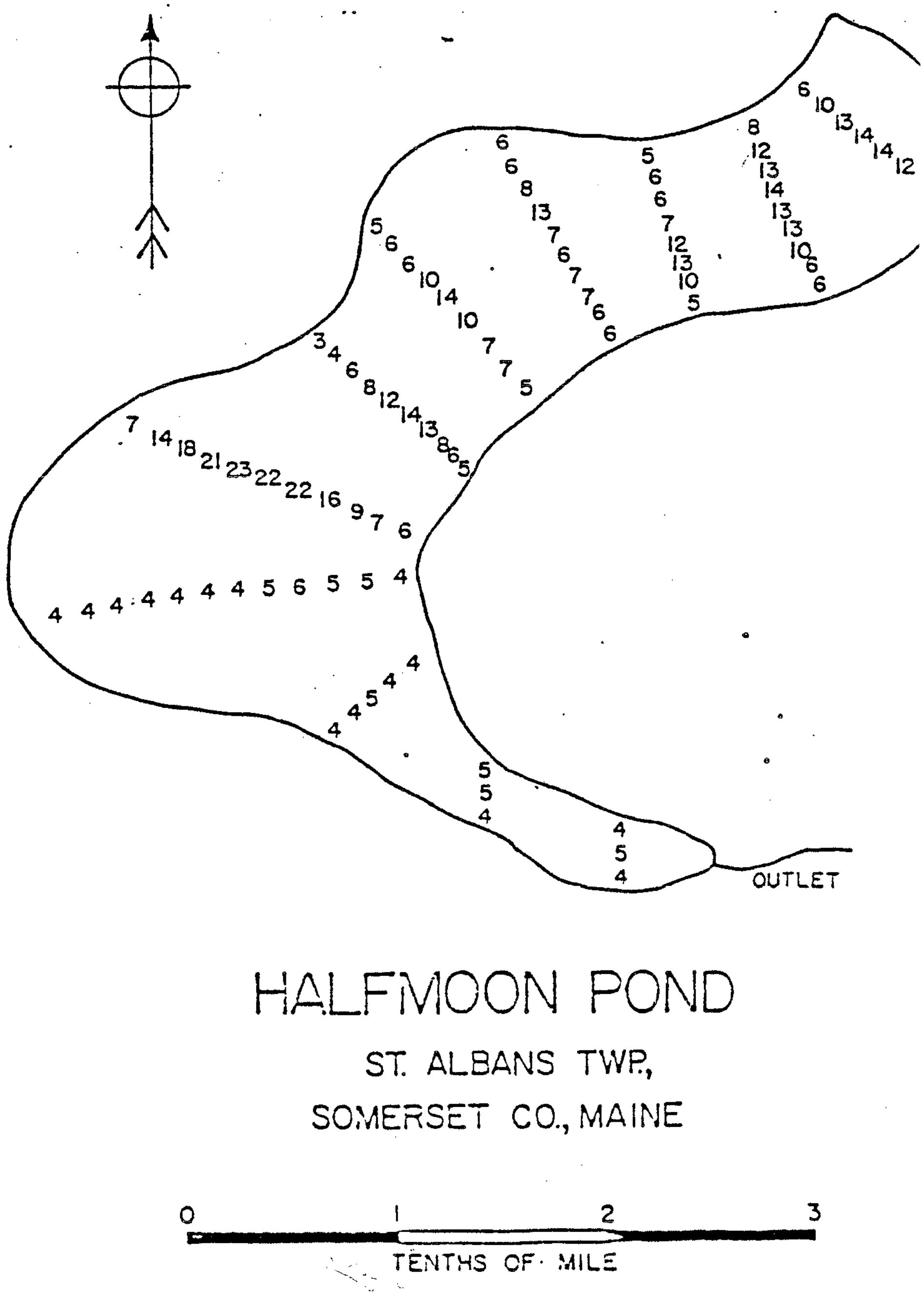
0 1 2 3
TENTHS OF MILE

Haley Pond # 3534

	1977	1978	1980	1981	1982
Mean Secchi (m)	3.5	3.2	2.0	2.1	2.5
Min. Secchi (m)	2.0	2.1	1.8	1.1	2.1
TSI	60	60	81	78	69
TSI Range	52 - 68	53 - 73	69-100	69-97	59-87
	CHL SD	TP SD	TP SD	TP SD	TP SD
Color(SPU)	40	40	40	40	40
pH	6.8mean	6.9mean	6.9mean	7.0mean	7.1
Chla(ug/l)	4.8mean	5.4mean	10.7mean	8.7mean	6.6mean
TP(ppb)		15mean	27mean	26mean	19mean

Halfmoon Pond #5460

Surface Area	15. ha (37.5 a)
Max. Depth	6.9 m (23 ft)
Mean Depth	2.0 m (6.6 ft)
Volume	3.0 X 10^5 m^3 (244 acre-feet)
Drainage Area	8.6 Km^2 (3.32 mi^2)
Flushing Rate	14.6 (flushes/year)



Halfmoon Pond # 5460

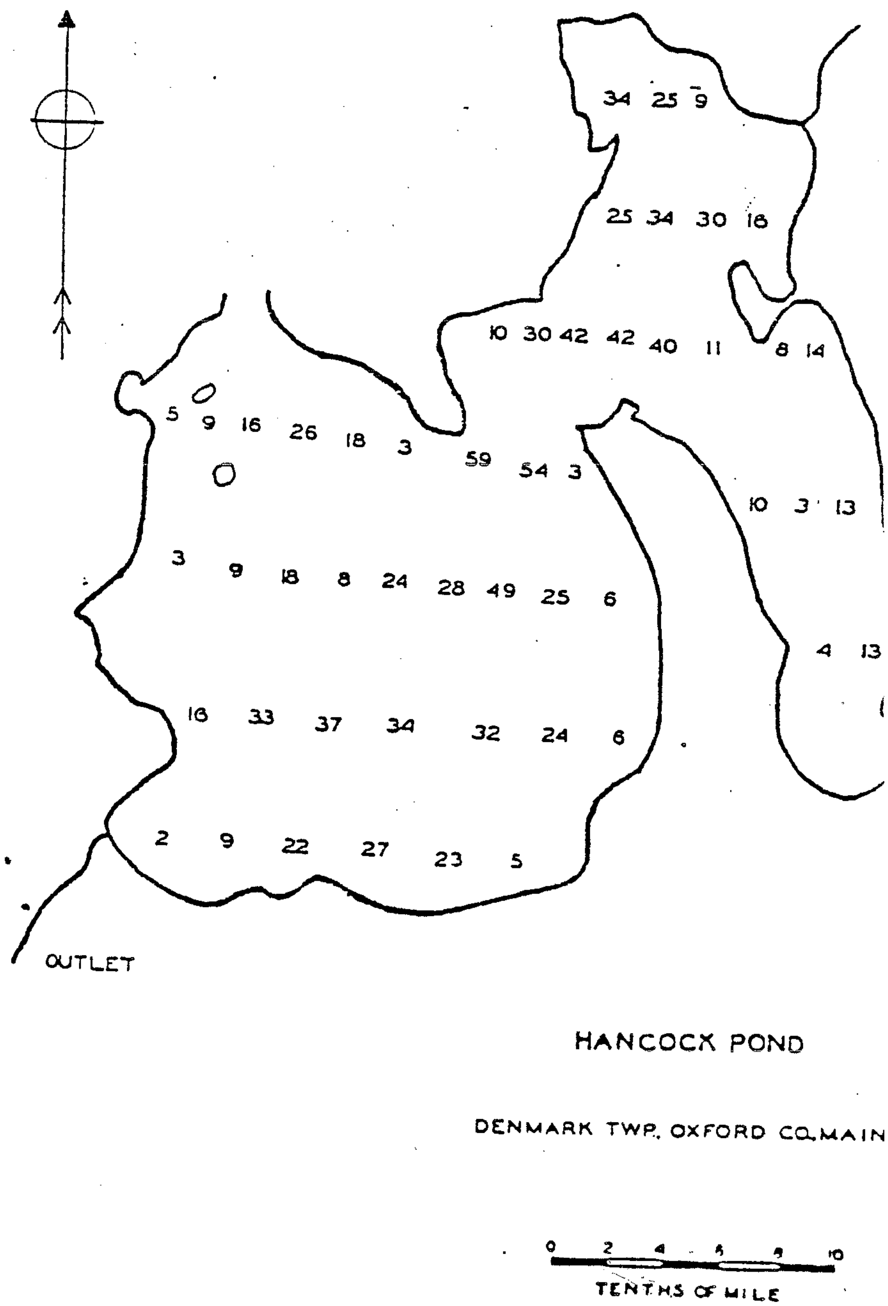
	1981	1982
Mean Secchi (m)	2.7	2.9
Min. Secchi (m)	2.4	2.6
TSI	82	78
Color(SPU)	30	30
pH		7.2
Chla(ug/l)		2.3
TP(ppb)		18

The pond is managed for warmwater fish.

Transparencies are below average for Maine lakes, but color probably is interfering. The Chla value is low and the TP value is high, but color also interferes with the TP. Color does not affect water quality but it does reduce transparencies and increase TP causing a lake to seem more productive than it really is. In cases like this, Chla is the best indicator of water quality.

Hancock Pond #3132

Surface Area	347 ha (858 a)
Max. Depth	17.7 m (50 ft)
Mean Depth	5.5 m (18 ft)
Drainage Area	24.7 Km^2 (9.5 mi^2)
Volume	1.7 X 10^7 m^3 (13821 acre-feet)
Flushing Rate	0.8 (flushes/year)



Hancock Pond # 3132

	1975-78	1979	1980	1981	1982
Mean Secchi (m)	7.6	7.8*(3)	8.3	7.9*(4)	7.6*(4)
Min. Secchi (m)	5.8	7.6	7.3	6.1	7.3
TSI	28	NA	24	NA	NA
Color(SPU)			10		
pH	6.3				
Chla(ug/l)	3.0(ls)		1.8(ls)		
TP (ppb)	4(ls)		4(c)(ls) 12(b)(ls)		

* Inadequate sampling season
(ls) late summer, (c) core, (b) bottom

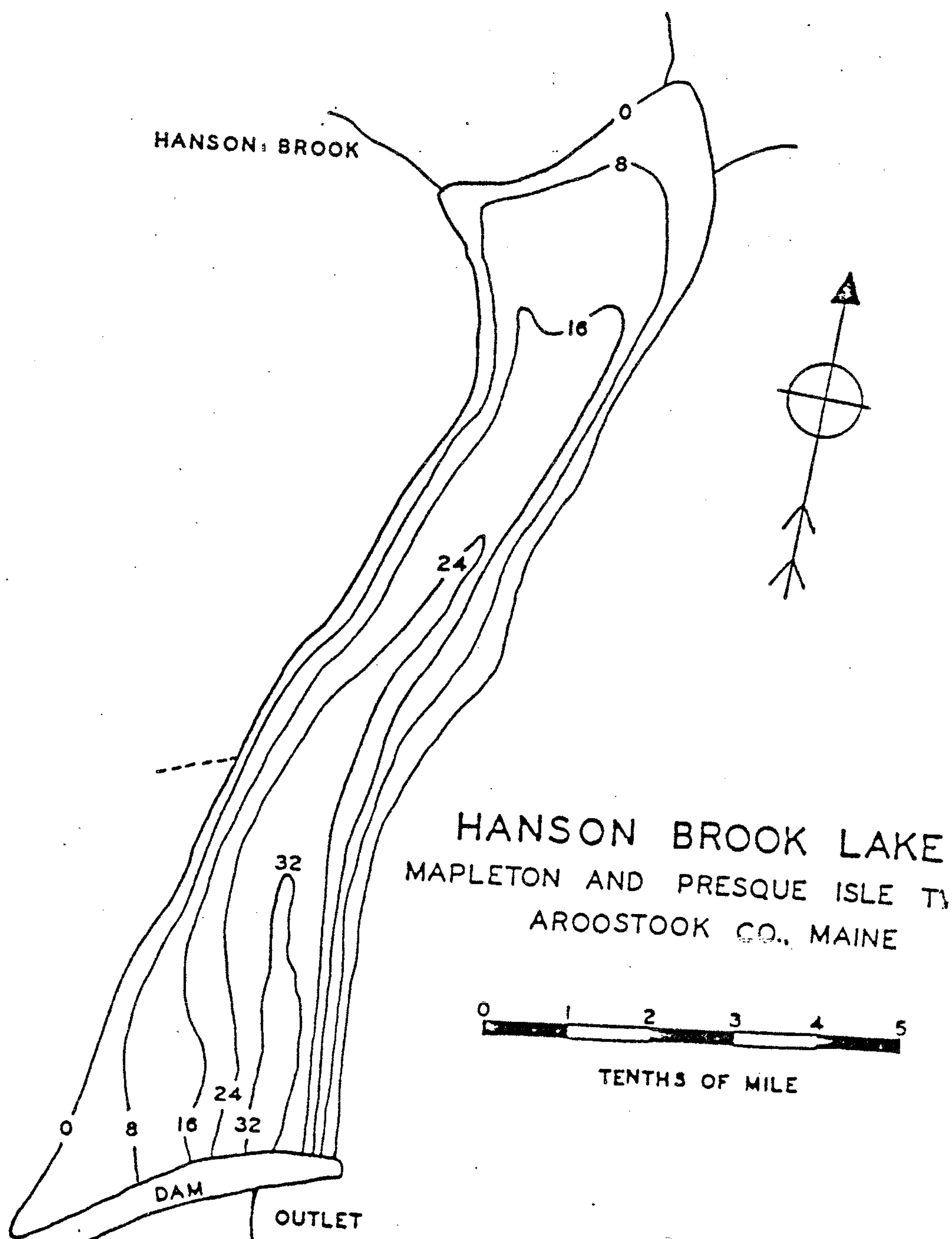
An oxygen deficiency (less than 5 ppm) exists in the hypolimnion by late summer. The pond is managed for bass, and brook trout.

Transparencies are above average for Maine lakes and indicate high water quality. Secchi disk readings show some fluctuation but always remain high. Chlorophyll a and TP levels are low. Continued sampling with complete seasons is necessary in order to predict water quality trends.

The slow flushing rate and small size of the pond indicates that the pond is sensitive to water quality changes. Residents of the watershed should exercise care not to increase the phosphorus load to the lake.

Hanson Brook Lake #9767

Surface Area	48 ha (118 a)
Max Depth	9.8 m (32 ft)
Mean Depth	4.3 m (14 ft)
Volume	2.12×10^6 m^3 (1725 acre-feet)
Drainage Area	9.32 Km^2 (3.6 mi^2)
Flushing Rate	1.8 (flushes/year)



Hanson Brook Lake #9767

	1976	1977	1978	1979	1981
Mean Secchi (m)	3.0	2.3*(4)	2.0*(4)	1.9*(4)	1.8*(4)
Min. Secchi (m)	2.1	1.7	1.2*	1.4	1.4
TSI	76	NA	NA	NA	NA
Color			25	25	
pH			7.6(surf)	7.5	
Chl*a*	9.6(sum)	4.8*(3)	15(sum)		12.9*(3)
TP	28*(4)	24*(2)		35*(1)	26*(4)

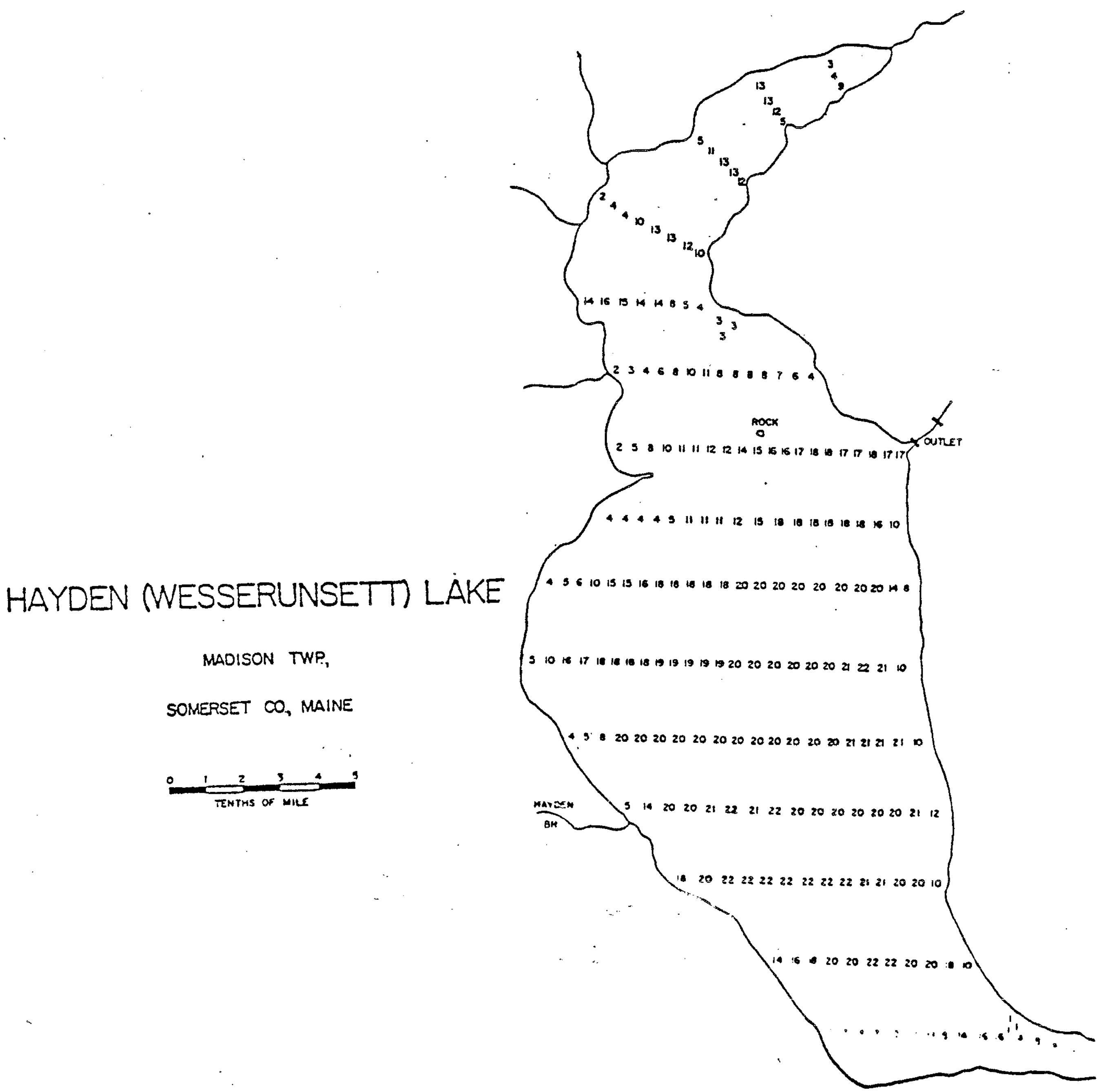
* Inadequate sampling season
(sum) summer, (surf) surface

The lake was created when Hanson Brook was dammed in 1966. Decomposition of organic matter causes an oxygen depletion in the lower levels during summer stratification. The lake is also subjected to agricultural run-off. Chl*a* and TP values are very high. The lake experiences annual algal blooms.

Hanson Brook Lake is managed for brook trout.

Hayden Pond (Wesserunsett Lake) #0070

Surface Area	591 ha (1446 a)
Max. Depth	6.6 m (22 ft)
Mean Depth	4.0 m (13 ft)
Volume	2.3×10^7 m^3 (18699 acre-feet)
Drainage Area	46.8 Km^2 (18.06 mi^2)
Flushing Rate	1.0 (flushes/ year)



Hayden Pond (Wesserunsett Lake) #0070

	1971-73[a]	1978	1980	1981	1982
Mean Secchi (m)	6.1+*	5.4+	4.9*(1)+	4.1*(3)+	6.0
Min. Secchi (m)		4.7+			4.8
TSI	NA	44		NA	39
Color(SPU)				20	
pH				7.2	
Chla(ug/l)		2.2(ls)		4.1(ls)	
TP(ppb)		10(ls)		10(ls)	

+ Many readings hit bottom
* Inadequate sampling season
(ls) late summer
(a) The lake was studied by Scott and Davis, 1970-1973, Descriptive and Comparative Studies of Maine Lakes, Ronald B. Davis, Bailey, Scott, Hunt and Norton, 1978.

Brown trout stocking provides a cold water fishery and Hayden Pond is also managed for warm water fish.

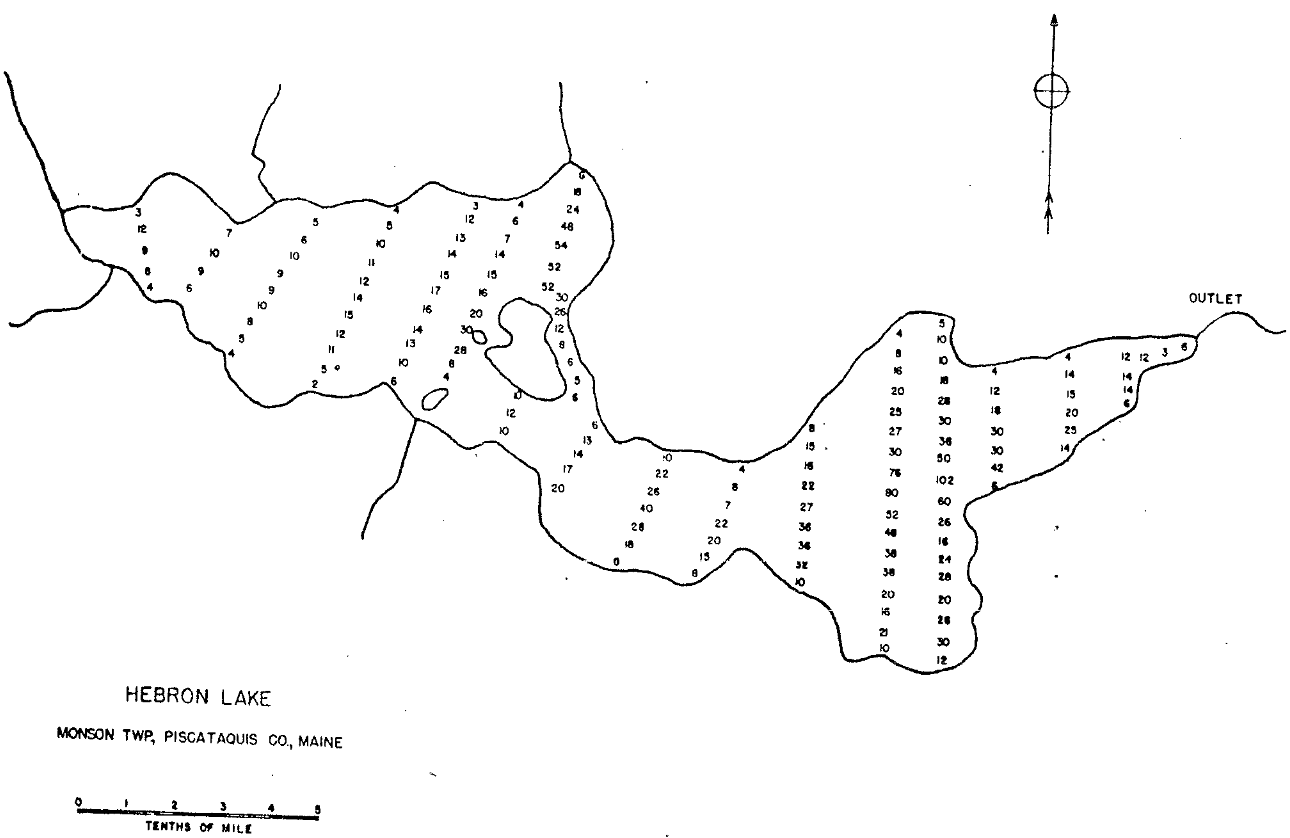
Often the Secchi disk hit bottom which indicates unusually clear water in that it is not typical to see bottom in a lake that depth. Transparencies are average for Maine lakes and ponds. Chla values are low to moderate and TP levels are moderate. Continued monitoring with complete seasons is necesary to assess water quality changes.

A study was done on the lake in 1976 by Wright, Pierce, Barnes and Wyman to determine how to handle septic waste disposal problems on the outlet in East Madison. Recommendations were made to build several small cluster systems. The lake is vulnerable to degradation but at this time water quality is stable.

Currently DEP is working with East Madison to design and build systems to be funded by the Small Community Grants Program. Work should begin in 1983.

Hebron Pond # 0301

Surface Area	212 ha (525 a)
Max. Depth	31 m (102 ft)



Hebron Pond #0301

	1981
Mean Secchi (m)	3.5+
Min. Secchi (m)	2.4
TSI	68
Color	NA

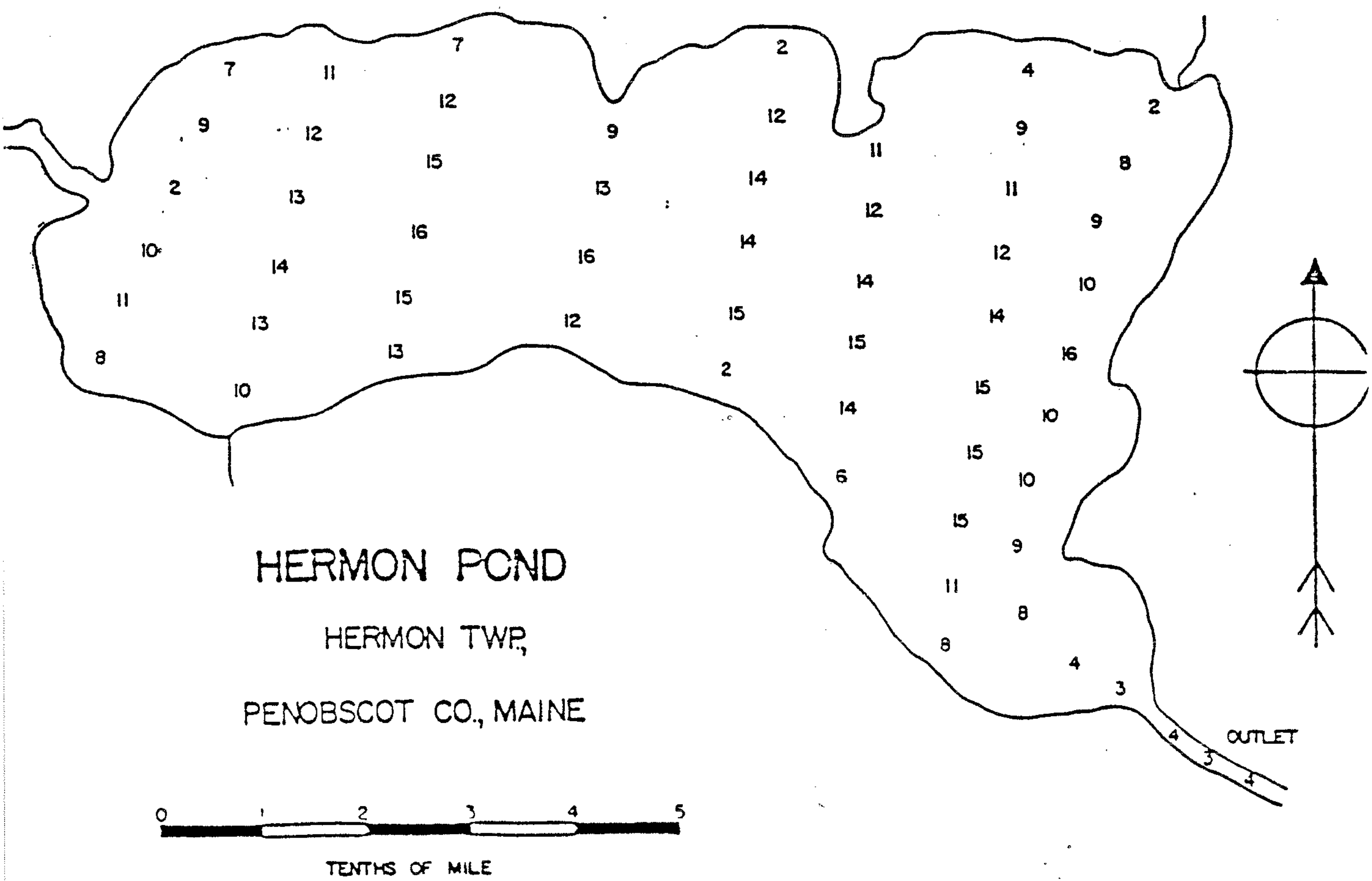
+ Some readings not taken from deepest basin

Hebron lake is well suited for cold water fish in the deep basin and warmwater fish in the shallow warm basin. The lake is managed for trout in one basin and perch are prevalent in the other basin.

Because the transparency readings were not all taken in the deepest part of the lake, and readings in the shallow basin did hit bottom, water quality is probably underestimated.

Hermon Pond #2286

Surface Area	187 ha (461 a)
Max. Depth	5.1 m (17 ft)
Mean Depth	2.9 m (9.3 ft)
Volume	5.31×10^6 m^3 (4306 acre-feet)
Drainage Area	249.5 Km^2 (97.6 mi^2)
Flushing Rate	33 (flushes/year)



Hermon Pond # 2286

	1980	1981
Mean Secchi (m)	1.7	2.0
Min. Secchi (m)	0.8	1.5
TSI	NA	68 Chl
Color		110
pH		6.9
Chl*a* (mean)		8.7
TP (mean)	54(©)	25

(©) Samples taken from near the bottom so probably are higher than a core would be. Some samples contained small amounts of sediment which also would give the samples high values.

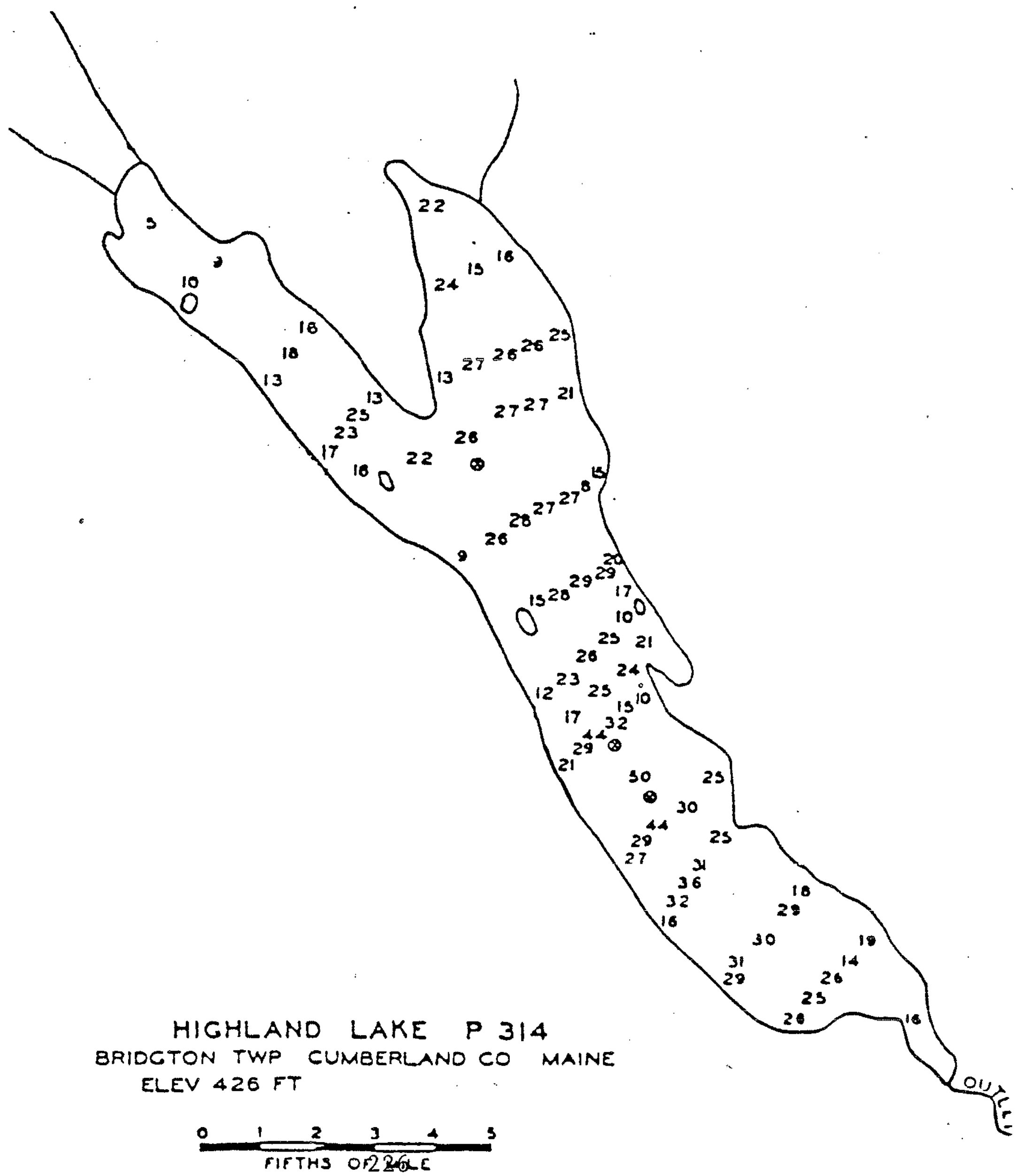
Hermon Pond is a shallow warm water pond currently being managed for warm water fish such as bass and perch. Hermon pond was one of seven lakes chosen for study in 1980-1981 by the Penobscot County Regional Planning Commission.

The Town of Hermon has prepared a municipal waste water treatment facility plan. Sewering of Hermon Pond was considered, but cost analysis showed it to be prohibitive, so the plan recommended no action for the present time.

Transparency is shallow partly because the pond is highly colored. Color also contributes to the high TP levels, but Chl*a* which is not affected by color is high which indicates a productive lake.

Highland Lake (Bridgton) #3454

Surface Area	573 ha (1401 a)
Max. Depth	8.8 m (29 ft)
Mean Depth	5.9 m (20 ft)
Volume	30.7 X 10^6 m^3 (4,4030 acre-feet)
Drainage Area	51.5 Km^2 (19.9 mi^2)
Flushing Rate	0.9 (flushes/year)



Highland Lake (Bridgton) #3454

	1976-78	1979	1980	1981	1982
Mean Secchi (m)	5.7*	6.8	5.5	6.3*(3)	7.2
Min. Secchi (m)	4.5	5.5	1.5	5.0	6.1
TSI	39	33	44	NA	30
Color(SPU)	20				
pH	6.4				
Chla(ug/l)	2.7(ls)		2.8*(3)		
TP(ppb)	11(c)(ls		11*(3)		
	13(b)(ls)				

* Inadequate sampling season
(ls) late summer, (b) bottom, (sur) surface, (c) (core)

There is less than 5 ppm of dissolved oxygen below 10m. The lake is managed for warm-water fish, such as bass, perch, and pickeral, and brown trout also are stocked.

Sampling of the tributaries for TP around Highland Lake was conducted in 1977, 1978 and 1980. TP samples from Trull Brook were low. Carlisle Brook at the Sweden Road was low, but samples from the brook closer to Highland Lake were higher. The stream from Stearns Pond had moderate levels (18 ppb) near Highland Lake.

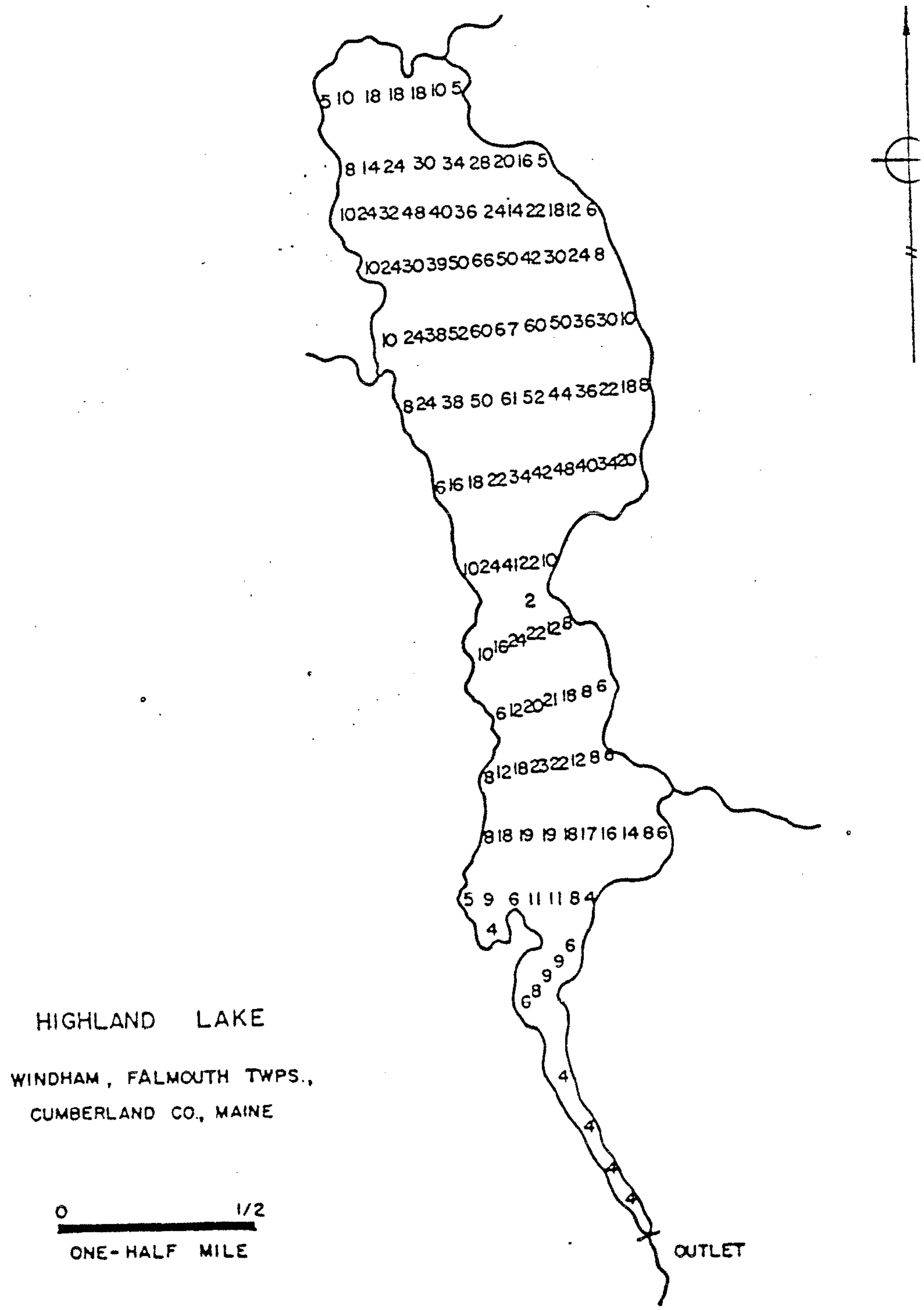
In early May, 1980, an algal bloom occurred. The blooming algae was identified as <u>Uroglena americana,</u> a colonial flagellate in the Division of Chrysophyta. The bloom lasted one week.

Highland Lake is the water supply for the Town of Bridgton. Concern for the quality of the lake prompted the Bridgton Lakes Enviromental Association to request that the selectmen inact stricter zoning ordinances in the Highland Lake Watershed, such as a buffer strip around the lake and buffer strips along the two major tributaries. Selectmen unanimously voted to bring the ordinances before the town meeting. In 1981 the town voted to accept the ordinances. Bridgton has also passed an ordinance prohibiting the sale of laundry detergents containing phosphorus.

Transparency fluctuates so it is difficult to predict water quality trends. This may be due to natural conditions. Continued monitoring with adequate sampling seasons is necessary in order to predict any trend in water quality. Chlorophyll and TP levels are low to moderate. Water quality is good to excellent.

Highland Lake (Falmouth) #3734

Surface Area	259 ha (1640 a)
Max. Depth	20.4 m (67 ft)
Mean Depth	6.7 m (22 ft)
Volume	1.73 X 10^7 m^3 (14,000 acre-feet)
Drainage Area	22.5 Km^2 (8.7 mi^2)
Flushing Rate	0.7 (flushes/year)



Highland Lake (Falmouth) #3734

	1974-76(@)	1977-79	1980	1981	982
Mean Secchi (m)	6.3	7.0	6.4*(4)	6.9	5.8*(3)
Min. Secchi (m)	4.0	4.3	5.2	6.1	5.3
TSI	36	33	NA	32	NA
TSI Range	34-40 CHL-TP	-			
Color(SPU)	13		12		
pH	6.2		6.0		
Chla(ug/l)	2.4 mean		2.2(f)		
TP(ppb)	9 mean		6(c)(ls) 16(b)(ls)		

* Inadequate sampling season
(@) The 1974 through 1976 data was collected through a cooperative project between DEP and U.S. Geological Survey.
(f) fall, (ls) late summer, (c) core (b) bottom

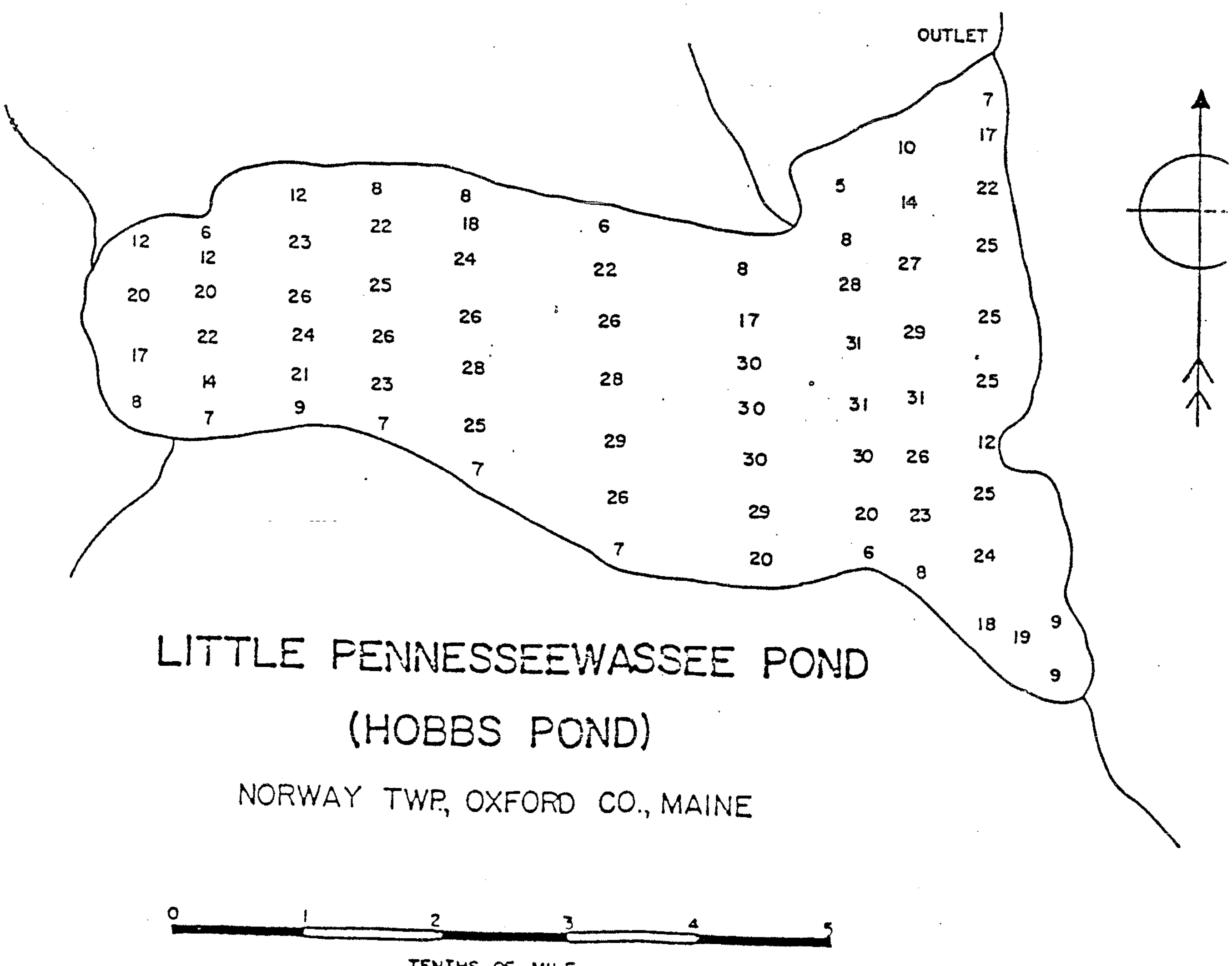
The hypolimnion is oxygen depleted (0-5ppm) below 10m. The lake supports a cold water fishery, of brown trout and warm water species of largemouth and smallmouth bass, perch and pickeral.

Chla results over a 3 year period, 1974-76, remained low and phosphorus was moderate. Chla and TP values for 1980 were also low. Transparency over the past years have been consistently high and remains relatively stable.

A vegetative survey was completed on Highland Lake in 1980 and compared to a survey done in 1976. A slight increase in the abundance of aquatic vegetation, especially pipewort, was noted. Pipewort is a slender long stem plant with a white button on top. It is an indicator of clean water and low nutrients. An increase in pipewort is not considered a problem and probably is due to lower water levels.

Hobbs Pond (Little Pennesseewasee Lake) #0367

Surface Area	39 ha (96 a)
Max. Depth	9.5 m (31 ft)
Mean Depth	5.7 m (18.7 ft)
Volume	2.2 X 10^6 m^3 (1789 acre-feet)
Drainage Area	3.6 Km^2 (1.40 mi^2)
Flushing Rate	0.8 (flushes/year)



Hobbs Pond #0367

	1976-78	1979	1980	1981	1982
Mean Secchi (m)	4.6*	4.6	4.2	4.8	4.8
Min. Secchi (m)	3.6	3.0	2.0	2.5	3.6
TSI	NA	53	58	51	51
Color(SPU)			10		
pH(core)		7.0(surf)	6.6	7.1(surf)	
Chl*a*(ug/l)	12(sum)		1.7(sum)		
TP(ppb)	8(sum)		9(sum) 15(b)(sum)		

* Inadequate sampling season
(b) bottom, (sum) summer, (surf) surface

Approximately six years ago poorly designed doors on a manure storage pit came open, dumping a large amount of cow manure into the pond. That summer the pond experienced an algal bloom, and high bacteria counts forced the pond to be closed to swimming. The pond has gradually recovered since that manure spill.

Transparencies were low in April and early May, 1980, and then returned to normal levels later in the summer. It is unknown what caused the drop. Some erosion problems have been reported at the southwest corner of Hobbs Pond. Any erosion should be prevented to keep nutrients from reaching the lake.

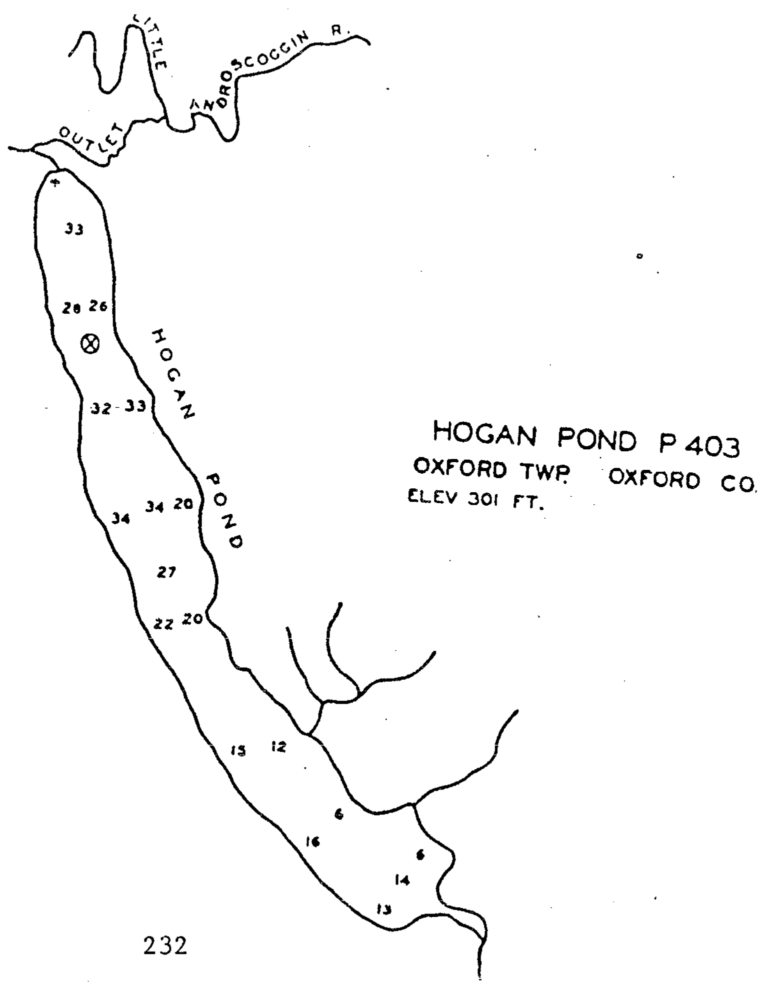
The transparency is slightly below average for Maine lakes but appears to be relatively stable. TP levels are moderate and Chl*a* levels in 1980 were low. Because of the pond's small size and relatively slow flushing rate (0.8 flushes/year), it may be sensitive to water quality degradation.

The Norway Lakes Association does additional testing for bacteria, dissolved oxygen and pH.

Hobbs Pond is managed as a cold water fishery with brown trout the principle species. Smelts are also present.

Hogan Pond #3770

Surface Area	66.0 ha (165.0 a)
Max. Depth	10.2 m (34.0 ft)
Mean Depth	4.8m (15.8 ft)
Volume	3.18 X 10^6 m^3 (2578 acre-feet)
Drainage Area	35.48 km^2 (13.70 mi^2)
Flushing Rate	5.5 (flushes/year)



Hogan Pond #3770

	1982
Mean Secchi (m)	3.3*(4)
Min. Secchi (m)	2.8
TSI	NA

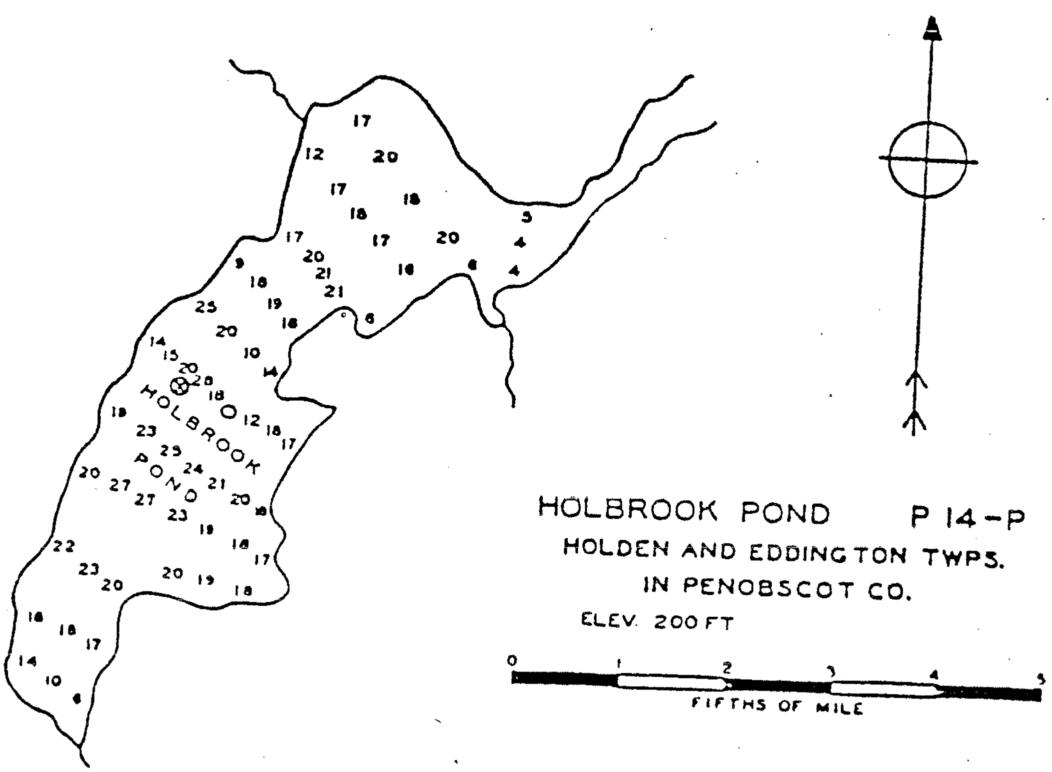
* inadequate sampling season

The transparency readings for Hogan Pond are below average for ponds in Maine, and the reason is not known. Color, which is unknown at this time may be a contributing factor.

An oxygen deficiency exists below 15 ft. in late summer. For this reason the Department of Inland Fisheries and Wildlife suggests the pond be managed for the existing warm water species that already inhabit the pond. Principal warm water species now present include smallmouth bass,largemouth bass, perch and pickeral.

Holbrook Pond #4274

Surface Area	113 ha (280 a)
Max. Depth	8.4 m (28 ft)
Mean Depth	4.4 m (14.8 ft)
Volume	4.95 X 10^6 m^3 (4015 acre-feet)
Drainage Area	17. Km^2 (6.6 mi^2)
Flushing Rate	2.3 (flushes/year)



Holbrook Pond # 4274

	1977-78	1979	1980	1981	1982
Mean Secchi (m)	4.7	4.6*(4)	4.4*(4)	4.4*(4)	4.6
Min. Secchi (m)	3.6	3.9	3.7	4.0	4.3
TSI	52	NA	NA	NA	52
Color(SPU)				30	
pH(core)				6.8	
Chla(ug/l)	3.1(f)			4.0(ls)	
TP(ppb)				9(ls)	

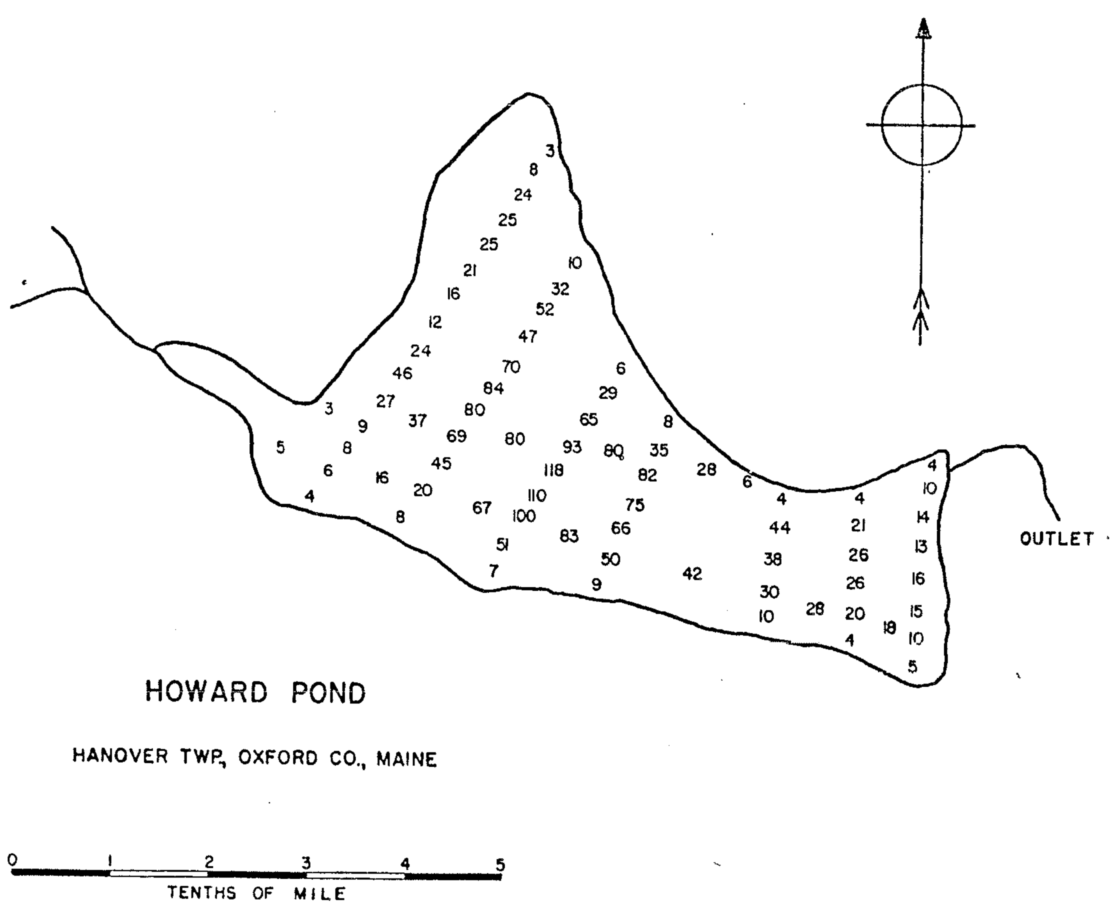
* Inadequate sampling season
(ls) late summer, (f) fall

Holbrook Pond is a shallow warm water pond which Inland Fisheries and Wildlife is managing for bass, perch, and pickerel.

Water quality appears stable. Transparencies are slightly below average for Maine lakes probably due to interference from color. Transparencies show little fluctuation over the years. Generally lakes with moderate to high color show less variation in Secchi disk readings than clear water lakes. For unknown reasons, color is a stabilizing factor in transparency. Chla and TP values are moderate.

Howard Pond # 3520

Surface Area	44 ha (109a)
Max. Depth	35.4 m (118 ft)
Mean Depth	9.8 m (32 ft)
Drainage Area	9.9 km^2 (3.8 mi^2)
Volume	5.1 X 10^6 m^3 (4134 acre-feet)
Flushing Rate	1.2 (flushes/year)



Howard Pond #3520

	1976-78	1979	1980	1982
Mean Secchi (m)	5.1	5.3*(4)	4.5	6.4
Min. Secchi (m)	2.9	4.9	2.7	5.5
TSI	58	NA	54	36
Color(SPU)	25		30	
pH	6.4		6.6	
Chl*a*(ug/l)	5.1(ls)		4.0(ls)	
TP(ppb)	6(ls)		14(c)(ls) 18(b)(ls)	

* inadequate sampling season
(ls) late summer, (b) bottom, (c) core

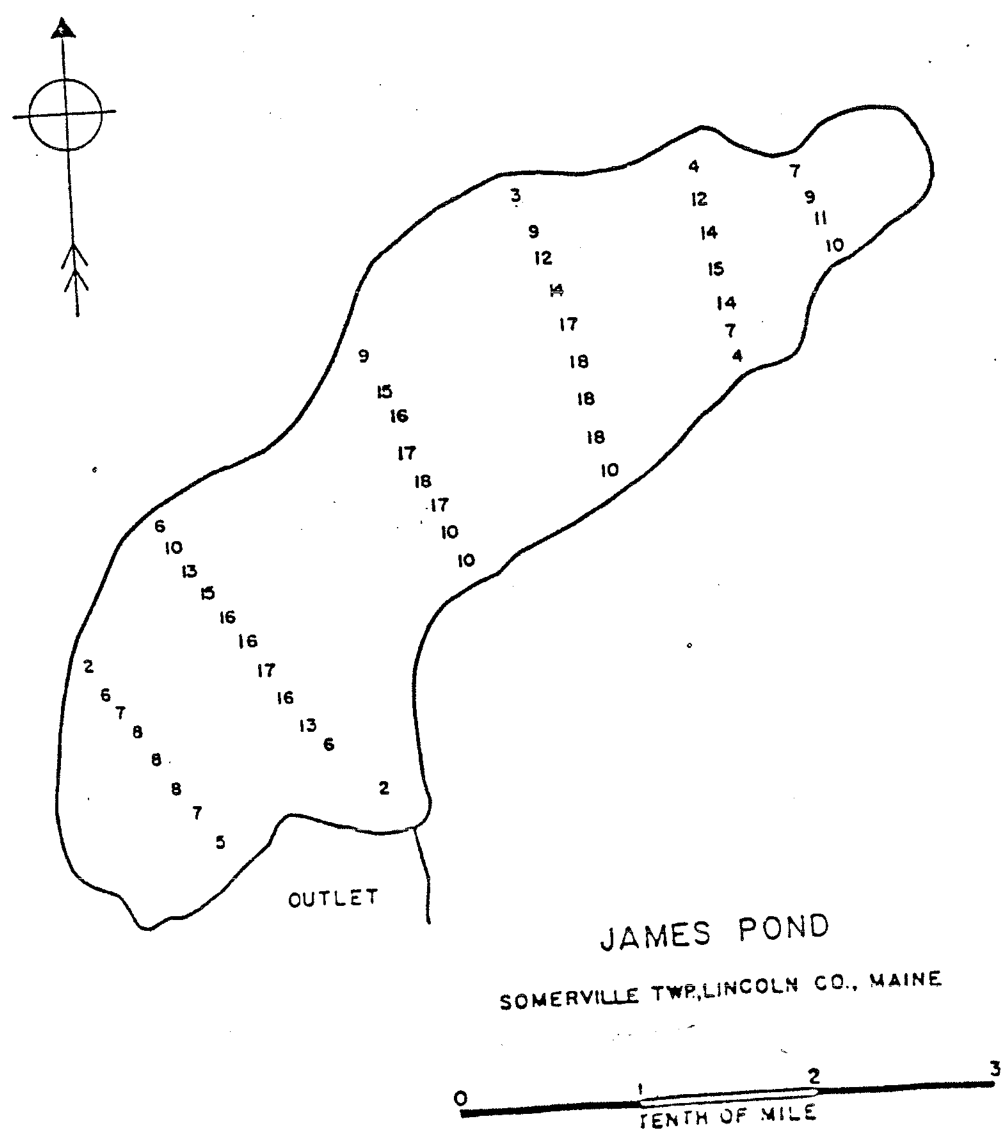
Transparency readings for 1980 were below average for lakes in Maine, but the 1982 readings are above average. Reasons for these fluctuations are not known but they could be due to natural changes or the weather.

Chl*a* and TP values are moderate. Water quality is considered good. The entire hypolimnion is well oxygenated although some changes in the oxygen concentration has been noted. The next few years of data will be important to determine if any water quality trends are occurring.

The Department of Inland Fisheries and Wildlife manages the pond for a cold water fishery. Brown trout are stocked annually and salmon are stocked every third year.

James Pond #4908

Surface Area	20.2 ha (50 a)
Max. Depth	5.5 m (18 ft)
Drainage Area	1.3 km^2(.50 mi^2)



James Pond # 4908

	1980	1981	1982
Mean Secci (m)	4.0*(4)	3.7*(4)	4.0
Min. Secchi (m)	3.8*	3.4	3.4
TSI	NA	NA	60
Color(SPU)			30
pH			6.7
Chla(ug/l)			2.8(1s)
TP(ppb)			9(1s)

* Inadequate sampling season

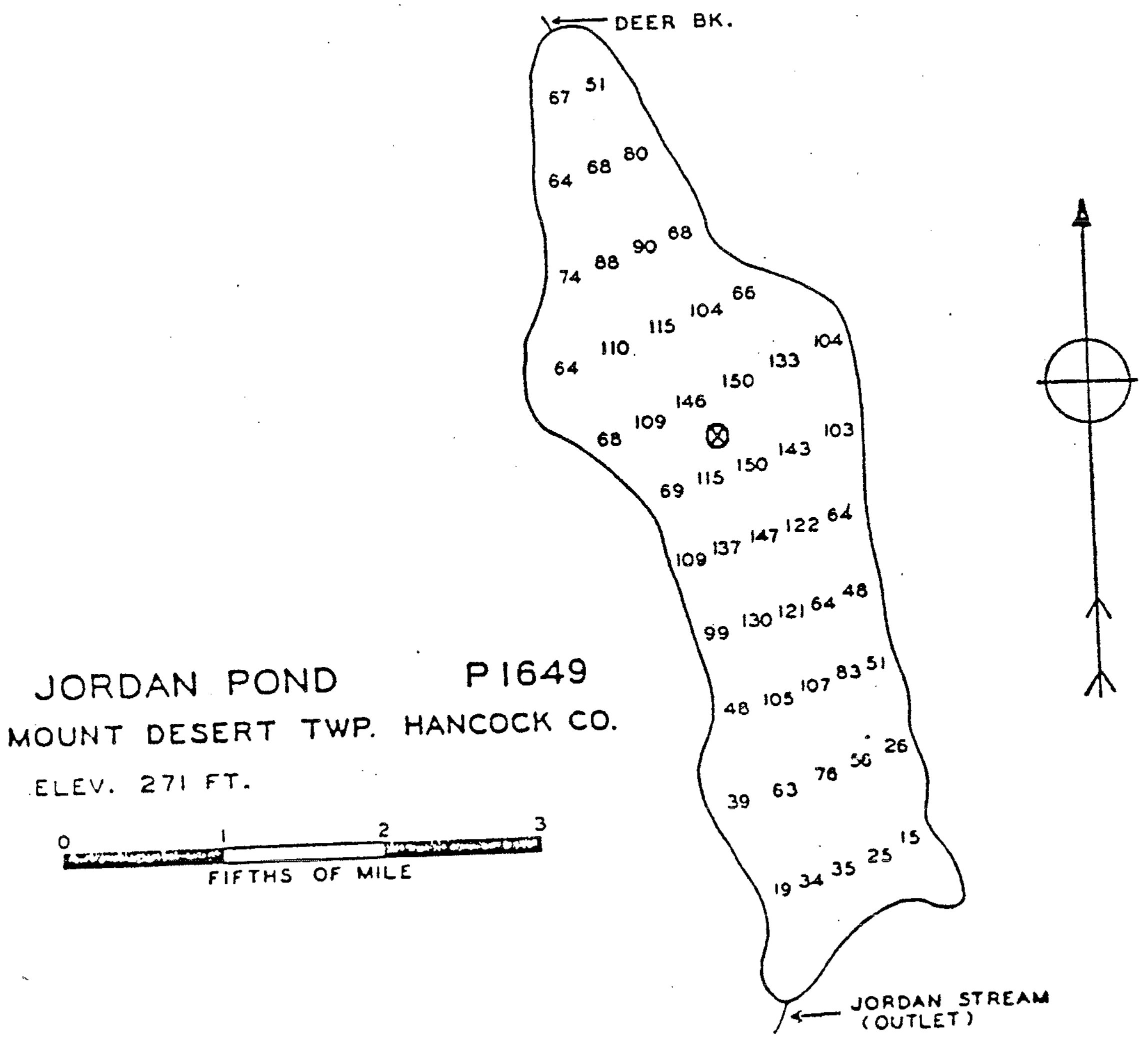
Inland Fisheries and Wildlife surveyed the pond in July, 1956. They reported that excellent habitat for warmwater fish such as white perch, pickerel and bullheads exists and that eventually smallmouth bass should become established naturally.

The pond is shallow and does not stratify. Transparencies are slightly below average for lakes and ponds in Maine. Transparency is probably reduced by the moderate water color; color reduces the transparency of the lake but does not affect water quality. Chla and TP values are low to moderate indicating good water quality.

Continued monitoring with adequate sampling seasons is necessary in order to establish any trends in water quality.

Jordan Pond #4608

Surface Area	72 ha (178 a)
Max. Depth	45 m (148 ft)
Mean Depth	24.2 m (79 ft)
Volume	$1.7 \times 10^7 m^3$ (13821 acre-feet)
Drainage Area	4.92 Km^2 (1.90 mi^2)
Flushing Rate	0.2 (flushes/year)



Jordan Pond # 4608

	1981
Mean Secchi (m)	10.0*(3)
Min. Secchi (m)	4.5
TSI	NA
Color	NA
pH	6.9
Chl*a*	0.6(f)
TP	3(c)(f)
	25(b)(f)

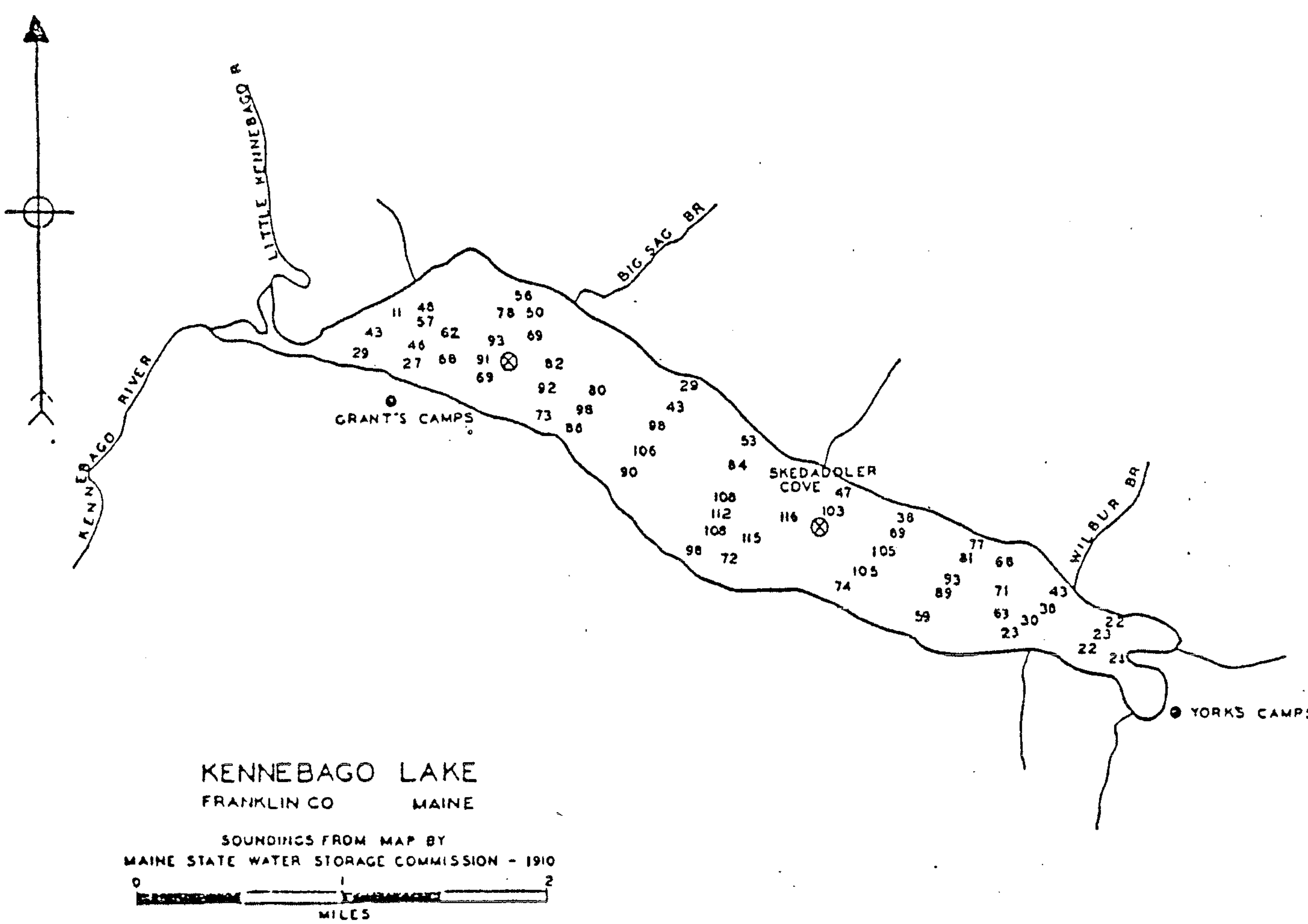
* Inadequate sampling season
(f) fall, (c) core, (b) bottom

Jordan Pond provides good habitat for coldwater fish and is managed for salmon and togue.

Water quality is excellent as indicated by the transparency. Chl*a* and TP values were low. The pond lies within Acadia National Park.

Kennebago Lake #2374

Surface Area	688 ha (1720 a)
Max. Depth	34.8 m (116 ft)
Mean Depth	18.4 m (60.4 ft)
Volume	1.26 X $10^8 m^3$ (102,439 acre-feet)
Drainage Area	115. 2 Km^2 (44.5 mi^2)
Flushing Rate	0.6 (flushes/year)



Kennebago Lake # 2374

	1981	1982
Mean Secchi (m)	5.4	5.6
Min. Secchi (m)	4.3	4.8
TSI	44	42
Color(SPU)		28
pH		7.0
Chl*a*(ug/l)		2.1(ls)
TP(ppb)		5(c)(ls)
		5(b)(ls)

(c) core, (ls) late summer, (b) bottom

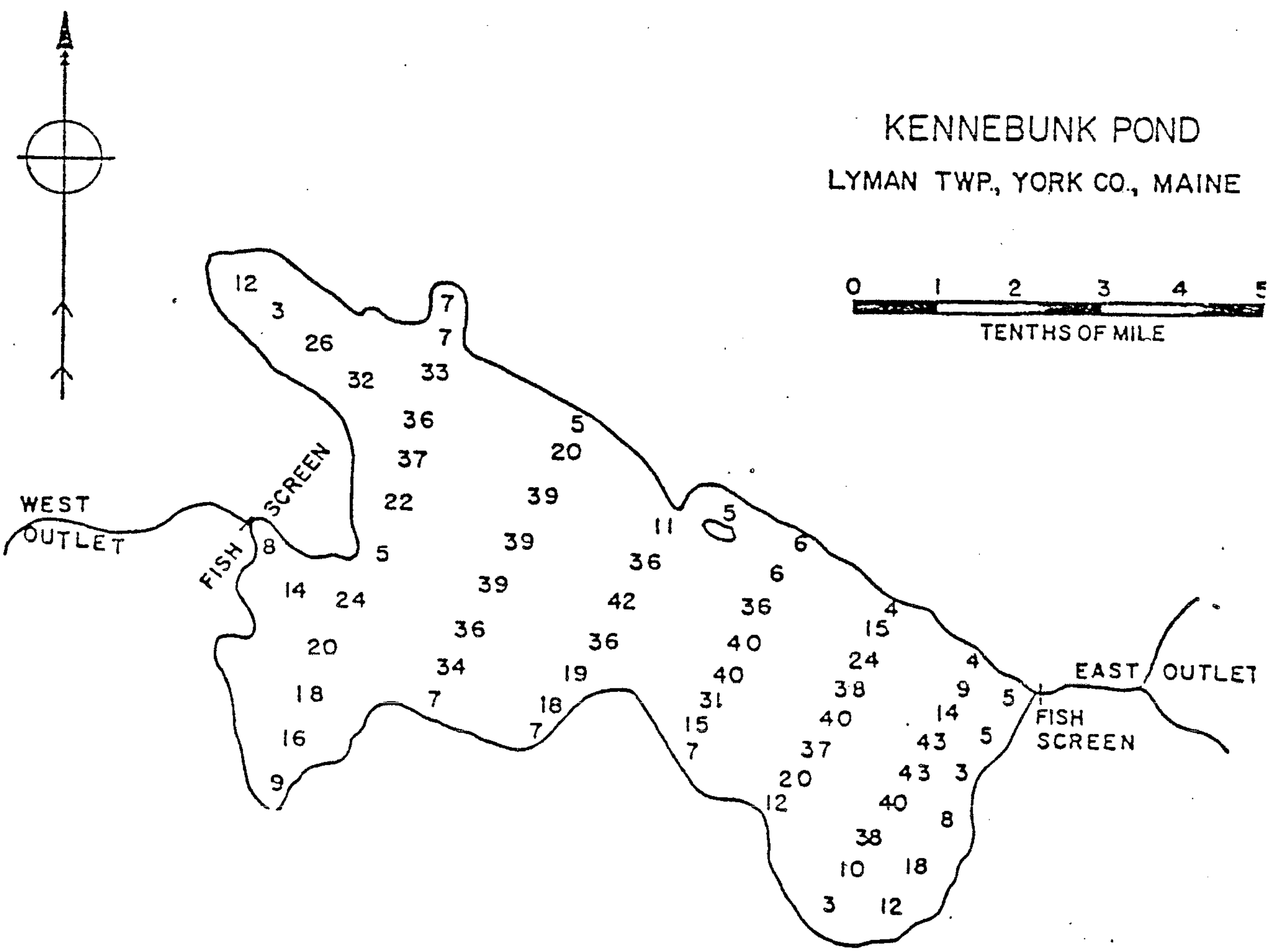
Kennebago Lake has excellent water quality for coldwater fish and is managed for salmon and trout. Currently no stocking is taking place. The lake remains well oxygenated at all depths.

Transparency is average for Maine lakes and water quality is good. Chl*a* and TP values are low.

There is a discrepency between pH readings obtained by the monitor and DEP. The monitor has been getting pH values of 5.4 but this Department's sampling of Kennebago Lake showed a pH value of 6.7. It is unknown at this time what is causing this wide difference in pH readings; it may be a difference in sampling techniques. DEP will be studying the problem in 1983. A standard technique is being developed so that pH readings taken by monitors and this Department's staff will be consistent.

Kennebunk Pond #3998

Surface Area	80.0 ha (200 a)
Max. Depth	13.1 m (43 ft)
Mean Depth	6.3 m (20.6 ft)
Volume	5.0 X 10^6 m^3 (4065 acre-feet)
Drainage Area	2.8 km^2 (1.10 mi^2)
Flushing Rate	0.3 (flushes/year)



Kennebunk Pond #3998

	1980	1981	1982
Mean Secchi (m)	5.4*(3)	7.0	6.6
Min. Secchi (m)	5.0*	6.4	5.5
TSI	NA	32	34
Color(SPU)			10
pH			6.1
Chl*a*(ug/l)			2.7(ls)
TP(ppb)			5(c) 8(b)(ls)

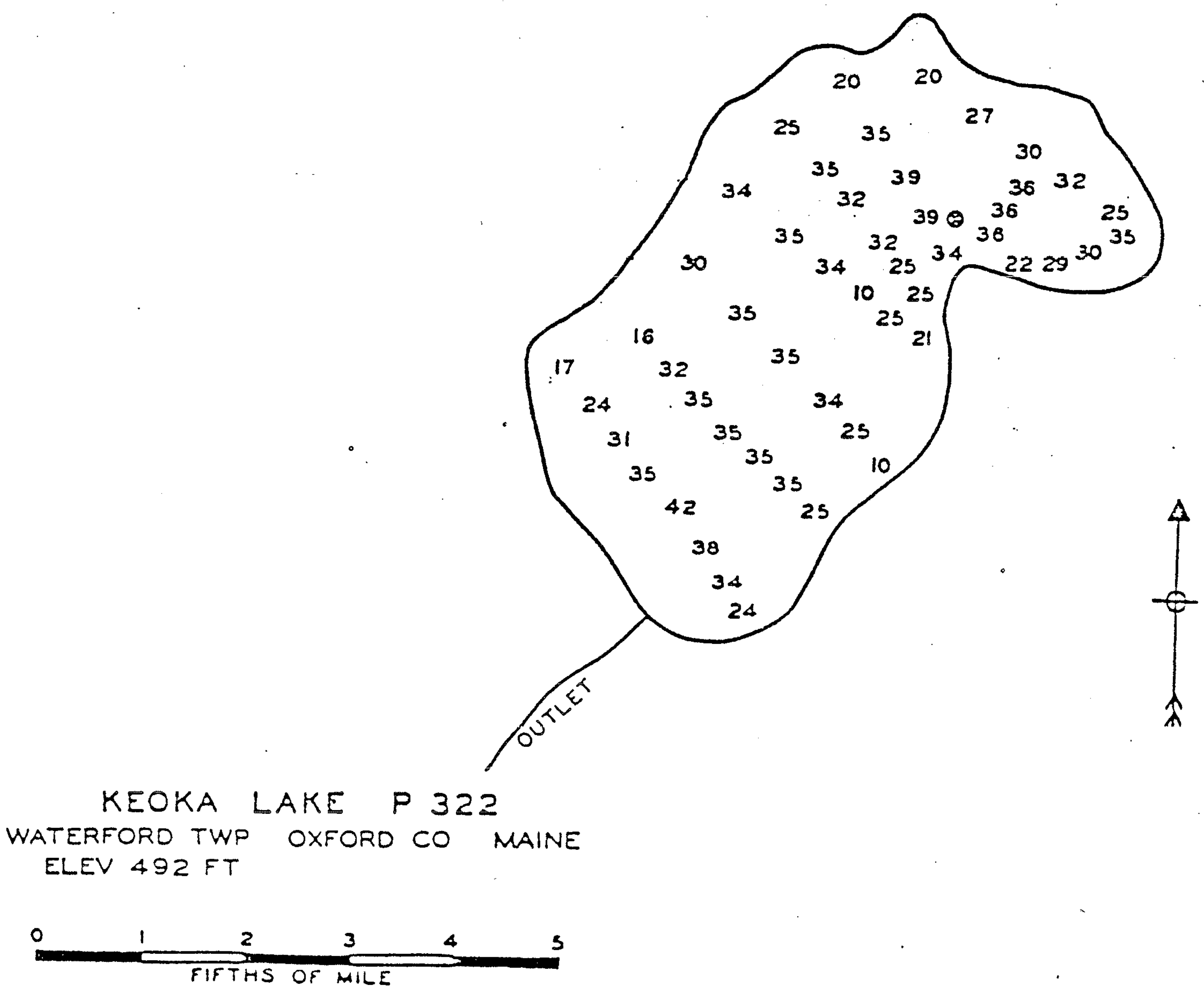
* Inadequate sampling season
(ls) late summer, (b) bottom, (c) core

Kennebunk Pond provides excellent warmwater fishing, and also some coldwater fishing for brown trout.

Transparency is above average for Maine lakes. Chl*a* and TP values are low. There is some oxygen depletion (less than 1 ppm) in the bottom two meters. The pond is fairly small and has a slow flushing rate (0.3 flushes/year) which may make it sensitive to water quality degradation. Cottage owners and watershed residents should exercise caution to avoid increasing the phosphorus loading to the lake. (See protction section in the introduction).

Keoka Lake #3416

Surface Area	191 ha (467 a)
Max. Depth	12.6m (42 ft)
Mean Depth	7.5m (24.6 ft)
Volume	$1.3 \times 10^7 m^3$ (10569 acre-feet)
Drainage Area	$18.4\ km^2$ ($7.1\ mi^2$)
Flushing Rate	0.7 (flushes/year)



Keoka Lake #3416

	1972-78	1979	1980	1981	1982
Mean Secchi (m)	4.1	5.6*(4)	4.8	4.7	4.8
Min. Secchi (m)	3.0	4.5	3.0	3.5	4.5
TSI	colored	NA	51	52	50
Color(SPU)			30		25
pH(core)			6.8		6.4
Chla(ug/l)	6.5(sum)		3.4(f)	4.0*(4)	5.1(1s)
TP(ppb)	8(sur)(sum)		11(sur)(f)		5(c)(1s)
	20(b)(sum)		29(b)(f)		16(b)(1s)

* Inadequate sampling season
(f) fall, (sur) surface, (b) bottom, (sum) summer, (f) fall, (c) core

---

Sampling was conducted on Kingman and Kedar Brooks in 1977, 78 and 80 because 1977 testing indicated high levels of TP and fecal coliforms at the mouth of the stream. Low levels were found in Kedar Brook. Results on Kingman are inconclusive as to the sources and indicate that further sampling is necessary.

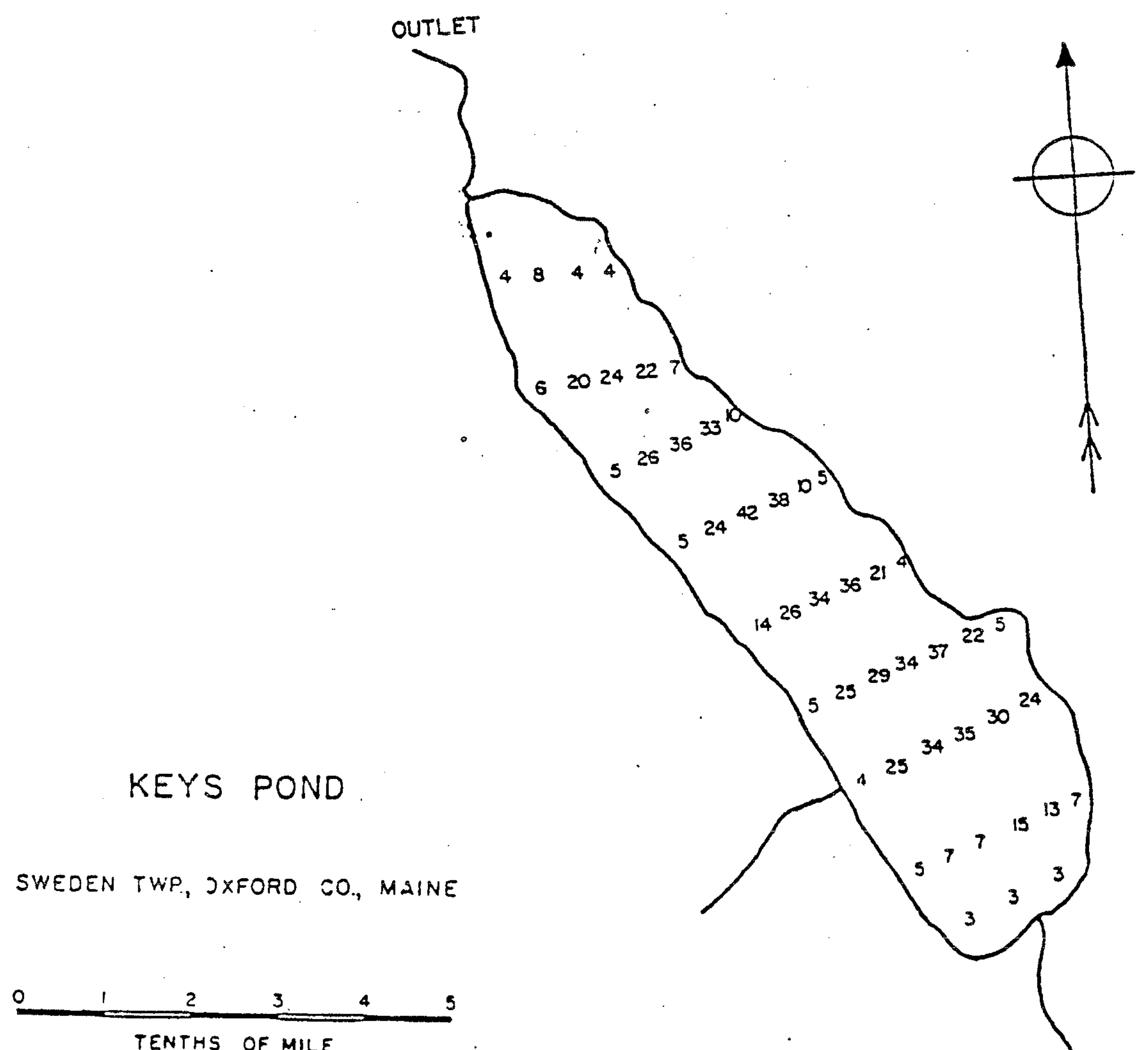
An interesting study was published on Bear, Keoka and McWain lakes by the Waterford Conservation Commission, Water Quality Report on Bear, Keoka, McWain, and Papoose Lakes of the Waterford Area, a 1972-1973, by John B. Craig Jr. It is worth while reading; however, there is one section I strongly disagree which is phosphate. The author appears to use the terms total phosphate and total phosphorus interchangeably which creates some confusion. Also the levels of total phosphate (phophorus)? given in Table III are high by a factor of about ten. The given values for Keoka are 160.9 and 210 ppb for surface and bottom, respectively, for winter, 1973. Sampling by DEP in July, 1977, revealed far lower levels; The surface was 8 ppb and the bottom was 20 ppb.

An oxygen depletion (less than 5 ppm) exists below 6m.

Transparency is slightly below average for Maine lakes probably due to interference from color. Chla values are considered moderate and TP values are low to moderate. Water quality appears stable. Keoka Lake is best suited for warmwater fish and is managed for smallmouth bass, perch and pickerel. Department of Inland Fisheries and Wildlife also manages the pond for brook trout.

Keyes Pond #3232

Surface Area	78 ha (192 a)
Max. Depth	12.6 m (42 ft)
Mean Depth	5.2m (17 ft)
Drainage Area	5.7km^2 (2.2mi^2)
Volume	4.1 X 10^{6}m^3 (3333 acre-feet)
Flushing Rate	0.8 (Flushes/year)



Keyes Pond # 3232

	1976-78	1979	1980	1981	1982
Mean Secchi (m)	5.7*	6.1*(4)	6.8	5.9	5.6*(4)
Min. Secchi (m)	4.3	4.9	6.2	4.4	5.5
TSI	45	NA	33	40	NA
Color(SPU)			25		17
pH(core)	6.6mean				6.6
Chla(ug/l)	2(ls)				5.0(ls)
TP(ppb)	7(surf)(ls)	6(spr)			6(c)(ls)
	15(b)(ls)				12(b)

* Inadequate sampling season
(ls) late summer, (b) bottom, (surf) surface, (spr) spring, (c) core

There is a lack of oxygen (0-2 ppm) below 7m in late summer.

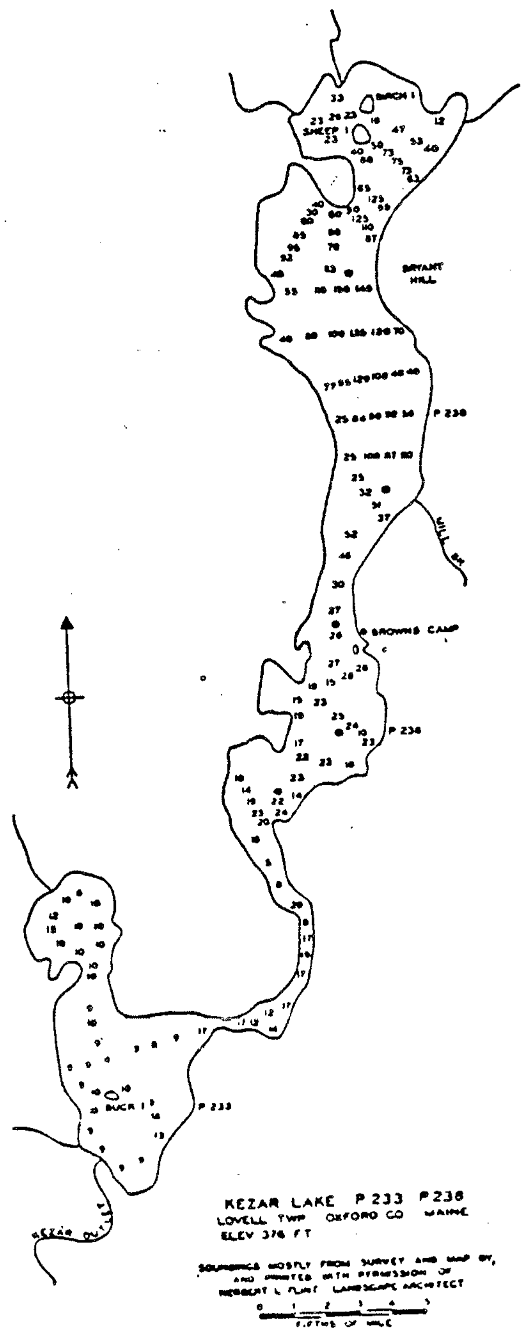
Transparency readings fluctuate which may be due to weather or natural conditions or short sampling seasons. Transparency is average for Maine lakes. Chla values are higher in 1982 than in 1977 but TP has remained about the same. No trend is evident.

The pond is fairly small and has a slow flushing rate (0.8 flushes/year). which indicates that the lake is sensitive to water quality degradation. Care should be exercised to avoid increasing the phosphorus load to the lake.

Keyes pond is now managed as a warm water fishery because the introduction of warmwater fish ruined an excellent trout pond, as it is now inhabited by pickerel and hornpout. Since there is no public right of way, stocking has been stopped by the Department of Inland Fisheries and Wildlife.

Kezar Lake #0097

Surface Area	1016 ha (2510a)
Max. Depth	47.2m (155 ft)
Drainage Area	144 km^2 (55.7 mi^2)



Kezar Pond # 0097

North Basin	1970-78@	1979	1980	1981	1982
Mean Secchi (m)	8.0*	7.7	8.1	7.3	7.9
Min. Secchi (m)	6.3*	5.8	6.7	5.8	6.1
TSI	22	27	25	30	26
Color(SPU)				20	
pH	6.5		6.5	6.4	
Chla(ug/1)	2.6(1s)		2.0	2.4(1s)	
TP(ppb)	4(1s)		9(c)(1s) 5(b)(1s)	8(1s)	

South Basin	1970-78@	1979	1980	1981	1982
Mean Secchi (m)		5.3+	6.3+	7.0	7.5+
Min. Secchi (m)		4.6	4.6	5.3	6.7
TSI				32	29

* Inadequate sampling season
\+ Some readings hit bottom underestimating water quality
(1s) late summer, (b) bottom, (c) core

(@)Kezar Pond was studied from 1970-1973, Descriptive and Comparative Studies of Maine Lakes. Ronald B. Davis, Scott, Hunt and Norton, 1978.

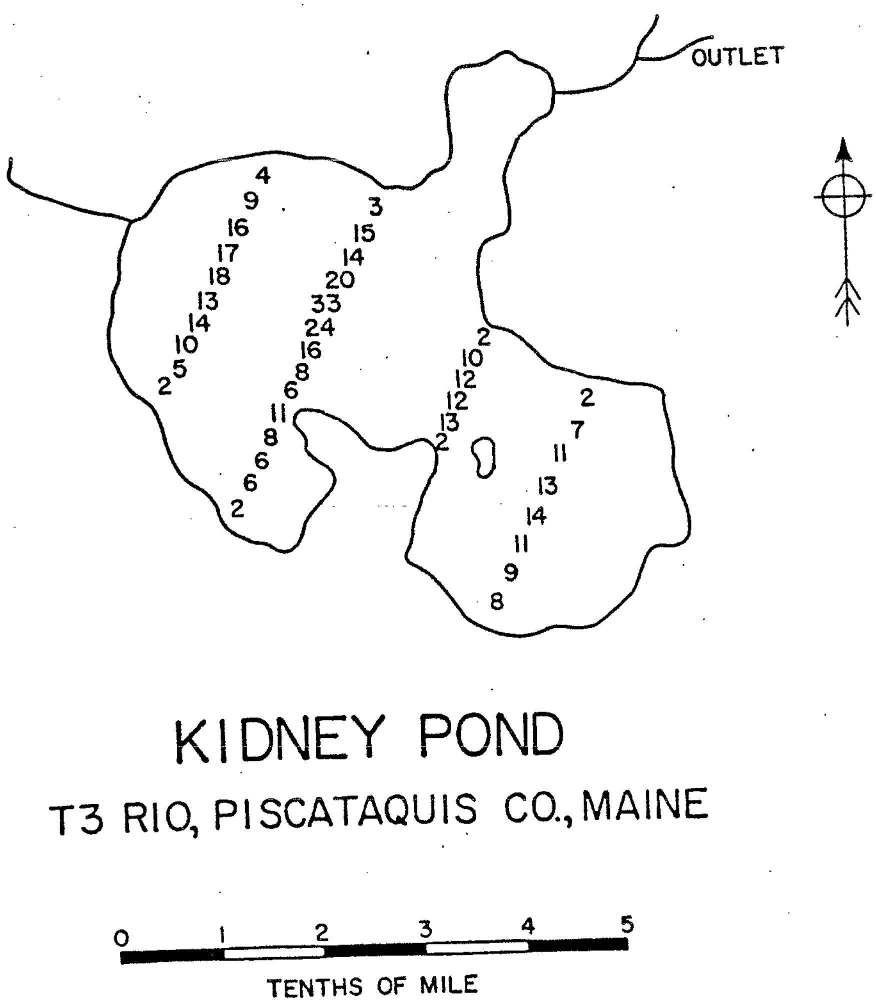
The hypolimnion remains well oxygenated throughout stratification.

Kezar lake continues to have above average water quality. Transparency in the north basin is far above average for Maine lakes and ponds. Transparency for the south basin is lower because some readings hit bottom. TP values are low to moderate and Chla levels are low. Water quality appears stable.

The principal fishery is salmon, lake trout, smallmouth bass, white perch, chain pickerel, and smelt.

Kidney Pond #0716

Surface Area	39 ha (96 a)
Max. Depth	10 m (33 ft)
Drinage Area	3.9 km^2(7.5 mi^2)



Kidney Pond # 0716

	1981	1982
Mean Secchi (m)	5.2*(2)	5.2*(3)
Min. Secchi (m)	4.9	4.9
TSI	NA	NA
Color(SPU)	25	
pH(core)	6.8	
Chl<u>a</u>(ug/l)	2.7(ls)	
TP(ppb)	8(ls)	

* Inadequate sampling season
(ls) late summer

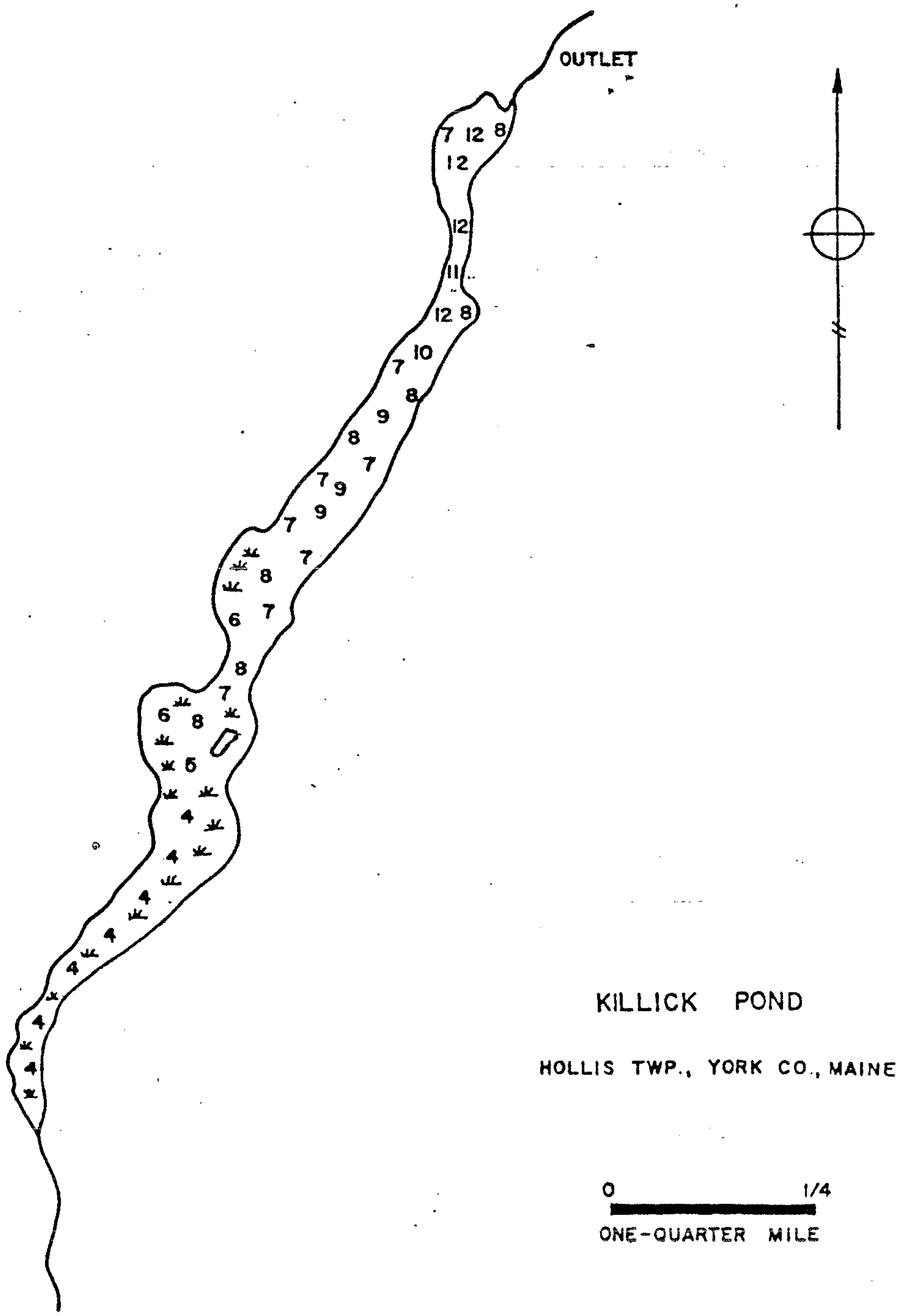
Kidney Pond is a small pond which is managed for trout. Most of the pond is shallow with cool water temperatures. There is little dissolved oxygen below 20 feet in the late summer.

Kidney Pond lies within the boundaries of Baxter State Park.

Chl<u>a</u> and TP values are low. Transparencies are about average for lakes and ponds in Maine. Incomplete sampling seasons prevent calculation of the pond's Trophic State Index. Continued monitoring with adequate sampling seasons is necessary to predict water quality trends.

Killick Pond #3014

Surface Area	20 ha (50 a)
Max. Depth	3.6m (12 ft)
Mean Depth	1.4m (4.6 ft)
Volume	$2.79 \times 10^5 m^3$ (227 acre-feet)
Drainage Area	19.42 Km^2 (7.5 mi^2)
Flushing Rate	40.1 (Flushes/year)



Killick Pond #3014

	1981	1982
Mean Secchi (m)	2.2*(4)	2.2*(4)
Min. Secchi (m)	1.9	2.0
TSI	NA	NA
Color(SPU)	55	
pH(core)	6.4	
Chl*a*(ug/l)	7.2(f)	
TP(ppb)	7(f)	

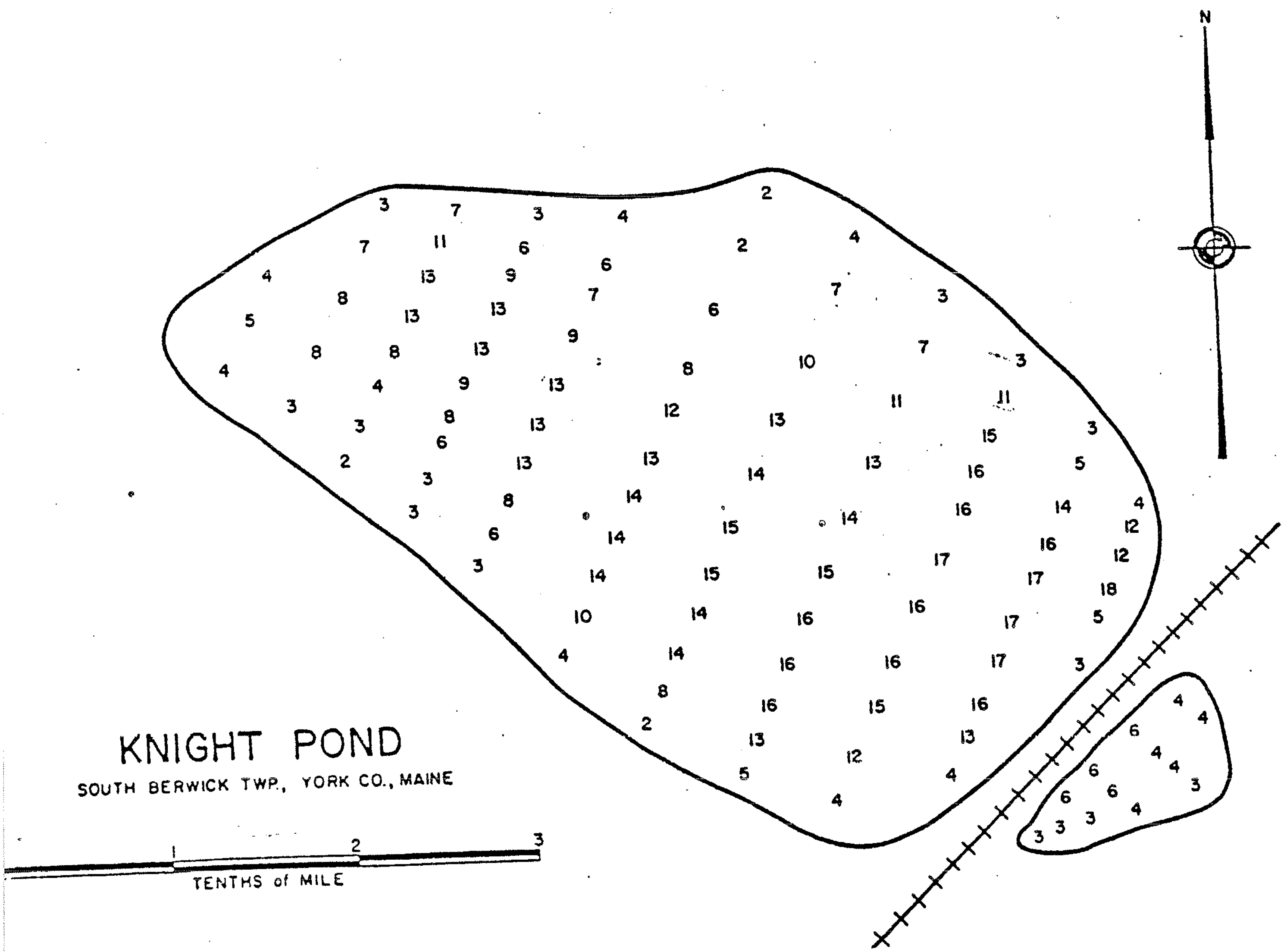
* Inadequate sampling season
(f) fall

Killick Pond is managed for largemouth bass.

The pond is shallow which may be a factor in the low transparency along with high water color. In a shallow pond, the sediments can be easily stirred up by the wind and this reduces transparency. High water color also reduces transparency but does not affect water quality. Chl*a* was high and TP low to moderate during 1981. No water quality problems are apparent at this time.

Knight Pond #3884

Surface Area	20 ha (49 a)
Max. Depth	5.2m (17 ft)
Mean Depth	2.7 m (9 ft)
Volume	5.45×10^5 m^3 (443 acre-feet)
Drainage Area	1.04 km^2 (.4mi^2)
Flushing Rate	1.0 flushes/year



Knight Pond # 3884

	1981	1982
Mean Secchi (m)	4.4*(3)	3.7*(1)
Min. Secchi (m)	4.2	
TSI	NA	NA
Color(SPU)		35
pH		6.7
Chla(ug/l)		7.1(c)(ls)
TP(ppb)		16(c)(ls)

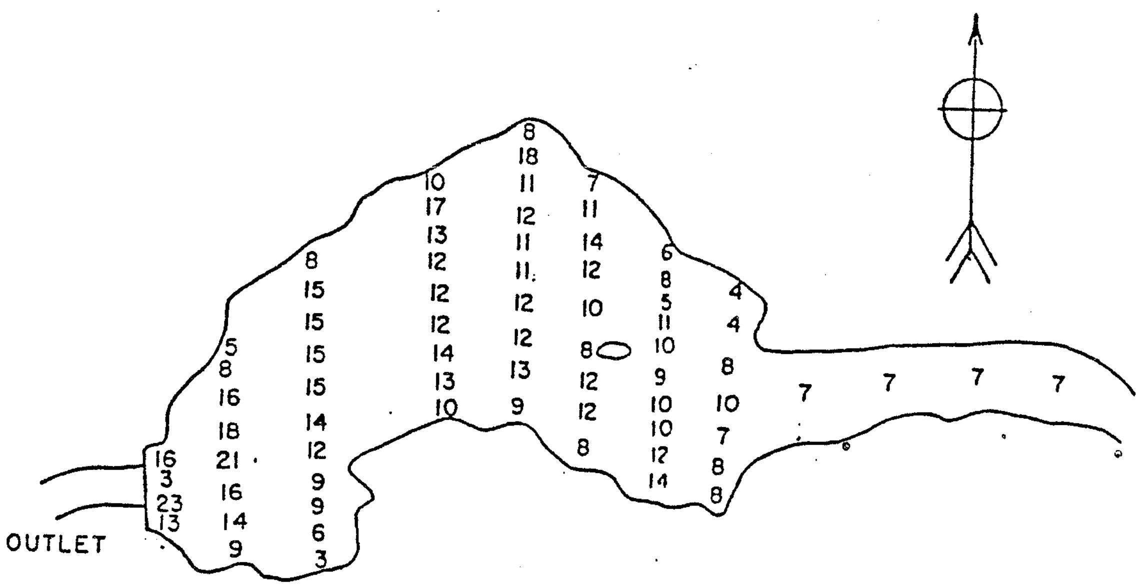
* Inadequate sampling season
(c)core, (ls) late summer,

Knight Pond is a shallow warmwater pond. It is managed for white perch and pickerel.

Transparency is slightly below average for Maine lakes, probably due to the shallowness of the pond and moderate water color. Knight Pond may be sensitive to water quality degradation because of its small size and relatively slow flushing rate. Care should be exercised not to increase the phosphorus load to the pond.

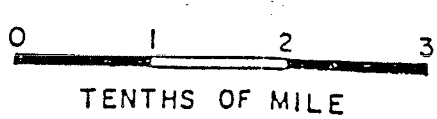
Leighs Mills Pond #0117

Surface Area	17 ha (43 a)
Max. Depth	7m (23 ft)
Mean Depth	2.9m (9.5 ft)
Volume	4.57 X 10^5 m^3 (372 acre-feet)
Drainage Area	224.3 Km^2 (86.6 mi^2)
Flushing Rate	249.1 (flushes/year)



LEIGHS MILL POND

SOUTH BERWICK TWP, YORK CO., MAINE



Leigh Mills Pond # 0117

	1978	1979	1981
Mean Secchi (m)	2.4*(1)	3.9*(3)	2.8*(1)
Min. Secchi (m)		2.0	
TSI	NA	NA	NA
Color	50	80	70
pH	6.8(surf)	6.7	7.4
Chl*a*	2.6(ls)	6.1*(3)	41.2*(2)
TP		30*(3)	47(ls)

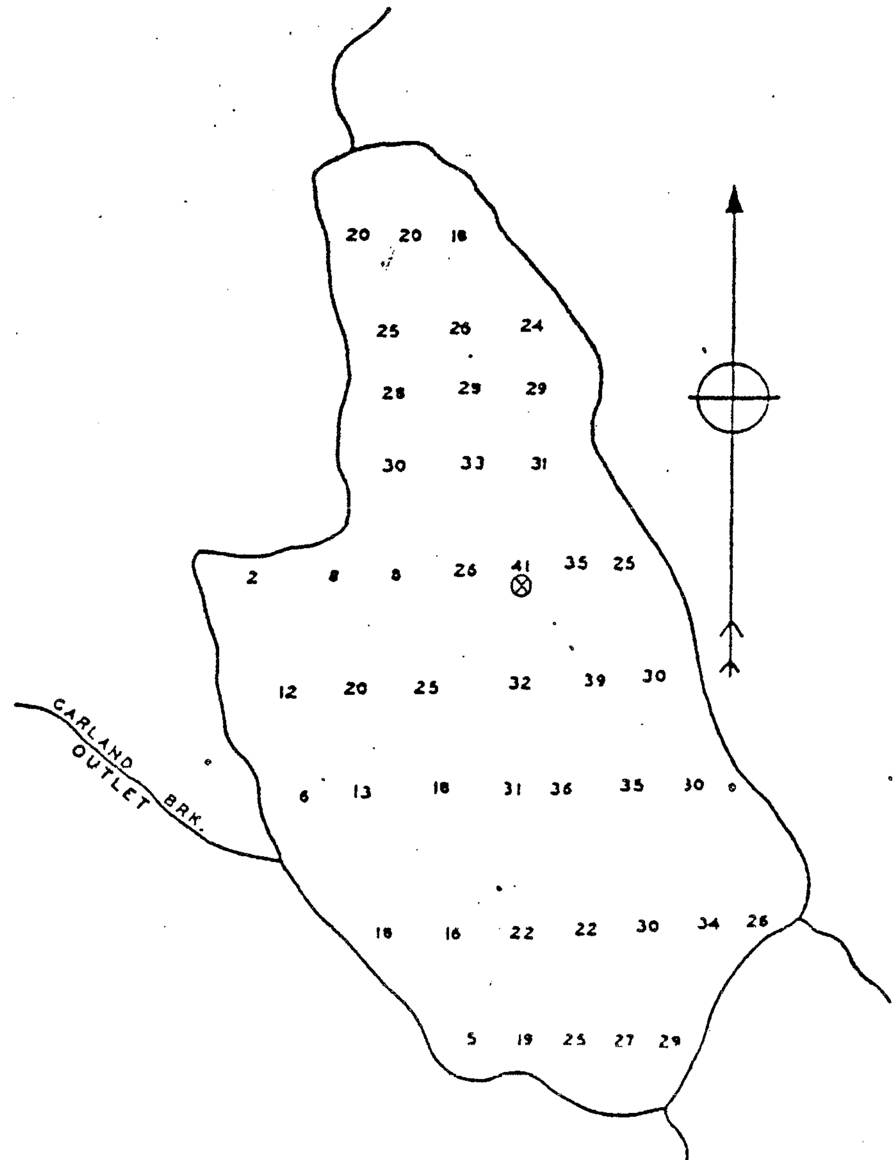
* Inadequate sampling season
(ls) late summer, (surf) surface

Leigh Mills Pond is managed for brown trout. Perch and pickerel also inhabit the pond.

Transparency is low partly due to the high color. Chl*a* and TP range from moderate to very high values. It is difficult to predict any trend since few readings were taken. Continued monitoring with adequate sampling periods is necessary in order to predict any trend.

Little Ellis Pond (Garland Pond) #3502

Surface Area	118 ha (292 a)
Max. Depth	12.3m (40.3 ft)
Mean Depth	6.6m (21.6 ft)
Volume	7.8 X $10^6 m^3$ (6341 acre-feet)
Drainage Area	6.76 Km^2 (2.61 mi^2)
Flushing Rate	0.5 (Flushes/year)



GARLAND OR LITTLE ELLIS POND P 516

BYRON TWP. OXFORD CO.

ELEV. 1,141 FT.

0 1 2 3 4 5

TENTHS OF MILE

Little Ellis Pond (Garland Pond) # 3502

	1981	1982
Mean Secchi(m)	6.2*(4)	4.7
Min. Secchi (m)	4.7	4.4
TSI	NA	52
Color(SPU)		8
pH		6.0
Chl*a*(mg/l)		1.9(ls)
TP(ppb)		5(c)(ls)
		12(b)(ls)

* Inadequate sampling season
(c) core, (ls) late summer, (b) bottom

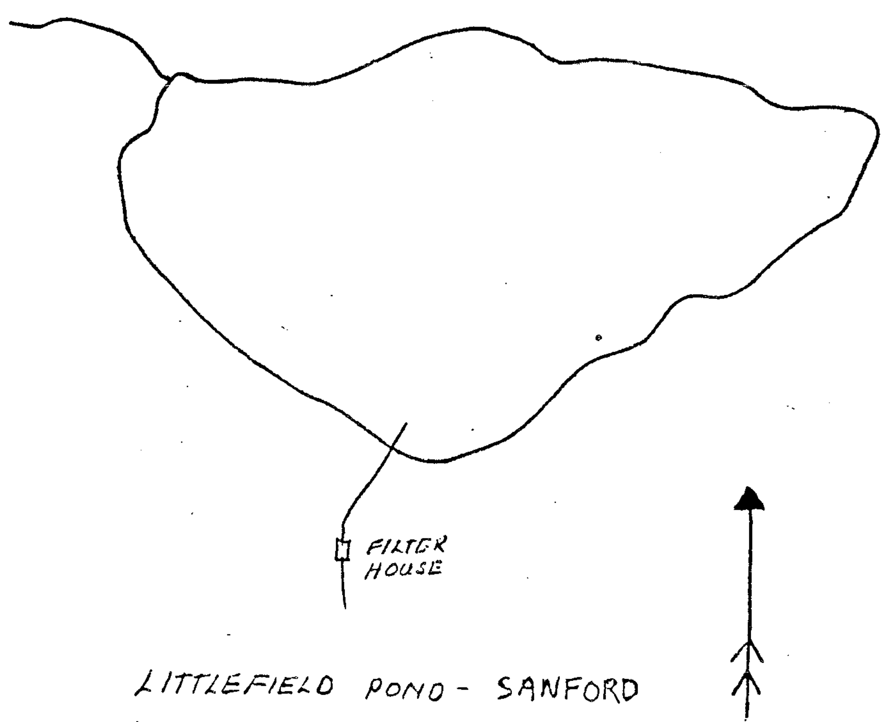
Little Ellis Pond is managed for brook trout, salmon, and smelt.

Transparency readings indicate slightly higher than average water quality in 1981. 1982 transparency was slightly below average water quality for lakes in Maine. It is not known at this time what is causing the fluctuations. Perhaps it is changes in climatic conditions or a short sampling season. Chl*a* and TP values are low indicating that water quality is good.

Littlefield Pond # 3840

Max Depth 6.4 M (21 ft)

The pond has not been surveyed by the Department of Fish and Wildlife so the morphometric characteristics are not calculated. A map was obtained from Dennis Knowles of Sanford Water District which was taken from aerial photographs. The depth measurement was taken from a survey done by Whitman and Howard Engineers.



LITTLEFIELD POND - SANFORD
400' = 1"
D. KNOWLES SWD
3-82

Littlefield Pond #3840

	1981
Mean Secchi (m)	3.0+ *(4)
Min. Secchi (m)	2.8
TSI	NA
Color	NA

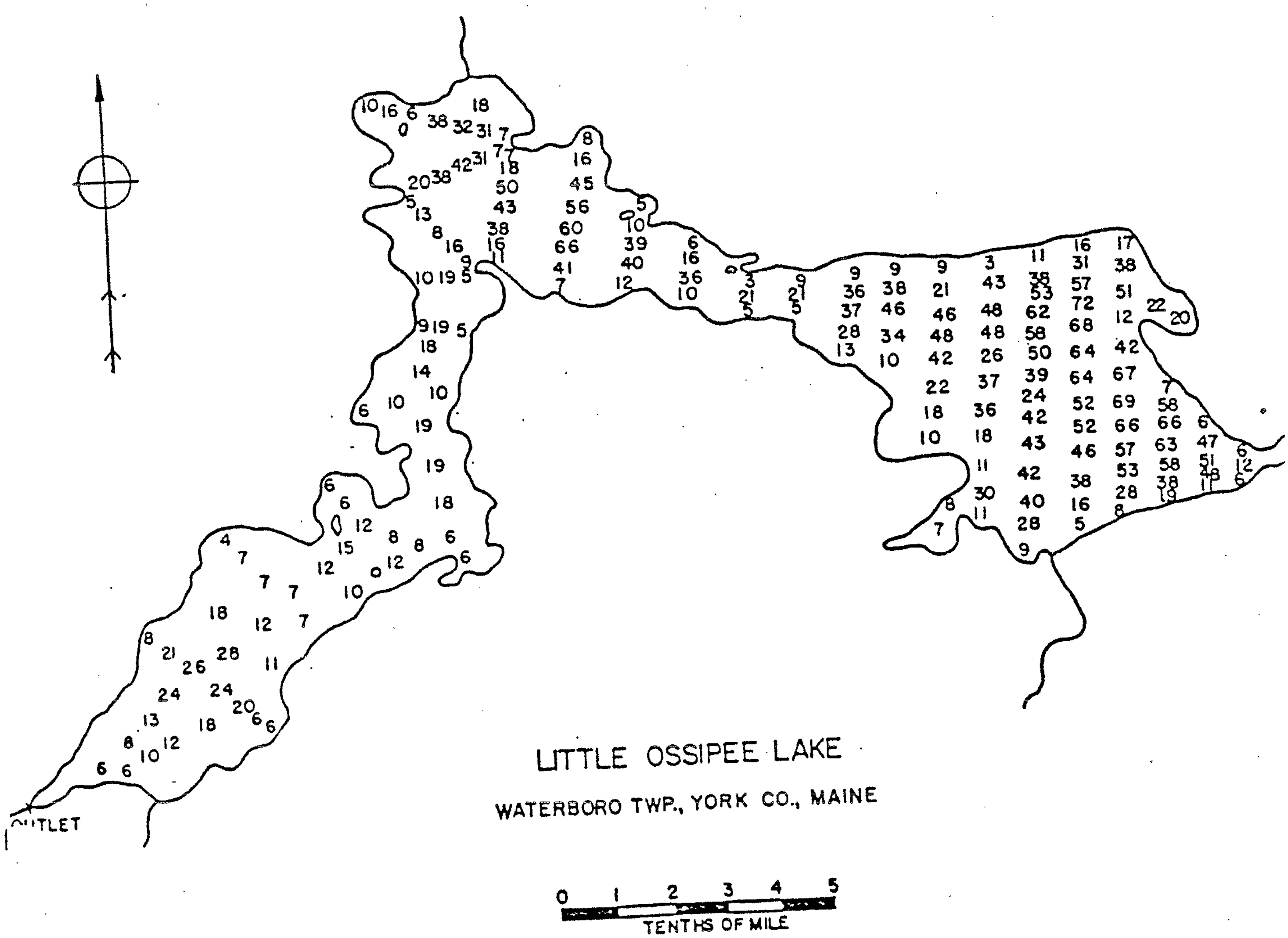
+ Some readings hit bottom
* Inadequate sampling season

Littlefield pond is the water supply for Sanford.

Transparency is below average and maybe limited by depth rather than productivity or color.

Little Ossipee Lake #5024

Surface Area	230 ha (564 a)
Max. Depth	22.4m (74 ft)
Mean Depth	6.8m (22.3 ft)
Drainage Area	6.4 mi^2 (16.6 km^2)
Volume	1.2 X $10^7 m^3$ (9756 acre-feet)
Flushing Rate	0.8 (flushes/year)



Little Ossipee Lake # 5024

	1978	1980	1981	1982
Mean Secchi (m)	7.5*	6.7	7.2	6.4
Min. Secchi (m)	6.5*	5.5	5.6	5.8
TSI	NA	34	31	36
Color(SPU)	20		8	
pH(core)	6.4		6.8	
Chla(ug/l)	1.5(ls)		1.9(ls)	
TP(ppb)	8(surf)(ls)		8(c)(ls)	
	30(b)(ls)		19(b)(ls)	

* Inadequate sampling season
(ls) late summer, (surf) surface, (b) bottom, (c) core

Dissolved oxygen remains high, above 4 ppb, almost to the bottom. The lake supports an excellent population of lake trout. Brook trout and salmon are stocked infrequently. Largemouth and smallmouth bass are present as well as pickeral.

Water transparency is excellent, well above average for lakes in Maine. Chla and TP values are low. The exceptional water quality is a rare and valuable resource that should be vigorously protected.

Transparencies have fluctuated over the last three years. This is probably due to natural conditions or climatic variations in the weather. No water quality trends are apparent.

Little Purgatory Pond #5250

No Fish and Wildlife Survey

Little Purgatory Pond #5250

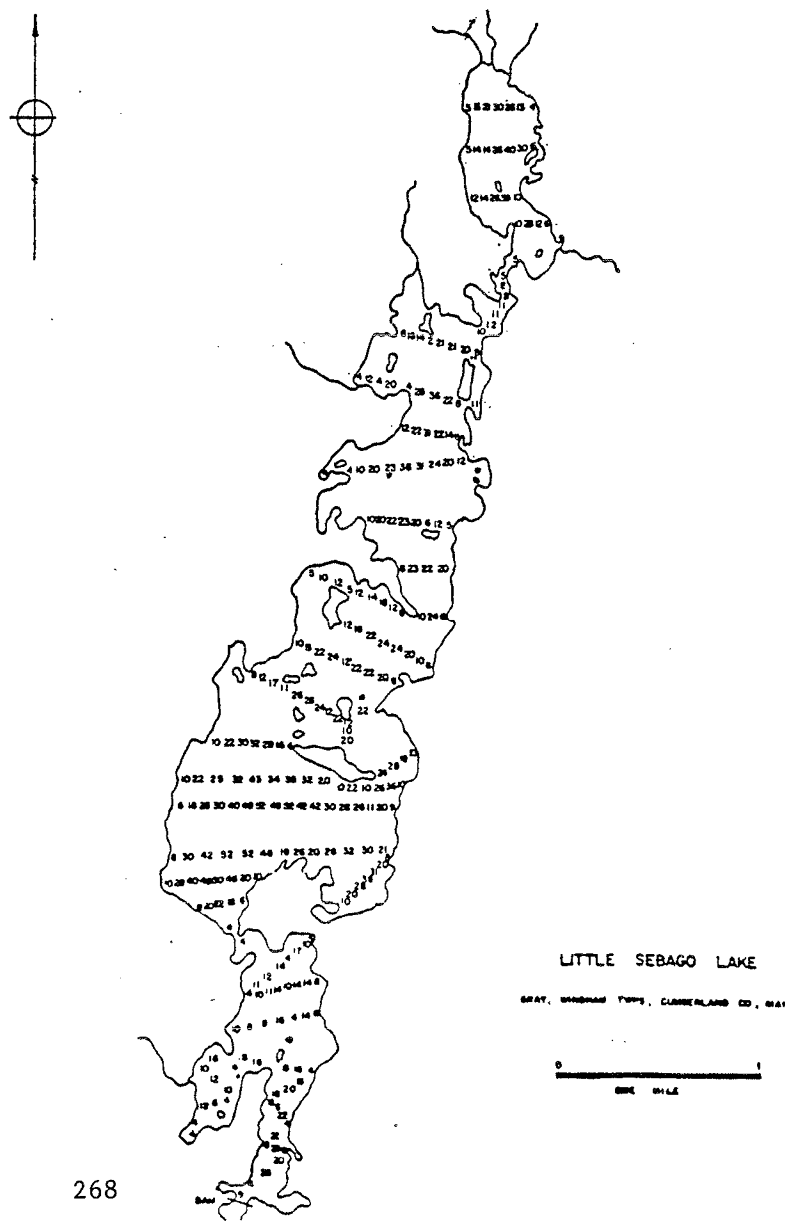
	1982
Mean Secchi (m)	4.0*(3)
Min. Secchi (m)	4.0
TSI	NA
Color(SPU)	15

* inadequate sampling season

Transparency readings are slightly below average for lakes and ponds in Maine. The reasons for this are unknown at this time. Perhaps it is due to water color, incomplete sampling season or shallowness of the pond. Water quality is good. No water quality problems have been reported. Continued monitoring with complete seasons is necessary to predict water quality trends. The pond has not been surveyed by the Department of Inland Fisheries and Wildlife. Present fish species are unknown by this Department.

Little Sebago Lake #3714

Surface Area	768 ha (1898 a)
Max. Depth	15.8m (52 ft)
Mean Depth	6m (20 ft)
Drainage Area	6.8 Km^2 (18.9 mi^2)
North Basin Flushing Rate	3.7 (flushes/year)
Middle Basin Flushing Rate	0.8 (flushes/year)
South Basin Flushing Rate	10 (flushes/year)



Little Sebago Lake # 3714

	1976	1978-79	1980	1981	1982
North Basin#1					
Mean Secchi (m)	4.0*(4)	3.7	3.7	3.6	3.0*(3)
Min. Secchi (m)		2.5	2.5	2.5	3.0
TSI	colored	colored	colored	colored	colored
Color(SPU)		40			55
pH(core)		6.6			6.4
Chla(ug/l)	2.8*	2.9(ls)			2.2(ls)
TP(ppb)		14(ls)			14(c)(ls) 11(b)(ls)
Middle Basin#2					
Mean Secchi (m)		6.0	6.2	6.3*(4)	5.5
Min. Secchi (m)		4.7	5.0	5.5	4.0
TSI		39	37	NA	43
Color(SPU)		15			
pH(core)					
Chla(ug/l)	6.2(spr)				
TP(ppb)	17(spr)	10(ls)			
South Basin#4					
Mean Secchi (m)		5.2*	4.0	5.1*(4)	4.9
Min. Secchi (m)		3.5*	3.5	4.0	42
TSI		44	60	NA	49
Color(SPU)		15			25
pH					6.6
Chla(ug/l)					5.4(ls)
TP(ppb)					6(c)(ls) 11(b)(ls)

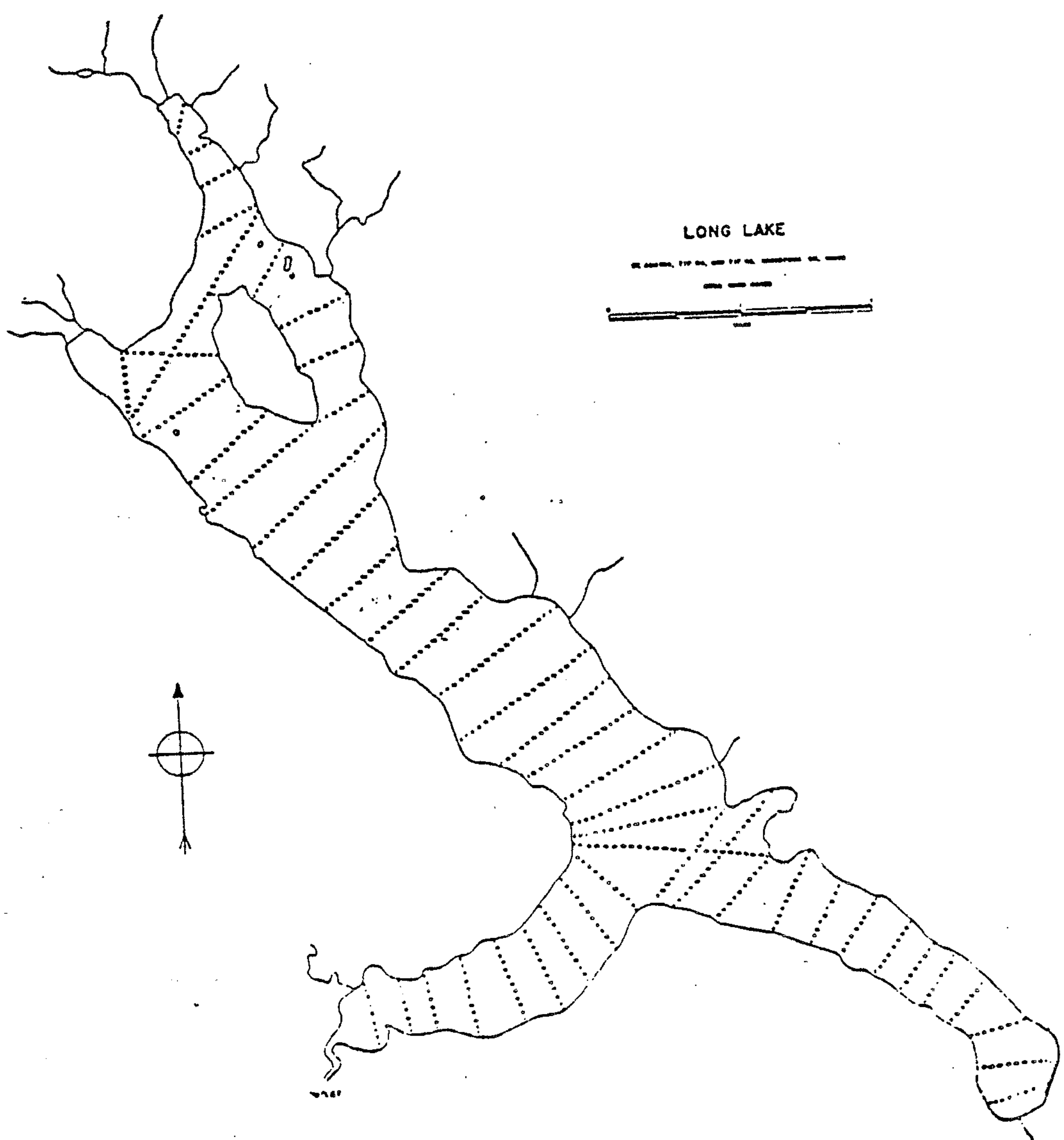
* Inadequate sampling season
(spr) spring, (ls) late summer, (b) bottom, (c) core

There is less than 5 ppm of dissolved oxygen below 12 m in the north basin. The Department of Inland Fisheries and Wildlife recommends the management of largemouth bass in Little Sebago.

Water quality is good. The north basin is colored which interferes with the transparency readings. TP levels are moderate and Chla values are low. There is little change between the 1979 and 1982 Chla and TP values indicating water quality has not changed in the north basin. In the south basin Chla values are moderate and TP levels are low to moderate. Continued monitoring with complete seasons is necessary in order to determine water quality trends particularly in the middle and south basins.

Long Lake (St. Agatha) #1682

Surface Area	2429 ha (6000a)
Max. Depth	49.7 m (163 ft)
Mean Depth	15 m (49 ft)
Volume	4.1 X 10^8 (333333 acre-feet)
Drainage Area	229.5 km^2 (88.6 mi^2)
Flushing Rate	0.3 (flushes/year)



Long Lake (St. Agatha) #1682

	1970-72 X	1980	1981	1982
Mean Secchi (m)	3.7*	3.4	4.6	3.2
Min. Secchi (m)	2.5*	1.8	2.9	2.1
TSI	NA	69	53	72
Color(SPU)			15	
pH(core)	7.0	7.3	7.6	
Chla(ug/l)			11.5(ls)	
TP(ppb)			15(c)(ls) 11(b)(ls)	

* Inadequate sampling season
(ls) late summer, (c) core, (b) bottom

X. Davis, Ronald B. et al 1978 Descriptive and Comparative Studies of Maine lakes. Life Sci. Agr. Exp. Sta. Tech Bull. 88

Transparencies are below average for lakes in Maine. Chla and TP values are high. The lake, although it did not bloom in 1981 or 1982, is at a critical point close to blooming conditions because Chla and TP levels are so high. Continued monitoring will be necessary to document changes in water quality.

The greatest impact on the water quality of Long Lake is nutrient rich runoff from potato farms in the watershed. The Town of St. Agatha has proposed upgrading its municipal discharge from secondary to tertiary treatment because the discharge goes into the lake carrying large amounts of phosphorus. Secondary treatment, though it removes the bacteria and much of the organics from the sanitary wastes, does not remove phosphorus. Tertiary treatment which is expensive is necessary to remove phosphorus. But because of the larger impact of agriculture on the water quality on Long Lake, the Department of Environmental Protection has removed Long Lake, St. Agatha, from the Priority list for funding until a management strategy plan is undertaken for controlling phosphorus from agricultural run-off. Removal of phosphorus from the municipal effluent would not reduce the phosphorus load to the lake significantly because the agricultural contribution is so high.

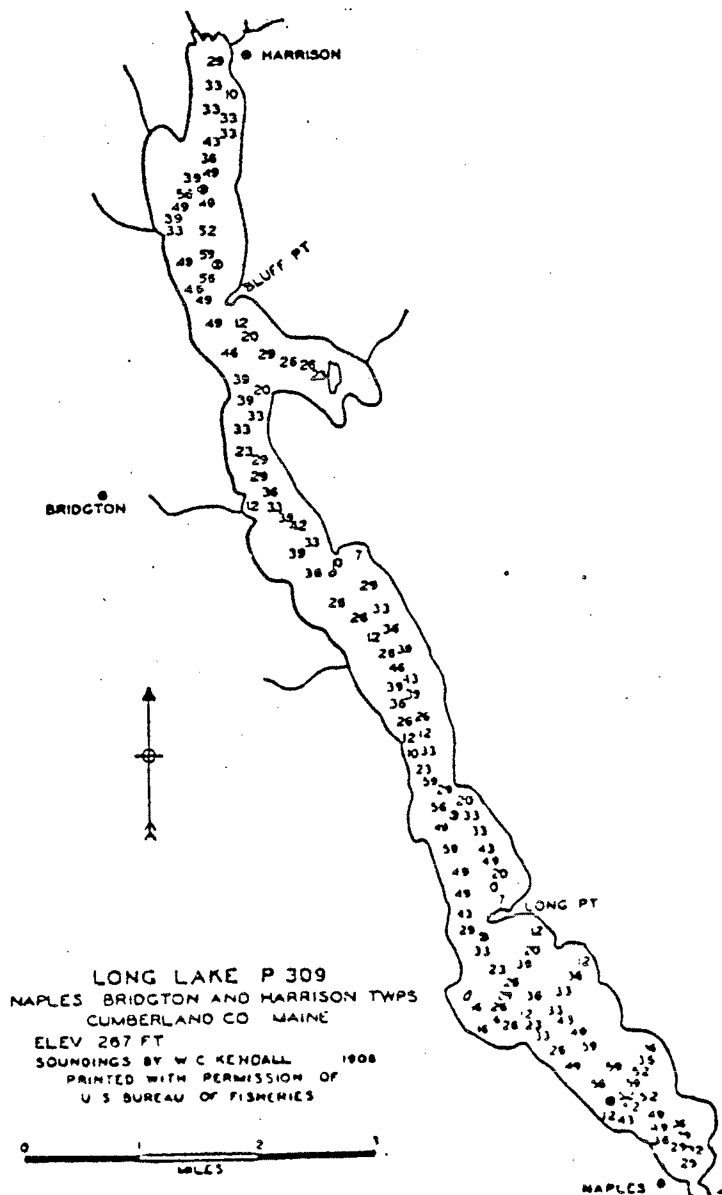
Long Lake was part of the EPA National Eutrophication Survey (1974)[1].

Long lake is well suited for cold water fish and is managed for salmon and brook trout.

1. U.S. EPA, 1974 Report on Long Lake Aroostook County Maine. National Eutrophication Survey Working Paper No. 7. Corvallis, Oregon.

Long Lake (Naples) #5780

Surface Area	1970 ha (4867 a)
Max. Depth	18.0 m (59 ft)
Mean Depth	10.2 m (34 ft)
Volume	$1.6 \times 10^8 m^3$ (165500 acre-feet)
Drainage Area	295 km^2 (114 mi^2)
Flushing Area	0.9 (flushes/year)



Long Lake (Naples) #5780

	1976-78	1979	1980	1981	1982
Mean Secchi (m)	6.2*	5.8	5.4	5.7	6.6*(4)
Min. Secchi (m)	4.4	5.0	3.8	5.0	4.4
TSI	NA	41	44	42	NA
Color(SPU)			10	15	
pH	6.4			6.5(core)	
Chla(ug/l)	2(ls)			2.5(ls)	
TP(ppb)	8(sur)(ls)			8(c)(ls)	
	7(b)(ls)			17(b)(ls)	

* Inadequate sampling season
(ls) late summer, (c) core, (b) bottom, (sur) surface

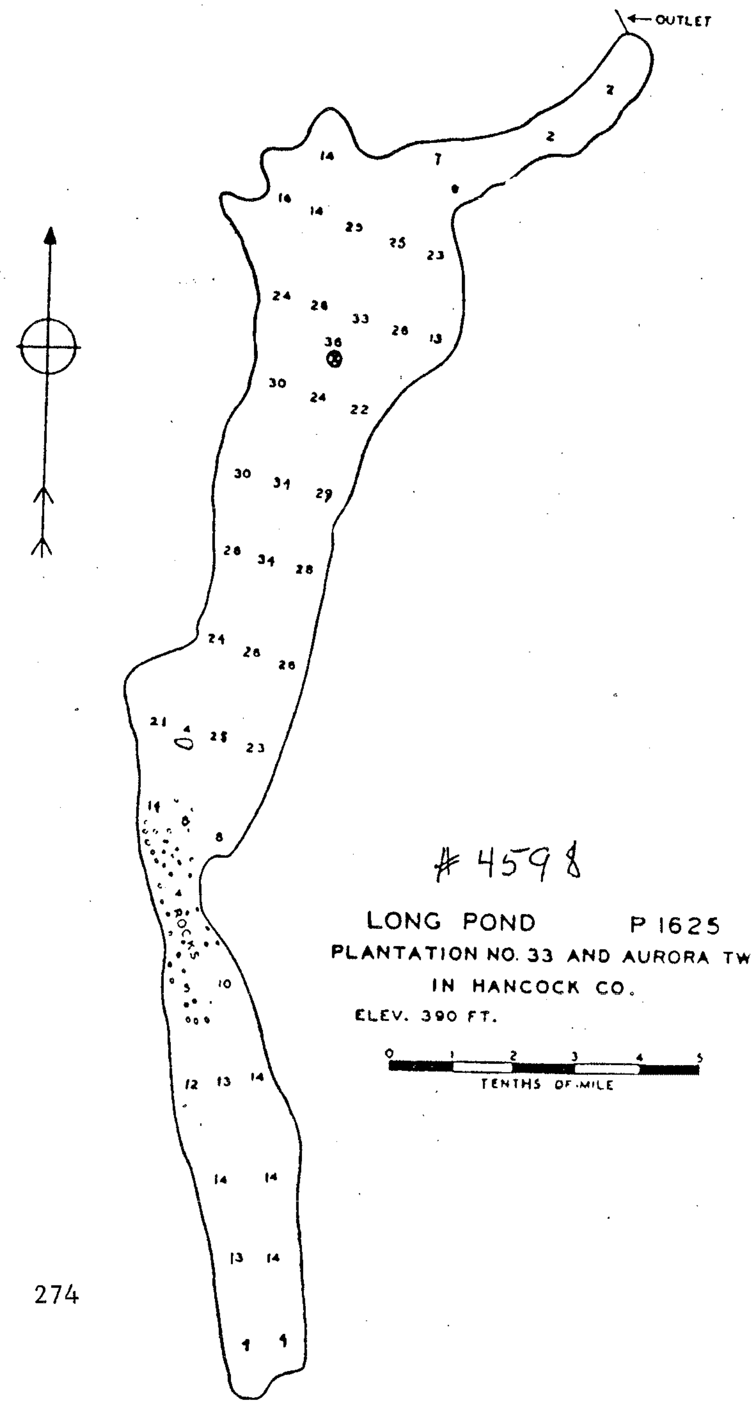
An oxygen deficiency (less than 4ppm) exists below 12m. The lake is managed for trout and salmon. Warmwater fish, bass, perch, and pickerel also inhabit the lake.

Transparency has remained stable and is average for lakes in Maine. Chla and TP values are low to moderate.

The lake is the recipient of Bridgton's municipal sanitary discharge. The town received a federal grant to study alternative methods of treatment and disposal. The study recommended cluster subsurface systems. Bridgton was on DEP's priority list but somewhat uncertain future federal funding caused the town to seek other sourcs of funding. The town applied for and has received funding under the State's Small Community Program. The Small Community Program is designed to help small towns correct malfunctioning or non-existent sanitary systems that threaten drinking water, clam flats, or create nuisances. The planning phase has been completed and construction should start in the summer of 1983.

Long Pond (Aurora) # 4598

Surface Area	103 ha (258 a)
Max. Depth	10.8 m (36 ft)
Mean Depth	4.6 m (15.2 ft)
Volume	4.76 X 10^6 m^3 (3858 acre-feet)
Drainage Area	7.5 km^2 (2.9 mi^2)
Flushing Rate	0.9 (flushes/year)



Long Pond (Aurora) #4598

	1982
Mean Secchi (m)	3.6*(2)
Min. Secchi (m)	3.4
TSI	NA

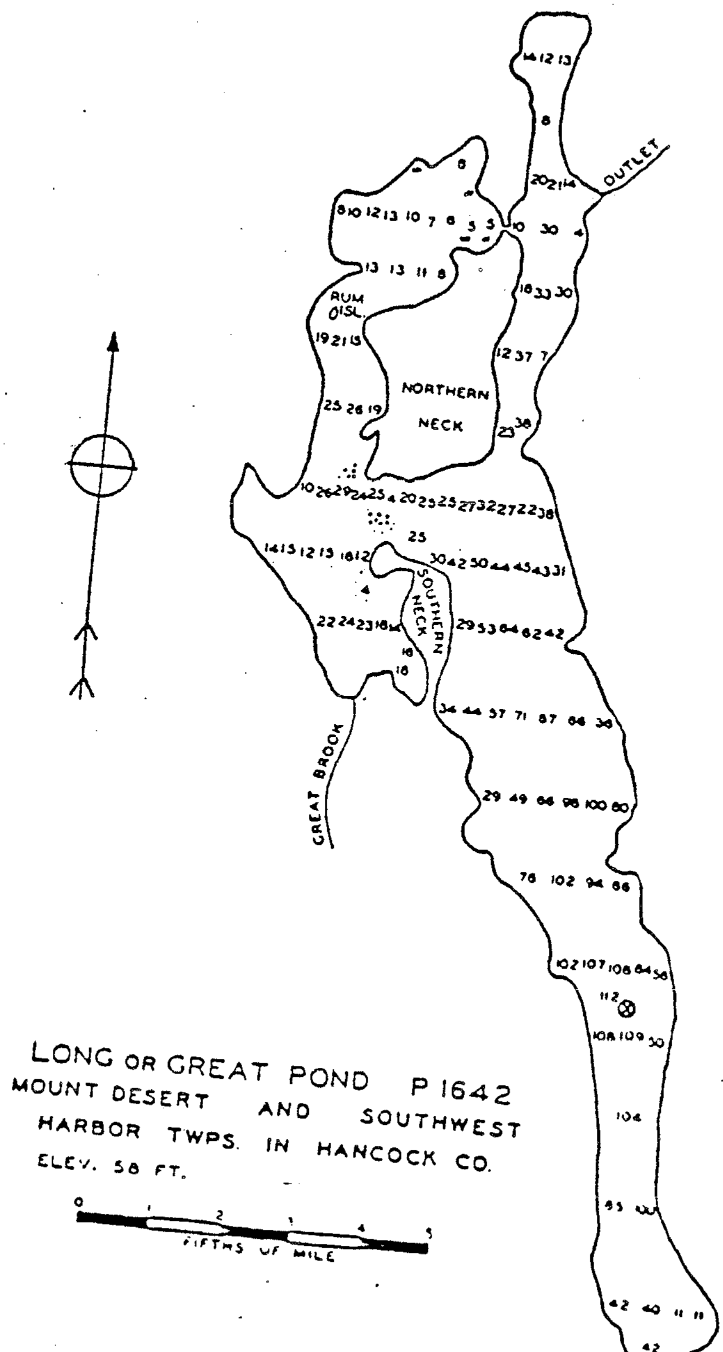
* inadequate sampling season

Long Pond is managed for both wild and hatchery raised brook trout. It was reclaimed in 1957 to reduce competition from warm water species. Although some competitor species are again present, they are not abundant enough to interfere with the present fishery.

The transparencies are below average for lakes and ponds in Maine. The reason for this is unknown at this time. Color or incomplete sampling season could be a factor. No known water quality problems have been documented for this pond.

Long Pond (Great Pond) (Mt. Desert) #4622

Surface Area	363 ha (897 a)
Max. Depth	34.4m (113 ft)
Mean Depth	11.0m (36 ft)
Volume	$33.4 \times 10^6 m^3$ (27154 acre-feet)
Drainage Area	17.35 km^2 (6.70mi^2)
Flushing Rate	0.3 (flushes/year)



Long Pond (Mt. Desert) # 4622

	1977	1980	1981	1982
South Basin				
Mean Secchi (m)	8.0	7.7	7.6*(3)	8.1*(3)
Min. Secchi (m)	6.0	6.0	6.5*	6.8
TSI	26	28	NA	NA
Color(SPU)			5	
pH(core)			6.4	
Chl<u>a</u>(ug/l)			3.0(ls)	
TP(ppb)			7(c)(ls)	
			9(b)(ls)	
North Basin				
Mean Secchi (m)		7.4	7.2*(4)	
Min. Secchi (m)		5.0	6.0*	
TSI		29	NA	

* Inadequate sampling season
(ls) late summer, (c) core, (b) bottom

Long Pond is a deep, cold lake thatd supports a cold water fishery. The pond is partially in Acadia National Park.

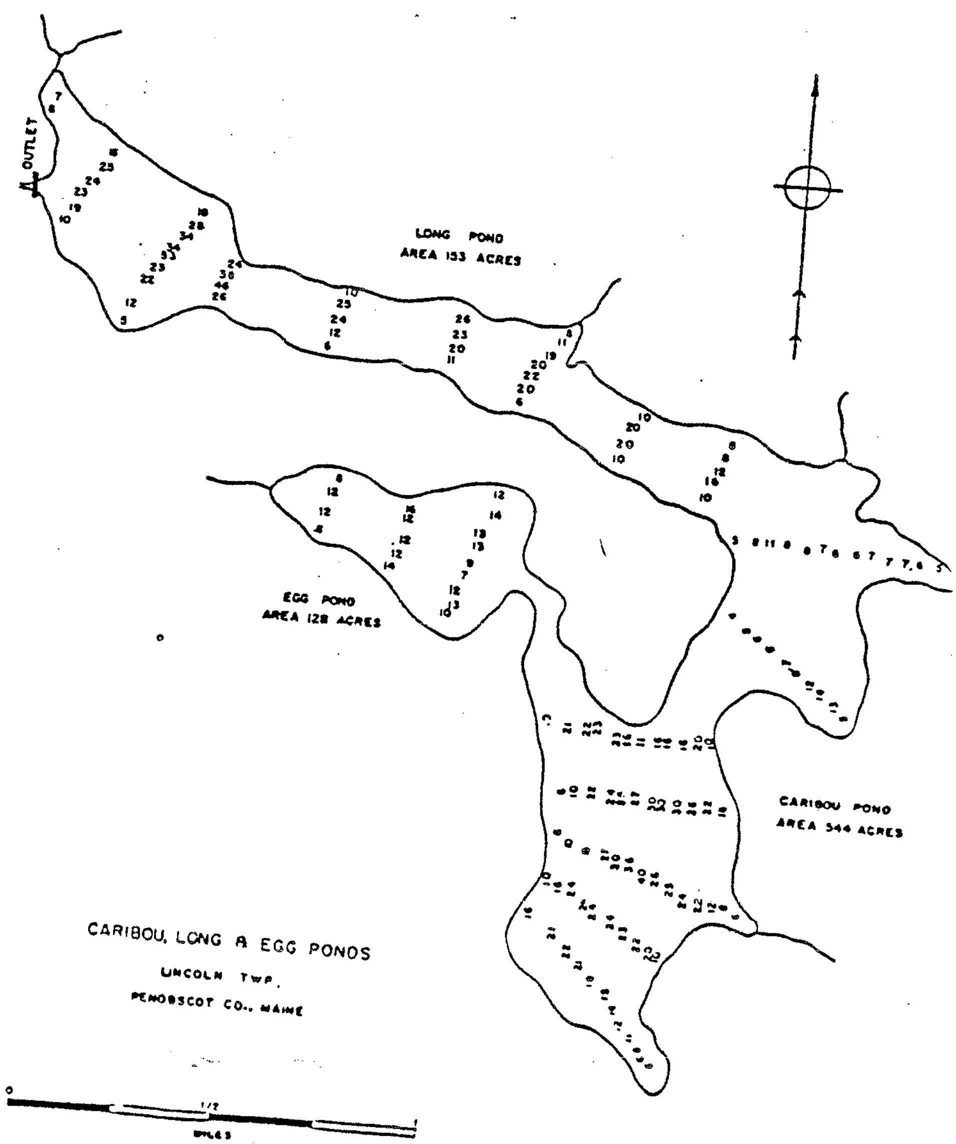
Transparencies are deeper than average for Maine ponds and Chla and TP values are low to moderate. Complete sampling season are necessary to predict water quality trends. Present water quality is excellent.

Long Pond (Lincoln) #2216

Surface Area	62 ha (153 a)
Max. Depth	14m (46 ft)

Caribou, Egg and Long Pond

Mean Depth	4.3 m (14 ft)
Volume	1.42×10^7 m^3 (11554 acre-feet)
Drainage Area	30.2 Km^2 (11.7 mi^2)
Flushing Rate	1.03 (flushes/year)



Long Pond (Lincoln) #2216

	1973-74	1975	1976	1981	1982
Mean Secchi (m)	5.3*	6.4*(2)	6.0*(2)	3.7	4.8
Min. Secchi (m)	4.3	6.2	5.5	3.0	4.3
TSI				colored	46
TSI Range					43 - 48 CHL SD
Color(SPU)				45	22
pH(core)				6.6	
Chla(ug/l)				7.6(ls)	3.4mean
TP(ppb)				19(ls)	10(c)(ls) 19(b)(ls)

* Inadequate sampling season
(ls late summer, (b) bottom, (c) core

There is little oxygen in the hypolimnion by late summer. The pond is managed as a warmwater fishery.

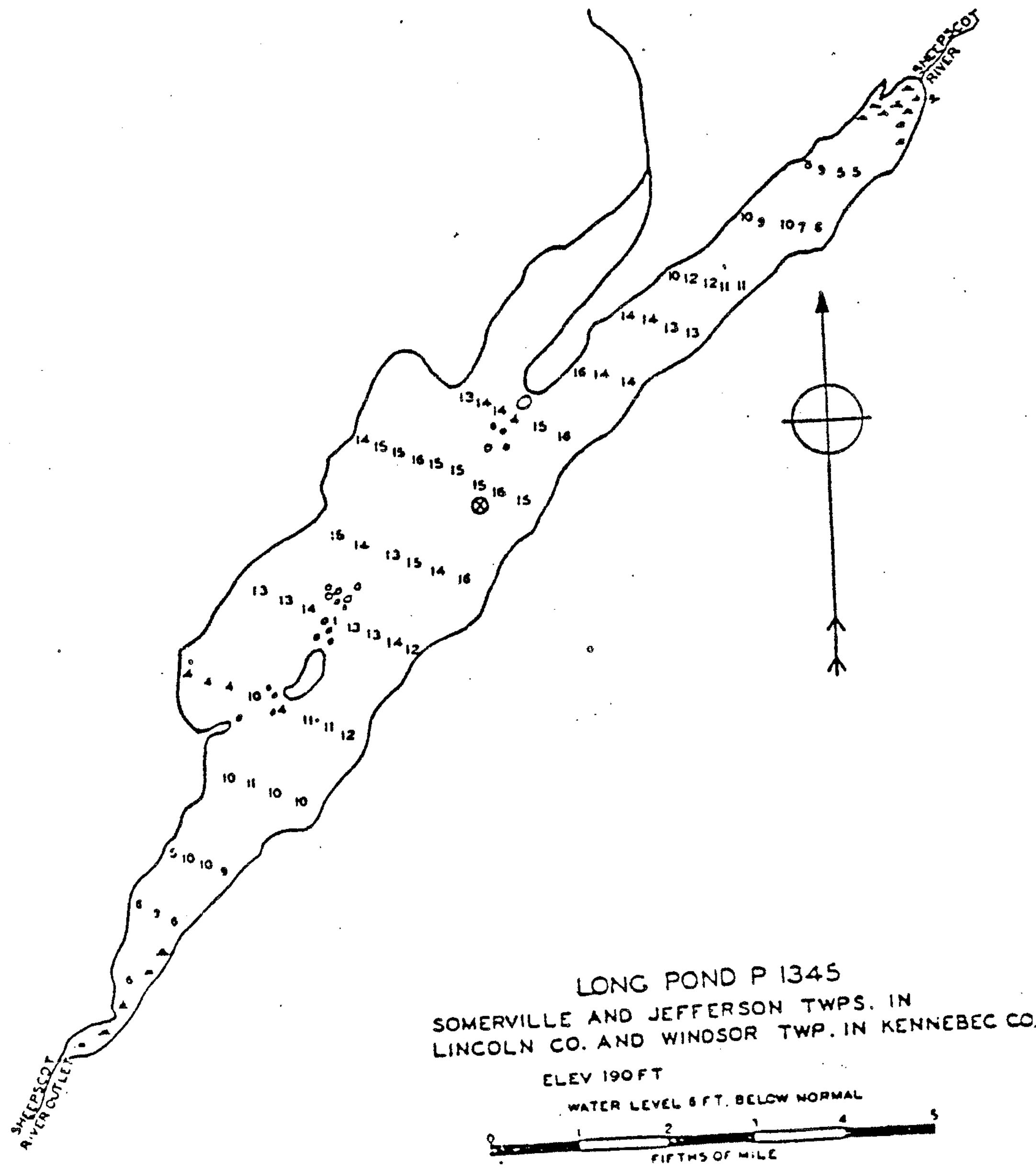
Transparency readings were far shallower in 1981 than previous years; however, care must be taken when making predictions because none of the previous years has a complete season. The reason for the difference in transparency is not known; it may be due to weather fluctuation, change in monitors, or an impact to the lake. Transparency did improve in 1982. Continued monitoring with complete sampling seasons will be necessary to determine water quality trends. Moderate color adversely affects the transparency and TP values, but does not affect water quality. Chlorophyll and TP levels are moderate.

In 1982, the monitor participated in the chlorophyll sampling program. This program was started in 1980 to collect data on lakes that are highly colored or were showing a decline in water quality.

Calculating the Trophic State Index by both Secchi disk transparencies (48) and Chla values (43) showed little difference suggesting that color is not reducing transparencies as much as previously thought; however, color did vary a lot between 1981 and 1982.

Long Pond (Somerville) #5444

Surface Area	302 ha (747 a)
Max. Depth	4.9m (16 ft)
Mean Depth	2.7 m (8.9 ft)
Volume	5.3×10^6 m^3 (4296 acre-feet)
Drainage Area	207.4 km^2 (80.1 mi^2)
Flushing Rate	22 (flushes/year)



Long Pond (Somerville) #5444

	1981	1982
Mean Secchi (m)	3.0*(3)	3.2
Min. Secchi (m)	2.8*	2.8
TSI	NA	colored
Color(SPU)		42
pH		6.7
Chl*a*(ug/l)		3.5(ls)
Tp(ppb)		10(ls)

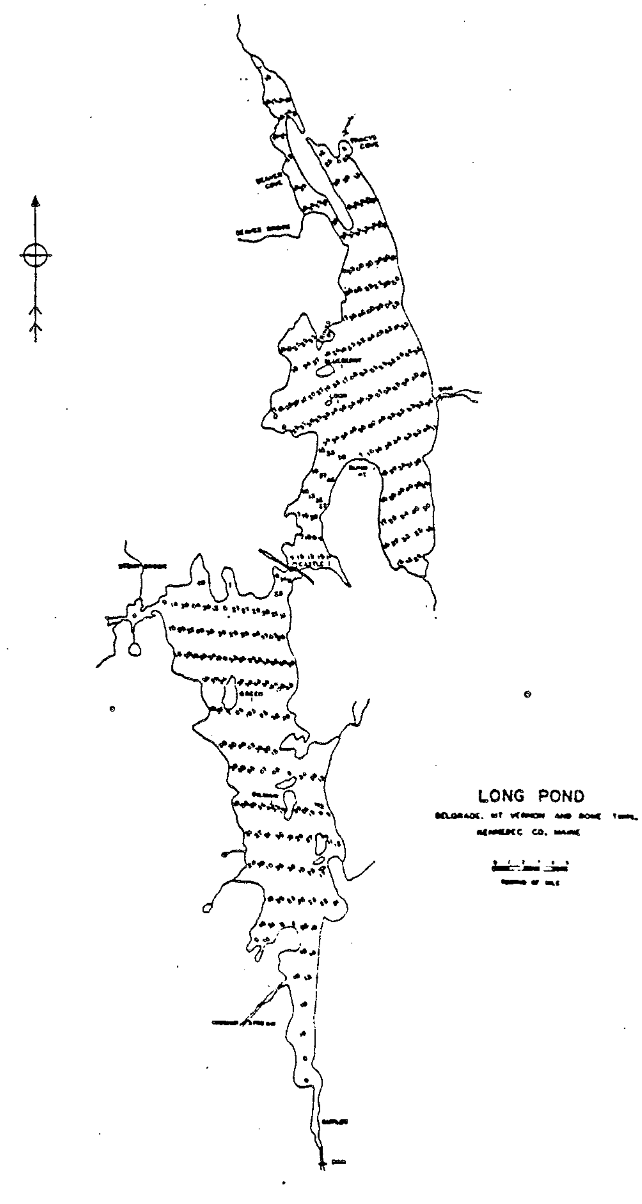
* Inadequate sampling season
(ls) late summer

Long Pond provides habitat for warm water fish, especially smallmouth bass. The pond also provides spawning habitat for alewives. Landlock salmon do drop down from other lakes in the watershed.

Transparency is below average, but water color is high. Water color reduces transparency but does not affect water quality. Chl*a* and TP values are low to moderate indicating good water quality.

Long Pond (Belgrade) #5272

Surface Area	1,079 ha (2,697 a)
Max. Depth North Basin	18.3m (60 ft)
Max. Depth South Basin	29.1 m (97 ft)
Mean Depth	8.4m (27.6 ft)
Volume	9.0 X $10^7 m^3$ (73171 acre-feet)
Drainage Area	313.9 km^2 (121.2 mi^2)
Flushing Rate	1.7 (flushes/year)



Long Pond (Belgrade) # 5272

	1975-78	1979	1980	1981	1982
North Basin					
Mean Secchi (m)	7.2	7.5	7.6	7.6	7.3
Min. Secchi (m)	5.8	6.7	5.9	6.6	5.9
TSI	31	29	29	28	30
Color(SPU)		20			15
pH	6.5(surf)	6.8(c)			6.9(c)
Chla(ug/l)	2.6(spr)				2.1(ls)
TP(ppb)	10(surf)(ls)	6(surf)(ls)			5(c)(ls)
	9(b)(ls)	45(b)(ls)			6(b)(ls)
South Basin					
Mean Secchi (m)	7.0	7.0	7.3*(4)	6.7	7.0
Min. Secchi (m)	5.5	6.2	6.1	6.1	5.6
TSI	3.2	32	NA	34	32
Color(SPU)		20			
pH	6.4(surf)	6.9(c)			

* Inadequate sampling season
(spr) spring, (b) bottom, (ls) late summer, (surf) surface

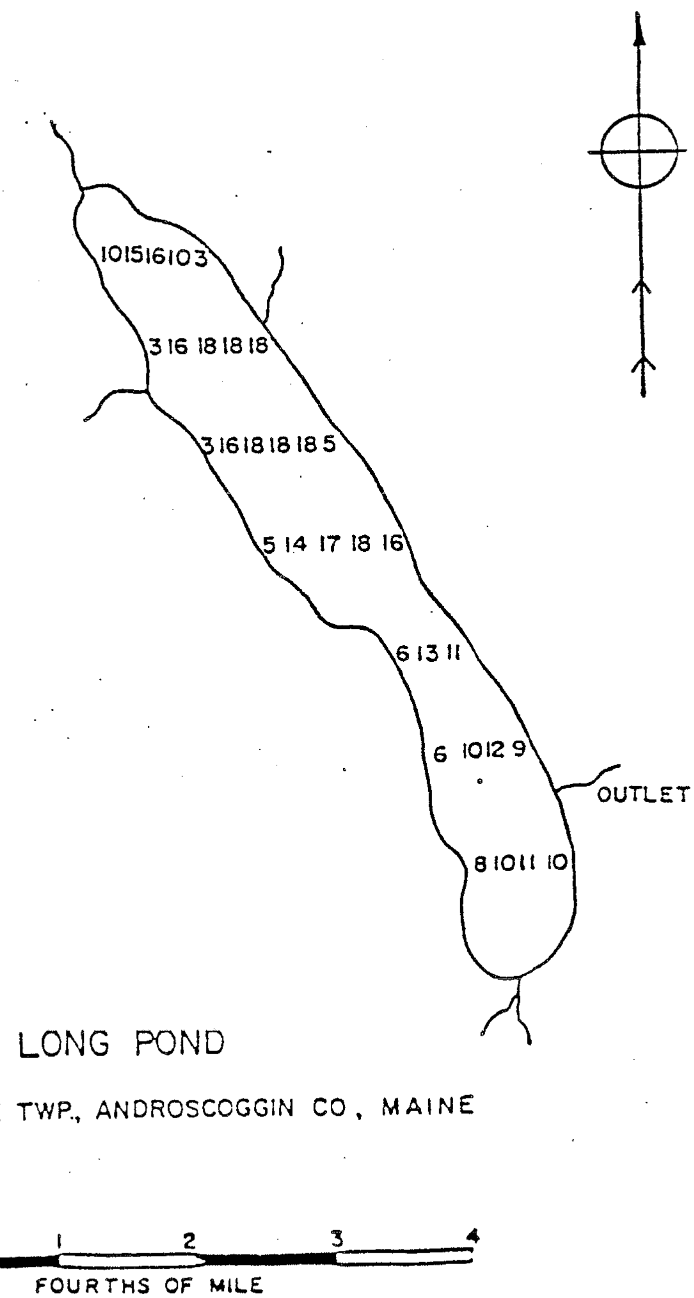
The lake was studied from 1970-1973, Descriptive and Comparative Studies of Maine Lakes. Davis, Bailey, Scott, Hunt and Norton, 1978.

Long Pond is well suited for both warm and coldwater fish and is managed for salmon and warmwater fish.

Transparency is well above average for Maine lakes. TP levels are low to moderate. Chl*a* values are low. There has been very little change in the TP, Chla, or transparency values over the last seven years which indicates stable water quality.

Long Pond (Livermore) #3816

Surface Area	82.2 ha (203 a)
Max. Depth	5.5 m (18 ft)
Mean Depth	3.0 m (10 ft)
Volume	2.4 X $10^6 m^3$ (2000 acre-feet)
Drainage Area	9.3 km^2 (3.6 mi^2)
Flushing Rate	2.5 (Flushes/year)



Long Pond (Livermore) #3816

	1974-76(+)	1980	1981	1982
Mean Secchi (m)	3.7	4.4*(4)	3.9	4.2
Min. Secchi (m)	2.4	3.2	3.5	3.6
TSI	52	NA	62	57
TSI Range	42-68 CHL-SD			
Color(SPU)	15		25	
pH	6.5		7.1(core)	
Chla(ug/l)	4.2mean		3.8(ls)	
TP(ppb)	11(ms)		11(c)(ls)	

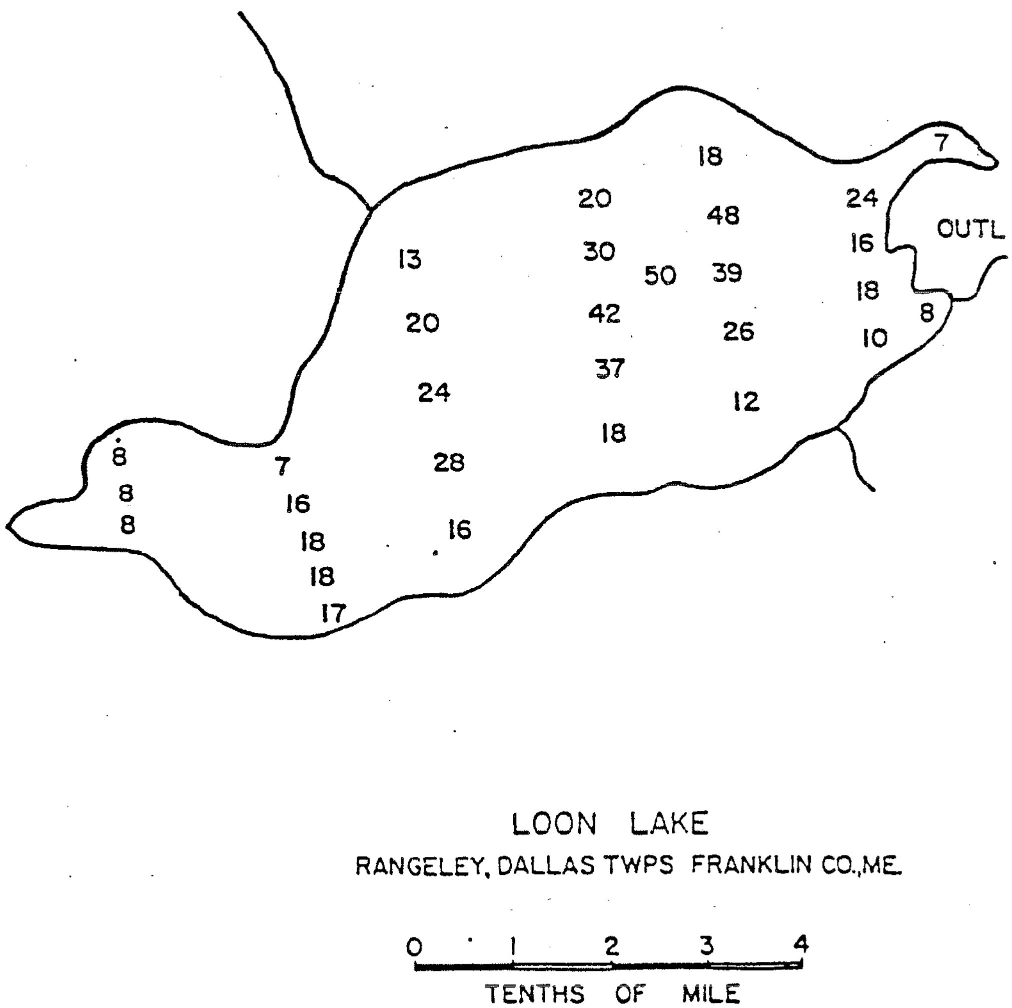
* Inadequate sampling season
(ls) late summer, (c) core, (ms) mean surface
\+ the 1974-76 data were collected in a cooperative project between the Department of Environmental Protection and the U.S. Geological Survey.

Long Pond is a shallow pond with excellent habitant for warm water fish such as bass and perch. The pond does not stratify.

Water quality appears stable. Chla and TP values are moderate. Transparencies are below average for Maine ponds. Judging from the variation in TSI values calculated from Chlorophyll (42) and Total phosphorus (47) verses Secchi disk readings (66), color or sediment may be interfering with the transparency and yet not with the phosphorus which is unusual. The reason for the differences is not known.

Loon Lake #2384

Surface Area	68 ha (170 a)
Max. Depth	15m (50 ft)
Mean Depth	5.6m (18.4 ft)
Volume	3.8 X $10^6 m^3$ (3089 acre-feet)
Drainage Area	2.85 km^2 (1.11 mi^2)
Flushing Rate	0.4 (flushes/year)



Loon Lake # 2384

	1975-78	1979	1980	1981	1982
Mean Secchi (m)	5.0	5.5	5.0	5.2	5.3
Min. Secchi (m)	4.4	4.7	4.4	4.6	4.6
TSI	47	43	48	46	45
Color(SPU)			15		
pH(core)				7.1	
Chla(ug/l)	4(sum)	1.4(spr)		1.9(sum)	
TP(ppb)	11(surf)(sum) 10(b)(sum)	5(spr)		12(b)(sum)	

* Inadequate sampling season
(sum) summer, (spr) spring, (surf) surface, (b) bottom

Loon Lake had an algal bloom of *Anabeaba flos-aquae* in July of 1974. The bloom was of short duration, lasting about three days. At that time lake association members and personnel from the DEP surveyed the waste disposal systems around the lake. Some problem areas were identified and the owners have since taken steps to correct the systems. Blooms of the same species of algae occurred in 1975 and 76, but the duration and magnitude of the blooms were not as great as in 1974. A one day bloom occurred in June, 1977. Blooms were of such short duration that no Secchi disk readings were taken during their occurrence. The data suggest that Loon Lake may be recovering from nutrient enrichment. TP was lower in 1979 than in 1976. The 1979 and 1981 Chla values are low. Transparency is about average for lakes in Maine.

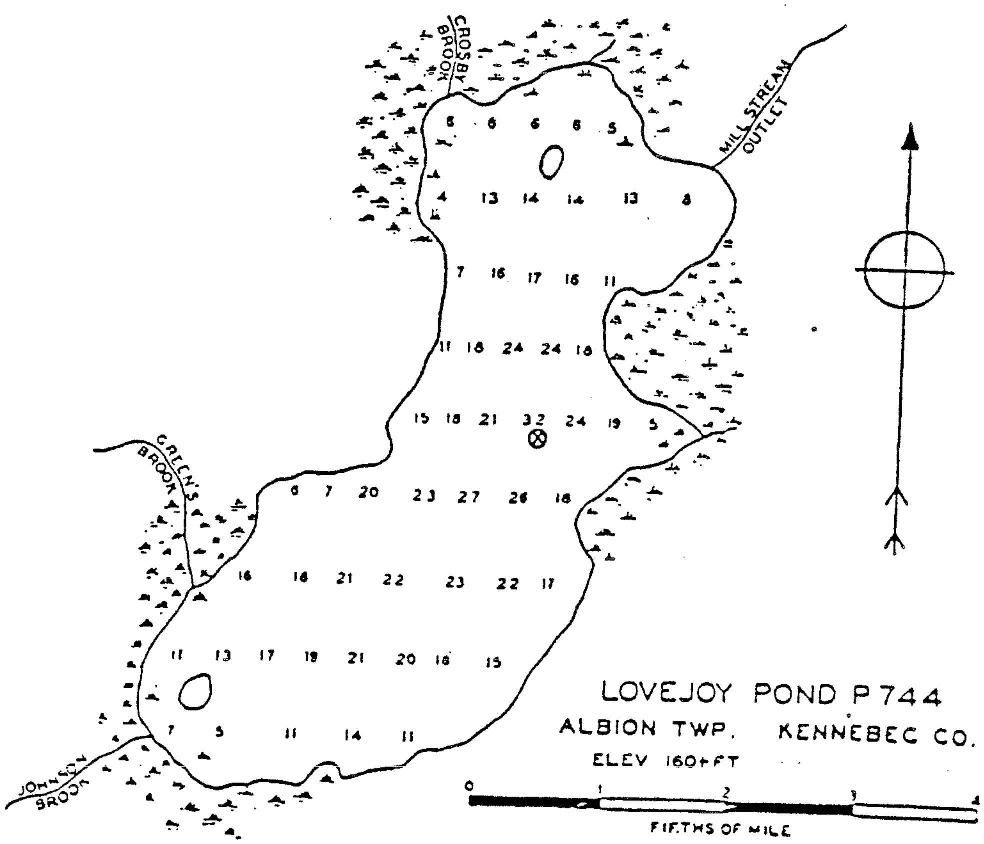
An oxygen deficiency (less than 2 ppm) exists below 9 meters .

Loon Lake may need a protection program becasue its slow flushing rate (0.4 flushes/year) which may make it sensitive to water quality degradation.

The lake is suitable for coldwater fish, and is managed for trout and hatchery salmon.

Lovejoy Pond #5176

Surface Area	134ha (332.5 a)
Max. Depth	9.8m (32 ft)
Mean Depth	4.1m (13.4 ft)
Volume	5.51 X $10^6 m^3$ (4480 acre-feet)
Drainage Area	29.2 km^2 (11.2 mi^2)
Flushing Rate	2.7 (Flushes/year)



Lovejoy Pond # 5176

	1978	1979	1980	1981	1982
Mean Secchi (m)	1.3*	1.9	2.2	1.9	1.6
Min. Secchi (m)	0.7	.8	0.6	1.0	0.8
TSI	NA	97(CHL)	101(CHL)	91(CHL)	90(CHL)
Color(SPU)			35		
pH(core)		7.4mean		7.9	7.4
Chl*a*(ug/l)		23mean	27mean	19mean	18.3mean
TP(ppb)		118mean	44mean	35mean	46mean

* Inadequate sampling season

While some residents of Lovejoy Pond felt algae was less of a problem than in previous years, others felt it was worse. Actually, Secchi disk readings indicate it was about the same as it has been since regular monitoring began in 1978. A bloom was present for virtually the entire swimming season and oxygen in the hypolimnion became depleted (less than 2 ppm) by mid July.

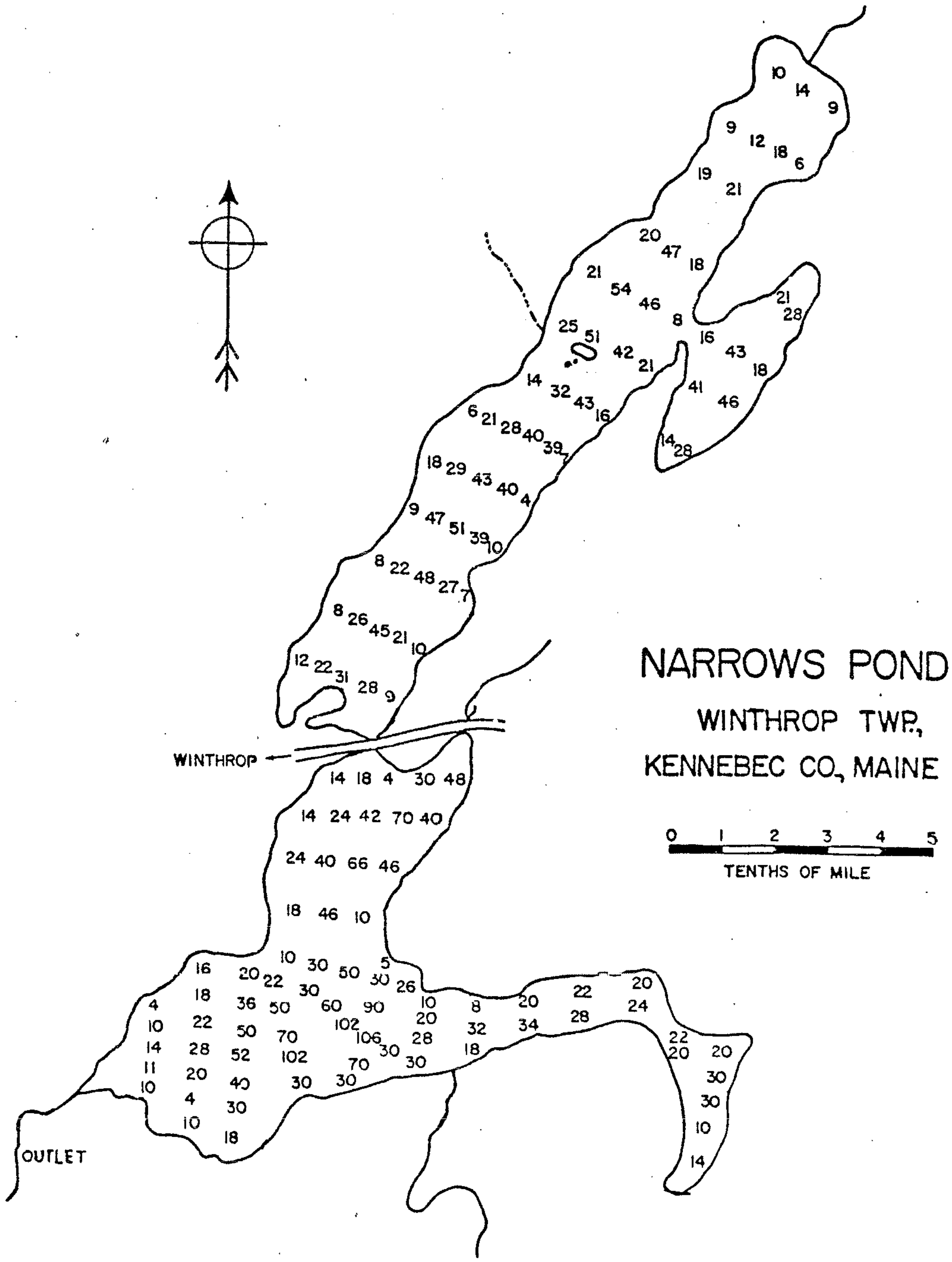
Steps are underway to reduce Lovejoy's nutrient supply through the cooperation of local farmers and the federal government. Every farmer in Lovejoy's watershed has volunteered to change the way of managing his or her farm in hopes of restoring water quality. This grand effort is probably a first in the history of lake restoration and one which the people of Albion and Maine may be proud.

Improved agricultural practices are almost finished and should be completed by the end of 1983. Restoration of the lake depends on how well the new practices control nutrient movement into Lovejoy. The Johnson Brook monitoring station is collecting data on nutrient movement now that farming practices have changed for comparison with data collected before the practices went into effect.

Two meetings with the Lovejoy Pond Restoration Committee were held in 1982. From these meetings it is clear that everyone wants to work for a cleaner lake. This is a good sign, since further work by the State is contingent on local support. A good start has been made and we are optimistic it will continue.

Lower Narrows Pond #0103

Surface Area	84 ha (208 a)
Max. Depth	32.3m (106 ft)
Mean Depth	8.6m (23 ft)
Volume	7.2 X 10^6 m^3 (6026 acre-feet)
Drainage area	22.0 Km^2 (8.5 mi^2)
Flushing Rate	1.6 (flushes/year)



Lower Narrows Pond # 0103

	1976	1978-79	1980	1981	1982
Mean Secchi (m)	6.7	5.4*	6.9*(4)	7.8	7.0
Min. Secchi (m)	5.8	4.0	6.0	6.5	5.0
TSI	30	50	NA	30	30
TSI Range	26-33 SD-CHL	43-57 SD-CHL		27-33 SD-CHL	28 - 32 CHL-SD
Color(SPU)			5		
pH(core)		6.8			
Chla(ug/l)	3mean	5.8mean	2.5*(4)	2.3mean	1.8mean
TP(ppb)	8mean	8mean	10*(2)		

* Inadequate sampling season

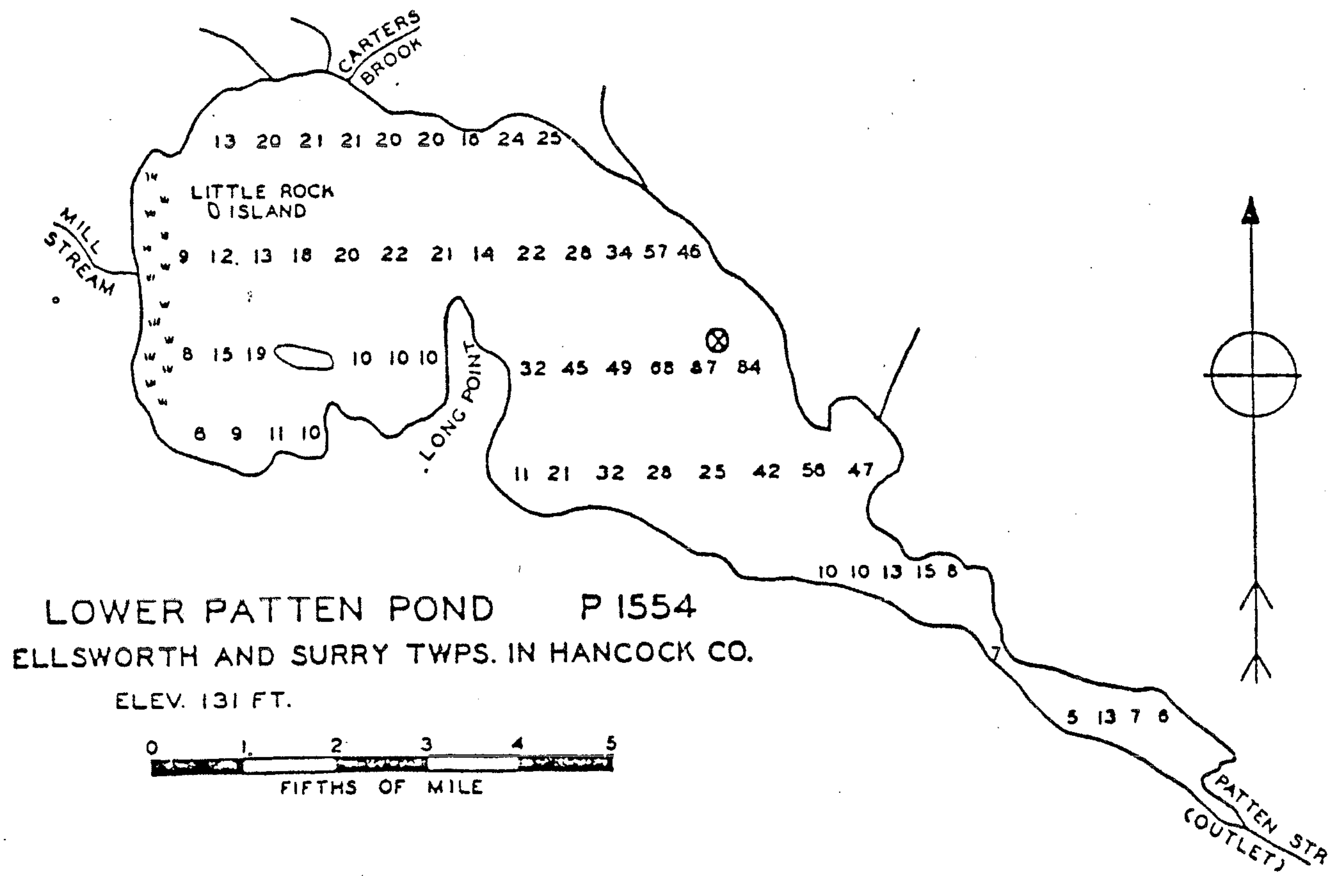
Much of the hypolimnion has less than 5 ppm oxygen by late summer and the lower hypolimnion has less than 1 ppm.

Transparency appears to have improved in 1981. TP levels are low to moderate. Chla values were moderate in 1979 and have generally reduced to less than 1976 levels and are now considered low. Continued monitoring is important because of the fluctuations from year to year.

Lower Narrows has a slow flushing rate and therefore, is susceptible to cultural degradation. Agricultural run-off is the most significant source of phosphorus. Run-off from developed areas is the second highest source of phosphorus. Run-off from these areas should be controlled to prevent further impact to the lake.

Lower Patten Pond #4344

Surface Area	370 ha (914 a)
Max. Depth	26.1m (85.6 ft)
Mean Depth	6.6m (21.6 ft)
Volume	2.4 X $10^7 m^3$ (19512 acre-feet)
Drainage Area	41.7 km^2 (16.1 mi^2)
Flushing Rate	1.0 (Flushes/year)



Lower Patten Pond # 4344

	1981	1982
Mean Secchi (m)	5.7*(4)	6.8*(1)
Min. Secchi (m)	5.1	
TSI	NA	NA
Color(SPU)	10	20
pH		
Chl*a* (ug/l)		2.0(ls)
TP(ppb)		3(c)(ls) 6(b)(ls)

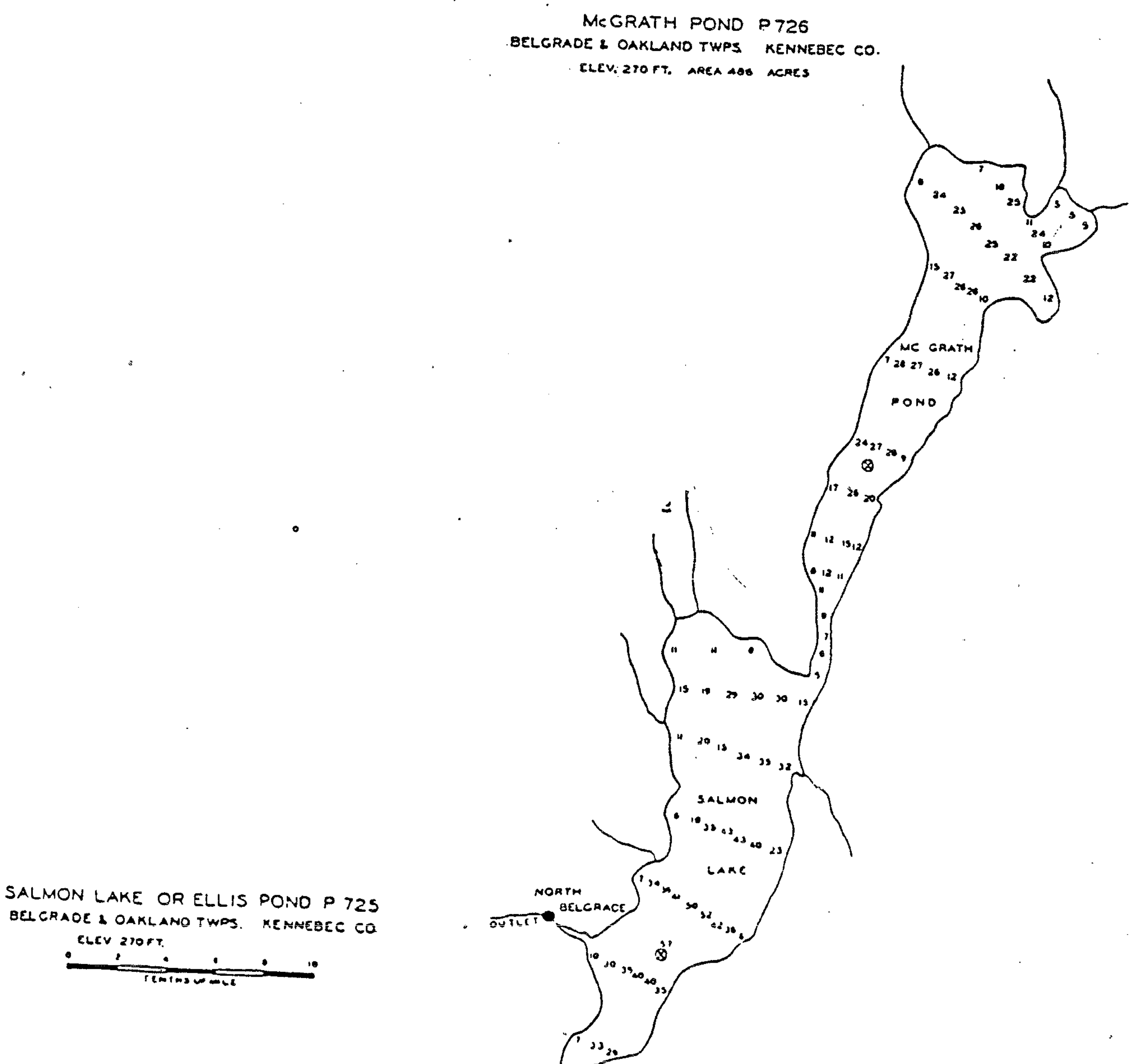
* Inadequate sampling season
(c) core, (ls) late summer, (b) bottom

Lower Pattern Pond is well suited for cold water fish and is managed for salmon. The pond also supports trout, perch, and pickerel.

Transparency is slightly above average for Maine lakes. Chl*a* and TP values are low. The pond is well oxygenated to the bottom.

McGrath Pond #5348

Surface Area	197 ha (486 a)
Max. Depth	8.2m (27 ft)
Mean Depth	4.4m (14.5 ft)
Volume	8.1 X $10^6 m^3$ (6561 acre-feet)
Drainage Area	11.4 km^2 (4.4mi^2)
Flushing Rate	0.8 (flushes/year)



McGrath Pond #5348

	1977-78	1979	1980	1981	1982
Mean Secchi (m)	5.2	5.3	4.6	5.5	5.2
Min. Secchi (m)	3.5	3.4	2.3	4.3	4.5
TSI	44	41	45	43	46
TSI Range	37-51 CHL TP	36-43 CHL-TP	39-53 CHL-TP		
Color(SPU)				15	
pH(core)	7.1mean	7.1		6.8	
Chla(ug/l)	3.2mean	2.6mean	2.9mean	2.2*(4)	
TP(ppb)	11.8mean	10.1mean	10.1mean	15*(4)	

* Inadequate sampling season

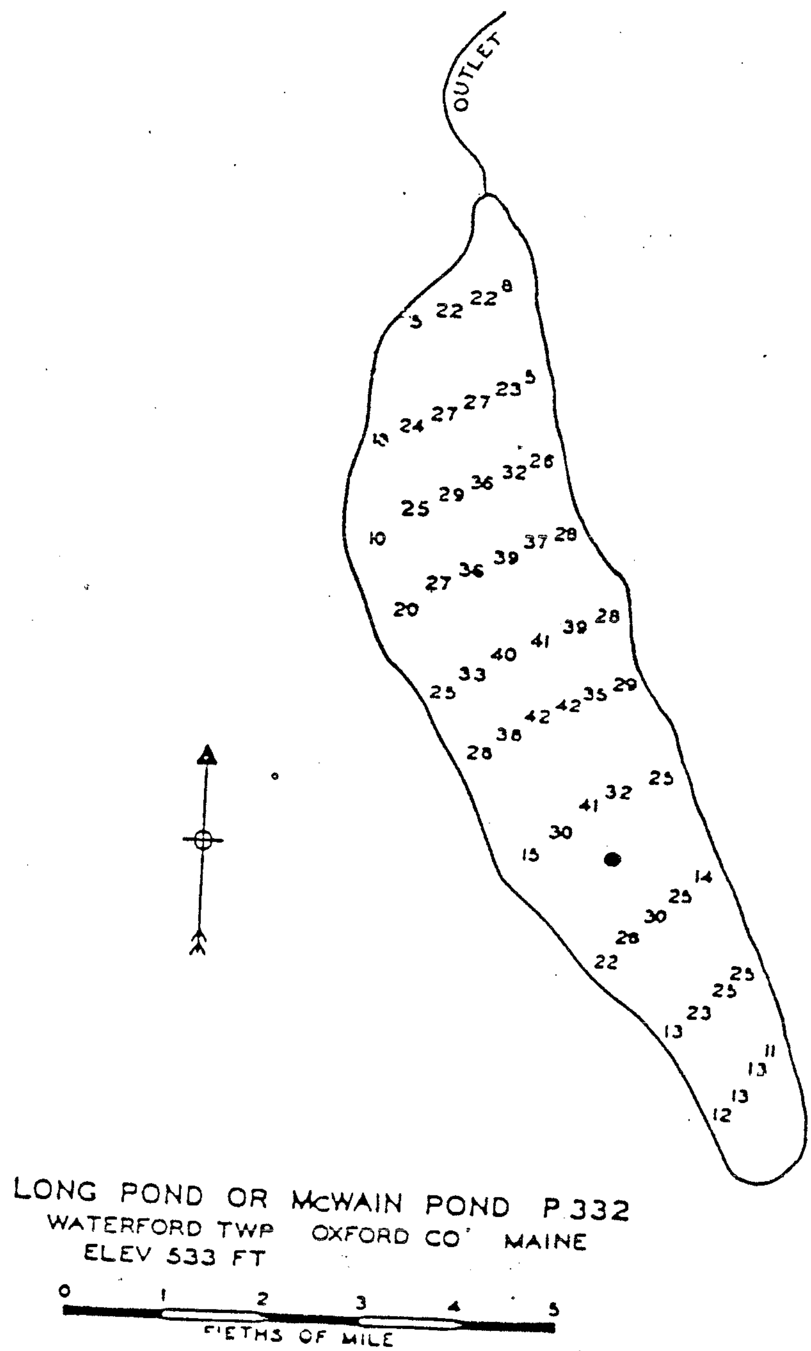
The hypolimnion had less than 4ppm oxygen below 6 meters in mid summer, 1979.

McGrath Pond is connected to Salmon Lake by a thorough-fare and is the largest tributary to Salmon. Salmon Lake has suffered algal blooms for the past several years. The DEP has determined a nutrient budget for Salmon Lake and in the process studied McGrath Pond. Tributaries to the lakes were gauged to determine the volume of water flowing through them and tested to determine total phosphorus levels. In-lake work was also conducted. During the 1980 summer, the DEP received a federal grant from the Environmental Protection Agency to help establish changes in the watershed. These changes will involve curbing the flow of phosphorus to both McGrath and Salmon. All preventive measures should be in place by 1983.

The 1981 and 1982 seasons for McGrath Pond can be described as average. No unusual Secchi disk readings were recorded. One major problem has been corrected in McGrath's watershed; however, several others need to be addressed. Efforts are underway to solve these problems.

McWain Pond (Long Pond) #3418

Surface Area	178 ha (445 a)
Max. Depth	12.6m (42 ft)
Mean Depth	7.0m (23 ft)
Volume	1.2 X $10^7 m^3$ (9756 acre-feet)
Drainage Area	11.4 km^2 (4.4 mi^2)
Flushing Rate	0.5 (flushes/year)



McWain Pond (Long Pond) # 3418

	1978	1979	1980	1981	1982
Mean Secchi(m)	5.3	5.3	3.4	3.3	3.1
Min Secchi (m)	4.4	4.0	2.4	2.5	2.2
TSI	46	NA	70	71	57
TSI Range					39 - 75 CHL SD
Color(SPU)	20				20
pH			6.2	6.7(Hach)	6.7(Hach)
Chl$\underline{a}$(ug/1)			3.6(f)		2.9mean
TP(ppb)			10(c)(f) 18(b)(f)		7(c)(f) 9(b)(f)

* Inadequate sampling season

(f) fall, (c) core, (b) bottom

An interesting study was published by the Waterford Conservation Commission of the Waterford lakes, Water Quality Report on Bear, Keoka, McWain and Papoose Lakes of the Waterford Area 1972-1973. By John B. Craig, Jr. It is well worth reading, but I have one major objection which is on the phosphate discussion. (Please see the excerpt from Keoka which is printed below).

"The author appears to use the terms total phosphate and total phosphorus interchangeably which creates some confusion. Also the levels of total phosphate (phosphorus?) given in Table III are high by a factor of about ten. The given values for Keoka are 160.9 and 210 ppb for surface and bottom, respectively, for winter 1973. Sampling by DEP in July 1977 revealed far lower levels; the surface was 8 ppb and the bottom was 20 ppb."

Transparency readings for McWain were reduced in 1980, 1981, and 1982. The cause is unknown. TP and Chla levels are low to moderate. The monitor of McWain participated in the Chla sampling program in 1982. The Chla levels were much lower than would be expected from the Secchi disk readings. Generally, Secchi disk readings of 3.4 m are associated with Chla levels of 9.3 ug/1 and conversely, Chla levels of 3.0 ug/1 are associated with transparencies of 5.9 m. This discrepancy is shown in the TSI range 39(Chl)-75(SD).

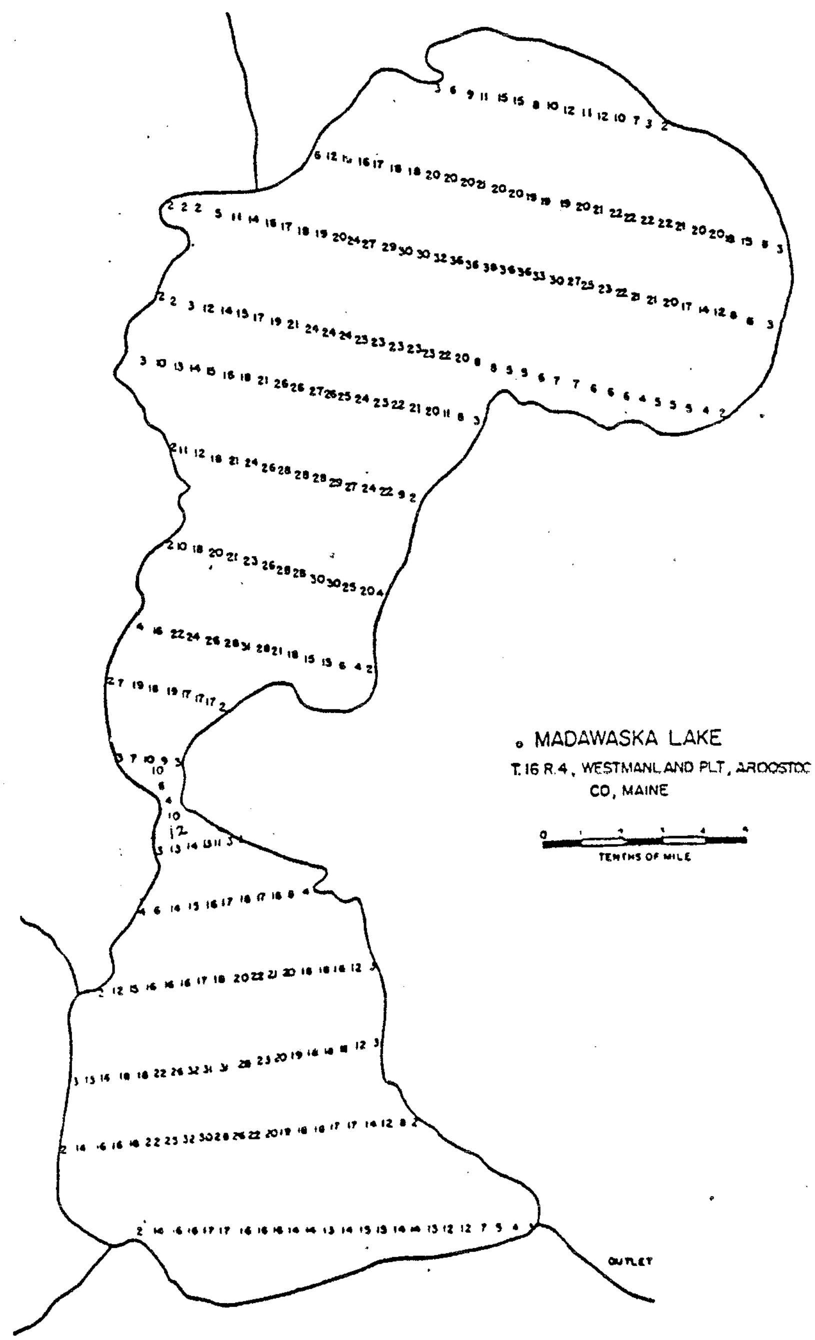
In 1983, the DEP with help from the monitor will do a watershed and lake study of McWain Pond. For a year, we will be measuring the phosphorus concentration in the tributaries to the lake during rain storms and snow melt to try to locate nutrient sources. We will also be studying intensively the lake water quality during the year.

In 1981, the dam was inspected and found to be inadequate and the board and gate will have to be removed or the dam repaired. The lake association has been working on a solution to this problem.

The pond is managed for pickeral and bass.

Madawaska Lake · #1802 (T16R4)

Surface Area	618 ha (1526 a)
Max. Depth	11.6m (38 ft)
Mean Depth	4.9m (16 ft)
Volume	2.96 X $10^7 m^3$ (24,000 acre-feet)
Drainage Area	82.9 km^2 (32.0 mi^2)
Flushing Rate	1.4(flushes/year)



Madawaska Lake # 1802

	1974-77X	1978	1980	1981	1982
North Basin					
Mean Secchi (m)	3.8	4.2*(4)	4.9*(1)	3.4	3.5
Min Secchi (m)	2.6	3.8	3.8	2.8	2.7
TSI	47	NA	NA	69	68
TSI range	31 - 64 Chl SD				
Color(SPU)			30	35	
pH	7.1(mean)		6.6(DEP)	7.3(mean)	7.1(mean)
Chla (ug/l)	2.1(mean)		7.4(ls)	3.4(ls)	
TP(ppb)	10(mean)		12(c)(ls) 18(b)(ls)	15(c)(ls) 20(b)(ls)	
South Basin.	1975-77	1978	1980	1981	1982
Mean Secchi (m)	4.1	4.1*	4.9*	3.5*(4)	3.7
Min Secchi(m)	2.7	3.7	4.9	3.0	3.0
TSI	60	NA	NA	NA	65

* inadequate sampling
(ls) late summer (c) Core (b) bottom

X Date collected from 1974-1976 by a cooperative project between D.E.P. and the U.S. Geological Survey.

The vast differences in TSI's calculated on the different parameters proves the inadequacy of our projections. Madawaska obviously does not fit the mold and moderate color is only a partial explanation. We obviously do not understand all the mechanisms involved in lake ecosystems.

Transparency readings appear to be slightly shallower than 1974-1977 average disregarding 1978 and 1980 which did not include spring sampling. There is also fluctuation in the Chla and TP values. 1974-1976 Chla levels are low and TP levels are moderate. 1980 and 1981 Chla and TP levels are moderate. Continued monitoring of the lake will be needed to verify any changes.

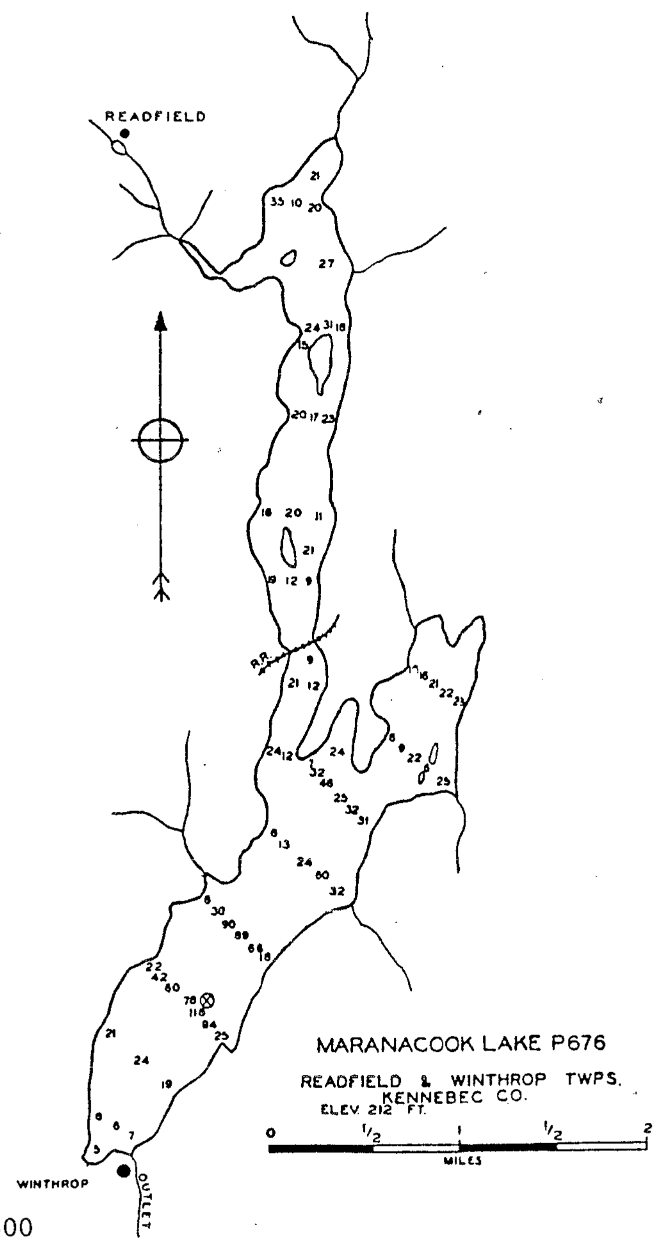
Madawaska does have some salmon and brook trout; however, the bottom waters do not have enough oxygen (5 ppm) by late summer to support a good cold water fishery.

Bacteria results from Sept. 1975, were high for Black, Johnson, and McClusky Brooks.

A discrepancy exists between the pH readings taken by the monitor and those taken by DEP. The reason for the variation is not known but may be a difference in sampling technique. DEP will be studying the problem and recommending a standard method so all pH readings taken by monitors, the DEP, and other agencies will be consistent.

Maranacook Lake #5312

Upper Basin	
Surface Area	257 ha (635 a)
Max. Depth	12.2 m (40 ft)
Mean Depth	8.4 m (27 ft)
Volume	5.66×10^7 m^3 (45,903 acre-feet)
Drainage Area	85.2 km^2 (32.9 mi^2)
Flushing Rate	3.2 flushes/year
Lower Basin	
Surface Area	420 ha (1038 a)
Max. Depth	39 m (128 ft)
Flushing Rate	0.9 (flushes/year)



Maranacook Lake #5312

Basin #1 (Lower)

	1978	1979	1980	1[981	1982
Mean Secchi (m)	4.9	6.4	6.3*(3)	6.5	6.5
Min. Secchi (m)	4.2	5.3	5.7	5.3	4.9
Chl*a*(ug/l)	2.9*	3.5	2.4	2.4	2.7
TP(ppb)					
TSI	49	40	NA	34	35
TSI Range		36-44 SD CHL		34-35 CHL SD	33-37 SD CHL
Color	20				

Basin #2 (Upper)

	1978	1979	1980	1981	1982
Mean Secchi(m)	5.8*	4.7		4.9	5.0
Min. Secchi(m)	5.2	3.7		4.0	4.5
Chl*a*(ug/l)	2.0*	4.9		2.9	2.9
TP(ppb)					
TSI	NA	52		48	43
TSI Range		52-52 SD CHL		46-49 CHL SD	39-48 CHL SD
Color	20				

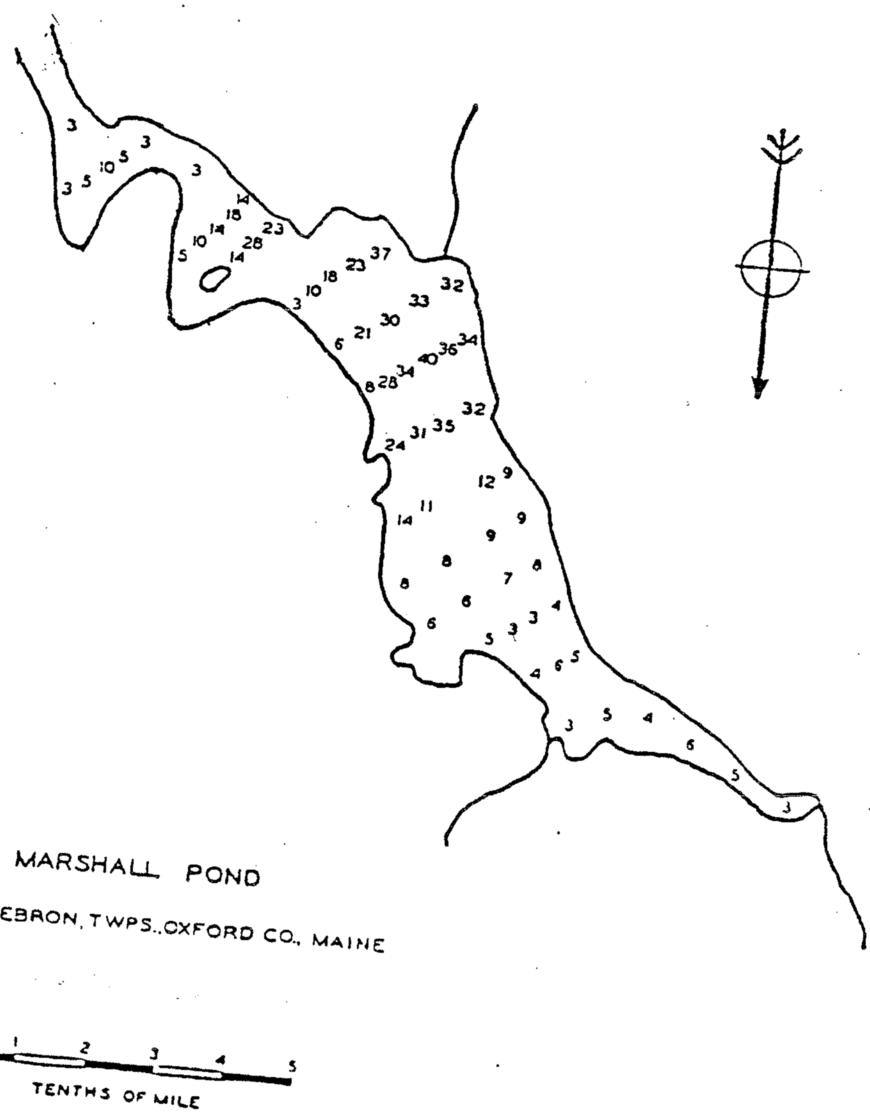
* inadequate sampling season

Maranacook Lake has good water quality. Transparency is above average for lakes in Maine. Chl*a* values are considered low to modeate. Water quality appears to have improved slightly from 1978.

The lake is managed for both a warm and cold water fishery. The hypolimnion remains well oxygenated.

Marshall Pond #3776

Surface Area	57 ha (142 a)
Max. Depth	12.2m (40 ft)
Mean Depth	3.8m (12.5 ft)
Volume	2.1 X $10^6 m^3$ (17070 acre-feet)
Drainage Area	22.3 km^2 (8.6mi^2)
Flushing Rate	5.3 (flushes/year)



Marshall Pond # 3776

	1980	1981	1982
Mean Secchi (m)	4.2	3.9*(4)	3.7
Min. Secchi (m)	2.7	3.7	2.7
TSI	colored	NA	colored
Color(SPU)	40		40
pH(core)	6.3(mean)	6.9	7.2(1s)
Chla (ug/1)	3.8*(4)	3.2*(4)	4.6(1s)
TP (ppb)	13*(4)	13(1s)	12(c)(1s)
			22(b)(1s)

* Inadequate sampling season
(1s) late summer, (c) core, (b) bottom

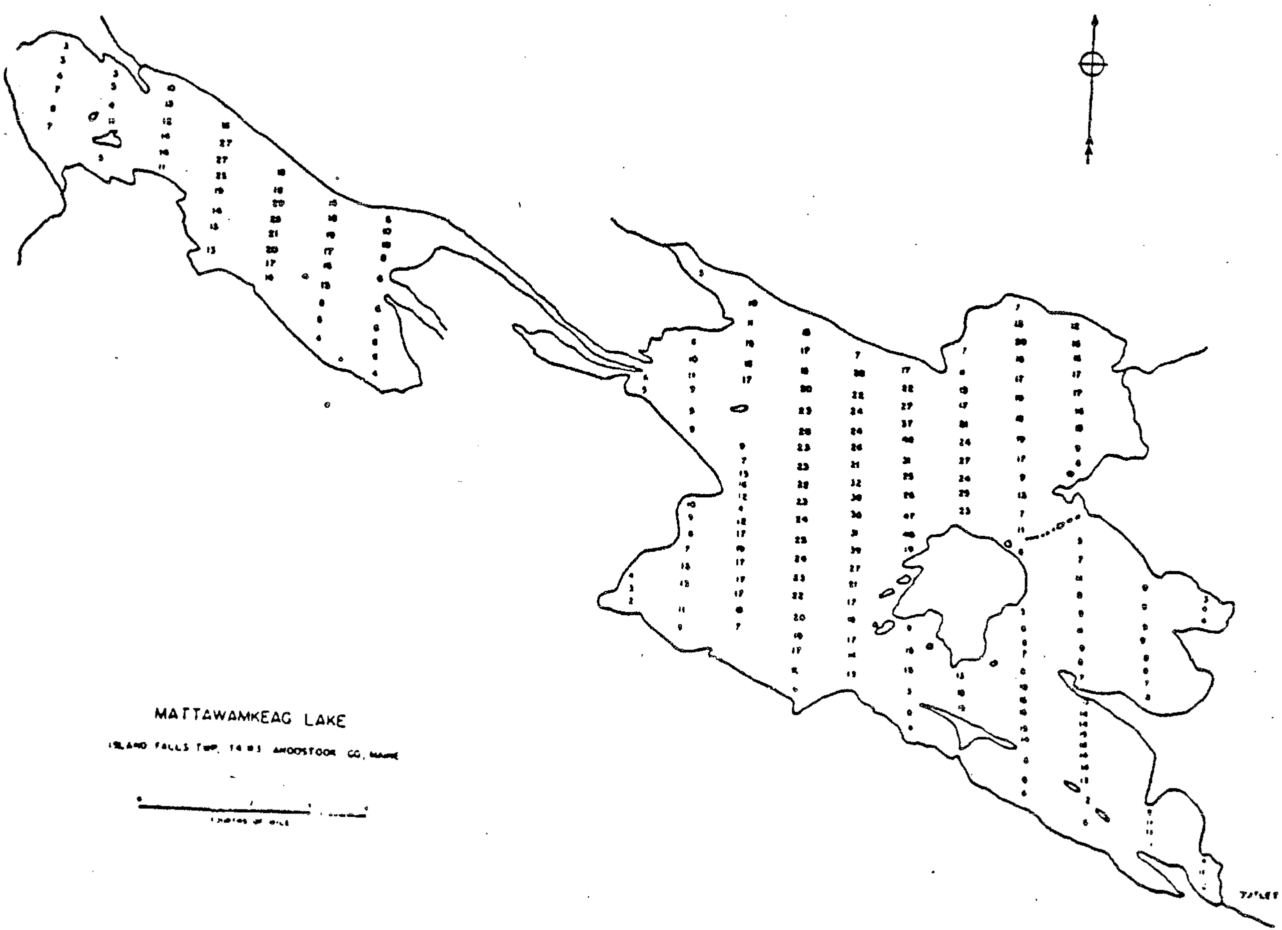
Although Marshall pond does support some trout; cold water fish habitat is marginal due to the lack of oxygen below 5 m. The pond is managed for bass and pickeral.

For the past several years, some area residents have complained about the water quality of Marshall pond blaming a faulty septic disposal system at Herbon Academy. The academy's system was found to be inadequate and the school began a several year program to install a new system. Three alternatives are being considered at this time. One is an underground disposal system that would drain into Middle Bog Brook. The second is a sand filter with or without disinfection that would discharge into the bog at the North eastend of Marshall Pond. The third alternative is an experimental peat system to handle the sanitary wastes. The Academy has hired engineers to study the situation.

Transparency, Total phosphorus, and Chlorophyll*a* measurements are all moderate.

Mattawamkeag Lake #1686

Surface Area	1361 ha (3330 a)
Max. Depth	14.1m (47 ft)
Mean Depth	3.6m (12 ft)
Volume	51 X $10^7 m^3$ (41463 acre-feet)
Flushing Rate	8.3 (Flushes/year)



Mattawamkeag Lake #1686

	1978	1980	1981
Mean Secchi (m)	4.1*(3)	3.4*(3)	4.8
Min. Secchi (m)	3.7*	3.0*	4.0
TSI	NA	NA	colored
Color(SPU)		50	
pH		6.8	
Chla (ug/l)		7.1 (ls)	
TP (ppb)		13(c)(ls)	18 (ls)
		11 (b)(s)	

* Inadequate sampling season
(ls) late summer, (b) bottom, (c) Core

There are a few untreated individual septic waste discharges to the river above the lake. A starch plant with secondary treatment having a low TP and high BOD discharge also dumps into the river above the lake.

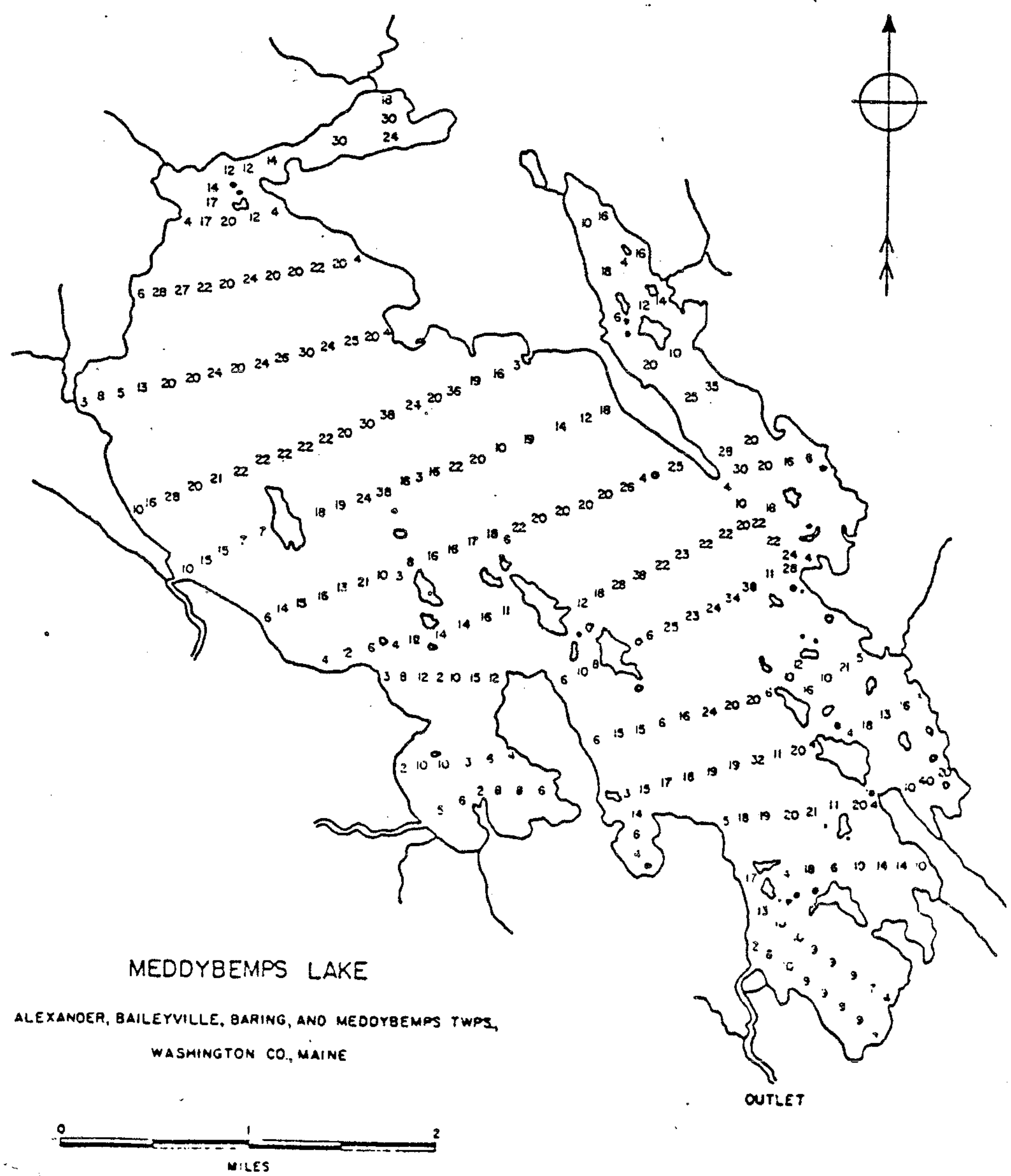
Although, Mattawamkeag supports some salmon and trout, the lack of oxygen below 8m severely limits cold water fish habitat.

Water quality appears to be improving but an adequate sampling season needs to be maintained in order to verify this, especially since the 1981 TP level was higher than the 1980 level.

Mattawamkeag Lake is well suited for warmwater fish.

Meddybemps Lake #0177

Surface Area	2718 ha (6795 a)
Max. Depth	11.4m (38 ft)
Mean Depth	4.3m (14 ft)
Volume	$1.2 \times 10^8 m^3$ (97561 acre-feet)
Drainage Area	115.5 km^2 (44.6 mi^2)
Flushing Rate	0.6 (flushes/year)



Meddybemps Lake #0177

	1979	1980	1981	1982
Mean Secchi (m)	4.6	4.4	4.0*(4)	4.1*(4)
Min. Secchi (m)	4.5	4.0	3.4	3.6
TSI	colored	41(Chl)	NA	NA
Color(SPU)	40			30
pH(core)		6.7		
Chl<u>a</u> (ug/l)		3.2(mean)		3.0(ls)
TP (ppb)		9(ls)		6(ls)

* Inadequate sampling season

(ls) late summer

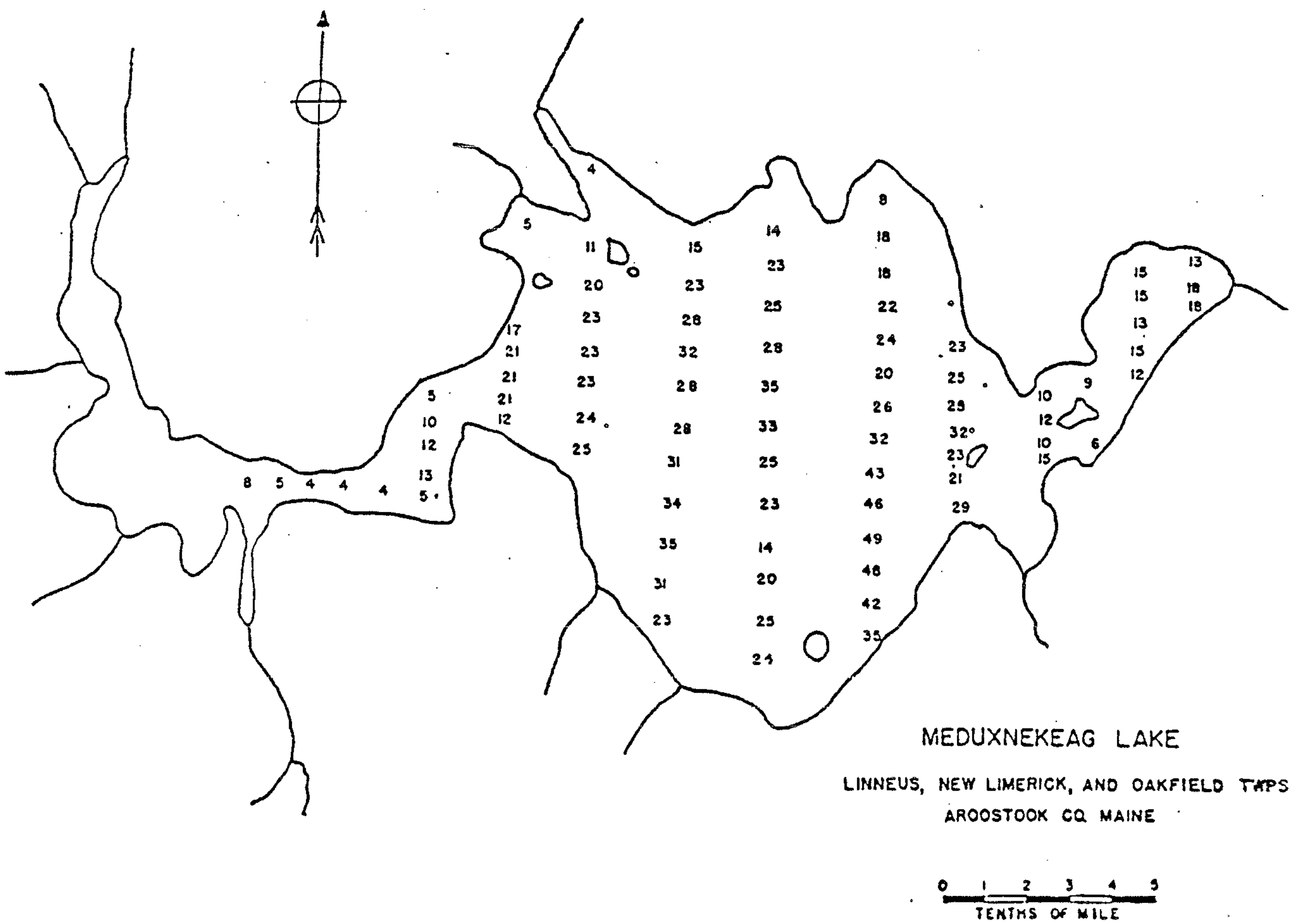
This office has received numerous complaints involving Staples Cove during the past several years. Local residents feared that Great Northern Paper Company's lagoons were leaking and that contaminants were reaching the north cove. Water tests of the tributary indicated no pollution was reaching the lake from Great Northern's Lagoons. Intense cottage development around the cove is the more likely the cause of localized water quality problems.

Despite interference from high color, transparency readings are slightly below average. Chlorophyll and total phosphorus levels are low to moderate. Transparency readings for 1981 and 1982 appear to be slightly less than previous years but continued monitoring of the lake is necessary to predict trends in water quality and water quality trends.

Meddybemps lake provides good warmwater habitat especially for smallmouth bass.

Meduxnekeag Lake (Drews Lake) #1736

Surface Area	413 ha (1033 a)
Max. Depth	15m (49 ft)
Mean Depth	5.7m (18.7 ft)
Volume	2.36 X 10^7 m^3 (19174 acre-feet)
Drainage Area	19.2 mi^2 (49.8 Km^2)
Flushing Rate	1.1 (flushes/year)



Meduxnekeag Lake (Drews Lake) # 1736

	1977	1981	1982
Mean Secchi (m)	4.9*(2)	4.2*(4)	4.6
Min. Secchi (m)	4.3	3.4*	3.7
TSI	NA	NA	53
Color(SPU)		20	
pH(core)	7.1	7.0	
Chl<u>a</u> (ug/l)	7(sp)	3.1	
TP (ppb)	7(c)(ls)	12(c)(ls)	
	11 (b)(ls)	10(b)(ls)	

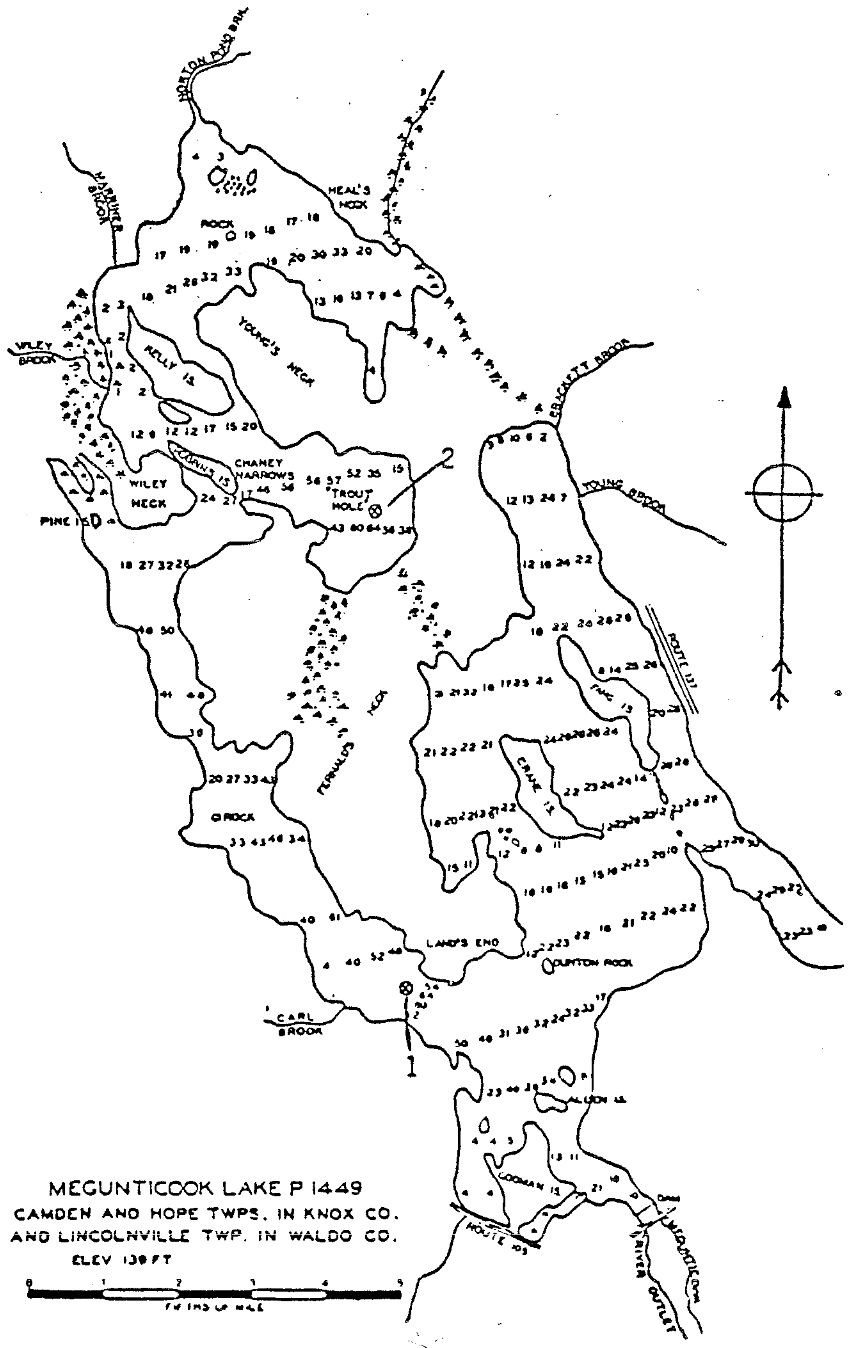
* Inadequate sampling season
(ls) late summer, (b) bottom, (c) core, (sp) spring

The lake is not considered to be well suited for cold water fish since dissolved oxygen levels below 25 feet are deficient (1 to 2 ppm) during the summer; however, the lake has been managed for landlock salmon. The lake also has a good population of smelts which provide an excellent food source for salmon. The lake is also managed for brown trout, white perch, and pickeral.

Transparencies are slightly below average for Maine lakes; Chl<u>a</u> and TP levels are moderate. Water quality is good. Continued monitoring with complete seasons is necessary to accurately determine water quality and water quality trends.

Megunticook Lake #4852

Surface Area	494 ha (1220 a)
Max. Depth	19.5m (64 ft)
Mean Depth	6.1m (20 ft)
Volume	28.1 X 10^6 m^3 (22778 acre-feet)
Drainage Area	78.9 km^2 (30.4 mi^2)
Flushing Rate	1.7 (flushes/year)



Megunticook Lake #4852

	1975-78	1979	1980	1981	1982
North Basin					
Mean Secchi (m)	5.2	5.4	5.8	5.7	6.0
Min. Secchi (m)	2.7	3.5	4.0	4.3	4.5
TSI	46	44	41	42	39
Color(SPU)					
pH(core)			6.5		
Chla (ug/l)	3 (sum)				
TP (ppb)	7 (sum)				
South Basin					
Mean Secchi (m)	5.3	5.1	6.3	6.1	5.6
Min. Secchi (m)	2.4	4.0	4.4	5.0	4.5
TSI	45	47	37	38	43
Color(SPU)				20	
pH(core)			6.6	7.1	
Chla (ug/l)	3.0 (sum)			2.4(ls)	
TP (ppb)	7 (sum)			11(c)(ls) 18(b)(ls)	

(ls) late summer, (sum) summer, (b) bottom, (c) core

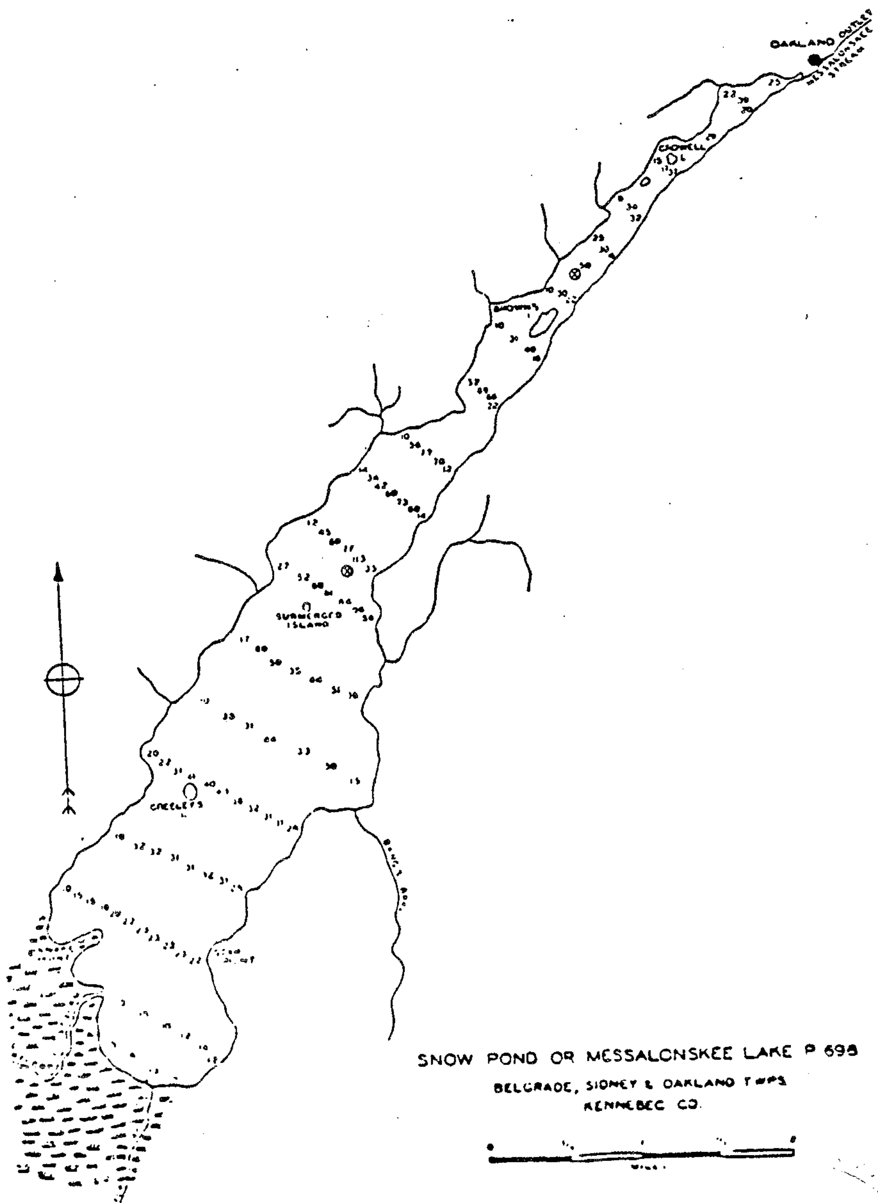
Megunticook Lake has areas of heavy cottage development. In the past, Megunticook has also been subjected to nutrient inputs resulting from poor manure disposal practices. Property owners, both cottage owners and farmers, must make sure that their wastes are properly disposed of to prevent degradation of the present water quality.

Some years the north basin has deeper transparency than the southern basin and other years the south basin is slightly better, but the trend seems to be improving especially for the north basin. Transparency is average, Chla levels are low to moderate and TP values are moderate.

Megunticook Lake has marginal salmon habitat because some oxygen depletion less than 2 ppm) occurs in the cold deep waters. The lake is managed for landlocked salmon and brook trout.

Messalonskee Lake (Snow Pond) #5280

Surface Area	1422 ha (3510 a)
Max. Depth	33.9m (113 ft)
Mean Depth	9.6m (31.5 ft)
Volume	$1.4 \times 10^8 m^3$ (113821 acre-feet)
Drainage Area	458.7 km^2 (177 mi^2)
Flushing Rate	1.6 (flushes/year)



Messalonskee Lake (Snow Pond) #5280

	1970-77	1979	1980	1981	1982
Mean Secchi(m)	5.4	5.7	5.6*(4)	5.7	5.4*(3)
Min. Secchi (m)	4.2	4.9	4.6	5.0	4.6
TSI	45	42	NA	42	NA
Color(SPU)	20			25	
pH(core)	6.6mean			7.0	
Chl*a* (ug/l)	3.2*			2.6(ls)	
TP (ppb)	8*			9(c)(ls) 25(b)(ls)	

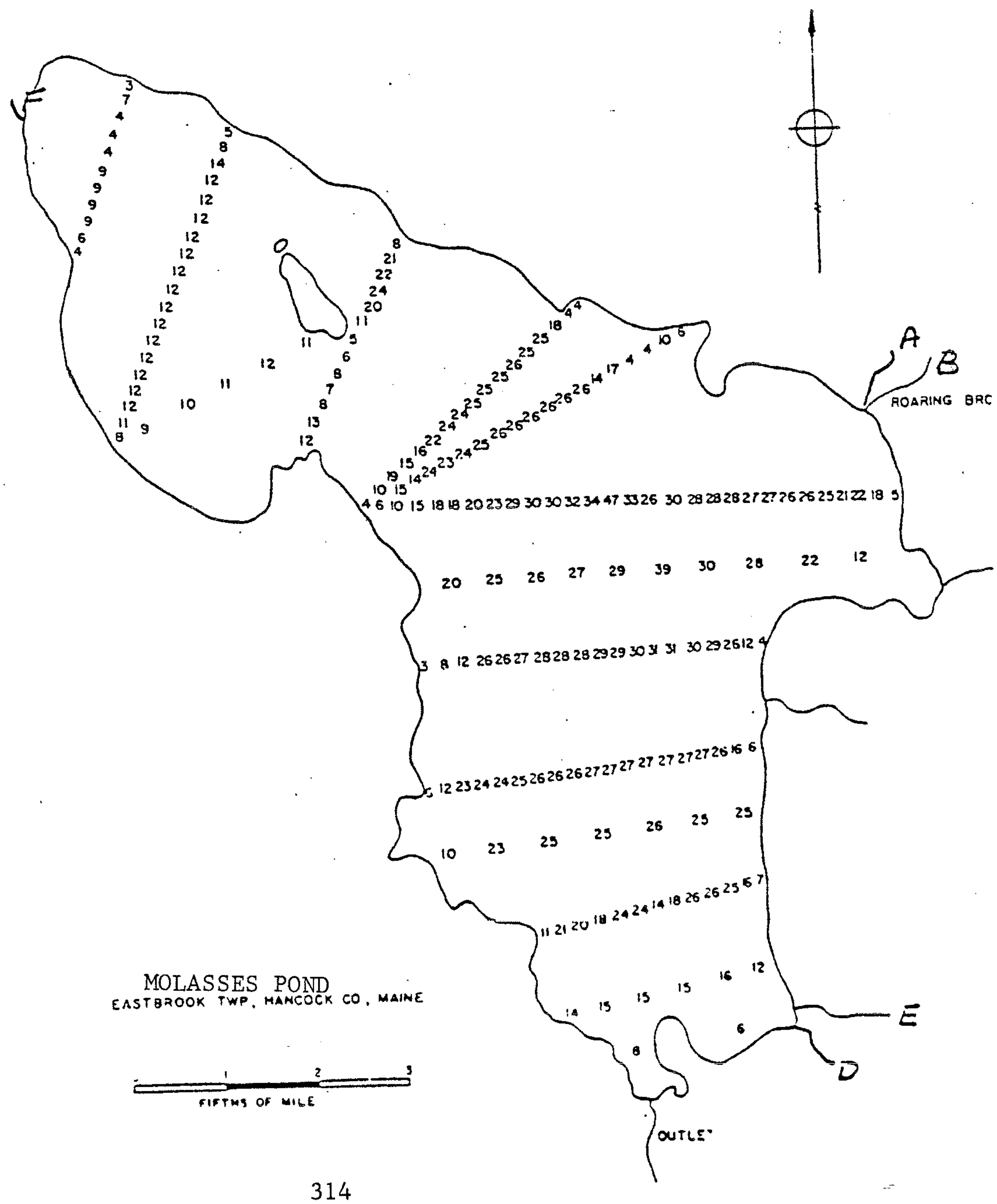
* Inadequate sampling season
(ls) late summer, (c) core, (b) bottom, (spr) spring.
X The lake was studied by Davis and Scott in 1970 - 1973 (Descriptive and Comparative Studies of Maine Lakes, Ronald Davis, Bailey, Scott, Hunt and Norton, 1979).

Transparency readings have remained relatively stable over the last 11 years with some fluctuation probably due mostly to weather conditions. For all years except 1976, the minimums occurred in the spring. No trends are evident. Water quality is slightly above average for Maine lakes. Chl*a* and TP values for 1981 as well as for previous years are low to moderate.

Messalonskee Lake provides habitat for both warmwater and coldwater fish. It is managed for salmon and brook trout by the Department of Inland Fisheries & Wildlife.

Molasses Pond #4448

Surface Area	507 ha (1252 a)
Max. Depth	14.3m (47 ft)
Mean Depth	5.2m (17 ft)
Volume	2.59 X $10^7 m^3$ (21,000 acre-ft)
Drainage Area	23.3 km^2 (9.0 mi^2)
Flushing Rate	0.6 (Flushes/year)



Molasses Pond #4448

	1974-75(x)	1976(x)	1979	1980	1981
Mean Secchi (m)	6.4	5.7	4.8*(4)	5.3	6.6
Min. Secchi (m)	4.9	4.4	4.5*	4.2	5.5
TSI	32	36	NA	NA	35
TSI Range	25-42 CHL-SD	29-42 CHL-SD			
Color					15
pH		6.5(mean)			6.3
Chla (ug/l)	1.7mean	1.9mean			2.8(ls)
TP (ppb)	6.8mean	8.1mean			8

* Inadequate sampling season
(ls) late summer
(x) The lake was studied as part of the DEP and the U.S.Geological Survey cooperative project

---

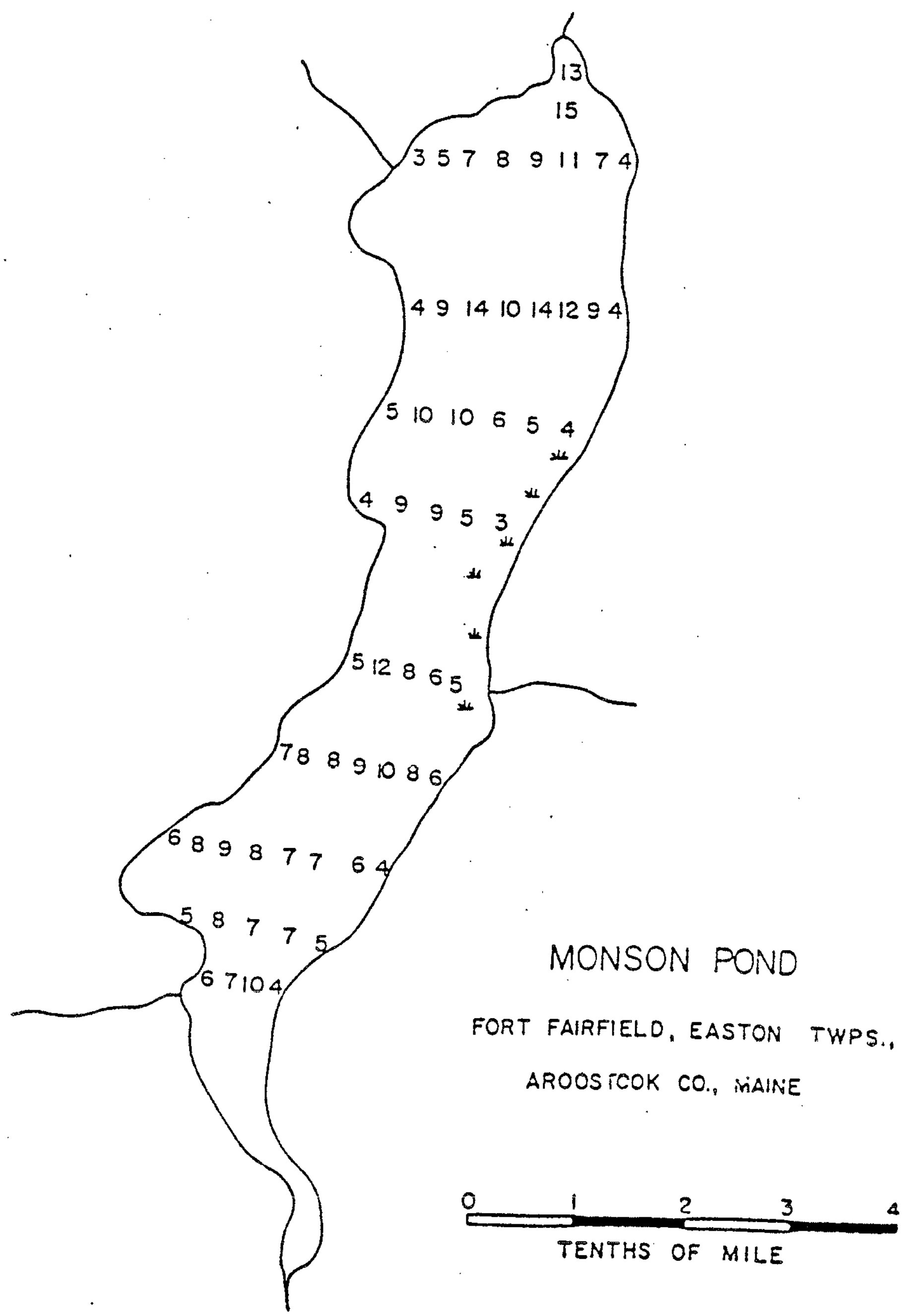
The lake supports a moderate cold water fishery.

Molasses Pond Association has been concerned with setting water levels for the lake. Stable water levels whether lower or higher than previous levels is preferable to a fluctuating water level because a fluctuating level causes shoreline erosion. As far as the fishery (salmon and trout) is concerned, water levels should be stabilized May through October.

Secchi disk transparencies fluctuate from a low of 5.3m in 1980 to 6.9m in 1975. This amount of variation is somewhat unusual but not rare for Maine lakes. It may be due to weather, conditions natural to Molasses Pond, or possibly an impact to the lake.

Monson Pond (Fort Fairfield) #1820

Surface Area	37 ha (92 a)
Max. Depth	4.6m (15 ft)
Mean Depth	2.0m (6.3 ft)
Volume	7.3 X 10^5 m^3 (1530 acre-feet)
Drainage Area	37.8 km^2 (14.6mi^2)
Flushing Rate	26.3 (flushes/year)



Monson Pond (Fort Fairfield) #1820

	1976-78	1979	1980	1981	1982
Mean Secchi (m)	1.1*	0.8*(4)	0.8	1.0*(4)	1.6*(2)
Min. Secchi (m)	0.5	0.4	0.6	0.7	1.3
TSI	NA	NA	colored	NA	NA
Color(SPU)			60		
pH(core)	7.5	7.5	8.1	8.1	
Chla(ug/l)	13.7mean			18.1*(4)	
TP(ppb)	37.6mean		55(f)	24(spr) 38(sum)	23(sum)

* Inadequate sampling season
(spr) spring, (sum) summer, (f) fall

During the summer, algal populations are very dense. A potato field is located on the eastern shore and undoubtably amounts of fertilizer and pesticides are washed into the pond through erosion. In late summer there is a lack of oxygen in the bottom waters and occasionally fish kills occur. Water quality of Monson pond is classified GP-B (see discussion under the section on classification in the Introduction).

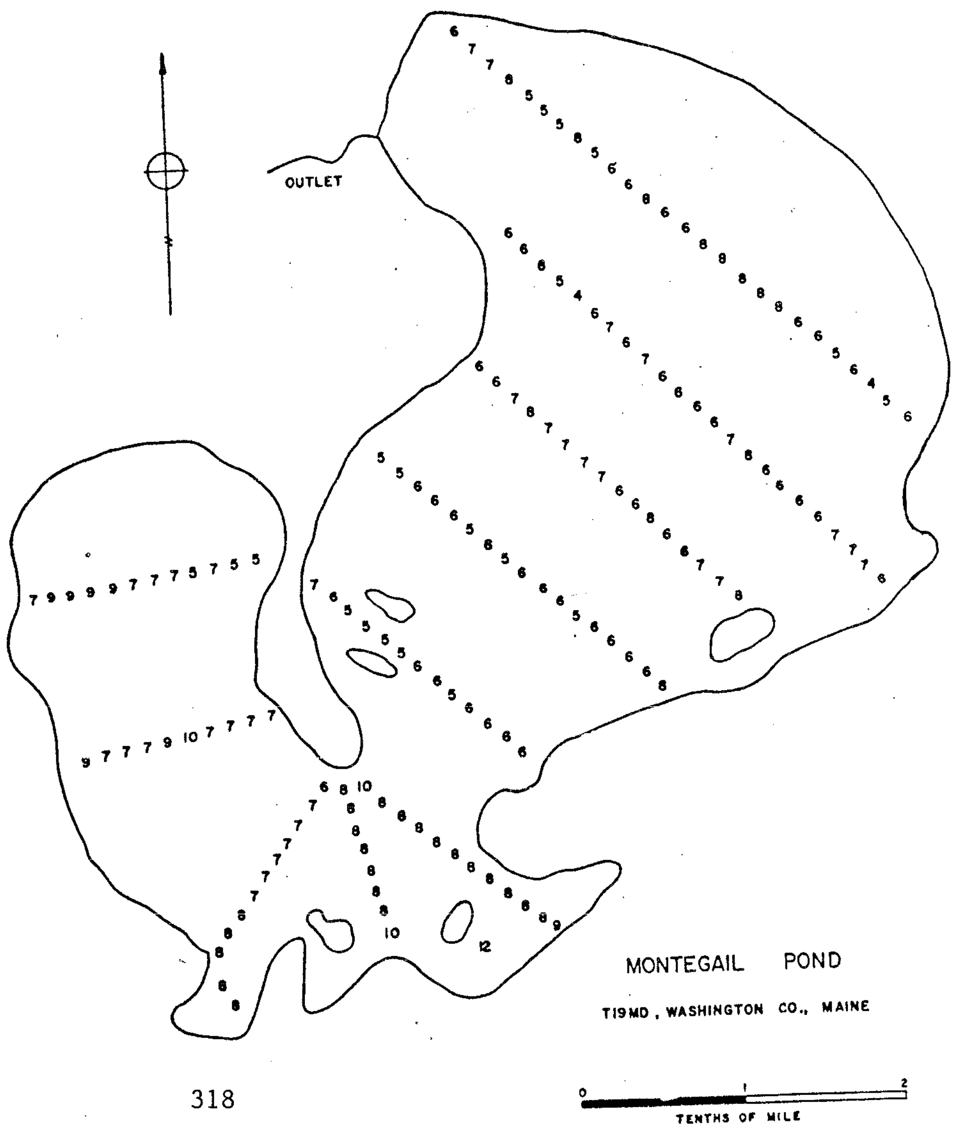
Monson pond is fairly small and shallow but has a very high flushing rate.

Due to the surrounding limestone, alkalinities, pH's and conductivities on Monson are unusually high for Maine lakes.

The pond is managed for brook trout.

Montegail Pond (Montigill Pond) # 1196

Surface Area	72.0 ha (180 a)
Max. Depth	3.6 m (12 ft)
Mean Depth	1.8 m (5.9 ft)
Volume	1.31 X 10^6 m^3 (1062 acre-feet)
Drainage Area	3.3 km^2 (1.3 mi^2)
Flushing Rate	1.6 (flushes/year)



Montegail Pond (Montigill Pond) #1196

	1982
Mean Secchi (m)	2.5+
Min. Secchi (m)	2.5
Chla(ug/l)	2.0mean
TP(ppb)	9mean
TSI	35
TSI Range	30-40 CHL-TP
pH(core)	7.0
Color	14

+ Most Secchi disk readings hit bottom

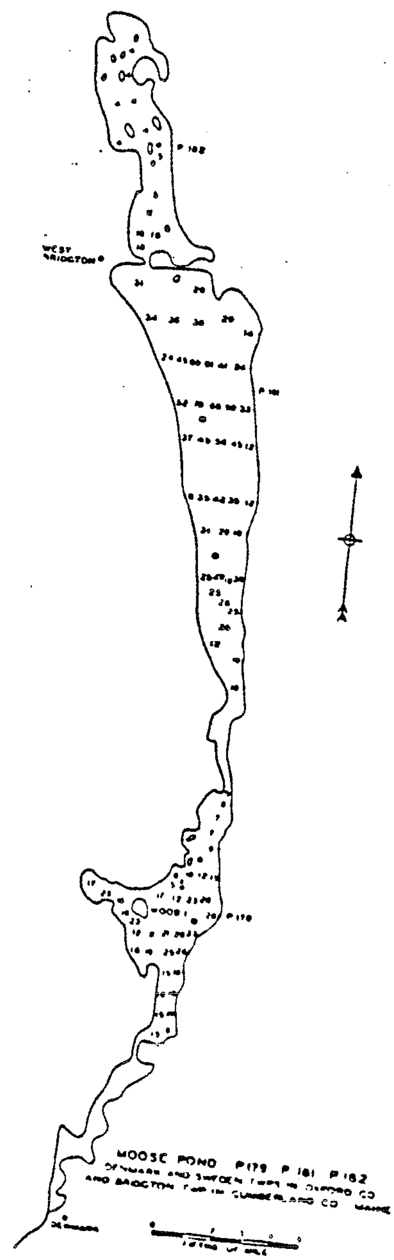
The Trophic State Index was not calculated using transparency because all but 1 Secchi disk reading hit bottom. To use transparency in this case would not be an accurate reflection of water quality. TSI based on Secchi disk is 87 versus a CHL TSI of 30 and TP TSI of 40.

In 1982, the monitor participated in the chlorophyll sampling program. The program was established in 1980 to collect additional data on lakes that were colored, or had declining water quality. The Montegail monitor also took total phosphorus samples to help us better understand the nutrient impact that blueberry barrens might have on water quality. Blueberry barrens surround Montegail Pond.

The pond was managed for brown trout but that program has been discontinued. Current management is for native brook trout.

Moose Pond #3134

Surface Area	686 ha (1694 a)
Max. Depth	21m (70 ft)
Mean Depth	6m (20 ft)
Drainage Area	66.3 km^2 (25.6 mi^2)
Flushing Rate	0.1 (flushes/year)



Moose Pond # 3134

	1976-78	1979	1980	1981	1982
North Basin (#1)					
Mean Secchi (m)	6.8*	6.7	6.5	6.9*(4)	5.7
Min. Secchi (m)	6.0*	5.0	5.8	5.5*	5.3
TSI	NA	34	35	NA	42
Color(SPU)	20			15	
pH	6.1mean			6.7(core)	
Chla(ug/l)	2.7(ls)			2.1(ls)	
TP(ppb)	9(ls)			10(c)(ls) 9(b) (ls)	
Mid-South Basin (#3)					
Mean Secchi (m)			6.6*(4)	6.2*(4)	6.3
Min. Secchi (m)			5.7	4.8	5.0
TSI			NA	NA	37
Chla(ug/l)				4.2(ls)	

* inadequate sampling season
(ls) late summer, (c) core, (b) bottom

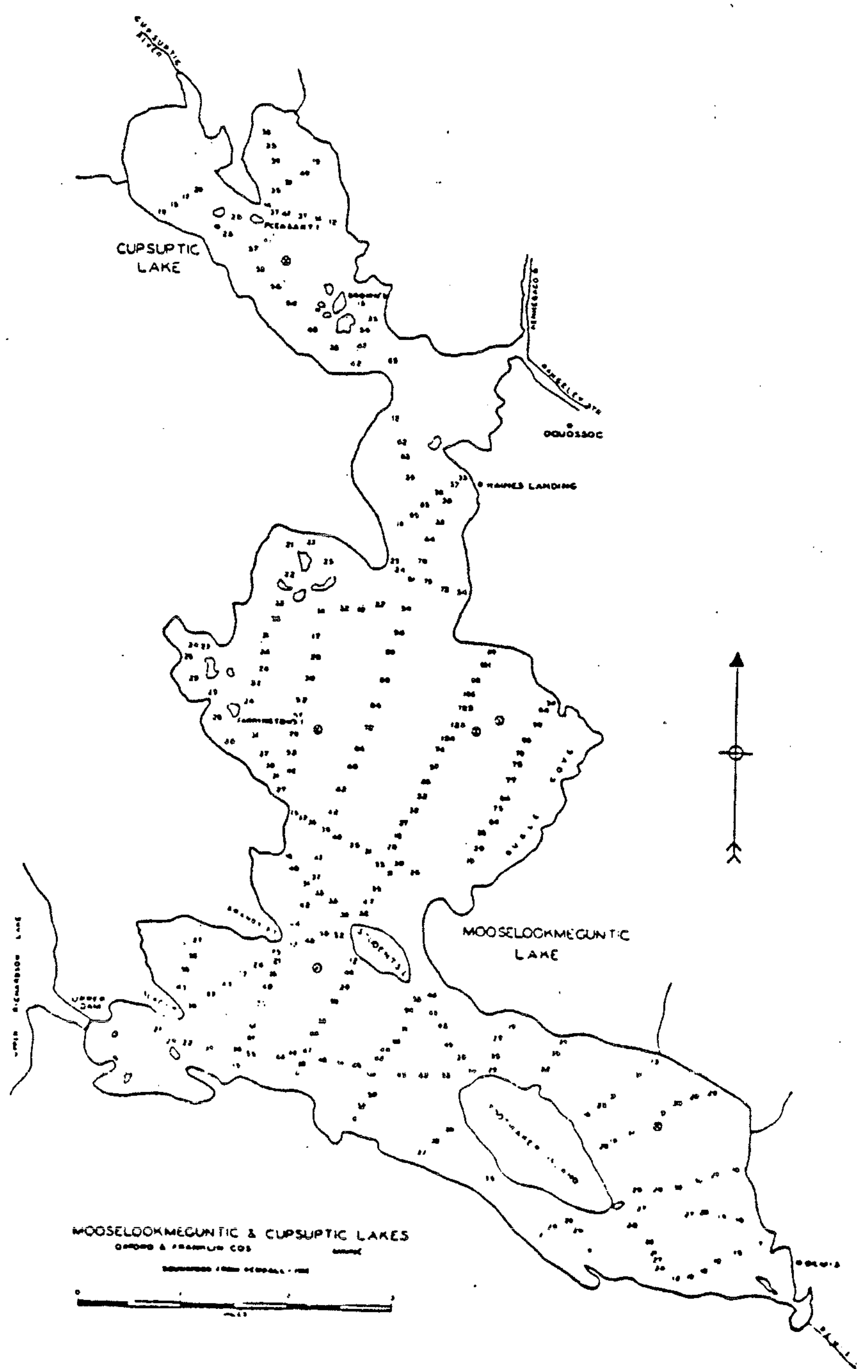
An oxygen deficiency (1-4ppm) exists below 11m.

Transparencies are above average for a Maine pond. Chlorophyll and TP levels are low to moderate. Minimum transparencies occur in June. 1982 transparencies are poorer than previous years and the cause is unknown. Continued monitoring with complete seasons is necesssary to determine if a water quality problem has been detected or if this is a natural fluctuation and transparency will improve next year.

Moose Pond is managed for togue and salmon, smallmouth bass, perch and pickeral.

Mooselookmeguntic Lake #3302

Surface Area	6,724 ha (16615 a)
Max. Depth	39.6m (130 ft)
Mean Depth	10.3m (34 ft)
Volume	6.9 X $10^8 m^3$ (560,976 acre-feet)
Drainage Area	1017.6 km^2 (392.9 mi^2)
Flushing Rate	0.9 (flushes/year)



Mooselookmeguntic Lake #3302

	1981	1982
Mean Secchi (m)	6.5	6.1
Min. Secchi (m)	5.5	4.3
TSI	35	38
Color(SPU)	NA	17
pH	5.5(mon)	5.5(mon)
Chla(ug/l)		2.1(ls)
TP(ppb)		4(c)(ls)
		4(b)(ls)

(c) core, (b) bottom, (ls) late summer, (mo) monitor

"Mooselookmeguntic and Cupsuptic Lakes are separate bodies of water that have been joined to make one lake by raising the water level of Mooselookmeguntic Lake by some 14 feet. This water level is maintained by a 20 foot dam at Upper Dam, the outlet of Mooselookmeguntic Lake."

"Mooselookmeguntic Lake, as with all the Rangeley lakes except Aziscohos, provides excellent temperatures, dissolved oxygen levels, and general water quality characteristics necessary for cold water fishes. These conditions, plus the absence of competing warm-water game fishes, provide a habitat that produces good salmon and trout fishing.(1)" The pond is managed for brown trout and togue, smallmouth and largemouth bass, perch, pickeral.

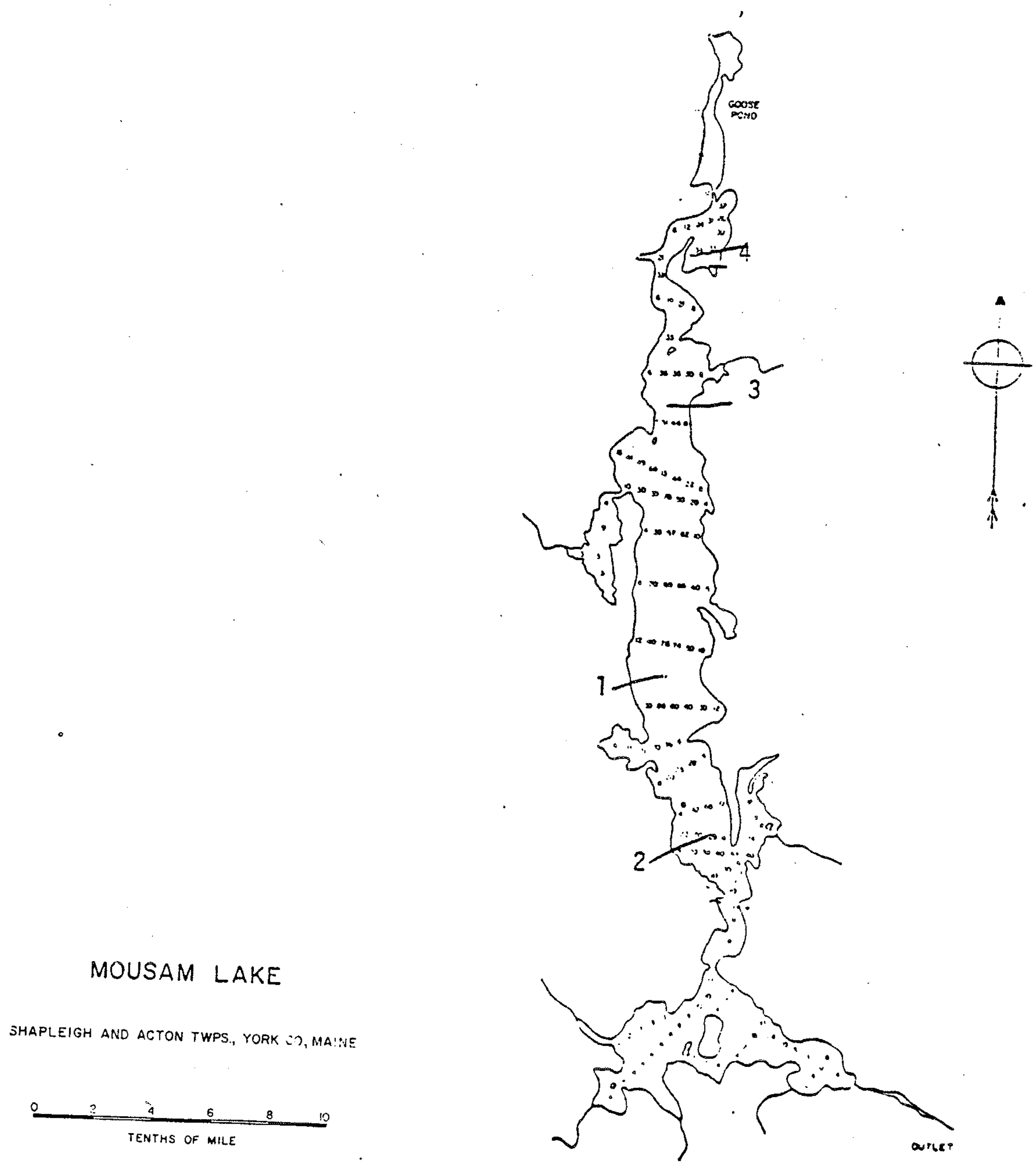
Water quality is above average. Chla and TP levels are low and transparencies are above average for a Maine lake.

A discrepancy exists between the pH readings taken by the monitor and those taken by D.E.P. The reason for the variation is not known but it may be a difference in sampling technique. The D.E.P. will be studying the problem and recommending a standard method so readings taken by monitors, the D.E.P., and other agencies will be consistent.

(1) Taken from The Department of Inland Fisheries and Wildlife Lake Survey.

Mousam Lake #3838

Surface Area	349 ha (872 a)
Max. Depth	29.4m (98 ft)
Mean Depth	6.6m (21.6 ft)
Volume	2.29 X $10^7 m^3$ (18618 acre-feet)
Drainage Area	76 km^2 (29.4 mi^2)
Flushing Rate	1.9 (flushes/year)



Mousam Lake # 3838

North Basin	1976-78	1979	1980	1981	1982
Mean Secchi (m)	6.7*	7.3*(4)	7.1	7.3	6.0
Min. Secchi (m)	5.3*	7.0*	6.1	6.4	4.7
TSI	NA	NA	31	30	39

Mid North Basin	1976-78	1979	1980	1981
Mean Secchi (m)	7.1*	7.8*(4)	8.3	7.4
Min. Secchi (m)	5.6*	7.3*	6.9	5.5
TSI	NA	NA	24	29

Mid South Basin	1976-78	1979	1980	1981	1982
Mean Secchi (m)	7.2	7.9*(4)	7.9	7.8	6.6
Min Secchi (m)	5.8	7.3*	6.4	6.7	5.2
TSI	30	NA	26	27	34
pH(core)				6.6	
Chla(ug/1)				1.3(ls)	
TP(ppb)				8(ls)	
Color(SPU)				10	

South Basin	1976-78	1979	1980	1981
Mean Secchi (m)	6.9*	7.6*(4)	8.3	7.5
Min. Secchi(m)	5.8*	6.7*	6.4	6.4
TSI	NA	NA	24	29
Chla(ug/1)	3.3(ls)			
TP(ppb)	0.2(ls)			

* Inadequate sampling season (ls) late summer

The soils around Mousam Lake are generally sandy and poorly suited to underground waste disposal systems. Local planning agencies have recognized this fact and have passed ordinances that require building lots to be large enough for construction of adequate leachfields to absorb septic wastes. Property owners should periodically pump septic tanks to assure that the leach field functions properly and prevents excess nutrients from reaching the lake.

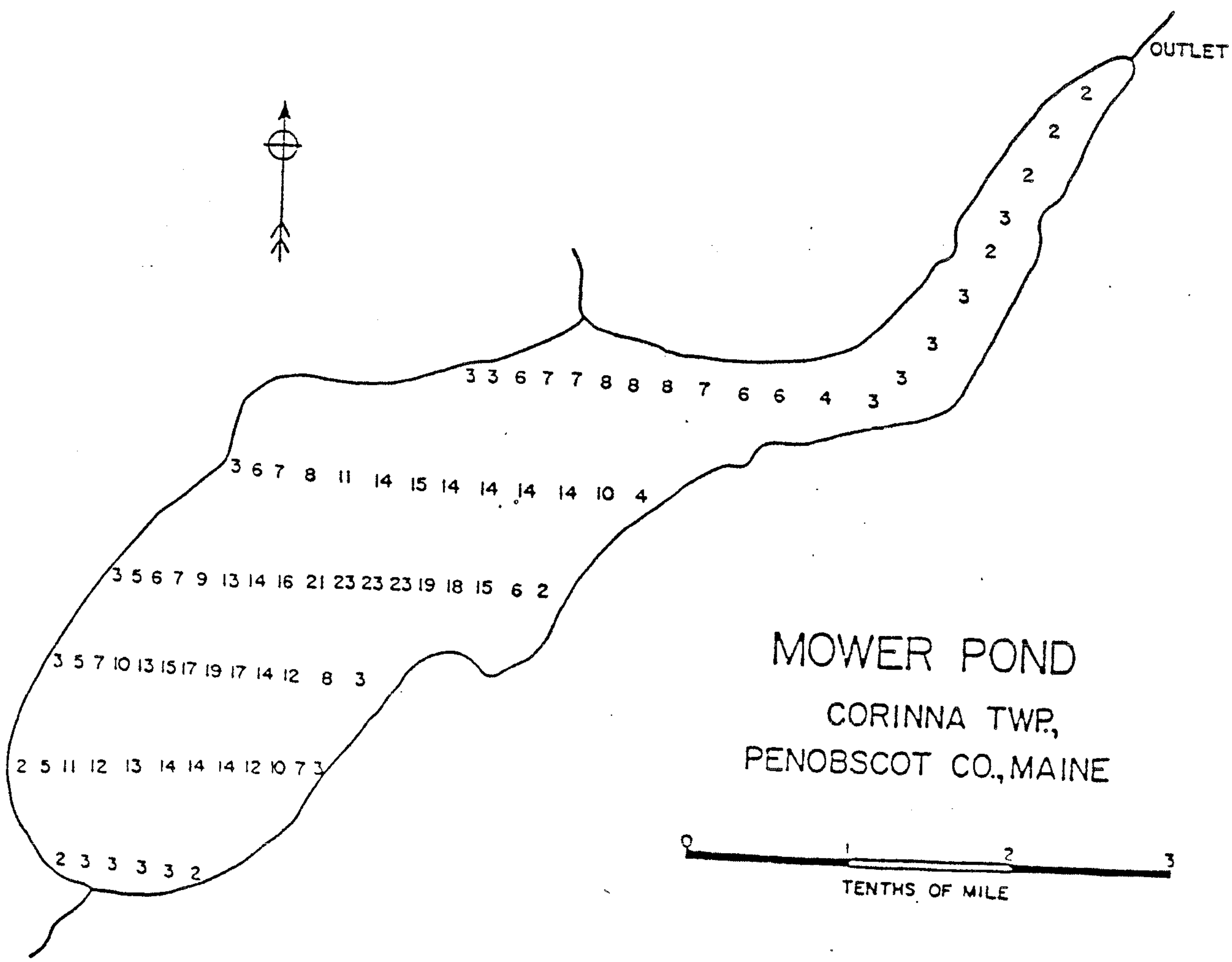
In July, 1980, routine bacteria testing by the Mousam Lake Association found high fecal coliform bacteria levels in Hamm's Cove and the Public Beach. The Beach was closed to swimming for a brief time until the bacteria counts returned to normal levels. The cause of the high bacteria was never identified, however, this incident should be a reminder to camp owners and lake users that each person is responsible for the protection of the lake's quality. The Lake Association continues to test for fecal coliform. Levels for 1981 were lower than 1980.

Water quality is above average. Some basins show an unusual amount of fluctuation in the transparencies readings, but that does not necessarily indicate any problems. Transparency declined in 1982 compared to previous years; the cause is unknown. Continued monitoring with adequate sampling periods is necessary to confirm any trends in water quality.

Mousam Lake is managed for brown trout, togue, smallmouth and largemouth bass, perch, pickeral, and smelt.

Mower Pond #5476

Surface Area	30 ha (75 a)
Max. Depth	7.0m (23 ft)
Mean Depth	2.4 m (8 ft).
Volume	7.29 X 10^5 m^3 (591 acre-feet)
Drainage Area	11.6 Km^2 (4.49 mi^2)
Flushing Rate	8.2 (flushes/year)



Mower Pond #5476

	1980	1981
Mean Secchi (m)	3.3	4.0
Min. Secchi (m)	2.1	2.8
TSI		58 CHL
Color(SPU)		35
Chla(ug/l)		
TP(ppb)	46 mean	16

(©) Sample taken near bottom; probably value is higher than a core would be.

Mower Pond was one of seven lakes tested by the Penobscot Valley Regional Planning Commission in 1980 and 1981.

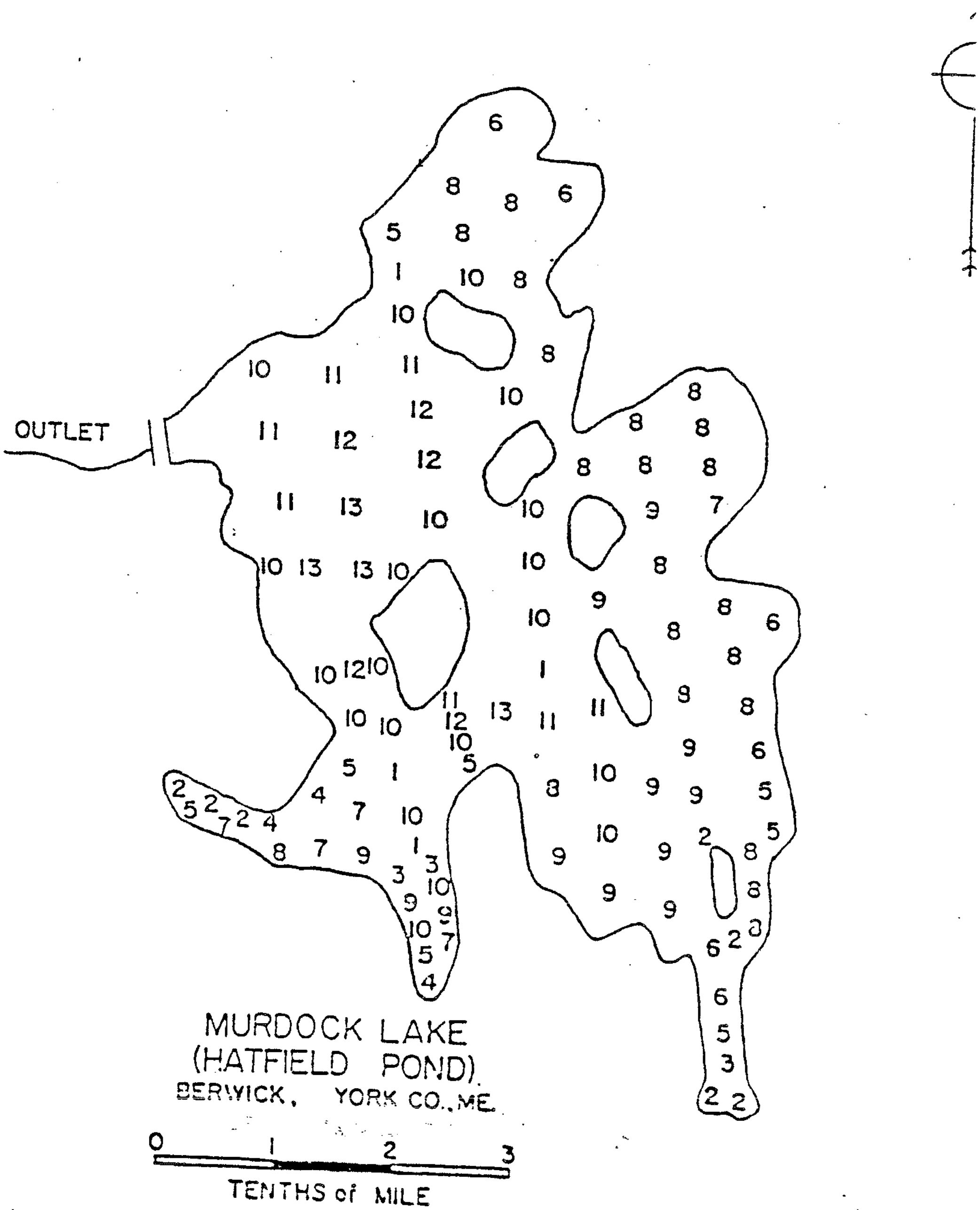
Mower Pond drains into Sebasticook lake whose water quality has been degraded over the years by direct and indirect discharges. As part of the restoration of Sebasticook's water quality, the Soil Conservation Service is helping area farmers control nutrient rich runoff from their farmlands. Data gathered on Mower Pond will be used to establish the efficiency of watershed controls.

TP and Chla values are high and transparencies are below average. Mower Pond is slightly colored which interferes slightly with transparencies and TP values.

Mower Pond is best suited for pickerel and perch.

Murdock Lake #3931

Surface Area	115 ha (284 a)
Max. Depth	3.9m (12.8 ft)
Mean Depth	2.3m (7.5 ft)
Volume	2.6 X $10^6 m^3$ (2114 acre-feet)
Drainage Area	4.9 km^2 (1.89 mi^2)
Flushing Rate	1.0 (Flushes/year)



Murdock Lake # 3931

	1981
Mean Secchi (m)	1.3*(3)
Min. Secchi (m)	1.0*
TSI	NA
Color	NA

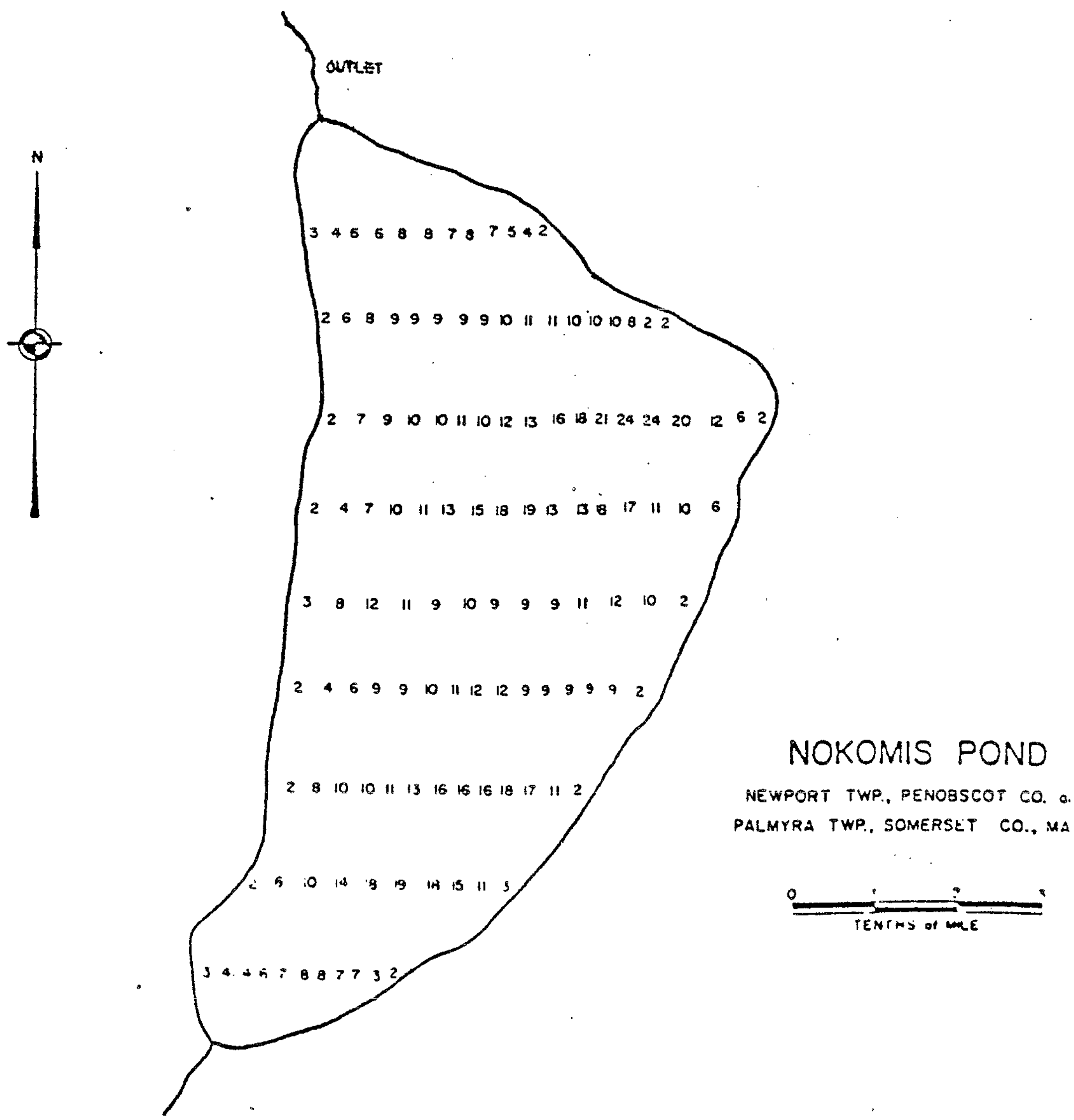
* Inadequate sampling season

Murdock lake is a man-made impoundment formed by a dam. It is managed for hornpout and pickerel.

The transparency data is much below average. This is probably due to high color since the pond was a bog before the outlet was dammed to make it into a pond.

Nokomis Pond #5480

Surface Area	80.5 ha (199a)
Max. Depth	7.3m (24 ft)
Mean Depth	2.7m (9 ft)
Volume	2.2 X $10^6 m^3$ (1789 acre-feet)
Drainage Area	5.0 km^2 (1.94 mi^2)
Flushing Rate	1.1 (Flushes/year)



Nokomis Pond #5480

	1978		1980	1981
Mean Secchi (m)	5.5		4.0	4.7
Min. SSecchi (m)	4.6		2.8	4.0
TSI	43		62	53
TSI Range			60-63	52-53
			SD-TP	SD-TP
Color				27
pH				6.7
Chl a				2.9
TP		(©)	22 mean	15 mean

(©) Phosphorus samples taken near bottom probably value higher than a core would be.

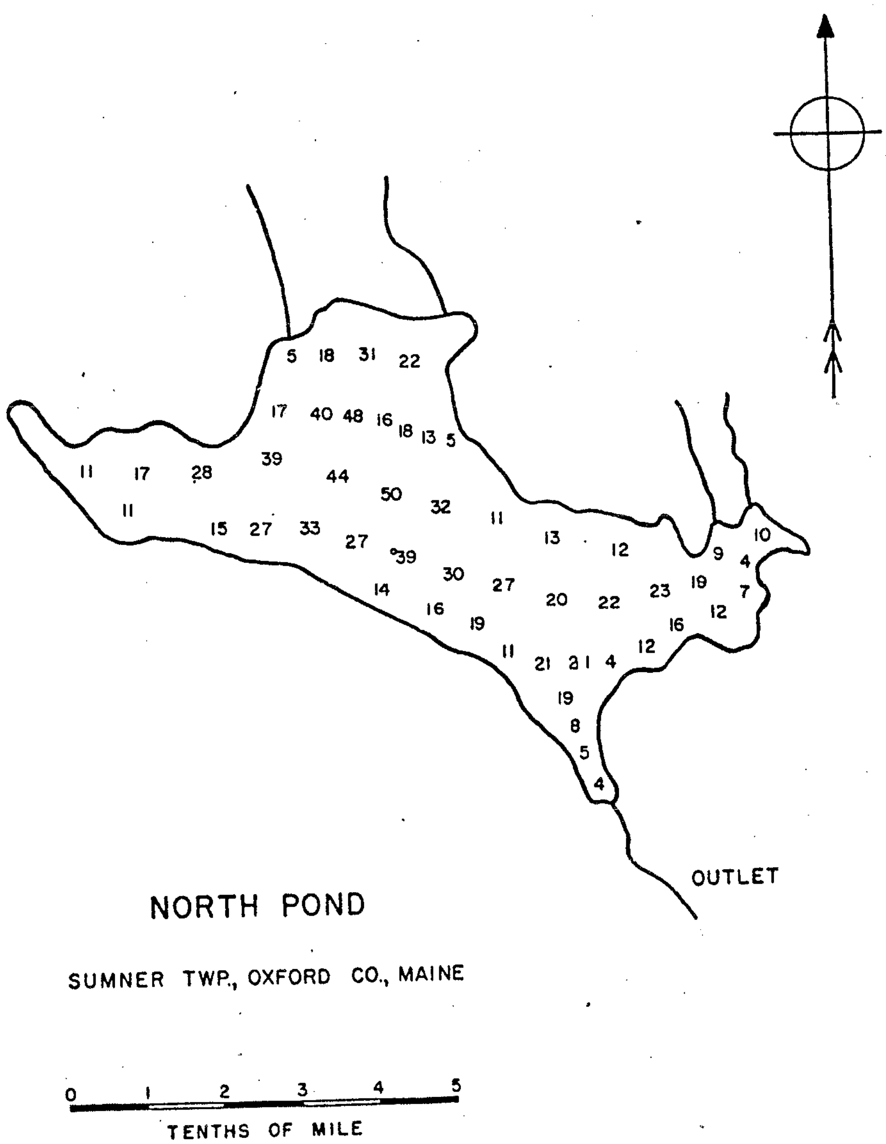
Nokomis Pond is a public water supply pond for the Newport Water District.

Nokomis Pond was one of seven lakes studied in 1980 and 1981 by Penobscot Valley Regional Planning Commission. Nokomis Pond drains into Sebasticook Lake whose water quality has been degraded over the years by direct and indirect discharges. As part of the restoration of Sebasticook's water quality, The Soil Conservation Service is helping area farmers control nutrient rich runoff from their farmland. Data gathered on Nokomis will be used to establish the efficiency of watershed controls.

TP values are moderately high since 15 ppb is considered high enough to support an obnoxious level of algae. The transparency readings fluctuate which may be due to weather or natural conditions; the transparency readings indicate average water quality.

North Pond (Buckfield) #3616

Surface Area	63 ha(158 a)
Max. Depth	15.0 m (50.0 ft)
Mean Depth	5.6 m (18.5 ft)
Volume	3.52 X 10^6 m^3 (2853 acre-feet)
Drainage Area	4.2 km^2 (1.6 mi^2)
Flushing Rate	0.7 (flushes/year)



North Pond (Buckfield) # 3616

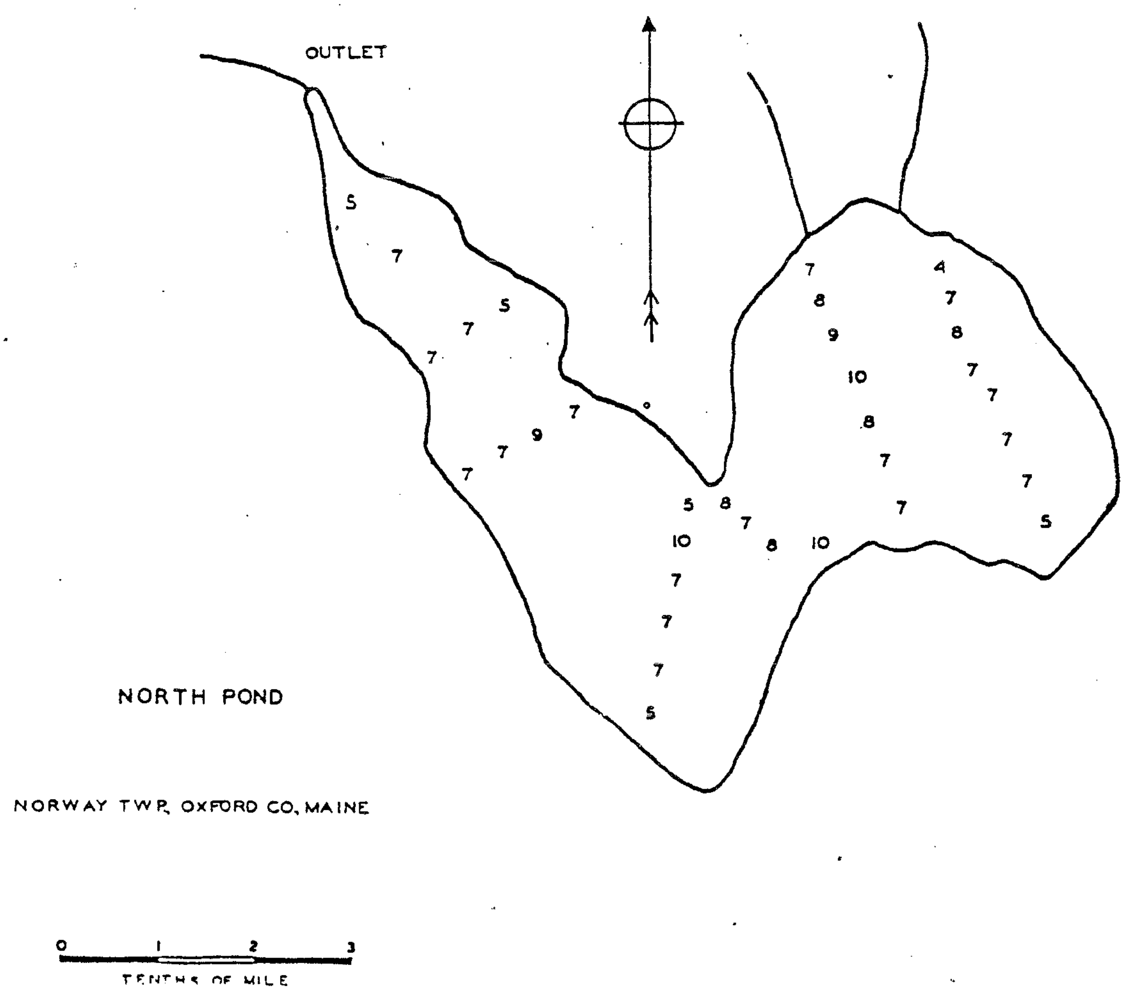
	1982
Mean Secchi (m)	6.8
Min. Secchi (m)	5.0
TSI	33
Color(SPU)	15

Secchi disk transparency is above average for Maine Lakes indicating excellent water quality. Continued monitoring is necessary to predict water quality trends. The slow flushing rate and small volume may indicate that the pond is sensitive to water quality degradation.

There is some oxygen depletion (2 ppm) in the bottom water by late summer. The pond is managed for brook trout and smallmouth bass.

North Pond (Norway) #3500

Surface Area	67 ha (168a)
Max. Depth	3.0m (10 ft)
Mean Depth	1.8m (5.9 ft)
Volume	1.2 X $10^6 m^3$ (976 acre-feet)
Drainage Area	3.4 km^2 (1.3 mi^2)
Flushing Rate	1.6 (flushes/year)



North Pond (Norway) # 3500

	1978	1979	1980	1981	1982
Mean Secchi (m)	2.8*(3)	3.0+	3.0+	2.9+	2.9+
Min Secchi (m)	1.5	3.0		2.5	2.1
TSI		76	76	78	78
Color(SPU)			20		
pH(core)	6.6mean	6.7mean	6.9 mean	7.0 mean	7.0 mean
Chla(ug/l)			4.0 (ls)(suf)		
TP(ppb)			17 (suf)(ls)		

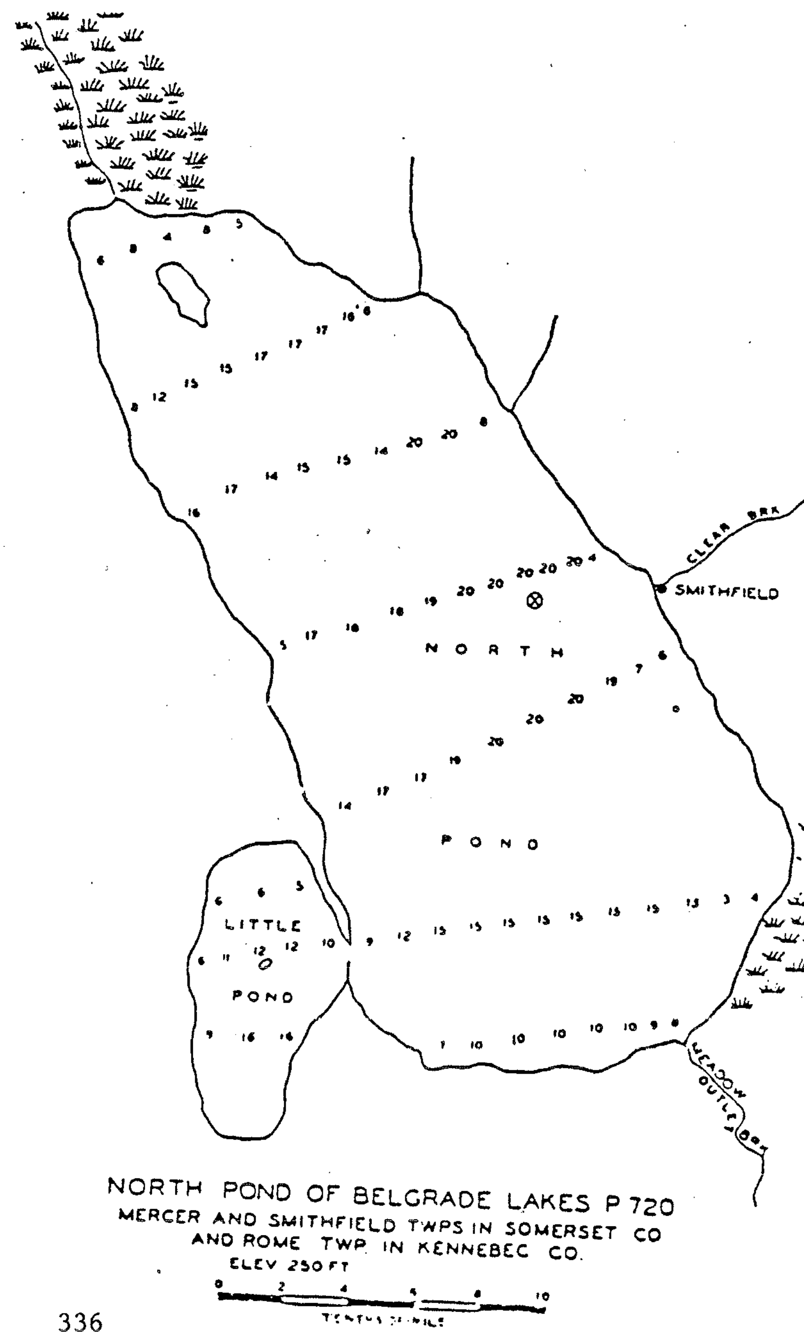
+ Readings hit bottom
* Inadequate sampling season
(ls) late summer, (suf) surface

The TSI is not accurate (water quality is underestimated) due to the lake being so shallow that the Secchi disk usually hits bottom. Water quality has remained stable. Chlorophyll levels are moderate. TP levels are high; 15 ppb is considered sufficient to support algal blooms. Care should be exercised by all lake users and residents of the watershed not to increase the nutrient loading to the lake and to try to reduce the load to the lake.

The lake does not stratify. Fish management is restricted to pickeral.

North Pond (Smithfield) · #5344

Surface Area	864 ha (2115 a)
Max. Depth	6.0m (20 ft)
Mean Depth	4.0m (13 ft)
Volume	3.6 X $10^6 m^3$ (2927 acre-feet)
Drainage Area	74.7 km^2 (28.9 mi^2)
Flushing Rate	1.0 (Flushes/year)



North Pond (Smithfield) # 5344

	1970-72	1978	1979	1980	1981
Mean Secchi (m)	4.2	4.2*(3)	5.1	4.7+	4.5*(4)
Min. Secchi (m)	2.9	4.0*	3.5	3.9	4.0
TSI	58	NA	47	52+	NA
Color					15
pH		7.0mean			6.4
Chla		2.7(ls)			2.8(ls)
TP		11(suf)(ls) 12(b)(ls)			17(ls)

+ Many Secchi disk readings hit bottom
* Inadequate sampling season
(ls) late summer, (suf) surface

An algae bloom was documented in 1970 but none have been documented since. North Pond was studied from 1970 through 1972 by Davis and Scott and the data is discussed in Descriptive and Comparative Studies of Maine lakes, Davis et al, 1978.

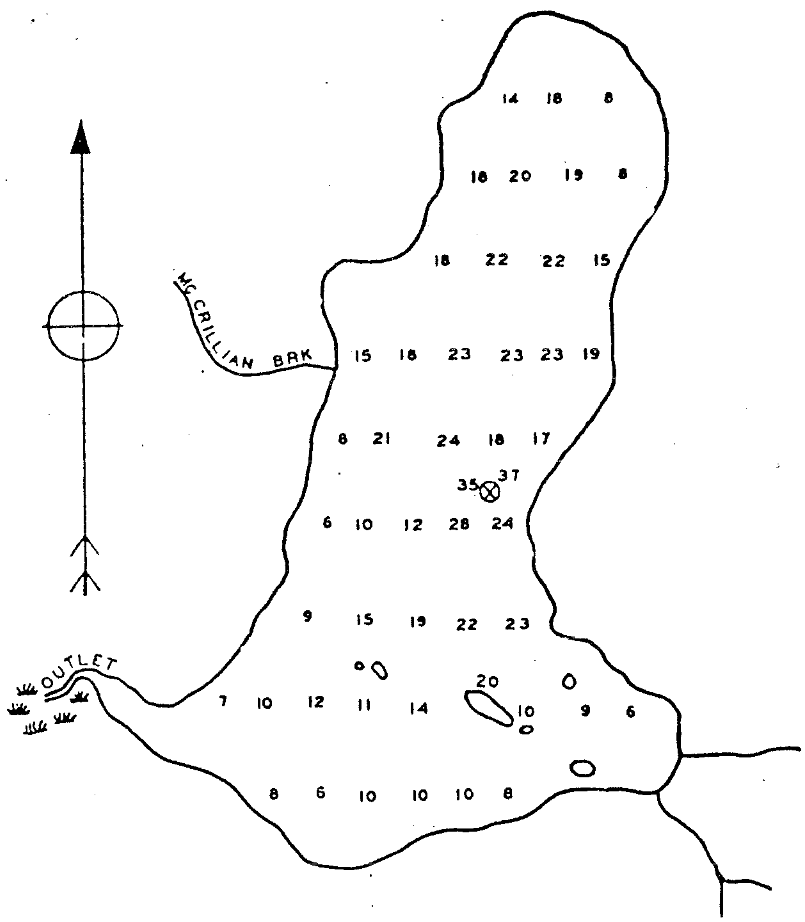
In 1980, all Secchi disk readings greater than 5.0m hit bottom thus TSI underestimates water quality because if the lake were deeper, the readings would have been deeper and the TSI would be better. In 1981, only one reading hit bottom.

TP values for 1981 were fairly high, but Chla was moderately low. Continued monitoring with adequate sampling seasons will be necessary in order to determine any trends in water quality.

North Pond is best suited for warmwater fish.

North Pond (Woodstock) #3460

Surface Area	124 ha (310 a)
Max. Depth	11.1 m (37 ft)
Mean Depth	3.9 m (12.9 ft)
Volume	4.86 X 10^6 m^3 (3940 acre-feet)
Drainage Area	10.4 km^2 (4.0 mi^2)
Flushing Rate	1.2 (flushes/year)



NORTH POND P 521

WOODSTOCK AND GREENWOOD TWPS. OXFORD CO.

ELEV. 719 FT.

0 1 2 3 4 5
TENTHS OF MILE

North Pond (Woodstock) # 3460

	1982
Mean Secchi (m)	4.8
Min. Secchi (m)	4.4
TSI	50
Color(SPU)	10

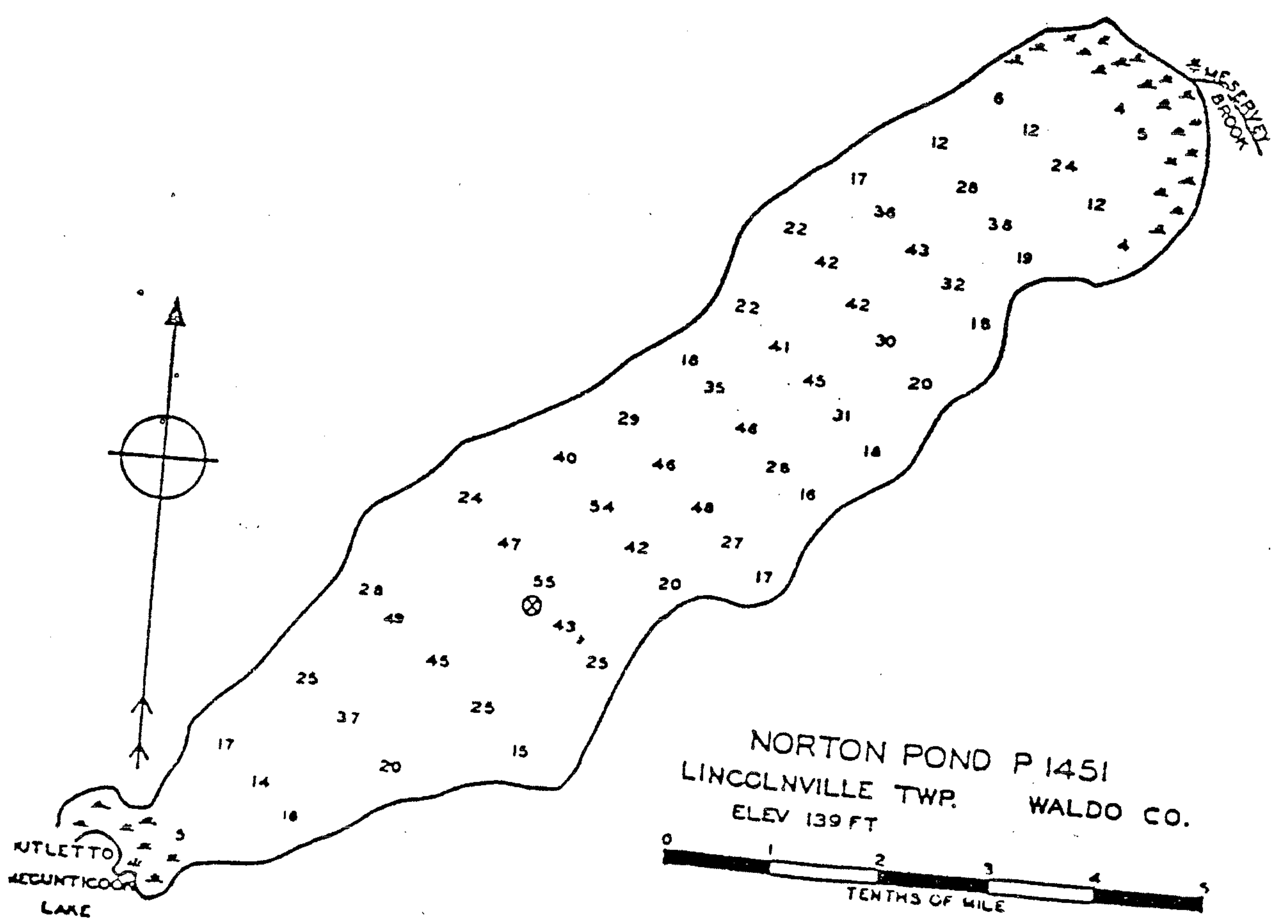
Water quality appears to be about average for Maine lakes. Additional years of monitoring will be necessary to accurately determine water quality trends. Transparencies are slightly below average for Maine lakes.

The hypolimnion, the cold bottom water, is only a small layer of water too low in dissolved oxygen by late summer (0 ppm) to support most trout species. The pond is managed for largemouth and smallmouth bass, perch and pickeral.

The Department of Inland Fisheries and Wildlife is considering stocking the pond with brown trout.

Norton Pond #4850

Surface Area	41 ha (101 a)
Max. Depth	16.8m (55 ft)
Mean Depth	7.7 m (25.4 ft)
Volume	3.1×10^6 m^3 (2530 acre-feet)
Drainage Area	23.5 km^2 (9.1 mi^2)
Flushing Rate	4.4 (flushes/year)



Norton Pond #4850

	1975-78	1979	1980	1981	1982
Mean Secchi (m)	4.8*	4.2	5.0	4.4	4.7
Min. Secchi (m)	3.6*	2.8	3.2	3.5	4.0
TSI	NA	Colored	Colored	Colored	colored
Color(SPU)			35	40	
pH(core)			6.4mean		
Chla (ug/l)	4.2(ls)		1.8(ls)		
TP (ppb)	11(ls)		10(ls)		

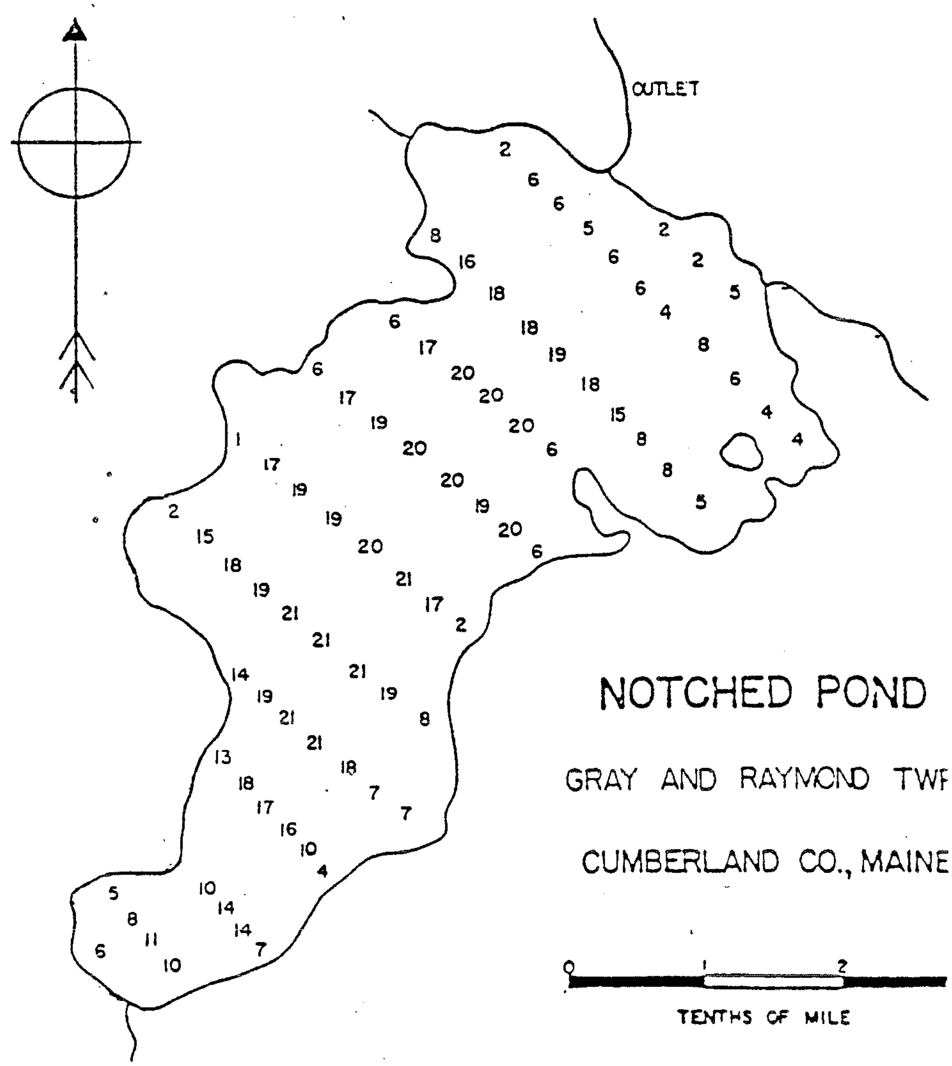
* Inadequate sampling season
(ls) late summer

Although some salmon and trout are found in Norton Pond, the lack of oxygen in the hypolimnion (1-5 ppm) precludes a good cold water fishery. The pond is managed for warm water fish.

Water quality is average for a Maine pond. Chlorophyll levels which are the best indicator of water quality in a colored lake vary from low to moderate. Total phosphorus is moderate as well. Transparency readings fluctuate slightly but no trends are apparent and water quality appears to be stable.

Notched Pond #3706

Surfce Area	29 ha (72 a)
Max. Depth	6.4m (21 ft)
Mean Depth	3.5m (11.6 ft)
Volume	1.01 X 10^6 m^3 (819 acre-feet)
Drainage Area	2.2 km^2 (.85 mi^2)
Flushing Rate	1.1 (flushes/year)



Notched Pond #3706

	1976-78	1979	1980	1981	1982
Mean Secchi (m)	5.3+	5.8+	5.6+	5.4+	5.4*(3)
Min. Secchi (m)	3.5	5.2	4.4	4.6	5.2
TSI	45	41	43	44	NA
Color(SPU)	20		20		
pH	6.8			6.7(f)(c)	
Chl<u>a</u>(ug/l)	3.7mean 2.3(ls)			4.6(f)	
TP(ppb)	5 (s)(ls) 16(b)(ls) 14(spr) 4(spr)			9(f)	

\+ Some readings hit bottom
(f) fall, (ls) late summer, (spr) spring, (s) surface, (b) bottom, (c) core

---

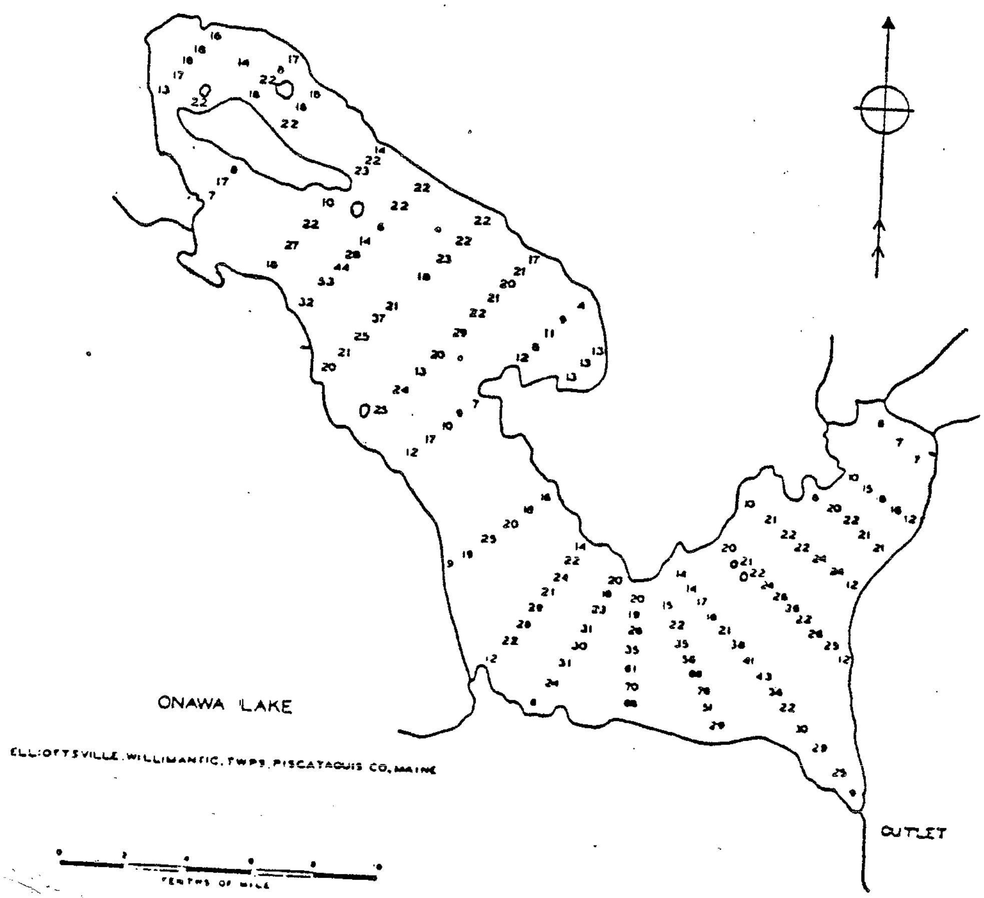
Water quality is underestimated since some Secchi disk readings hit bottom. If the lake was deeper, the TSI would be better. Water quality appears to be stable and about average for Maine ponds. Chlorophyll <u>a</u> and total phosphorus levels are moderate.

Greater Portland Council of Governments (GPCOG) study in 1976 considered Notched to be a potential water quality problem area. High values (Chl<u>a</u> 7.1 and TP 14) did occur in the spring of 1976 but the rest of the season maintained good water quality. The rest of the data indicates good water quality without any problem dates. It is true someday Notched Pond may exhibit problems but they are not apparent today. If land owners are careful and maintain good land use practices there should be no problem. The slow flushing rate (1.1 flushes/year) and small volume indicate that the pond is sensitive to TP loading which makes protection even more important.

Notched Pond is managed for pickeral and largemouth bass.

Onawa Lake #0894

Surface Area	544 ha (1,344 a)
Max. Depth	22.8m (76 ft)
Mean Depth	6.1 m (20 ft)
Volume	3.2 X 10^7 m^3 (26126 acre-feet)
Drainage Area	134 Km^2 (52 mi^2)
Flushing Rate	2.9 (flushes/year)



Onawa Lake # 0894

	1976-78	1979	1980	1981	1982
South Basin					
Mean Secchi (m)	4.9	4.7	4.2	5.2	5.5
Min. Secchi (m)	3.8	4.1	2.6	3.7	3.8
TSI	50	51	58	39	43
TSI Range				32-46 CHL-SD	
Color(SPU)			30	22	
pH(core)				6.8	
Chla(ug/l)			2.4(s)(ls)	2.2mean	
TP(ppb)	7(ls)		4(ls)	7(ls)	
North Basin					
Mean Secchi (m)	4.4	4.2	3.8	4.8	4.8
Mean Secchi (m)	3.4	3.5	2.0	3.8	4.1
TSI	55	57	63	50	50

(s) surface, (ls) late summer

During the summer of 1976, electric power lines were extended into the south shore of this relatively undeveloped lake. With electricity available many cottage owners will undoubtedly install flush toilets, showers, washing machines, and other conveniences. Every effort should be made to keep septic wastes and gray water (shower and wash water) out of the lake. Proper disposal of wastes is essential to assure continued high water quality in Onawa lake.

The lake supports a cold water fishery of salmon and trout.

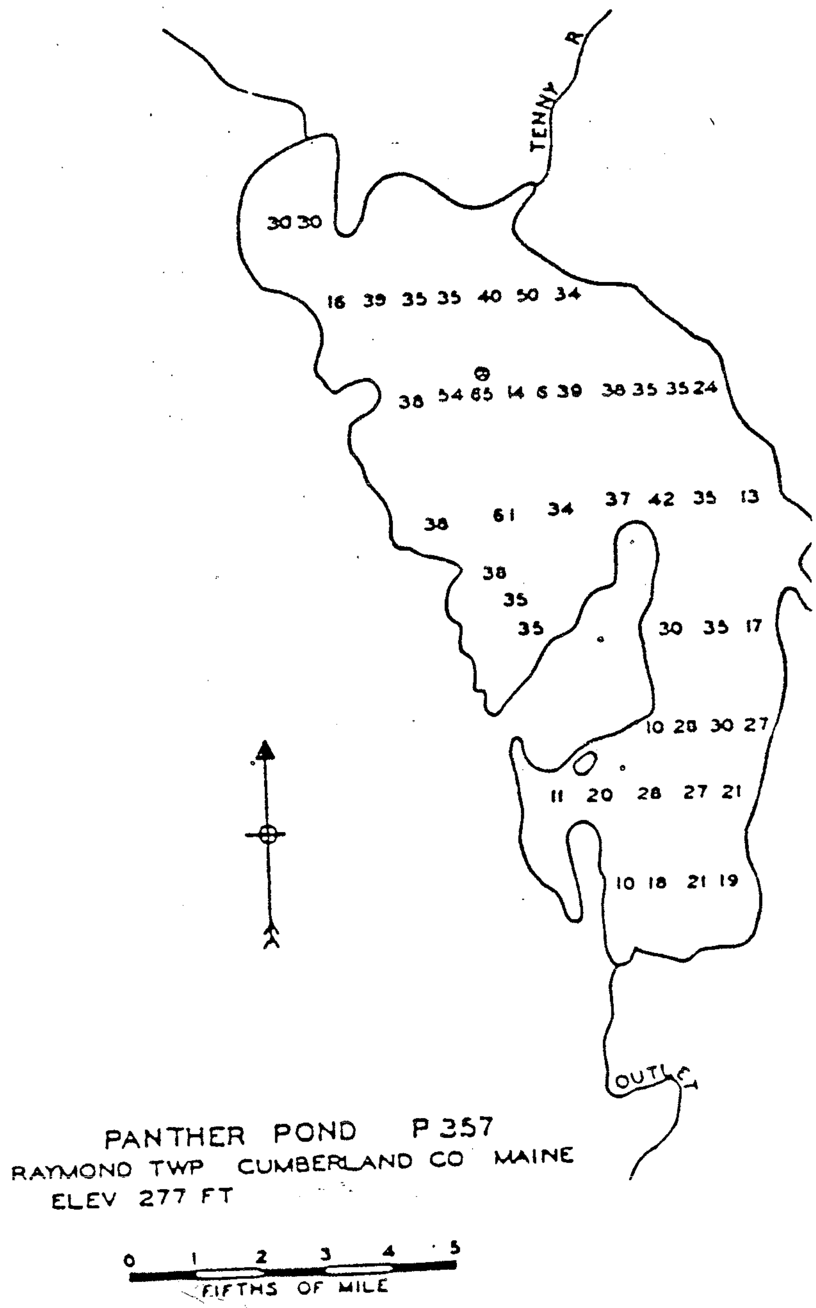
Onawa was one of several volunteer monitor lakes which particpated in a chlorophyll sampling program in 1981. Onawa was chosen because of the poorer transparency readings in 1980, however, 1981 and 1982 readings improved to even better levels than before. The rêason for the fluctuation is not known.

Transparency readings for the past 2 years are average for Maine lakes. Chlorophyll a and total phosphorus values are low to moderate.

In 1981, there was a problem with siltation due to an illegal logging operation within the drainage area of the lake. Cottage owners voiced concern that such siltation might affect the water quality of Onawa Lake. The problem was investigated by the State.

Panther Pond #3694

Surface Area	582 ha (1439 a)
Max. Depth	19.8m (65 ft)



Panther Pond # 3694

	1974(x)	1975(x)	1976(x)	1981
Mean Sechhi (m)	6.7	7.8	6.3	7.0*(3)
Min. Secchi (m)	5.2	5.6	4.9	4.9*
TSI	36	31	37	NA
TSI Range	34-37	27.34	37.38	
	SD-TP	SD-TP	TP,SD,CHL	
Color	10 (surf)	10(surf)		
Chla	2.6mean	2.1mean	2.8mean	
TP	8mean	7mean	8mean	
pH	6.9(surf)	6.7(surf)		

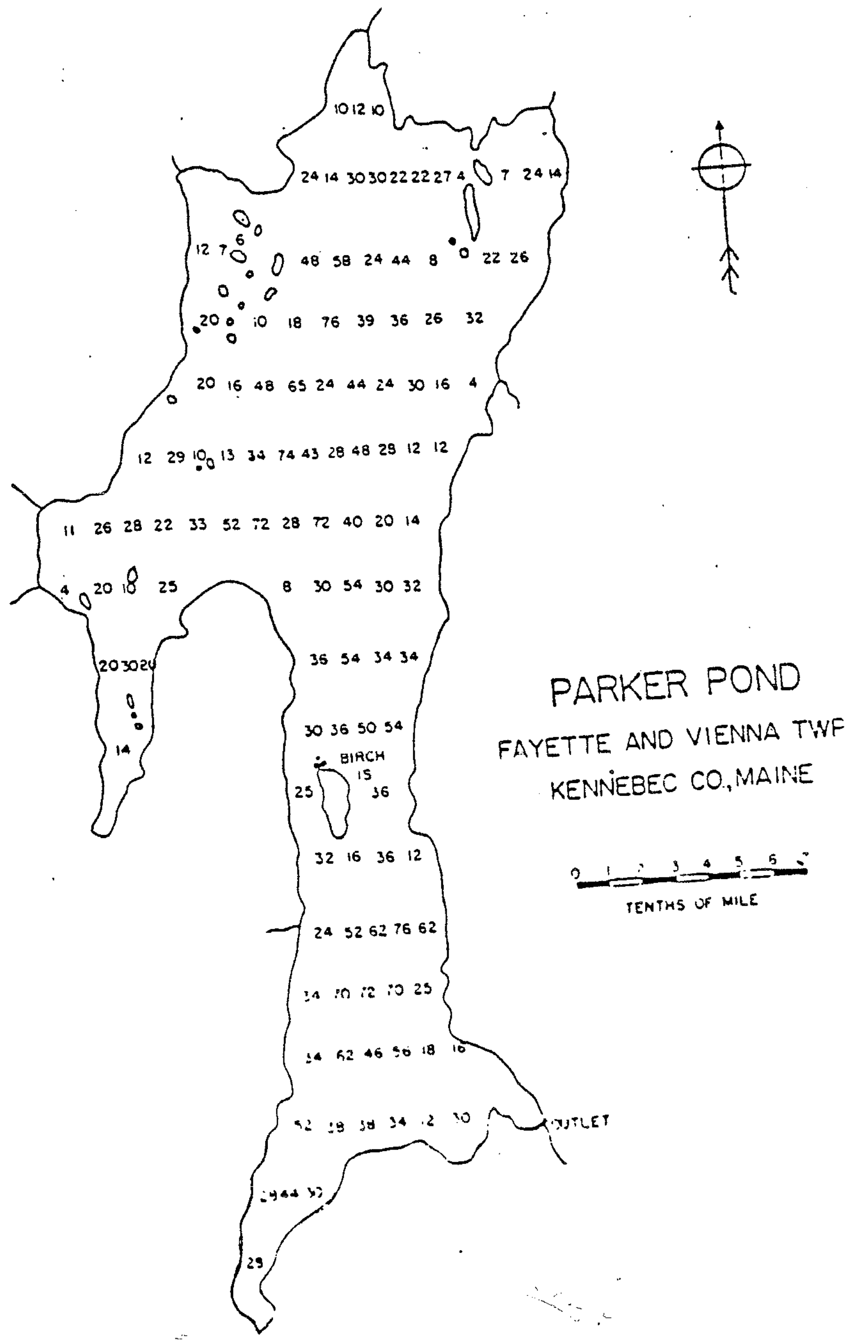
* Inadequate sampling season
(surf) surface
(x) Panther Pond was one of the lakes which was studied from 1974-1976 by DEP and USGS.

The pond is managed for salmon and also supports large numbers of smallmouth bass which provide excellent summer fishing.

Transparencies fluctuate but overall water quality is above average. The fluctuation may be due to weather, or natural conditions

Parker Pond #5186

Surface Area	628 ha (551 a)
Max. Depth	23.2m (76 ft)
Mean Depth	8.2 m (27 ft)
Volume	51.36 X $10^6 m^3$ (41632 acre-ft)
Drainage Area	39.6 km^2 (15.3 mi^2)
Flushing Rate	0.4 (flushes/year)



Parker Pond #5186

	1976	1980	1981	1982
Mean Secchi (m)	6.3	7.0	6.2*(2)	6.6
Min. Secchi (m)	5.3	6.0	6.0*	6.0
TSI	33	32	NA	35
TSI Range	31-37 TP-SD			
Color(SPU)			10	
pH(core)			6.8	
Chla(ug/l)	2.2 mean		2.0(ls)	
TP(ppb)	6.2.mean		6.0(ls)	

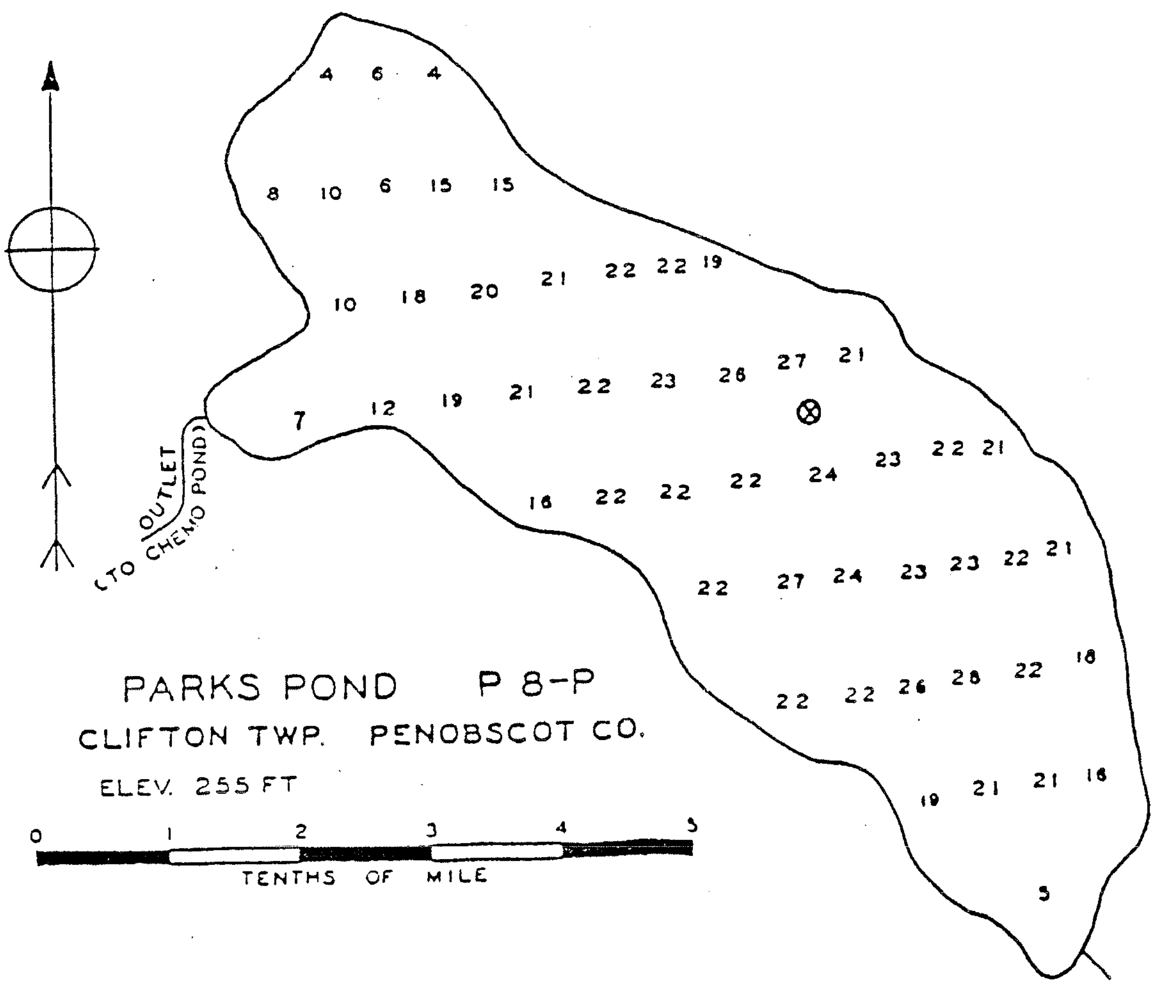
* Inadequate sampling season
(ls) late summer

Parker Pond has high water quality. Chla and TP levels are low, and transparencies are above average and remain relatively stable. However, due to a slow flushing rate, water quality is vulnerable to the effects of increased nutrient loadings. Cottage owners, lake users and residents of the watershed should exercise caution to avoid harming the lake's water quality.

Parker Pond is managed for landlocked salmon and brook trout.

Parks Pond #4272

Surface Area	50.2 ha (124 a)
Max. Depth	8.5m (28 ft)
Meam Depth	5.2 m(17 ft)
Volume	2.6 X 10^6 m^3 (2111 acre-feet)
Drainage Area	12.1 Km^2 (4.67 mi^2)
Flushing Rate	2.43 (flushes/year)



Parks Pond # 4272

	1980	1981	1982
Mean Secchi (m)	4.5	4.5	4.6
Min. Secchi (m)	3.5	3.7	3.7
TSI	54	54	53
Color(SPU)		25	
pH(core)		6.5	
Chl*a*(ug/l)		2.5 (ls)	
TP(ppb)		11 (ls)	

(ls) late summer

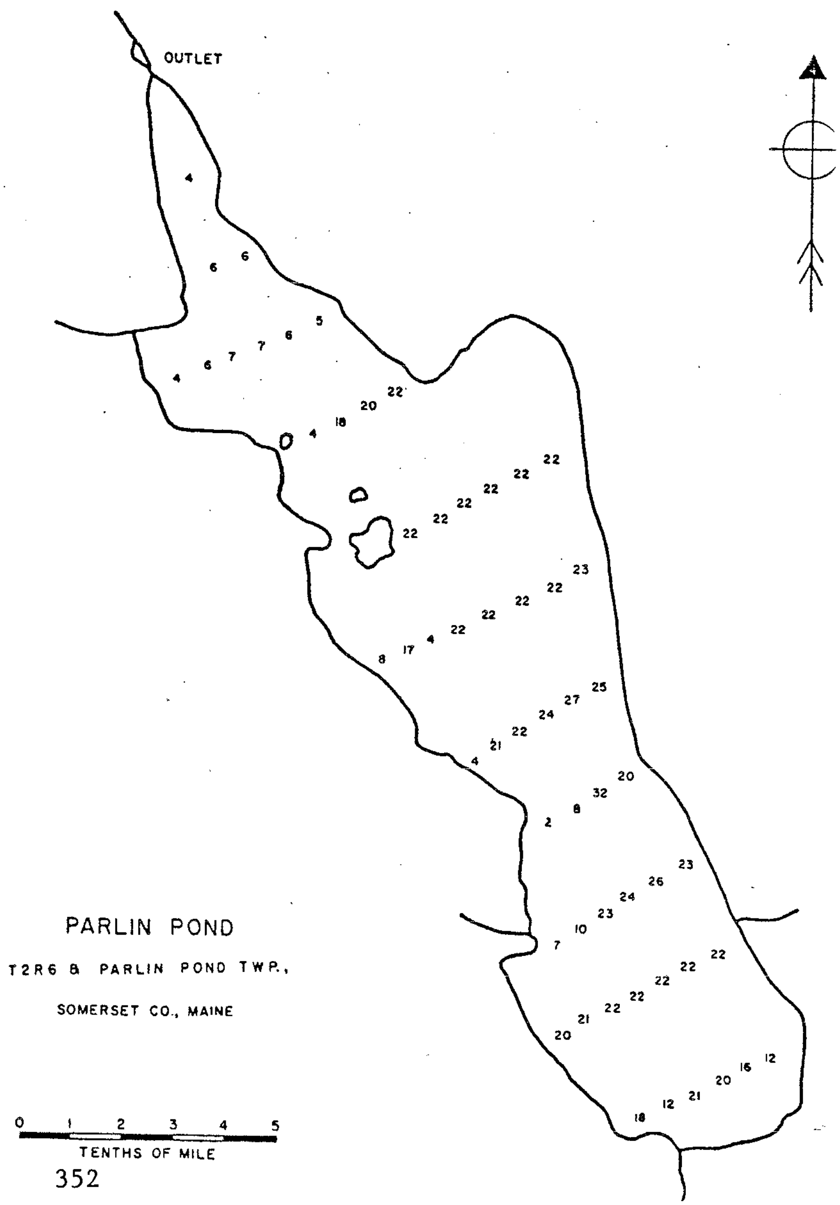
Parks Pond is a shallow warmwater pond which supports a fishery of bass, perch, and pickerel.

Water quality is good; transparencies are slightly below average for Maine lakes and have remained stable. Chlorophyll *a* levels are low and TP values are moderate.

Moderate water color may be affecting transparencies and TP. Water color reduces Secchi disk readings and interferes with TP analysis but does not affect water quality.

Parlin Pond # 2544

Surface Area	224 ha (560 a)
Max. Depth	9.6 m (32 ft)
Mean Depth	4.5 m (14.8 ft)
Volume	$9.98 \times 10^6\ m^3$ (8090 acre-feet)
Drainage Area	45.4 km^2 (17.5 mi^2)
Flushing Rate	2.8 (flushes/year)



Parlin Pond # 2544

	1982
Mean Secchi (m)	4.4*(3)
Min. Secchi (m)	4.0
TSI	NA
Color(SPU)	25
Chla(ug/l)	2.5(ls)
TP(ppb)	8(c)(ls)
pH(core)	6.6

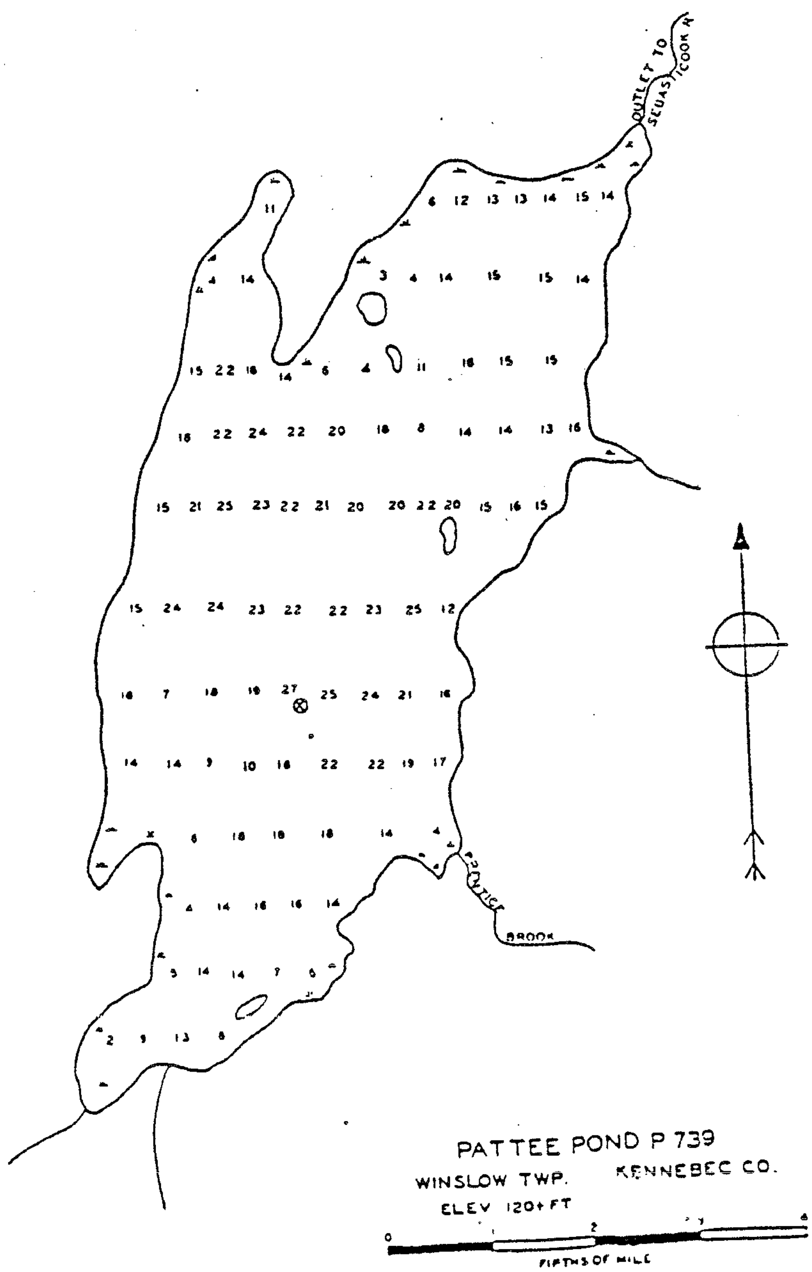
* inadequate sampling season
(c) core (ls) late summer

Parlin Pond is managed for brook trout and salmon. In 1982, the pond was open to flycasting and trolling with a length limit of 12" and a 2 fish limit.

Transparency for Parlin Pond is slightly below average for Maine Lakes. Total phosphorus levels are moderate and chlorophyll values are low. Continued transparency sampling for a full season is necessary to establish any trends and confirm water quality status.

Pattee Pond #5458

Surface Area	202 ha (505 a)
Max. Depth	8.2m (27 ft)
Mean Depth	4.4m (15 ft)
Volume	8.93 X $10^6 m^3$ (7300 acre-ft)
Drainage Area	44.1 km^2 (17.0 mi^2)
Flushing Rate	2.3 (Flushes/year)



Pattee Pond #5458

	1970-78X	1979	1980	1981	1982
Mean Secchi (m)	2.8	2.5	3.2*(3)	2.6(7)	2.9
Min. Secchi (m)	1.8	1.8	2.8	1.7	2.0
TSI	82	87	NA	70	69
TSI Range				56-85 TP-SD	60 - 78 TP - SD
Chl*a*(ug/l)	14.3	13.4(f)		8.5mean	8.5(c)(ls)
TP(ppb)	12 (spr)	19(ls)		17mean	20mean
Color(SPU)		40			

* Inadequate sampling season
(spr) spring, (f) fall, (c) core, (ls) late summer
X The pond was studied by Scott, and Davis, Descriptive and Comparative Lakes Studies, Ronald Davis, et al, 1978.

Pattee Pond is a shallow, productive pond which maintains only a weak, short term thermal stratification during the summer. Mild algal blooms of short duration occur annually. Chl*a* levels and TP values are high.

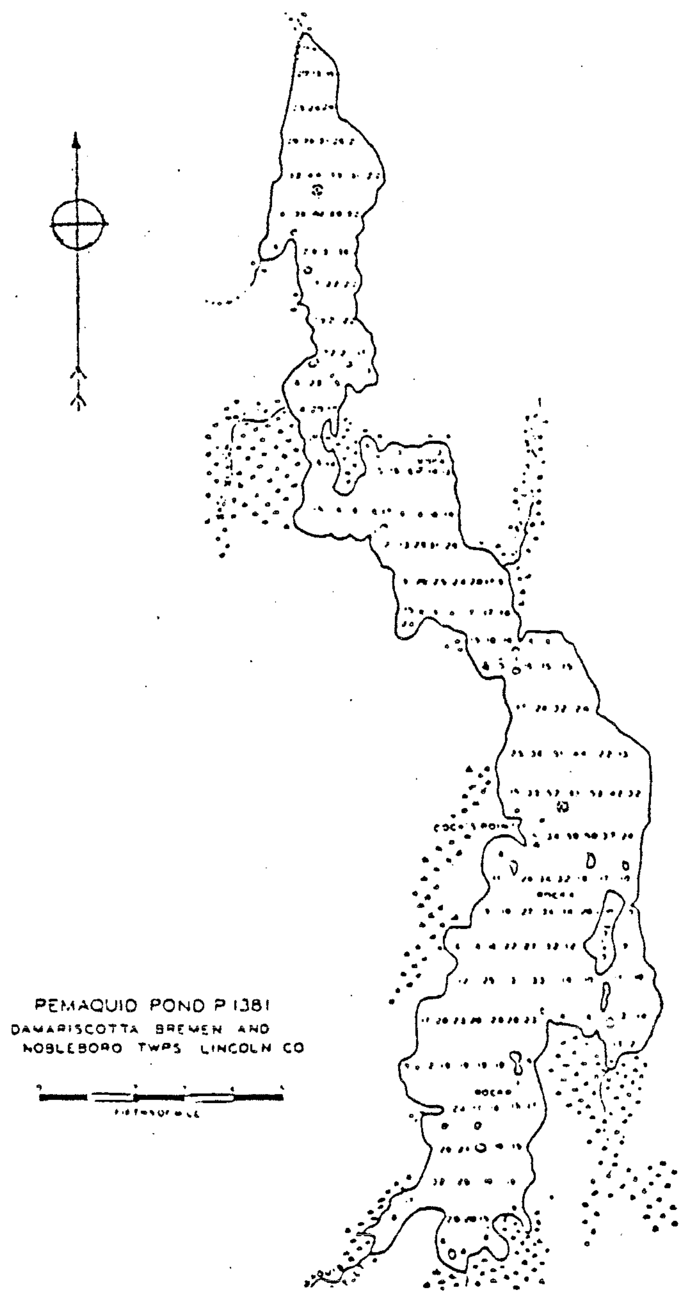
Historically, much of the Pattee Pond watershed was devoted to agriculture. It is suspected that past agricultural practices are largely responsible for the present condition of the pond. The economic situation over the past few years has caused many farms to drop out of production so that presently there is only one active farm in the pond's watershed, and only a small portion of this farm is in the watershed. This economic misfortune may be a blessing to the lake's water quality.

The shoreline is extensively developed. Much of this development occurred in the 1940's and 50's and, as a result, many cottages have marginal if not inadequate sewage disposal systems. The recently revived Pattee Pond Association has initiated a large scale and effective campaign to renovate systems which appear to be inadequate. Thus far cooperation has been exceptional from most of the affected cottage owners.

The pond is managed for warmwater fish.

Pemaquid Pond #5704

Surface Area	614 ha (1515 a)
Max. Depth	18.6m (61 ft)
Drainage Area	58.5 km^2 (22.6 mi^2)



Pemaquid Pond #5704

	1975-78	1979	1980	1981	
South Basin					
Mean Secchi(m)	5.0*	6.0*(3)	5.6*(3)	4.5*(1)	
Min Secchi(m)	4.5*	5.0*	5.4*(3)	4.5*(1)	
TSI	47	NA	NA	NA	
Color(SPU)			20	30	
pH	6.3(mean)			6.6(c)	
Chla(ug/l)	5.5(ls)			4.0(ls)	
TP(ppb)	7(ls)			9(ls)	
	1975-77	1979	1980	1981	1982
North Basin					
Mean Secchi(m)				3.5*(2)	3.5*(2)
Min Secchi(m)				3.5	3.0
TSI				NA	NA

*inadequate sampling

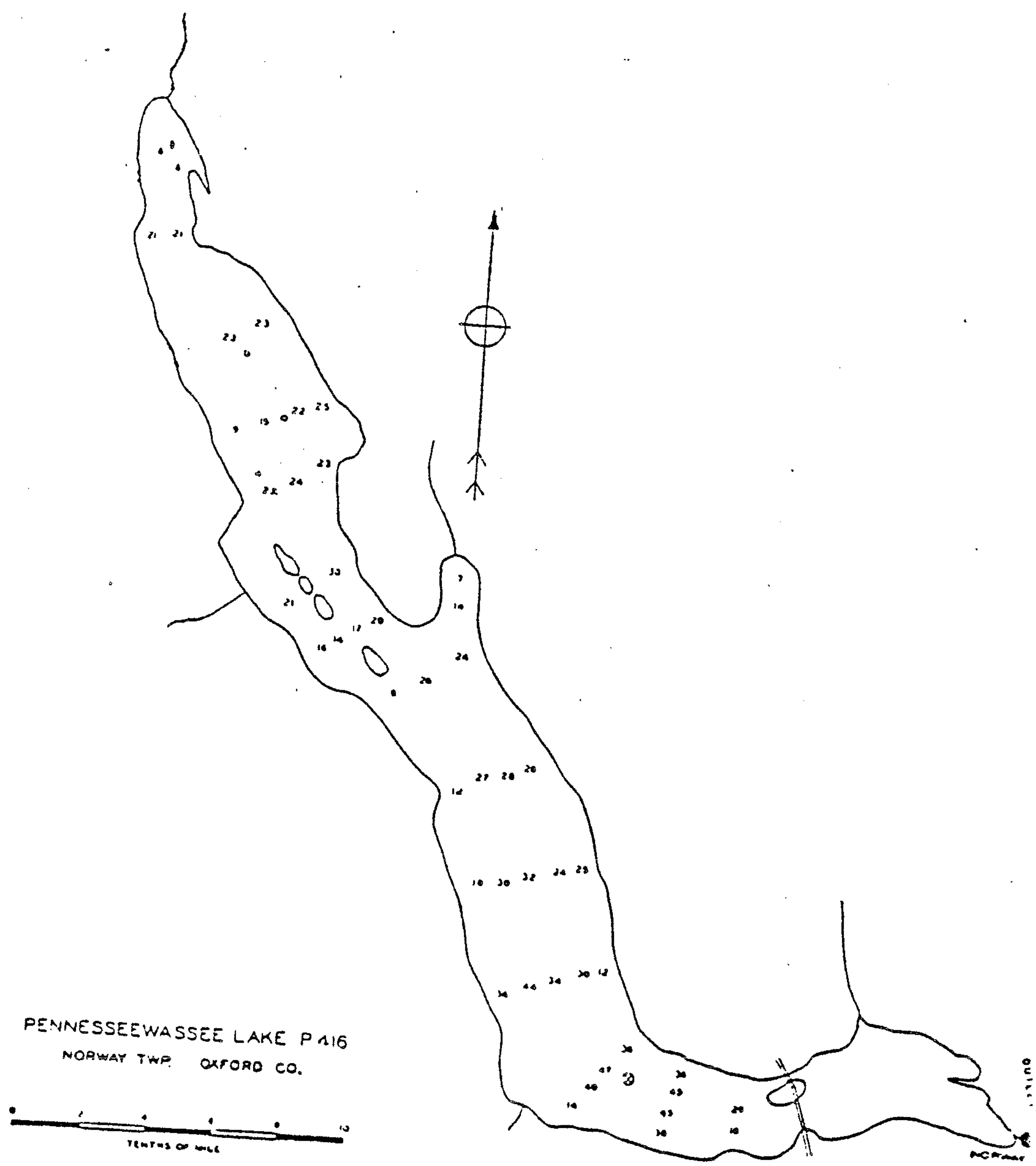
(ls) late summer, (c) core,

A dissolved oxygen depletion (0-3ppm) is evident below 12m during late summer stratification. Pemaquid Pond is managed for coldwater fish, specifically brown trout.

Chla and TP levels are moderate. Annual transparency means fluctuate so much and combined with short sampling seasons that it is difficult to estimate water quality. A longer sampling season for transparency is necessary in order to predict water quality accurately and establish trends.

Pennesseewassee Lake #3434

Surface Area	384 ha (960 a)
Max. Depth	14.4 m (48 ft)
Mean Depth	5.7 m (18.7 ft)
Volume	2.20 X $10^7 m^3$ (1789 acre-feet)
Drainage Area	57.5 km^2 (22.2 mi^2)
Flushing Rate	1.5 (flushes/year)



Pennesseewassee Lake # 3434

	1976-78	1979	1980	1981	1982
Mean Secchi(m)	5.1*	5.5	5.1	5.4	5.5
Min Secchi(m)	3.8	4.3	4.2	4.0	4.6
TSI	46	43	47	44	43
Color(SPU)			15		
pH	6.6mean	6.7mean	6.7mean	7.1(sur)	6.9(sur)mean
Chla(ug/l)	5.7(ls)	3(ls)	8.2(ls)		
TP(ppb)	7(ls)	9(ls)	19(cls) 24(bls)		

*inadequate sampling
(ls) late summer, (c) core, (b) bottom, (sur) surface

The pond is known to have supported algal blooms in the past.

An oxygen deficiency (less than 1ppm) exists below 9m.

Chla and TP values from 1980 are high indicating potential water quality problems; however, transparency on that day was 6.7m. Chla and TP levels previous years were moderate. Transparencies remain stable and are average for Maine lakes.

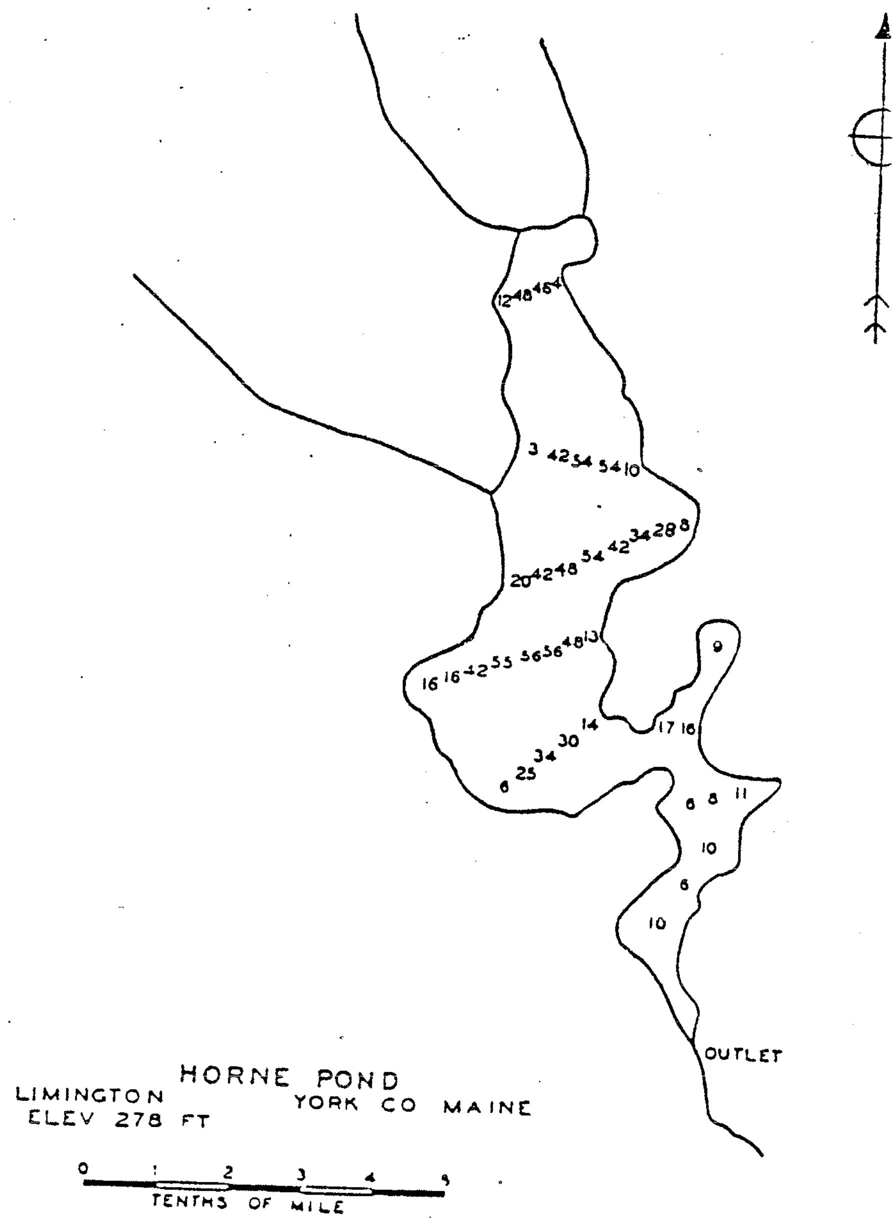
Pennessewassee has many cottages and year-round homes around its shoreline. When heavy development of this type occurs, improperly maintained septic tanks may have an adverse effect on the lake. In one instance, a year-round home was found to be discharging directly into the lake. Fortunately, this problem has been corrected. Shoreline owners must be aware of the impact they can have on the lake. The addition of nutrients, particularly phosphorus, may cause future problems such as algal blooms and increased aquatic plant growth along the shoreline.

The Norway Lakes Association conducts additional sampling such as bacteria tests, pH measurements and dissolved oxygen levels.

Pennesseewassee Lake is suitable for both warm water and cold water fish. Brown trout, small and largemouth bass, perch and pickeral inhabit the lake.

Pequawket Lake (Horne Pond) #3408

Surface Area	53.0 ha (132 a)
Max. Depth	17.7 m (58 ft)
Mean Depth	7.0 m (23 ft)
Volume	3.7 X $10^6 m^3$ (3008 acre-feet)
Drainage Area	7.6 m^2 (2.93 mi^2)
Flushing Rate	1.2 (flushes/year)



Pequawket Lake # 3408

	1980	1981	1982
Mean Secchi(m)	7.4*(4)	7.6	4.7*(1)
Min Secchi(m)	6.2	6.5	
TSI	NA	28	NA
Color(SPU)		10(ls)	
pH(core)		6.7	
Chla(ug/l)		1.4(ls)	
TP(ppb)		8(c)(ls)	
		12(b)(ls)	

* inadequate sampling
(ls) late summer (c) core (b) bottom

Pequawket Lake has excellent water quality. Lakes of this quality are a rare and valuable natural resource and should be vigorously protected.

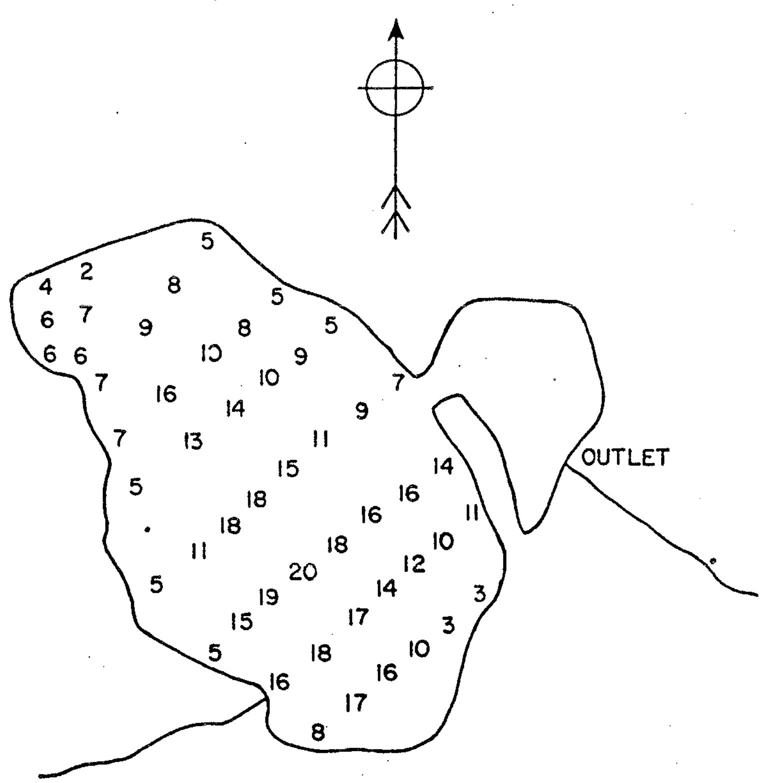
Pequawket has ideal brook trout habitat, but warmwater species, such as perch and pickeral, are out competing the brook trout.

Chla and TP values for 1981 were low.

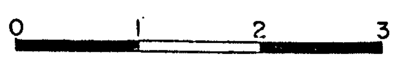
Only one transparency reading was done for 1982 and was much lower than any previous reading for this lake. Continued sampling for a full season is necessary to confirm any trend in water quality

Pequawket Pond (Rattlesnake Pond) #0401

Surface Area	33 ha (82 a)
Max. Depth	6.0 m (20 ft)
Mean Depth	2.8 m(9.2 ft)
Volume	9.4×10^5 m^5 (762 acre-feet)
Drainage Area	3.6 km^2 (1.4 mi^2)
Flushing Rate	2.4 (flushes/year)



PEQUAWKET LAKE
(FORMERLY RATTLESNAKE POND)
DENMARK TWP., OXFORD CO., MAINE



TENTHS OF MILE

Pequawket Pond (Rattlesnake Pond) # 0401

	1977	1978	1979	1980	1982
Mean Secchi (m)	4.0*	4.3	4.2*(4)	4.2*(3)	4.3*(4)
Mi. Secchi (m)	3.5	3.5	3.5	3.4	4.0
TSI	NA	56	NA	NA	NA
Color(SPU)					15
pH					7.0
Chl<u>a</u>(ug/l)		3.0(c)(ls)			1.8(c)(ls)
TP(ppb)		12(c)(ls)			10(c)(ls)

* inadequate sampling season
(c) core, (ls) late summer

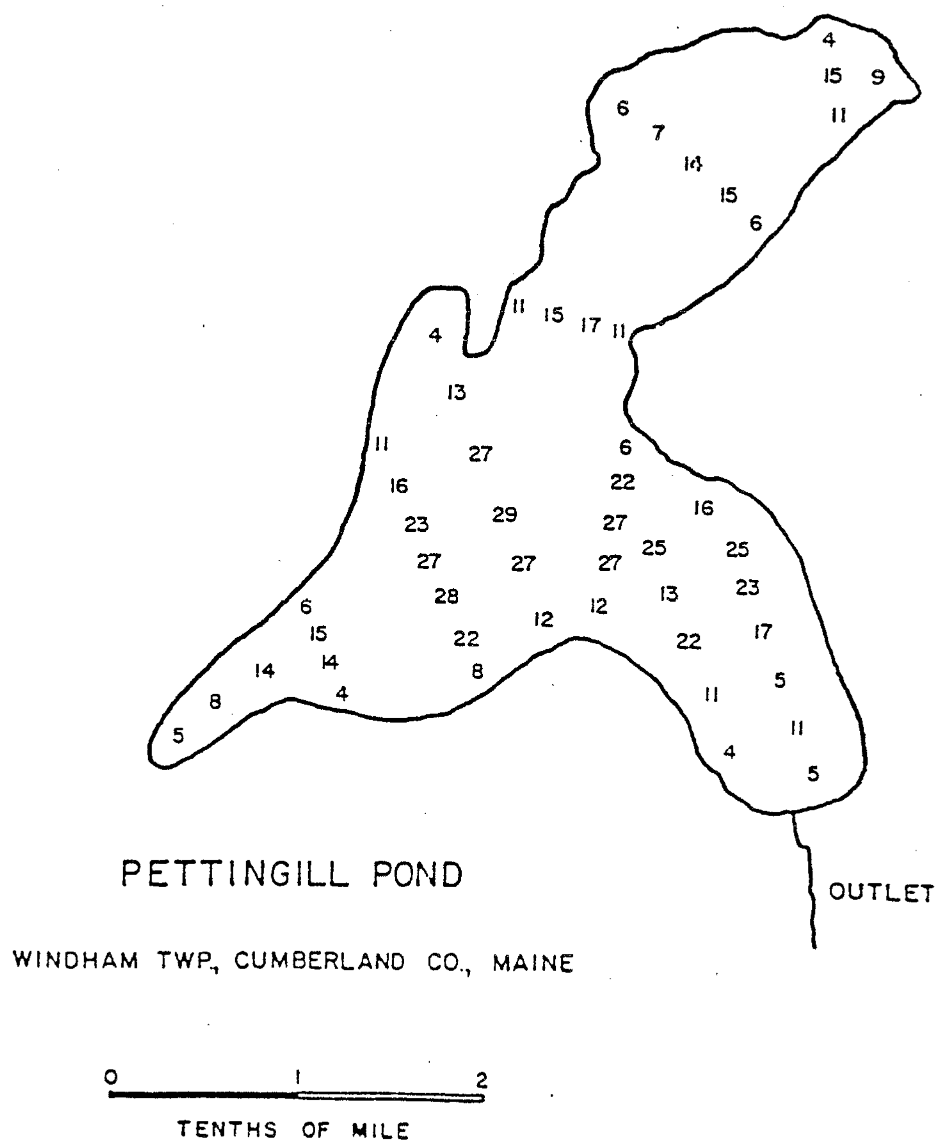
The pond supports a warm water fishery of smallmouth and largemouth bass, perch, and pickeral.

Although most sampling seasons are incomplete, water quality appears to be stable. Transparencies are below average for Maine Lakes. Chl<u>a</u> levels are low and TP levels are moderate.

There is extensive development around the lake. Cottage owners should exercise caution to avoid increasing the phosphorus load to the lake. Septic systems should be conscienciously maintained because the sandy soils around Pequawket are not highly efficient soils for septic systems.

Pettingill Pond #3716

Surface Area	15 ha (37 a)
Max. Depth	8.8 m (29 ft)
Mean Depth	4.2 m (13.9 ft)
Drainage Area	1.61 km^2 (.62 mi^2)
Volume	6.24 X 10^5 m^3 (506 acre-feet)
Flushing Rate	1.3 (flushes/year)



Pettingill Pond #3716

	1974-1976	1979	1980	1981	1982
Mean Secchi(m)	5.2*(2)	5.2*(4)	5.7	4.8	4.5
Min Secchi(m)	3.5	3.5*	4.5	3.5	3.5
TSI	NA	NA	42	50	54
Color(SPU)		30			18
pH(core)		6.8mean			
Chla(ug/l)	5.2*	8.3*(3)			5.7mean
TP(ppb)	7.0*(2)	13*(3)			9(c)(ls)

*inadequate sampling
(ls) late summer, (c) core, (b) bottom

(Limited data available for 1978). Rumors of algal blooms in Pettingill Pond have been received but not confirmed by this Department. The pond has concentrated residential development all around the shore of the lake. The lake has no tributaries and a slow flushing rate which may make the lake vulnerable to cultural degradation.

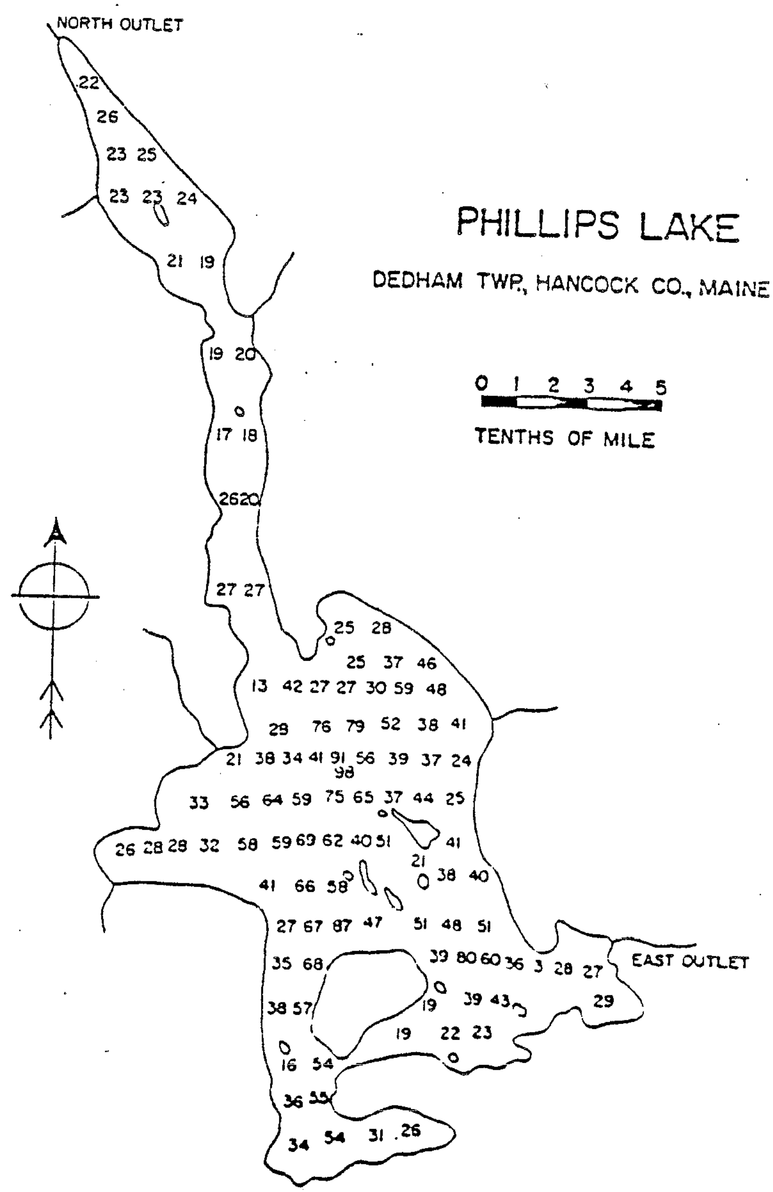
Transparency declined significantly from 1980 to 1981 and remained low in 1982. Continued sampling is important in order to monitor any further trend in water quality. Chla and TP levels are moderate to high.

During the summer, there is little oxygen (less than 1 ppm) at the bottom. The pond supports warmwater fish including large and smallmouth bass, and pickeral. There is no right of way to the pond.

In 1982, thee monitor participated in the chlorophyll program. The program was established in 1980 to collect additional data on lakes that were colored, shallow, or had declining water quality.

Phillips Lake #4300

Surface Area	335 ha (828 a)
Max. Depth	29.9 m (98 ft)
Mean Depth	9.4m (31.0 ft)
Drainage Area	30.6 km^2 (79.3 mi^2)
Volume	32.1 X 10^6 m^3 (26,020 acre-feet)
Flushing Rate	0.6 (flushes/year)



Phillips Lake #4300

	1974-78(©)	1979	1980	1981	1982
Mean Secchi(m)	8.3	7.2	7.7	8.0	8.2
Min Secchi(m)	6.2	6.0	6.0	7.0	6.5
TSI	20	31	29	26	25
TSI range	21-19 SD CHL		28-29 SD-CHL		
Color(SPU)			15		
TP(ppb)	6.3mean		6(c)(1s) 9(b)(1s)		
Chla(ug/l)	1.7mean		1.9 mean		
pH	6.3mean		6.8(c)		

*inadequate sampling
(1s) Late summer (c) Core (b) Bottom

(©) Data gathered during 1974-1976 in a cooperative project between D.E.P. and U.S.Geological Survey.

The lake is unusual in that it has two outlets.

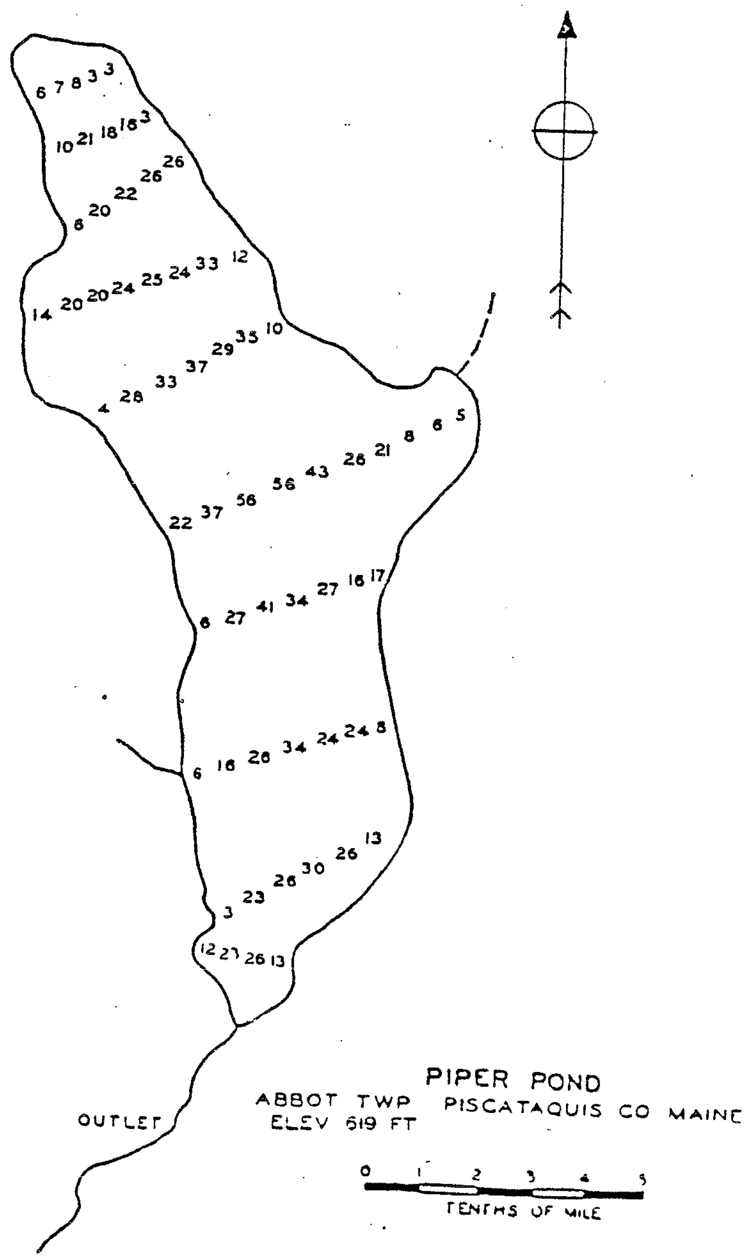
The hypolimnion remains well oxygenated and provides excellent habitat for cold water fish. The pond is presently managed for salmon.

Transparency dropped off sharply in 1979, down slightly below the 1974 levels. The average Secchi disk readings vary considerably from 7.2m - 9.1m over the years which the lake has been monitored. The four years of chlorophyll data also show some fluctuation although less than the Secchi disk. Although there is considerable fluctuation, water quality of Phillips Lake always remains high. The cause of the fluctuation is unknown.

In 1980, the monitor participated in the chlorophyll program. The program was established to collect additional data on lakes that were colored, shallow or had declining water quality.

Piper Pond #0298

Surface Area	162 ha (420 a)
Max. Depth	17.1 m (56 ft)
Mean Depth	6.4 m (21 ft)
Volume	10.40×10^6 m^3 (8430 acre-feet)
Drainage Area	11.7 Km^2 (4.52 mi^2)
Flushing Rate	0.7 (flushes/year)



Piper Pond # 0298

	1981	1982
Mean Secchi(m)	5.8	5.8
Min Secchi(m)	4.5	5.4
TSI	41	41
Color(SPU)	20	20
pH		6.5
Chl*a*(ug/l)		2.5(c)(ls)
TP(ppb)		11(c)(ls)
		8(b)(ls)

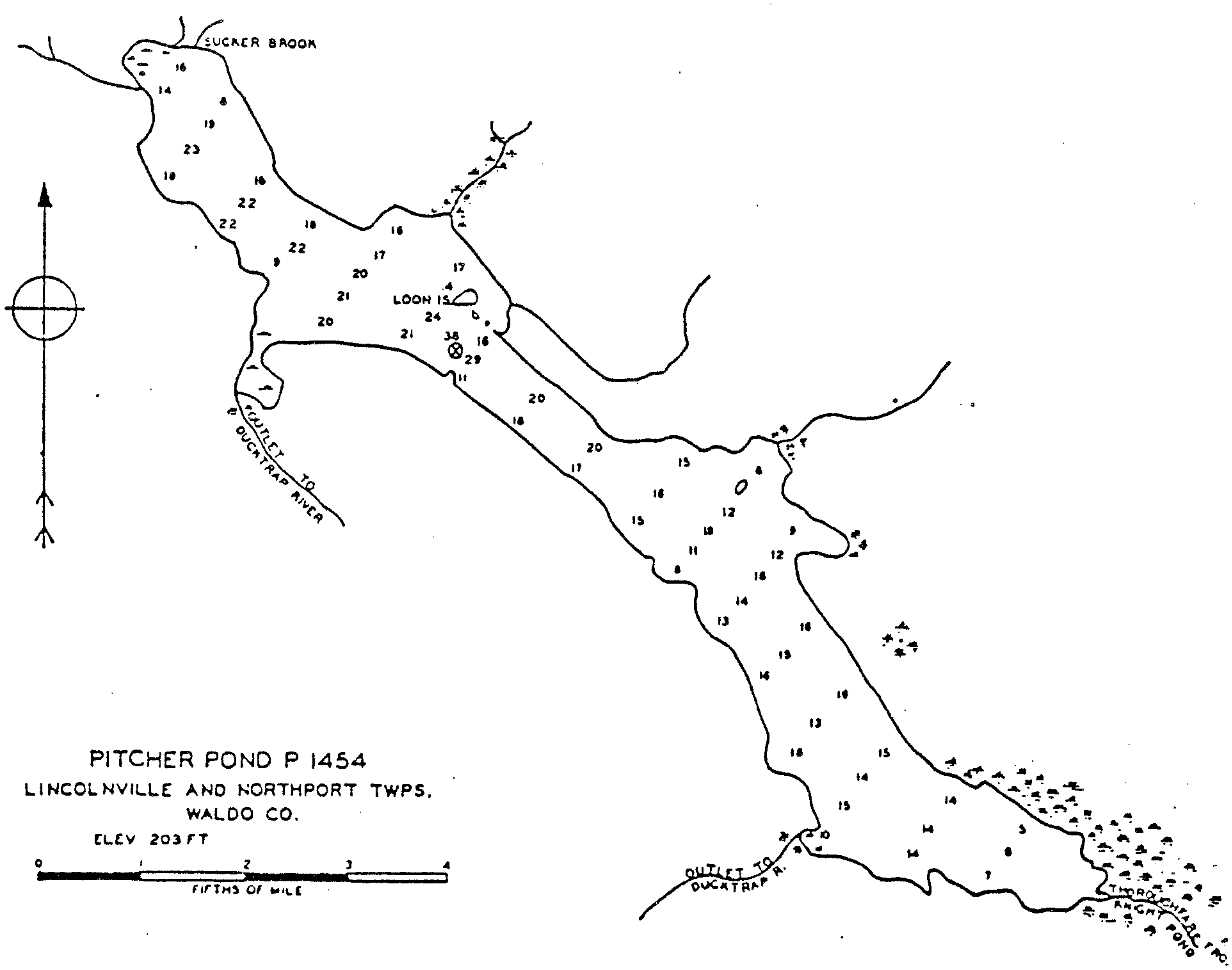
*inadequate sampling
(ls) late summer, (c) core, (b) bottom

Piper Pond is suitable for both warm water and cold water fish. The pond is managed for salmon.

Transparencies are average and have remained stable for the two years that the pond has been monitored. Chl*a* levels are low and TP values are moderate.

Pitcher Pond #4848

Surface Area	146 ha (366 a)
Max. Depth	11.6 m (38 ft)
Mean Depth	3.9 m (12.9 ft)
Drainage Area	22.7 km^2 (8.8 mi^2)
Volume	5.76 X 10^6 m^3 (4670 acre-feet)
Flushing Rate	2.3 (flushes/year)



Pitcher Pond # 4848

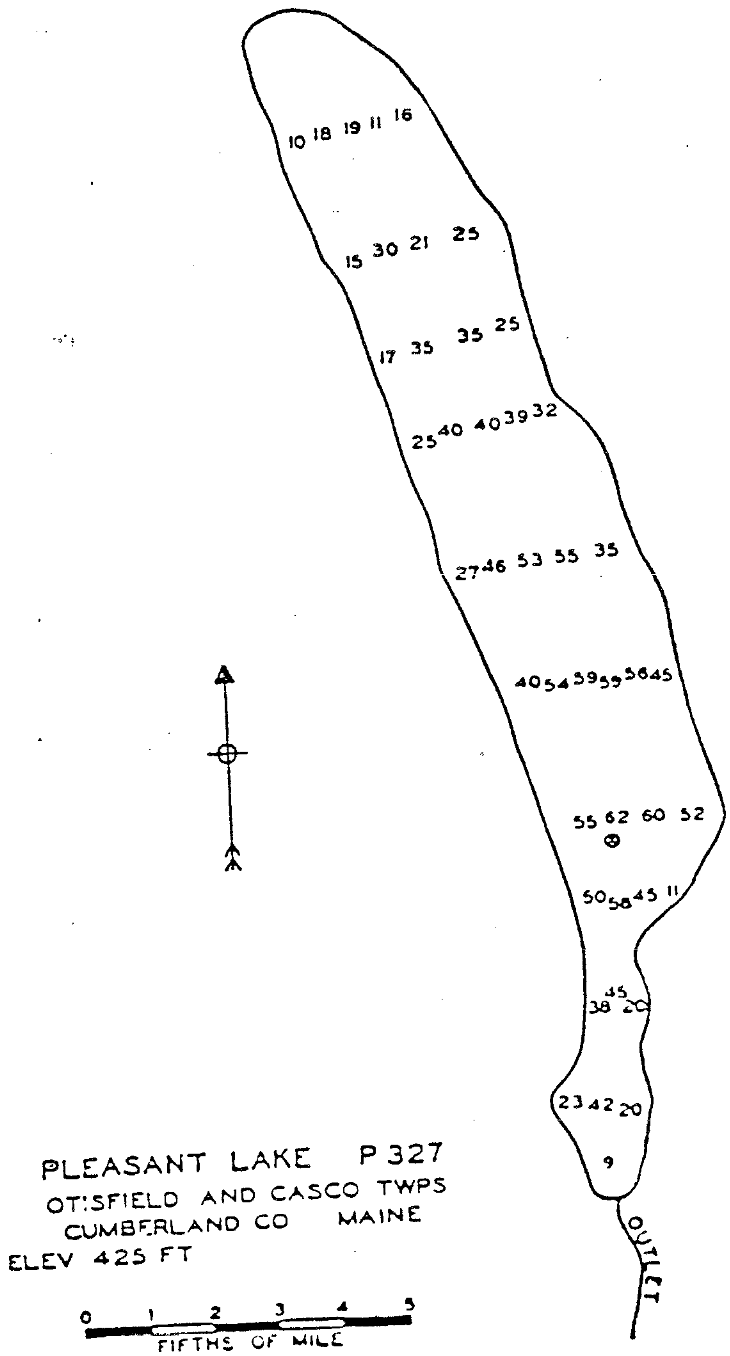
	1981	1982
Mean Secchi(m)	3.8	4.9
Min Secchi(m)	3.3	3.8
TSI	63	49
Color(SPU)		17
pH		6.6
Chla (ug/l)		2.2 (1s)
TP(ppb)		8(1s)

Pitcher Pond is suited for warm water fish.

Transparencies increased significantly from 1981 to 1982. The 1982 mean transparency is slightly below average for Maine lakes. Continued monitoring is necesssary to confirm whether there is an upward trend on a fluctuation in water quality. Chla values are low and TP levels are moderate.

Pleasant Lake (Casco) #3446

Surface Area	531 ha (1312 a)
Max. Depth	18.9 m (62 ft)
Mean Depth	9.3 m (30.7 ft)
Drainage Area	25.5 km^2 (9.8 mi^2)
Volume	49.49 X 10^6 m^3 (40,117 acre-feet)
Flushing Rate	0.3 (flushes/year)



Pleasant Lake (Casco) #3446

	1977-78	1979	1980	1981	1982
Mean Secchi(m)	7.9	8.2	8.8	8.6	8.2
Min Secchi(m)	4.0	7.3	6.0	7.5	7.5
TSI	26	25	22	23	25
Color(SPU)				10	
pH(core)	6.4mean			6.5	
Chla(ug/l)	2.7(ls)			1.8(ls)	
TP(ppb)	9(ls)			6(cls) 16(bls)	

*inadequate sampling
(ls) late summer, (c) core, (b) bottom

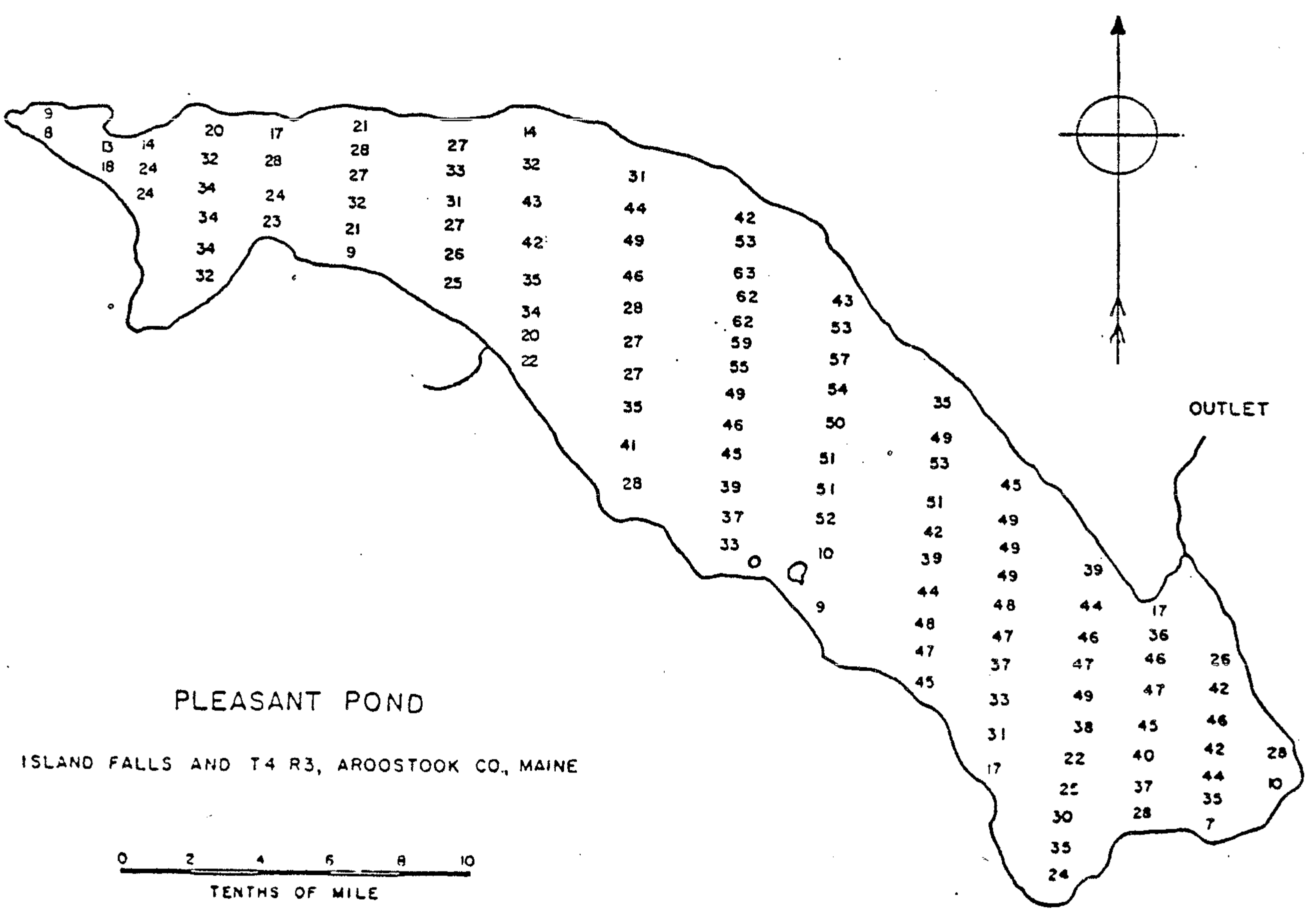
Transparency readings are well above average and remain stable. TP values are low to moderate and Chla levels are low. Such high water quality is a rare natural resource and should be carefully protected and maintained.

The lake is the water supply for the Wade Fish Hatchery in Casco. The lake is managed for warm and cold water fish, including salmon, brook trout and brown trout, smallmouth bass, perch, and pickeral.

An oxygen deficiency (0-3 ppm) exists below 14 m by late summer.

Pleasant Lake (Island Falls) #1728

Surface Area	742 ha (1832 a)
Max. Depth	18.9 m (63 ft)
Mean Depth	9.8 m (32 ft)
Volume	7.16 X $10^7 m^3$ (58000 acre-ft)
Drainage Area	18.6 km^2 (7.2 mi^2)
Flushing Rate	0.1 (flushes/year)



Pleasant Lake (Island Falls) # 1728

	1974-78X	1979	1980	1981	1982
Mean Secchi (m)	9.6	11.9*(3)	10.4*(4)	12.4	11.5*(2)
Min Secchi(m)	8.5	11.0*	8.0	10.5	10.5
TSI	25	NA	NA	9	NA
TSI Range	19 34 SD TP				
Color(SPU)				5	
Chla (ug/l)	1.4mean		1.1 (ls)		
TP(ppb)	7.1mean		5(cls) 8(bls)		
pH(mean)	6.5		6.9		6.5(c)

*inadequate sampling
(ls) late summer, (c) core, (b) bottom
X Lake studies from 1974-1976 as part of cooperative project between DEP and U.S. Geological Survey.

The hypolimnion remains well oxygenated (greater than 6ppb) throughout the summer. Pleasant Pond supports a good cold-water fishery.

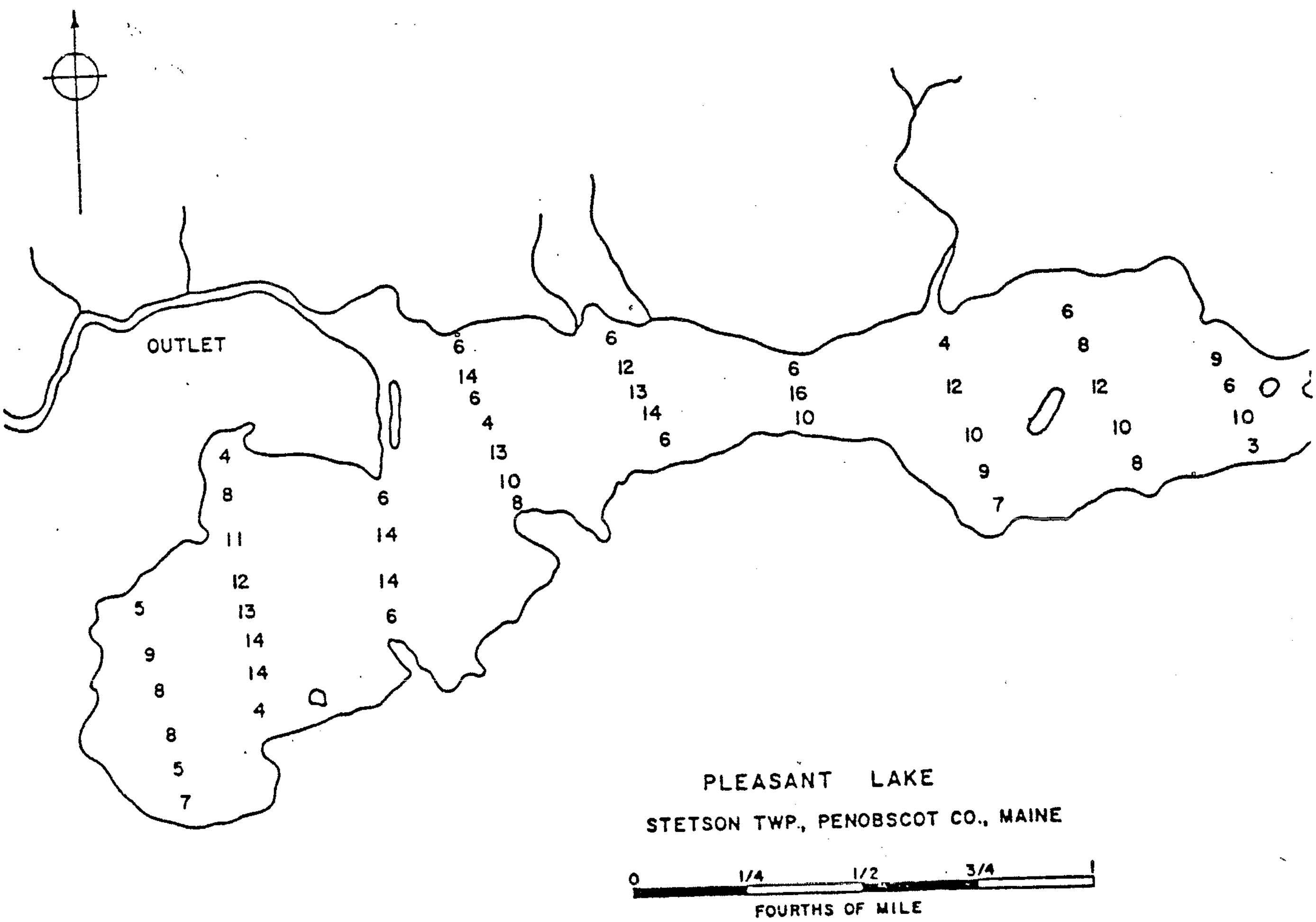
Average transparency values reported by the cooperative DEP-U.S. Geological Survey project, 1974-1976, are considerably lower than values reported by lay monitors. The project readings were taken from the pontoon of a float plane which creates worse conditions for obtaining good readings than normal procedures. The monitor's readings are considered a more accurate indicator of water quality than the DEP-USGS project readings.

Chla levels are low and TP values are low to moderate. Transparency readings are far above average for lakes in Maine. The exceptional water quality of Pleasant Pond is a rare and valuable resource and should be vigorously protected.

Cottages have recently been constructed on the southern shore of the pond and access roads have been built to reach these dwellings. The erosion problem on at least one of these roads is quite severe. In places where the road transverses steep terrain, deep ruts make the road nearly impassable. During spring runoff this eroded soil ends up in the pond.

Pleasant Lake (Stetson) #2270

Surface Area	311 ha (768 a)
Max. Depth	4.9 m (16 ft)
Mean Depth	2.3 m (7 ft)
Volume	6.98 X 10^6 m^3 (5663 acre-feet)
Drainage Area	27.9 Km^2 (10.8 mi^2)
Flushing Rate	1.98 (flushes/year)



Pleasant Lake (Stetson) #2270

	1980	1981
Mean Secchi(m)	3.4	4.6+
Min Secchi(m)	3.1	4.3
TSI	64	56
TSI range	59-69	33-56
	TP-SD	CHL-SD
Color		25
pH		7.0
Chl<u>a</u>		2.3mean
TP	22©mean	13mean

+ Some readings hit bottom
© Sample taken near bottom, probably value higher than a core would be

---

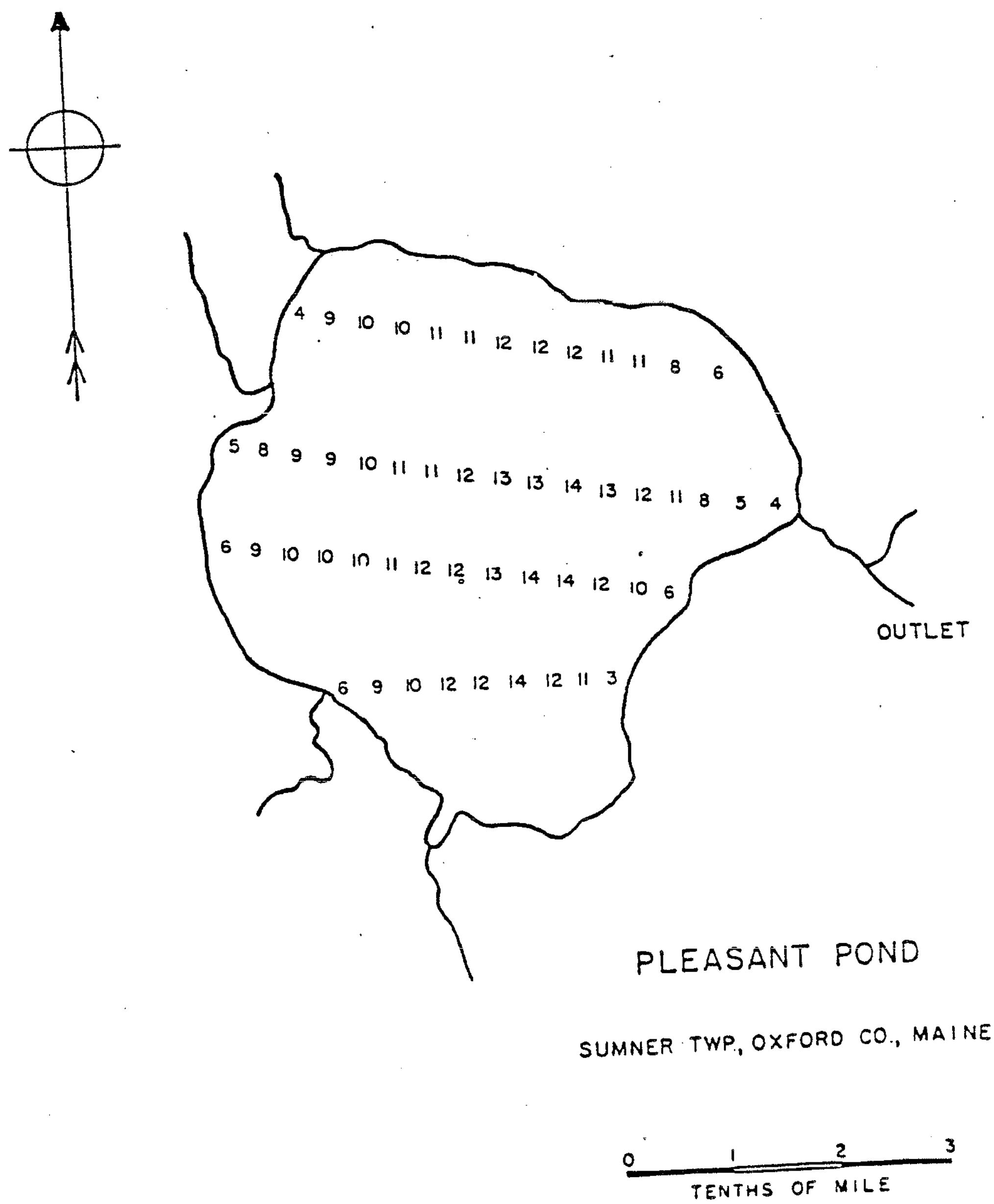
Pleasant Lake was one of seven lakes studied by Penobscot Valley Regional Planning Commission in 1980-1981. Pleasant Lake drains into Sebasticok Lake whose water quality has been degraded over the years by direct and indirect discharges. As part of the restoration of Sebasticook's water quality, the Soil Conservation Service is helping area farmers control nutrient rich run-off from their farms. Data gathered on Pleasant will be used to establish the efficiency of watershed controls.

TP values for 1981 were moderately high and Chl<u>a</u> moderately low. Transparency values improved significantly for 1981. This may be due to weather or natural conditions or improved water quality. Continued monitoring should clarify this trend.

The TSI based on Secchi disk readings is higher than TP or Chl<u>a</u> TSI because the Secchi disk bottomed out on many readings. If the lake were deeper, many of the Secchi disk readings would be deeper.

Pleasant Pond (West Sumner) #3612

Surface Area	325 ha (812 a)
Max. Depth	4.2 m (14 ft)
Mean Depth	2.6 m (8.5 ft)
Volume	8.5 X $10^6 m^3$ (6911 acre-feet)
Drainage Area	7.2 km^2 (2.8 mi^2)
Flushing Rate	0.5 (flushes/year)



Pleasant Pond (Sumner) #3612

	1979	1980	1981	1982
Mean Secchi(m)	2.9*(4)	3.7+	3.3+	3.0+
Min Secchi(m)	2.4			2.1
TSI	NA	65	71	76
Color(SPU)			30	
pH			7.1	
Chl<u>a</u> (ug/l)			6.8(1s)	
TP (ppb)			18(1s)	

+ Secchi disk readings hit bottom
* Inadequate sampling

This lake does not stratify during summer months and remains well oxygenated to the bottom. It is best suited for warm water fish especially for large mouth bass, which were introduced, and pickeral.

In 1979, this office received several complaints from nearby residents of Pleasant Pond. Fish were dying, the water had a bad odor and was full of a yellow-green material. An investigation showed that the yellow material was pine pollen, not algae. As the pollen decomposed, it gave off a musky odor. Although pesticide spraying of a nearby orchard might possibly have killed the small number of fish that were found along the shore, it is more likely that fishermen threw them up on the bank.

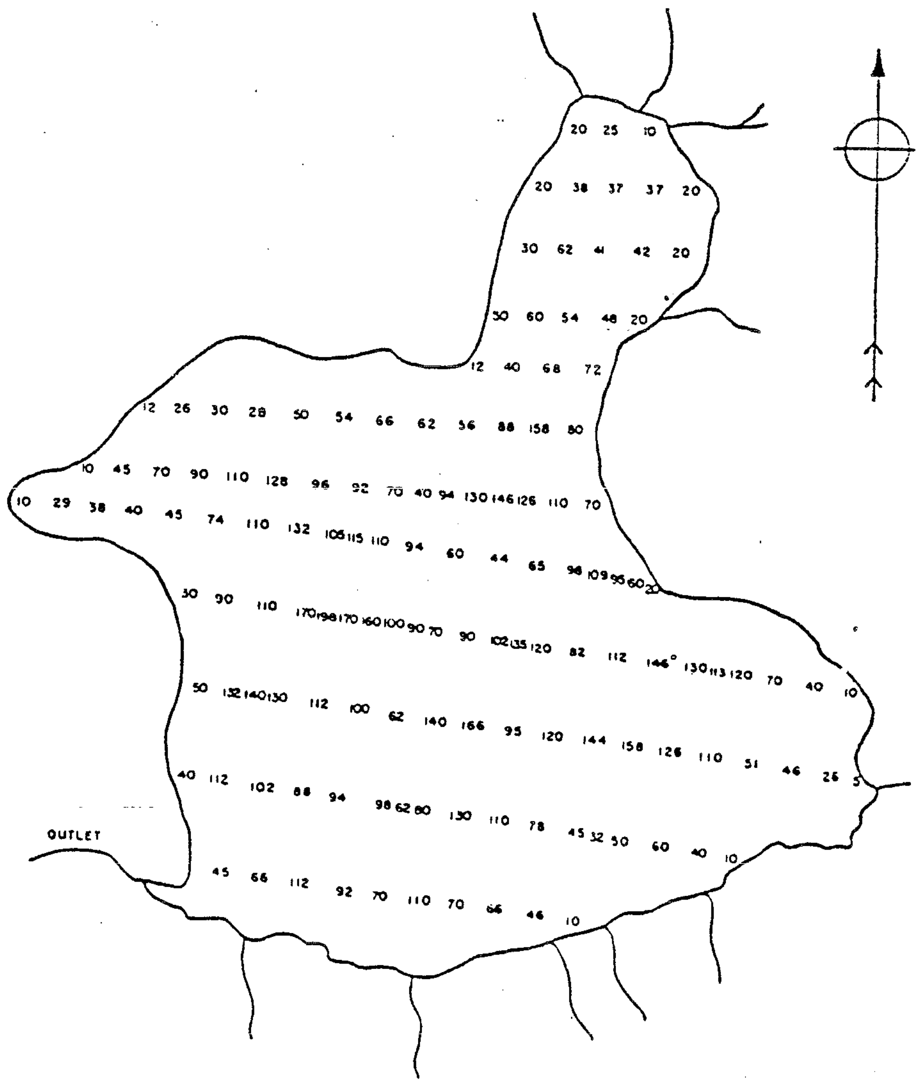
The water quality is underestimated because most Secchi disk readings hit bottom.

The pond has a fairly slow flushing rate (0.5 flushes/year) which may make it vulnerable to water quality degradation.

Chl<u>a</u> values are moderate and TP levels are high.

Pleasant Pond (Caratunk) #0224

Surface Area	422 ha (1055 a)
Max. Depth	59.4 m (198 ft)
Mean Depth	22.8 m (74.7 ft)
Volume	9.6 X 10 ^{7}m^3 (78049 acre-feet)
Drainage Area	14.97 km^2 (5.78 mi^2)
Flushing Rate	0.1 (flushes/year)



PLEASANT POND

CARATUNK, SPAULDING TWPS, SOMERSET CO., MAINE

TENTHS OF MILE

Pleasant Pond (Caratunk) #0224

	1981	1982
Mean Secchi(m)	12.3	12.0
Min Secchi(m)	9.5	9.5
TSI	10	11
Color(SPU)	5	12
pH		6.9
Chl*a*(ug/l)		0.5 (1s)
TP(ppb)		4 (1s)

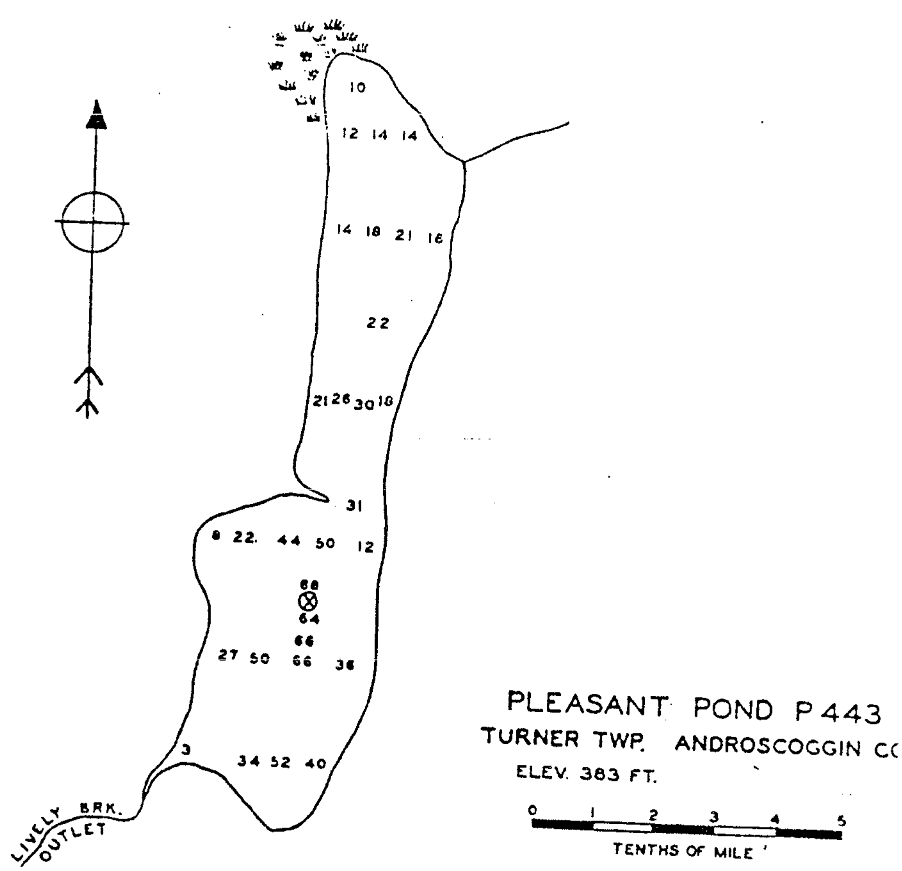
Pleasant Pond is excellently suited for cold water fish. The pond is managed for brook trout.

Because of a slow flushing rate (0.1 flushes/year) the lake may be sensitive to cultural degradation. The pond has exceptionally high water quality which should be vigorously protected.

Transparencies are far above average for lakes and ponds in Maine. Chl*a* levels are very low and TP values are low.

Pleasant Pond (Turner) # 3822

Surface Area	77 ha (192 a)
Max. Depth	20.4 m (68 ft)
Mean Depth	7.7 m (25 ft)
Volume	5.95×10^6 m^3 (4823 acre-feet)
Drainage Area	3.11 km^2 (1.2 mi^2)
Flushing Rate	0.3 (flushes/year)



Pleasant Pond (Turner) #3822

	1976	1977	1978	1980	1982
Mean Secchi(m)	6.9*	5.1*	6.0*	6.0*(4)	5.0
Min. Secchi (m)	5.4	4.6	4.9	4.3	3.5
TSI	NA	NA	NA	NA	48
Color(SPU)	15				
pH	6.7(s)			7.1(c)	7.1(s)
Chla (ug/l)	8.9(s)(ls)			5.2(ls)	
TP(ppb)	7(s)(ls)			9(c)(ls)	
	45(b)(ls)			11(b)(ls)	

* inadequate sampling season

(ls) late summer, (c) core, (b) bottom, (s) surface

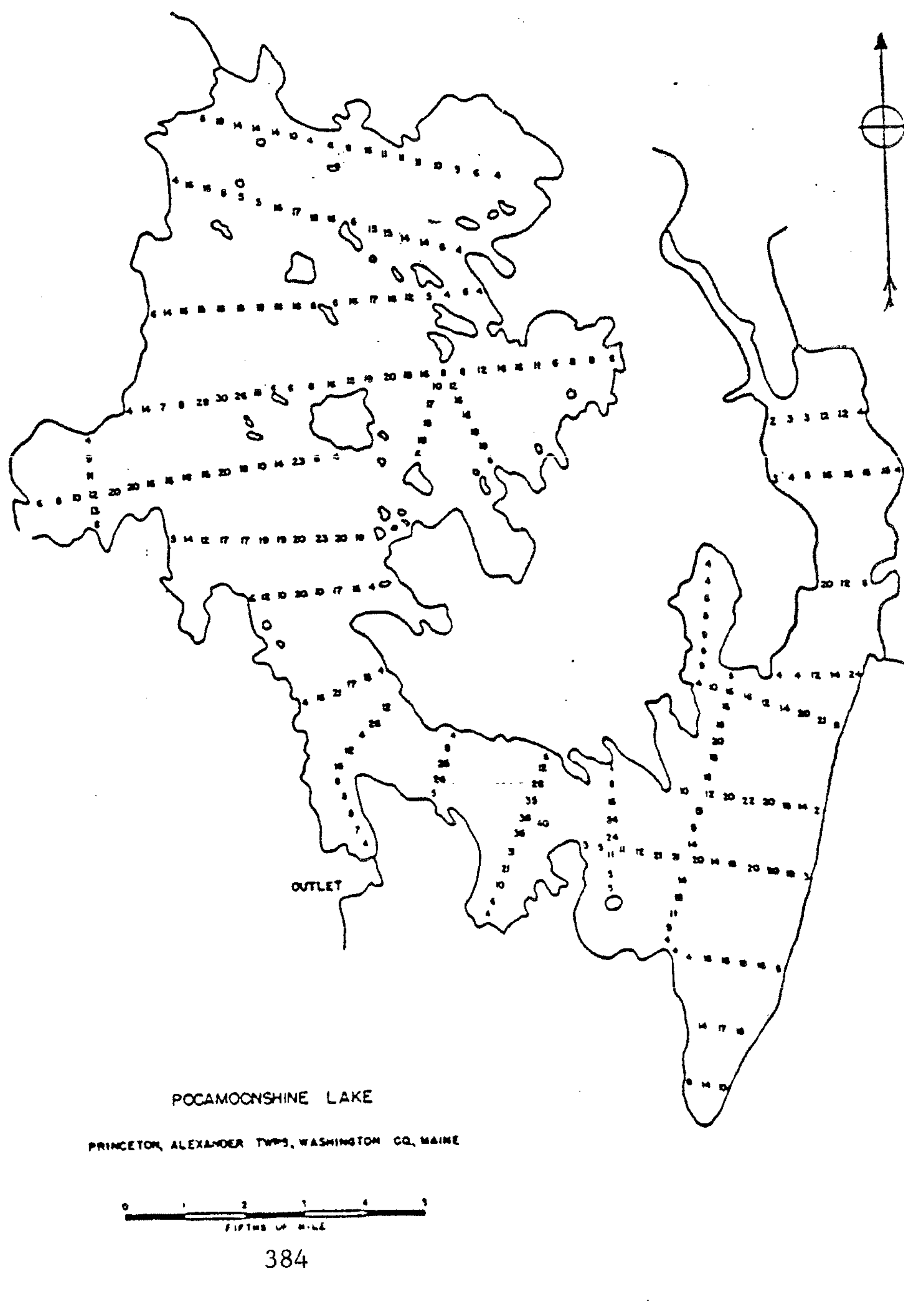
There is less than 1ppm oxygen below 8m. Until recently this pond was known for its high water quality and good brook trout and salmon fishery.

In the past years, the pond has experienced nuisance algal blooms and increased filamentous algal growth along the shoreline. It appears that farming activities in the watershed are the most likely source of nutrients to the pond. A farm pond to the northeaast of the pond has high total phosphorus levels, and is probably a source of phosphorus during time of runoff. During an investigation in August, 1975, several piles of chicken manure were noticed on the steep eastern shore of the lake.

Transparency for 1982 appears to have decreased from previous years; Continued sampling with complete seasons will be necessary to determine if this is the start of a problem or a natural fluctuation. Chla levels are moderate and TP levels are low to moderate.

Pocamoonshine Lake #1290

Surface Area	1022 ha (2555 a)
Max. Depth	12.9 m (40 ft)
Mean Depth	3.4m (11 ft)
Volume	34.6 X $10^6 m^3$ (2813 acre-feet)
Drainage Area	74.85 km^2 (28.9 mi^2)
Flushing Rate	1.3 (flushes/year)



Pocamoonshine Lake # 1290

	1977-78	1979	1980	1981	1982
Mean Secchi(m)	4.5	4.6	4.7	4.6	4.2
Min Secchi(m)	3.5	3.5	4.5	4.0	3.0
TSI	Colored	Colored	41(Chl)	colored	colored
Color(SPU)		45	30		40
pH(core)		6.6			6.9
Chl*a*(ug/1)		2.7(1s)	3.1mean		3(c)(1s)
TP(ppb)	7(spring)	8(1s)	9(1s)		6(c)(1s)

(1s) late summer, (c) core

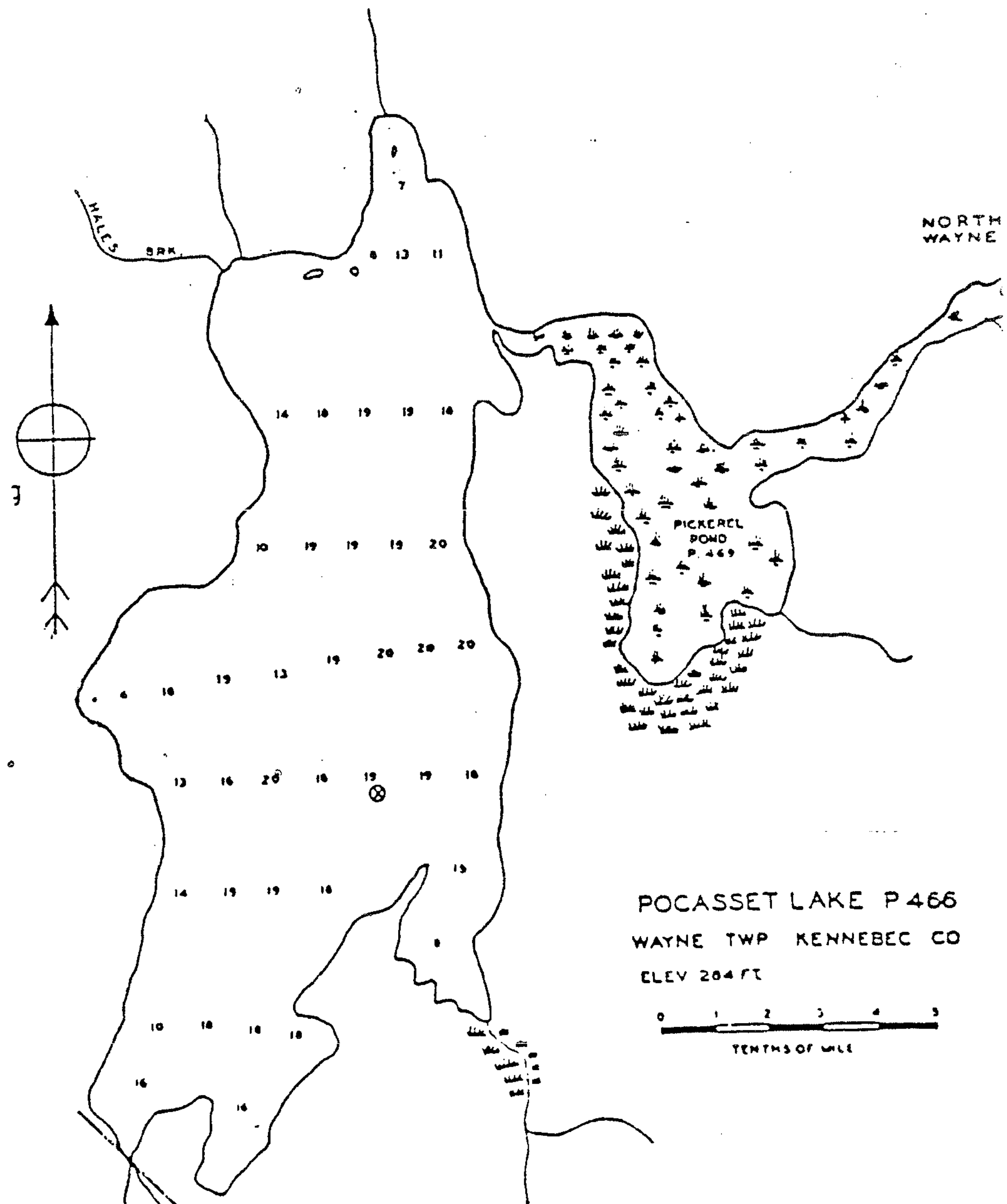
Transparency readings indicate stable water quality over the past several years. Considering the moderate water color, transparencies indicate good water quality. Although no TSI value can be calculated for Pocamoonshine because of the moderate color, transparency readings are useful to document water quality and establish water quality trends on Pocamoonshine Lake. Chl*a* and TP levels are low to moderate.

The lake doesn't stratify. The Department of Inland Fisheries and Wildlife manages the pond for bass, perch and pickeral.

Pocomoonshine was one of twelve lakes that participated in 1980 in an experimental Chl*a* sampling program on colored lakes. The program was successful and is repeated on a different set of lakes each year.

Pocasset Lake #3824

Surface Area	229 ha (566 a)
Max. Depth	6.1 m (20 ft)
Mean Depth	3.9 m (11 ft)
Volume	$8.91 \times 10^{6} m^3$ (6460 acre-feet)
Drainage Area	152.8 km^2 (59 mi^2)
Flushing Rate	8.7 (flushes/year)



Pocasset Lake #3824

	1976-78	1979	1980	1981	1982
Mean Secchi(m)	5.0	5.5*(3)	5.3	5.1*(3)	5.3+
Min Secchi(m)	4.2	4.3*	4.7	4.7*	4.6
TSI	43	NA	45	NA	45
TSI Range	39-48 CHL-SD				
Color(SPU)			25		
pH(core)			6.8	7.1	7.1(sur)
Chla(ug/l)	2.9mean		2.3(fall)		
TP(ppb)	10mean				

*inadequate sampling season
+ some readings hit bottom
(sur) surface

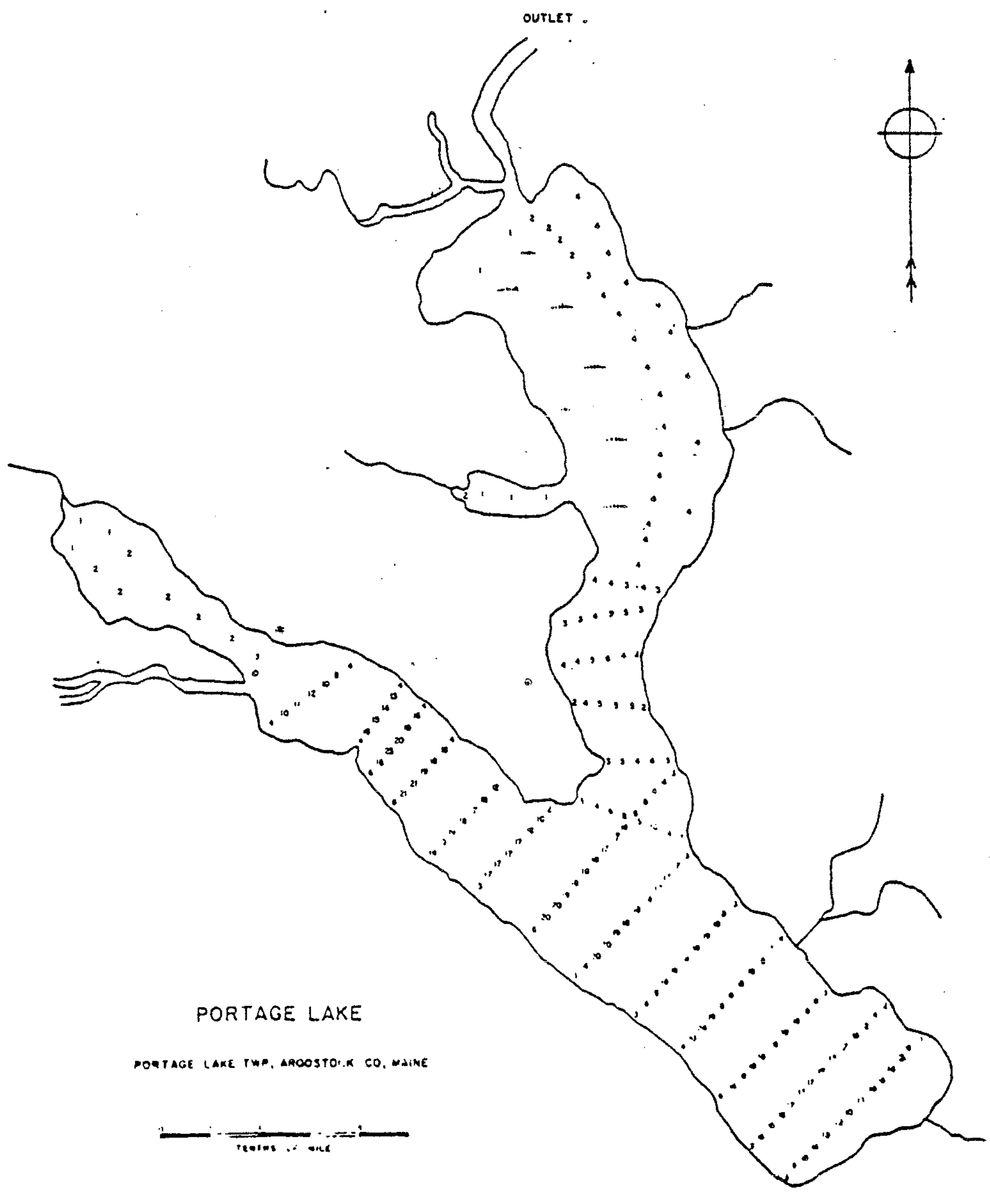
Transparency readings appear stable and are average for lakes in Maine. In 1976 and 1980, Chla levels were low to moderate and TP levels for 1976 were moderate. Water quality is good.

The lake is managed for warm water fish.

The Cobbossee Watershed District in 1976 found that runoff from manured fields in the direct drainage of the lake was the most significant source of phosphorus to Pocasset Lake and accounted for 29% of the phosphorus load. Natural background phosphorus from unstressed stream lakes accounted for 48% of the load and development in the direct drainage accounted for 11%. The remaining 11% was made of contributions from forested land, direct precipitation, and septic tanks.

Portage Lake #1602

Surface Area	1001 ha (2474 a)
Max. Depth	7.6 m (25 ft)
Mean Depth	2.4 m (7.9 ft)
Drainage Area	536 km^2 (206.9 mi^2)
Volume	23.4 X 10^6 m^3 (18,968 acre-feet)
Flushing Rate	12.5 (flushes/year)



Portage Lake #1602

	1974-75(©)	1976(©)	1977	1981	1982
Mean Secchi(m)	3.2	3.0	3.2*(1)	2.9	3.1
Min Secchi(m)	2.1	2.5	3.2*(1)	2.9	1.9
TSI	52	54		Colored	colored
TSI range	34-76 Chl-SD	38-76 Chl-SD			
Color(SPU)	35			55	
pH	7.0(sur)			6.9(c)	
Chla(ug/l)	2.5mean	2.8mean		4.0(ls)	
TP(ppb)	11(sm)	12mean	7(sp)	19(ls)	

*inadequate sampling
(ls) late summer, (sm) surface mean, (c) core), (sur) surface
(©) From 1974-1976, the lake was studied by the DEP and US Geological Survey as part of a joint project.

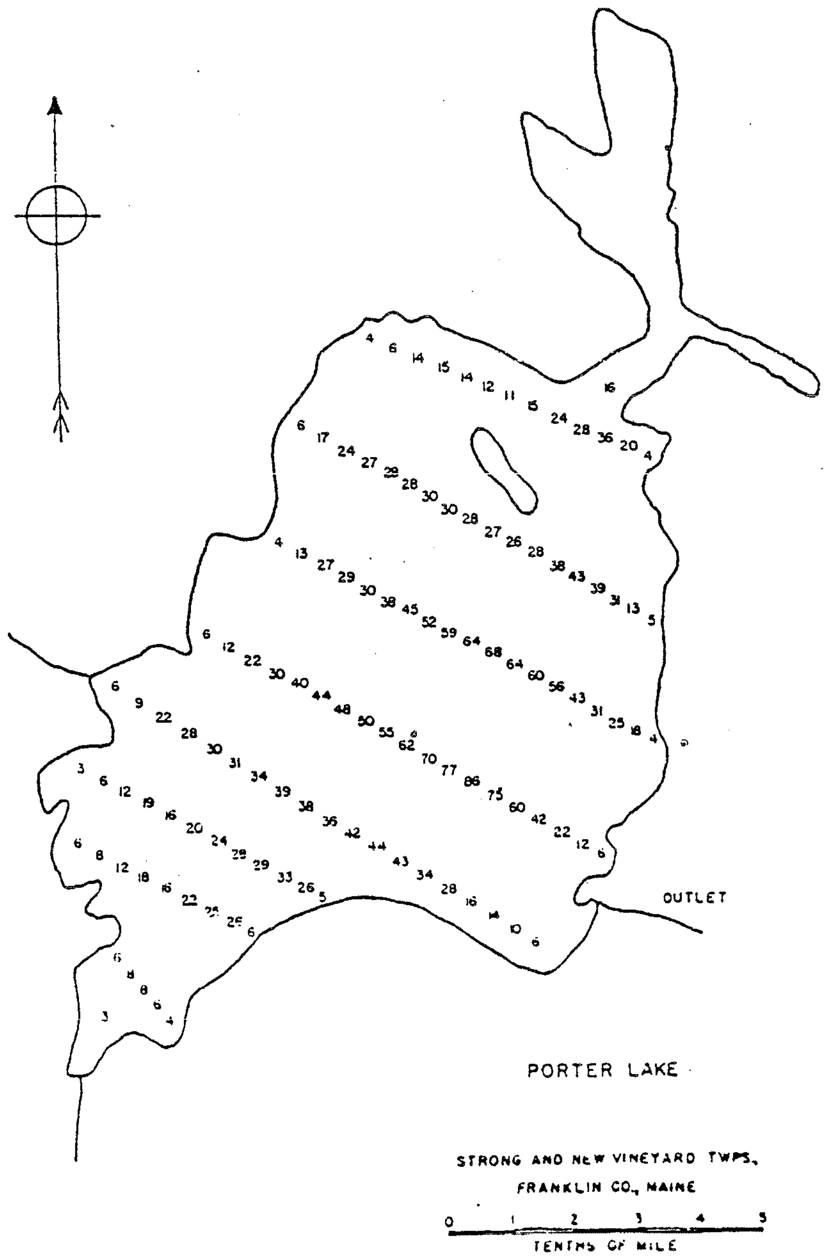
Portage Lake does not stratify and is considered marginal for cold water fish; however, it is managed for salmon, brook trout, and smelts.

Transparencies are low for Maine lakes, but Secchi disk readings are affected by the fact that Portage is colored. These low transparencies underestimate the water quality as shown by the vast difference between the Secchi disk TSI (76) and Chla TSI (34). Because of the color, the reliability of the TSI based on Secchi disk (1974-1976) is inaccurate. Secchi disk transparency is still useful, however, to document water quality trends within Portage lake.

Chla and TP values for 1974-1976 were moderate, values for 1981 appear higher, but are comparable to late summer values for 1974-1976.

Porter Lake #0012

Surface Area	213 ha (527 a)
Max. Depth	26.2 m (86 ft)
Mean Depth	7.6 m (25.1 ft)
Drainage Area	14.2 km^2 (5.5 mi^2)
Volume	16.0 X 10^6 m^3 (12,970 acre-feet)
Flushing Rate	0.5 (flushes/year)



Porter Lake # 0012

	1974-75(@)	1976(@)	1978	1981	1982
Mean Secchi(m)	5.6	5.8	6.5*(3)	6.6	6.1
Min Secchi(m)	3.5	4.9	5.5	5.3	4.3
TSI	42	39		35	38
TSI range	34-49 TP SD	41-37 SD TP			
Color(SPU)				10	
pH(core)				6.4(c)	
Chla(ug/l)	3.7mean	3.0mean	2.4(ls)	1.5(ls)	
TP(ppb)	7.0(sm)	8.0mean		6(c)(ls) 11(b)(ls)	

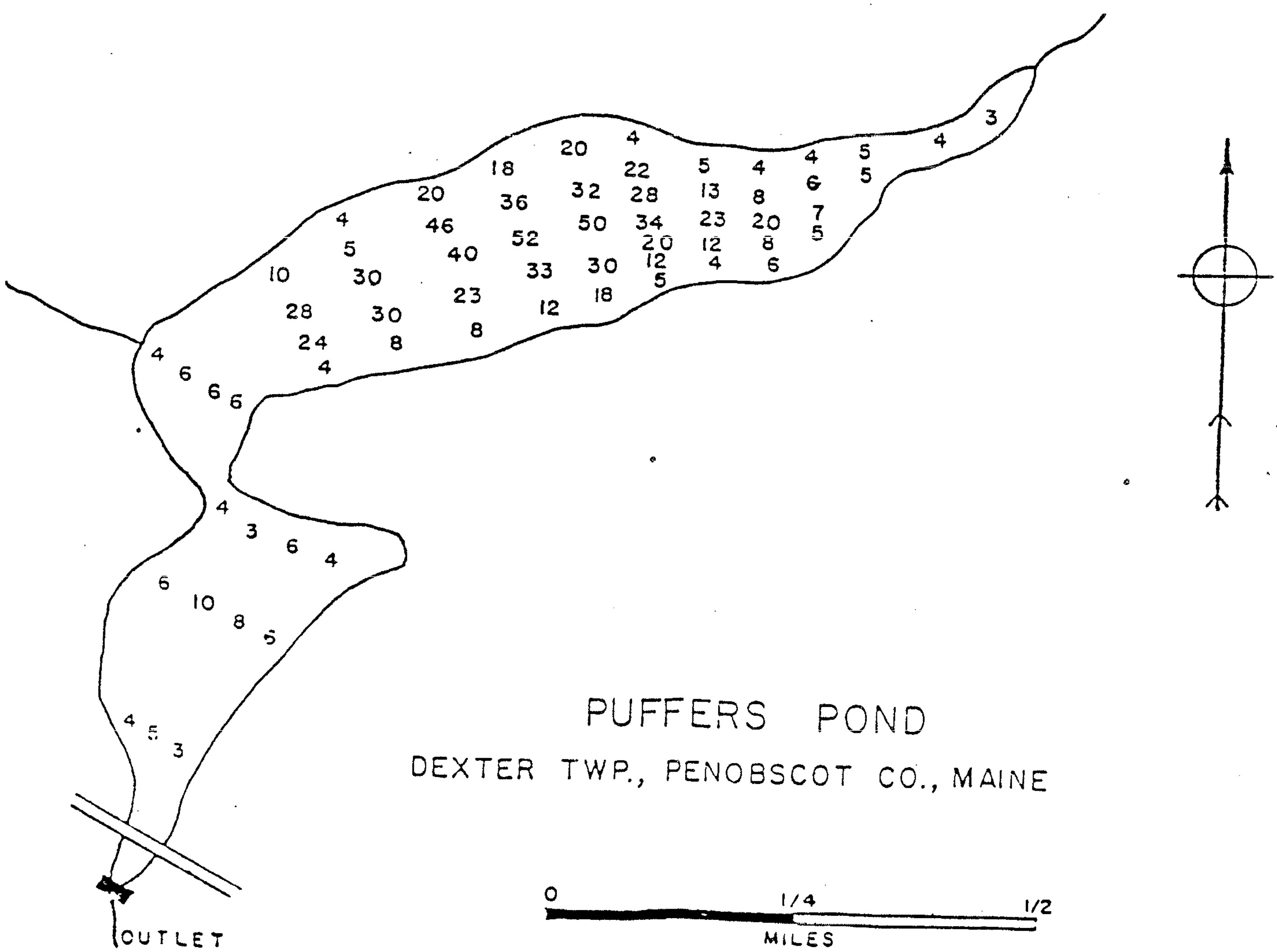
*inadequate sampling
(sm) surface mean (ls) Late summer, (c) core, (s) surface, (b) bottom
@ From 1974-76 the lake was part of a joint lake study between DEP and the U.S. GEological Survey.

Porter Lake supports both warm and cold water fish. The lake is managed for lake trout and salmon and also has a good population of pickeral.

Transparency readings indicate good water quality. Secchi disk readings fluctuate a bit more than usual but generally remain slightly above average for Maine lakes. Chl*a* levels for 1974-1976 are considered moderate and the 1981 Chl*a* value is low. The TP levels are low to moderate.

Puffers Pond #0744

Surface Area	41.3 ha (102 a)
Max. Depth	15.8 m (52 ft)
Mean Depth	3.9 m (13 ft)
Volume	1.6 X 10^6 m^3 (1301 acre-feet)
Drainage Area	5.9 km^2 (2.29 mi^2)
Flushing Rate	1.88 (flushes/year)



Puffers Pond #0744

	1980	1981
Mean Secchi(m)	4.5	5.9
Min Secchi(m)	2.4	4.7
TSI	58	36
TSI range	54-62	27-42
	SD-TP	Chla-TP
Color		
Chl*a*		1.7mean
TP	21©mean	10mean

© Sample taken near bottom, probably value higher than a core would be.

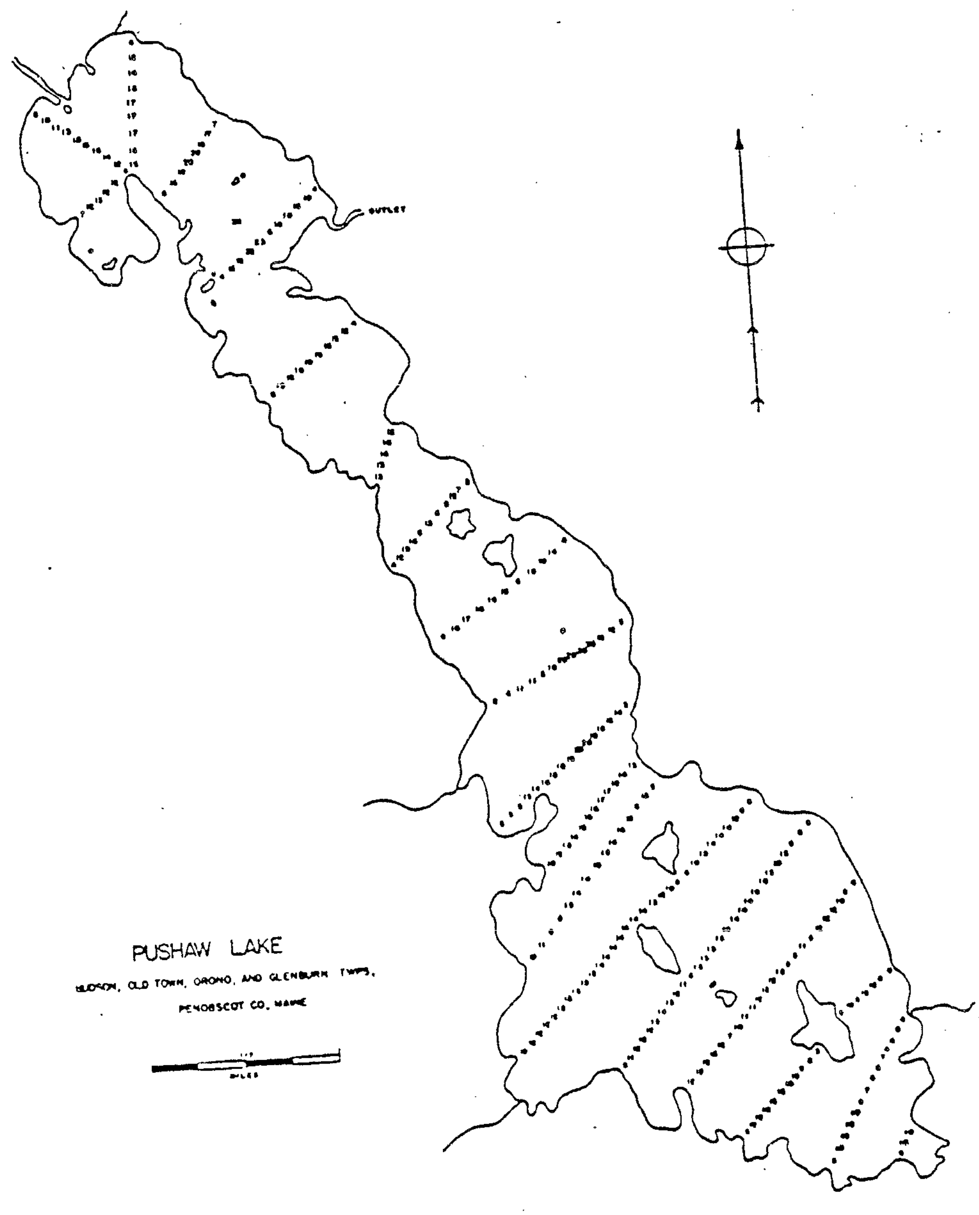
Puffers Pond was one of seven lakes studied in 1980 and 1981 by the Penobscot Valley Regional Planning Commission. Puffer's drains into Sebasticook lake, whose water quality has been degraded over the years by direct and indirect discharges. As part of the restoration of Sebasticook's water quality, the Soil Conservation Service is helping area farmers control nutrient rich run-off from their farmlands. Data gathered on Puffer's will be used to establish the efficiency of watershed controls.

Transparency readings improved in 1981 which indicates either a lot of natural fluctuation in transparency or an improvement in water quality. Continued monitoring is needed to confirm this trend. Chl*a* values for 1981 were low and TP values moderate.

Puffers Pond is managed for trout.

Pushaw Lake #0080

Surface Area	2048 ha (5056 a)
Max. Depth	7 m (23 ft)
Mean Depth	3 m (10 ft)
Volume	6.53 X $10^7 m^3$ (53000 acre-ft)
Drainage Area	293 km^2 (113 mi^2)
Flushing Rate	2.1 (flushes/year)



Pushaw Lake #0080

	1974-77@	1979	1980	1981	1982
Mean Secchi(m)	3.3	3.8	3.3*(4)	3.9	4.1
Min Secchi(m)	2.3	3.3	2.7	2.7	2.7
TSI	55	Colored	NA	Colored	colored
TSI range	44-71 Chl-SD				
Color(SPU)	50		80		
Chla(ug/l)	3.6mean		5.0(ls)		
TP(ppb)	13.8mean		22(ls)		
pH(core)	7.0		6.4		

*inadequate sampling
(ls) Late summer
@ From 1974-1976, the lake was part of a joint study between DEP and U.S. Geological Survey.

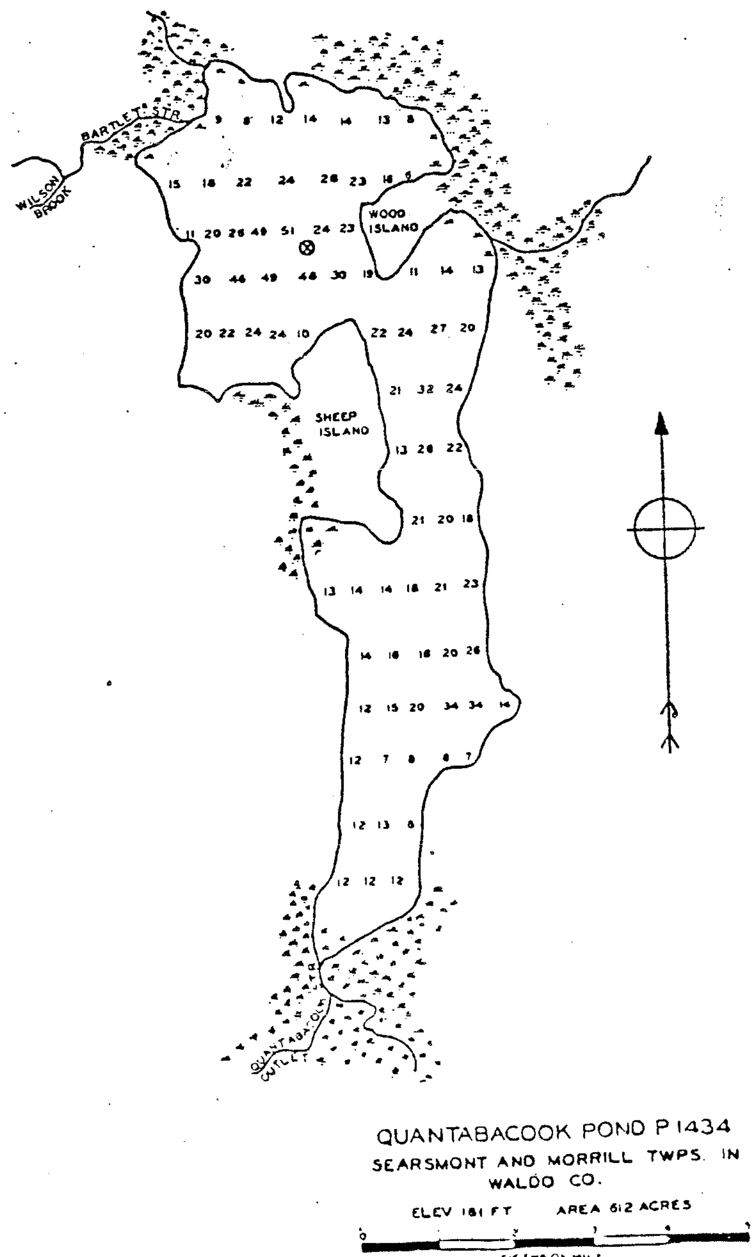
The lake is known to have supported one algal bloom. Every spring when the water level of Pushaw Lake arises above the normal shoreline, roads into the lake become impassable, and a large number of cottages are flooded. Septic tanks, cesspools, and leach fields around the lake are saturated with water. At this time of the year, the lake undoubtedly receives a large input of nutrients. In an effort to drain off water as the lake rises in the spring, proposals have been made to build a box type outlet at the southern end. No definite plans have been made to implement this project.

Reports of algal blooms, high bacteria, and extensive growth of aquatic plants caused Pushaw to be classified GP-B. Data collected from 1974-1978 showed that Secchi disk readings were limited by high color rather than algae. A large portion of the watershed is composed of peat bogs which result in high water color due to dissolved humic acids. Chla and TP results are moderate, and bacteria counts are low. For these reasons Pushaw Lake has been reclassified GP-A. Transparency readings have remained relatively stable over the past 9 years.

Pushaw Lake is well suited for a warm water fishery.

Quantabacook Pond #4832

Surface Area	248 ha (612 a)
Max. Depth	15.5 m (51 ft)
Mean Depth	5.1 m (16.8 ft)
Drainage Area	99.2 km^2 (38.3 mi^2)
Volume	12.70 X 10^6 m^3 (10,295 acre-feet)
Flushing Rate	4.6 (flushes/year)



Quantabacook Pond #4832

	1981	1982
North Basin		
Mean Secchi(m)	3.6*(3)	4.3*(3)
Min Secchi(m)	2.0	3.9
TSI	NA	NA
Color(SPU)		37
Chla(ug/l)		3.1(ls)
TP(ppb)		14(ls)
		23(b)(ls)
pH		6.5(c)(ls)
South Basin		
Mean Secchi(m)	4.1*(1)	
Min Secchi(m)		
TSI	NA	

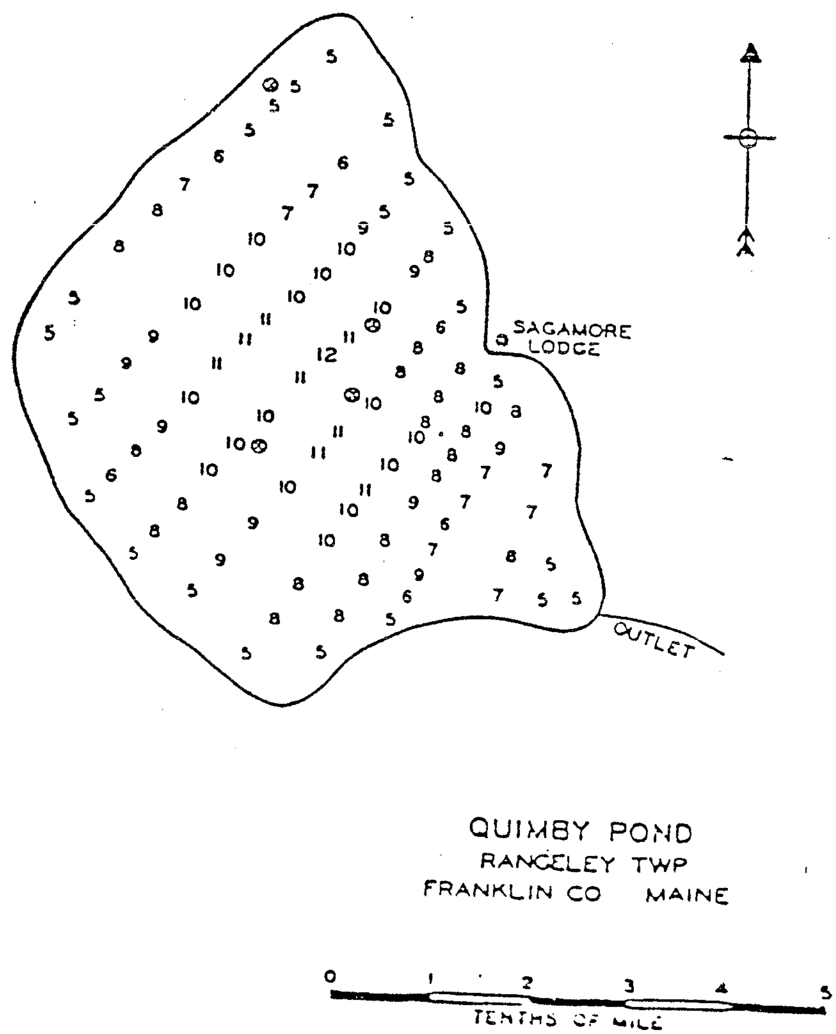
*inadequate sampling
(ls) late summer, (c) core, (b) bottom

Quantabacook Lake is well suited for warm water fish. There are many shallow, weedy areas which provide excellent habitat for largemouth bass.

Transparencies are below average for Maine lakes, which is probably due to the moderate color of the pond. Chl*a* and TP values are moderate. Continued monitoring with complete seasons is necessary to accurately determine water quality and water quality trends.

Quimby Pond #3526

Surface Area	67 ha (165 a)
Max. Depth	3.7 m (12 ft)
Mean Depth	2.1 m (7 ft)
Volume	1.4 X $10^6 m^3$ (1138 acre-feet)
Drainage Area	1.8 km^2 (.67 mi^2)
Flushing Rate	0.7 (flushes/year)



Quimby Pond # 3526

	1979	1980	1981	1982
Mean Secchi(m)	2.0*(3)	2.2*(4)+	2.2+	2.1*(2)+
Min Secchi(m)	1.4	1.8	1.9	1.3
TSI	Colored	Colored	Colored	colored
Color(SPU)		50		
pH(core)				7.1(ls)
Chla(ug/l)	3.0(s)			5.5*(3)
TP(ppb)	5(s)			18(c)(ls)

* inadequate sampling + Many Secchi disk readings hit bottom
(s) summer, (ls) late summer, (c) core

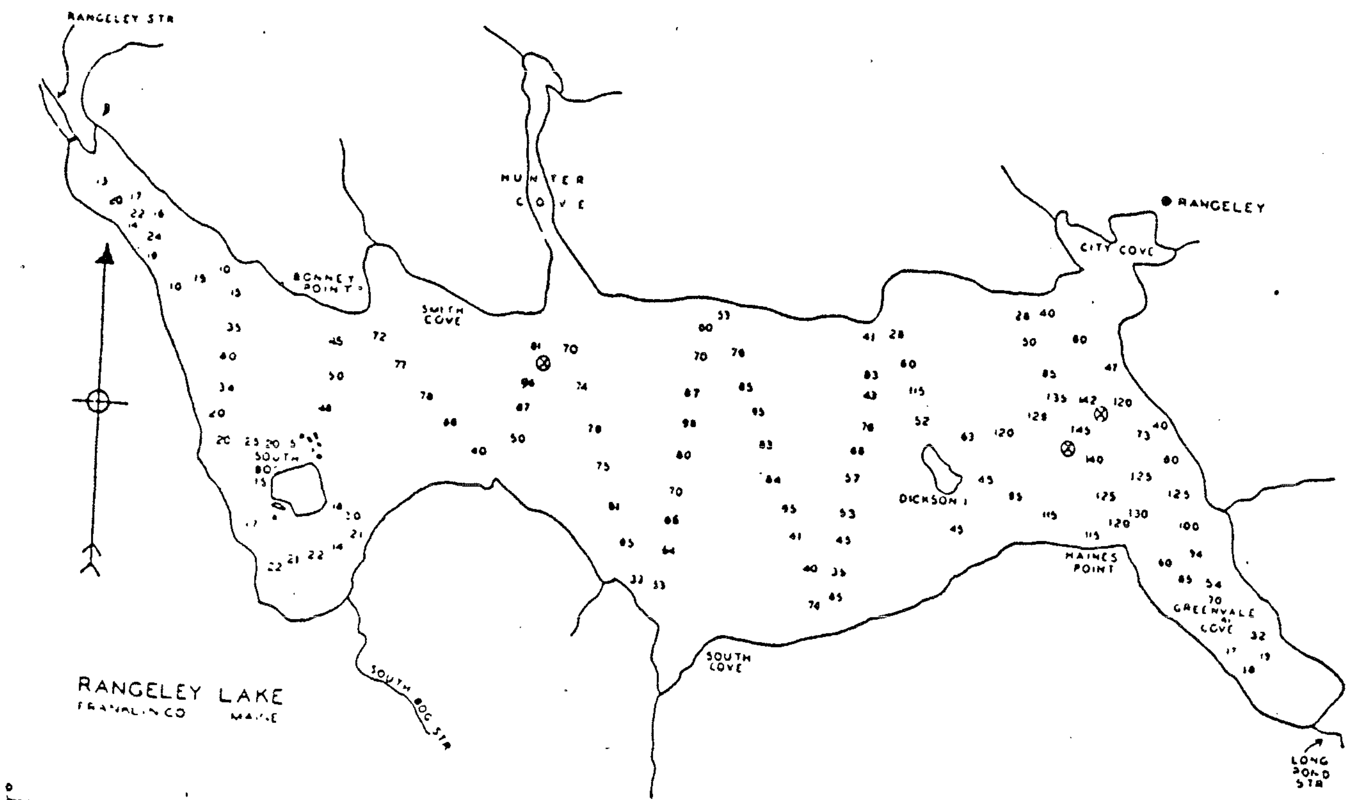
The pond is broad and shallow and does not stratify during the summer months. It remains well oxygenated to the bottom. The pond supports 2 species of trout.

Secchi disk readings underestimate the water quality because of the highly colored nature of the pond and most of the Secchi disk readings hit bottom. Transparencies have remained stable. Chl*a* results are moderate and TP levels are low to moderate.

In 1982, the monitor participated in the chlorophyll sampling program. The program was established in 1980 to collect additional data on lakes that were colored, shallow, or had declining water quality.

Rangeley Lake #3300

Surface Area	2428 ha (6000 a)
Max. Depth	45.4 m (149 ft)
Mean Depth	14.8m (48.8 ft)
Volume	359.0 X 10^6 m^3 (291005 acre-feet)
Drainage Area	264 km^2 (101.9 mi^2)
Flushing Rate	0.4 (flushes/year)



Rangeley Lake # 3300

	1970-71@	1972@	1973@	1981	1982
Mean Secchi(m)	6.7*	6.9*(4)	7.6*(2)	6.8	7.4
Min Secchi(m)	5.8	5.8	6.4	6.1	6.1
TSI	NA	NA	NA	33	29
Color(SPU)	20				
pH(core)		6.9(sur)			5.5(sur)
Chla(ug/l)					2.9(ls)
TP(ppb)					6(c)(ls)
					3(b)(ls)

* inadequate sampling

@ The lake was studied by Scott and Davis from 1970-1973, (Descriptive and Comparative Lake Studies in Maine. Ronald B. Davis, Bailey, Scott, Hunt, and Norton, 1978).

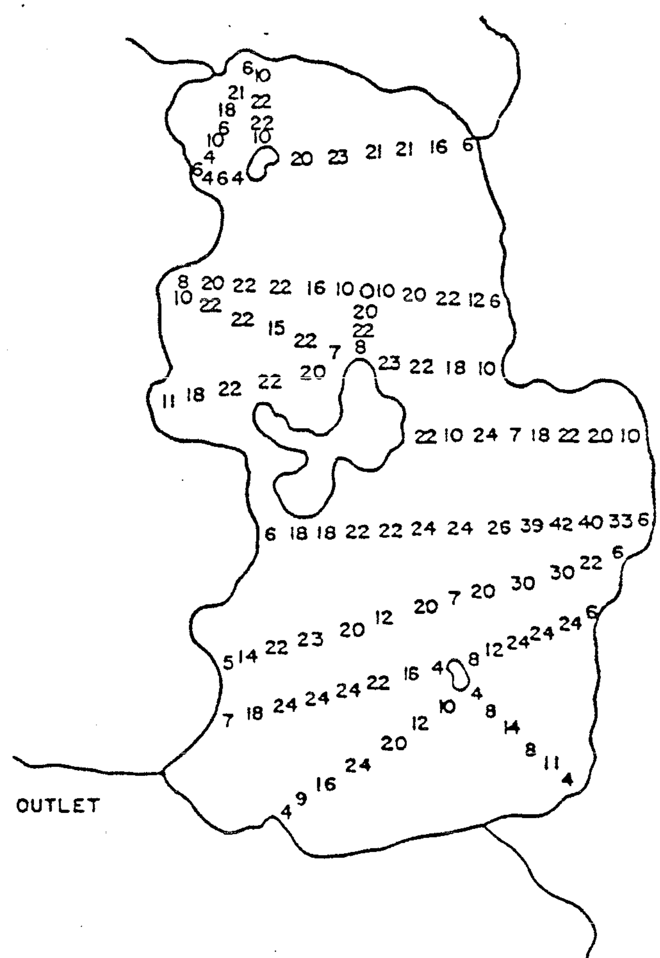
(surf) surface, (c) core, (b) bottom, (ls) late summer

Rangeley Lake provides excellent habitat for salmon and brook trout. The Department of Inland Fisheries and Wildlife determined that Rangeley would be best managed as a separate lake rather than in conjunction with other lakes in the drainage, so a fish screen at the outlet is maintained. Part of the lake's management also includes keeping tributaries clean and undisturbed in order to maintain a good population of smelts.

Rangeley lake has above average water quality. Transparencies are above average for lakes in Maine and Chla and TP results are low.

Raymond Pond #3960

Surface Area	140 ha (346 a)
Max. Depth	12.8 m (42 ft)
Mean Depth	4.9 m (16 ft)
Volume	6.9 X $10^{6}m^{3}$ (5,600 acre-feet)
Drainage Area	13.5 km^2 (5.2 mi^2)
Flushing Rate	1.0 (flushes/year)



RAYMOND POND

RAYMOND TWP., CUMBERLAND CO., MAINE

0 1/2

ONE-HALF MILE

Raymond Pond # 3960

	1974-76@	1977-78	1980	1981	1982
Mean Secchi(m)	5.9	7.2*	7.2*(3)	5.9	6.4*(3)
Min Secchi(m)	4.8	6.2	6.1	4.6	6.1
TSI	41	NA	NA	40	NA
Color(SPU)			30		
TSI range	38 - 53 SD-TP Chl				
Chl*a* (ug/l)	4.1mean		2.5(ls)		
TP (ppb)	8mean		7(ls)		
pH	6.6(s)				

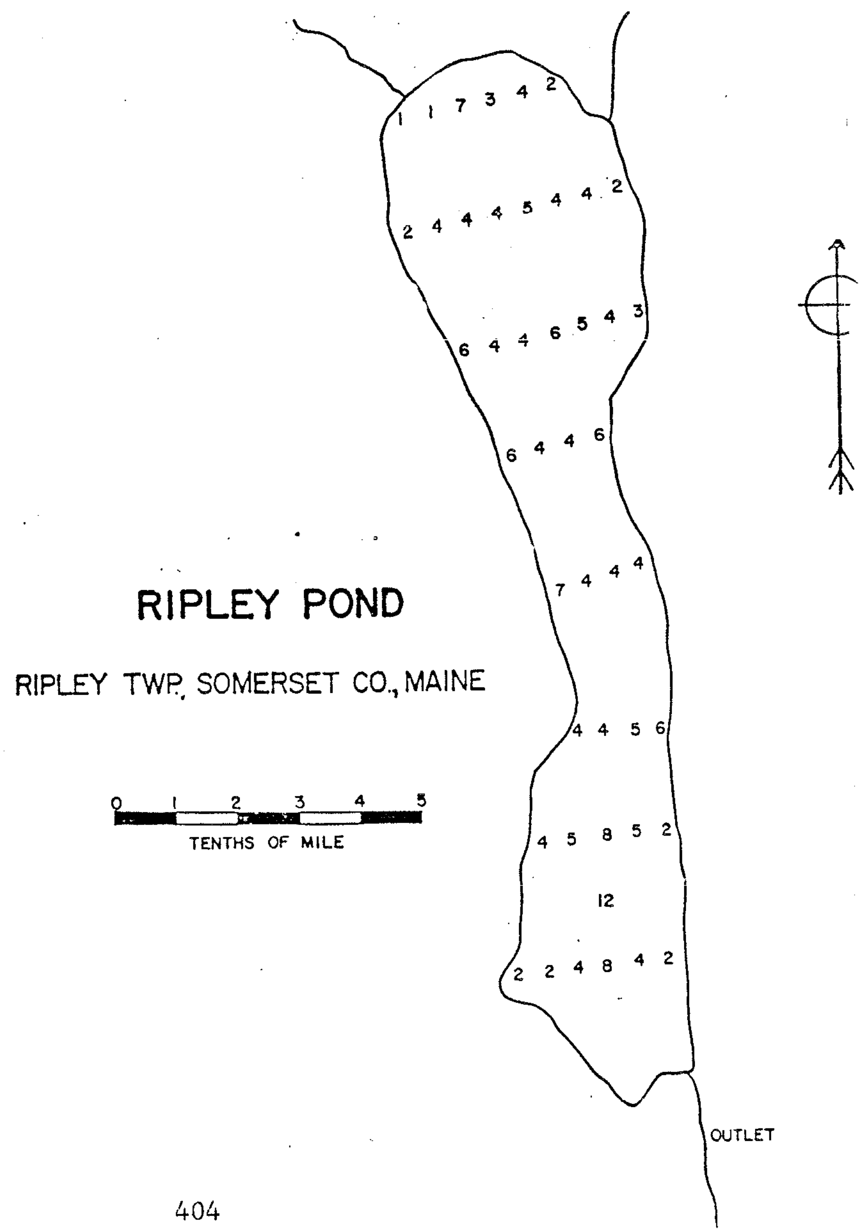
* inadequate sampling
(ls) late summer, (s) surface
@ Studied as part of cooperative project between DEP and the U.S. Geological Survey.

Raymond Pond provides habitat for both warm and cold water fish. Bass and cusk, pickeral, and perch as well as brown trout inhabit the pond. There is an oxygen deficiency (less than 1 ppm) below 8 m by late summer.

Water quality is average for Maine lakes. Inadequate sampling seasons, however,prevent, however, accurate prediction of water quality trends. Water quality appears to be stable when comparing 1981 transparency readings to 1974-1976 transparency. TP and Chl*a* levels are low to moderate. Transparency is average for lakes and ponds in Maine.

Ripley Pond # 0746

Surface Area	97 ha (242 a)
Max. Depth	3.6 m (12.0 ft)
Mean Depth	1.2 m (4.0 ft)
Volume	1.19 X 10^6 m^3 (965 acre-feet)
Drainage Area	10.8 km^2 (4.2 mi^2)
Flushing Rate	4.6 (flushes/year)



Ripley Pond # 0647

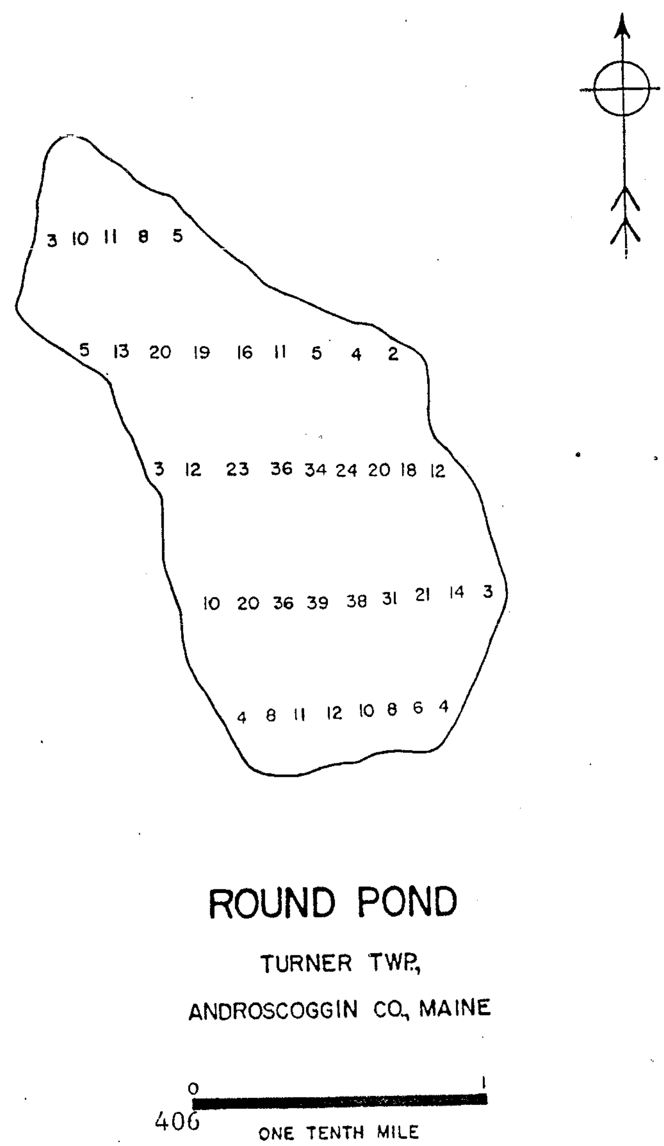
	1982
Mean Seccchi (m)	2.8
Min. Secchi (m)	2.8
TSI	80
Color(SPU)	NA

Ripley Pond has below average transparency reading for lakes and ponds in Maine. The reasons for this are unknown at this time. Perhaps it is due to water color or the shallowness of the pond. Shallow ponds tend to be turbid because organic material, such as decaying plants, and bottom sediments are easily stirred up into the water column by the wind. The pond does not stratify.

The pond was reclaimed and is being managed for brook trout.

Round Pond #3818

Surface Area	64.0 ha (160 a)
Max. Depth	9.6 m (32.0 ft)
Mean Depth	4.8 m (15.8 ft)
Volume	3.08 X 10^6 m^3 (2500 acre-feet)
Drainage Area	3.9 km^2 (1.5 mi^2)
Flushing Rate	0.7 (flushes/year)



Round Pond # 3818

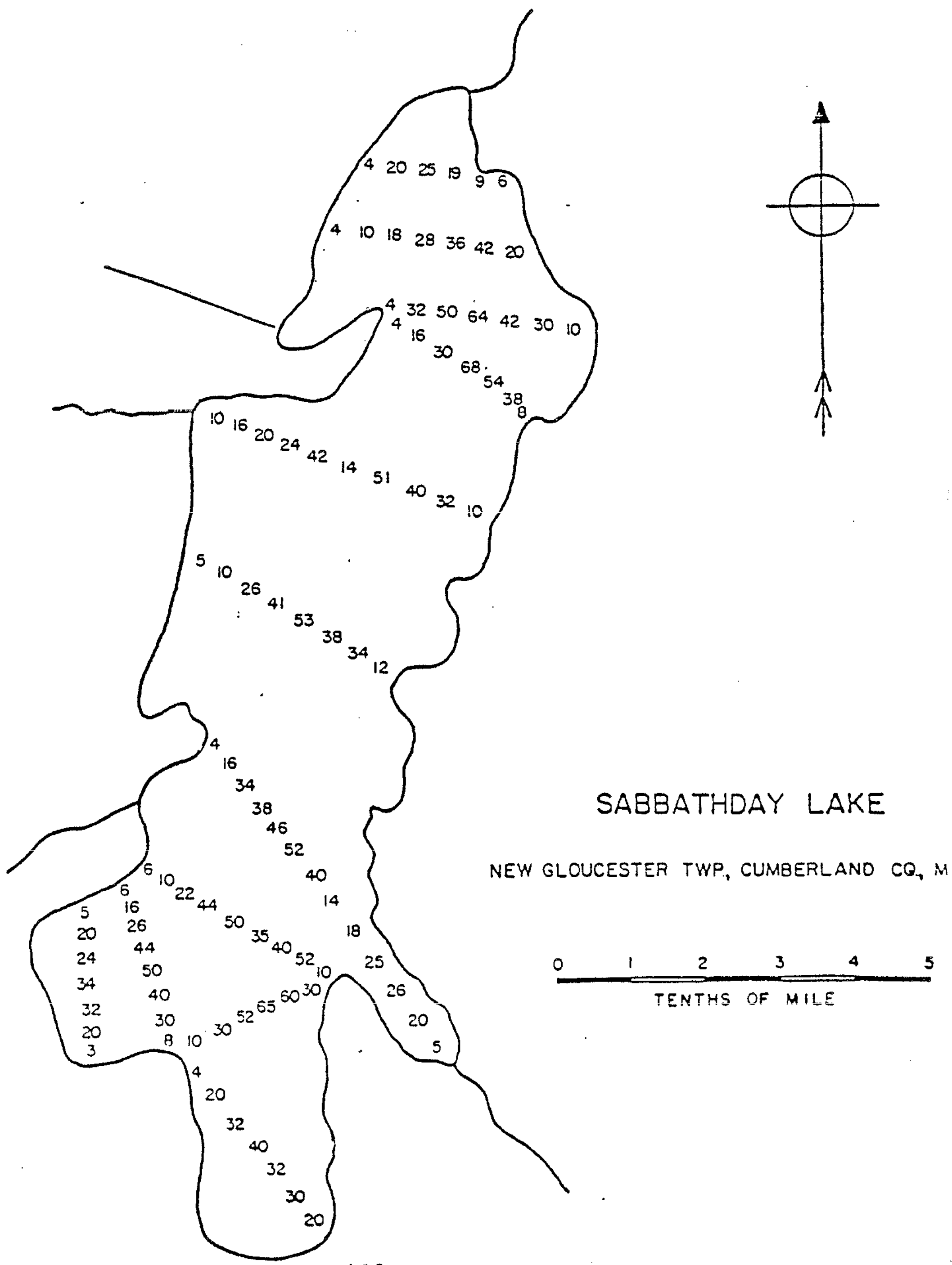
	1982
Mean Secchi (m)	6.5
Min. Secchi (m)	6.0
TSI	35
Color(SPU)	22

Round Pond is managed for cold water fish, especially brown trout.

Transparency is above average for Maine lakes which indicates high water quality. Continued monitoring will be necessary to accurately detemine water quality and water quality trrends.

Sabbathday Lake #3700

Surface Area	134 ha (331 a)
Max. Depth	20.7 m (68 ft)
Mean Depth	8.4 m (27.7 ft)
Volume	11.27 X 10^6 m^3 (9135 acre-feet)
Drainage Area	20.0 km^2 (7.7 mi^2)
Flushing Rate	0.9 (flushes/year)



Sabbathday Lake # 3700

	1975	1981	1982
North Basin #1			
Mean Secchi(m)	6.5*(1)	6.9*(2)	6.0*(1)
Min Secchi(m)		6.7*	5.3
TSI		NA	NA
Color(SPU)			
pH(core)			
Chla(ug/l)	3.6(summer)		3.1(ls)
TP(ppb)	7(summer)		5(c)(ls)
			9(b)(ls
South Basin #2			
Mean Secchi(m)		6.8*(2)	6.1*(1)
Min Secchi(m)		6.7*	
TSI		NA	NA

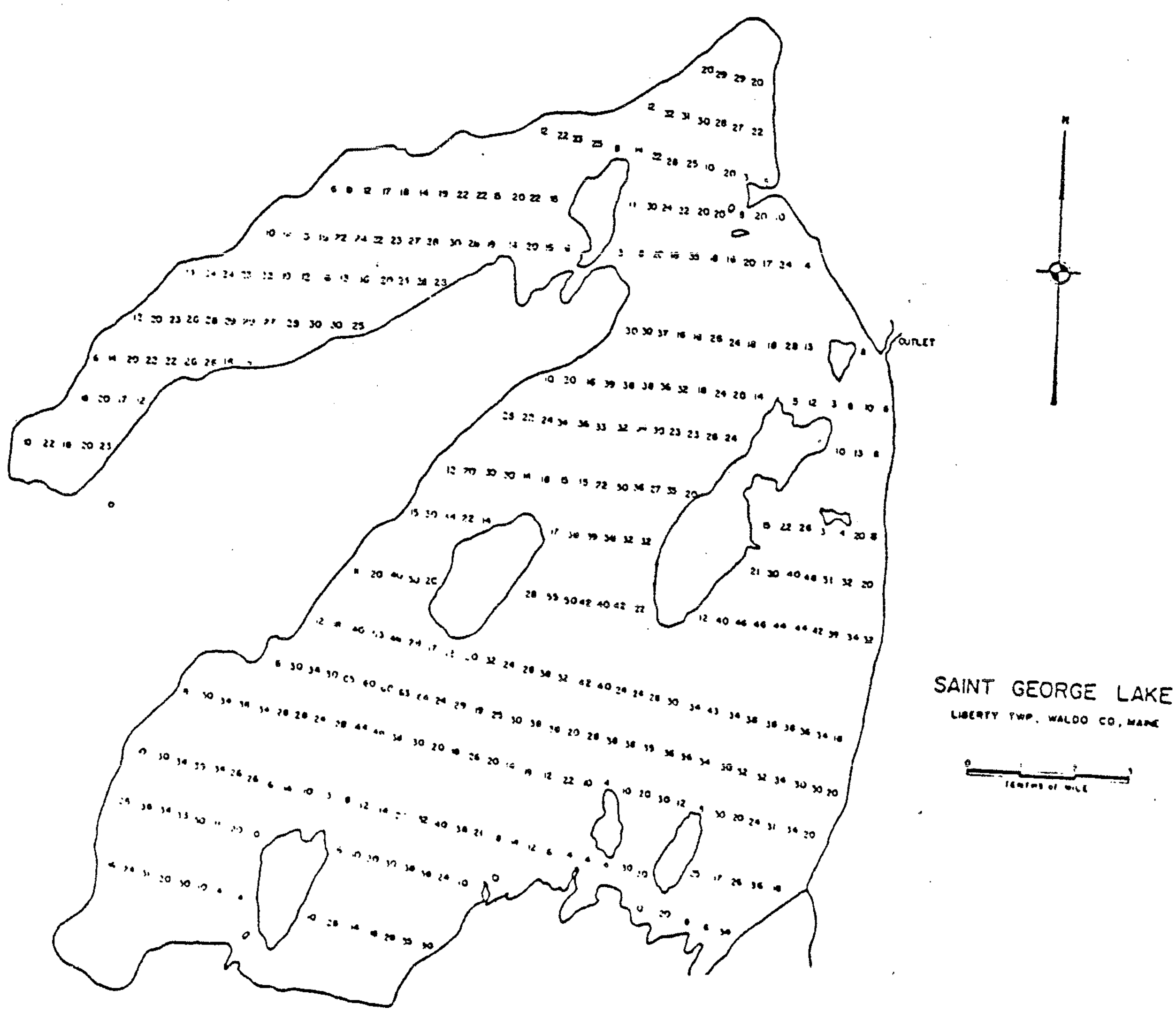
* inadequate sampling
(ls) late summer, (b) bottom, (c) core

Sabbathday Lake is managed for both brown trout and brook trout. Largemouth bass and pickeral are also present.

It is difficult to predict any trends in water quality because of inadequate sampling seasons. Chla and TP values for 1975 and 1982 were low to moderate. Transparency readings indicate good water quality. There is some oxygen depletion (i.e. less than 5 ppm) below 15 meters.

St. George Lake #9971

Surface Area	427 ha (1055 a)
Max. Depth	19.8 m (65 ft)
Mean Depth	6.5m (21.4 ft)
Volume	27.73 X 10^6 m^3 (22,478 acre-feet)
Drainage Area	14.8 km^2 (5.7 mi^2)
Flushing Rate	0.3 (flushes/year)



St. George Lake # 9971

	1976-78	1979	1980	1981	1982
Mean Secchi(m)	8.4	8.5	7.6	8.0	7.6
Min Secchi(m)	6.2	6.4	4.1	6.4	6.0
TSI	23	23	28	26	28
Color(SPU)			15		
pH	6.5(s)		6.6		
			7.3(mon(c)		7.2(mon)
Chla(ug/l)	2.5(ls)		1.6(ls)		
TP(ppb)	4(ls)		6(c)(ls)		
			33(b)(ls)		

(c) core, (b) bottom ,(ls) late summer, (s) surface, (mon) tested by monitor

---

An oxygen depression of less than 5 ppm exists in late summer below 16 meters. An excellent land-locked salmon fishery exists in the lake as well as a brown trout and brook trout fishery.

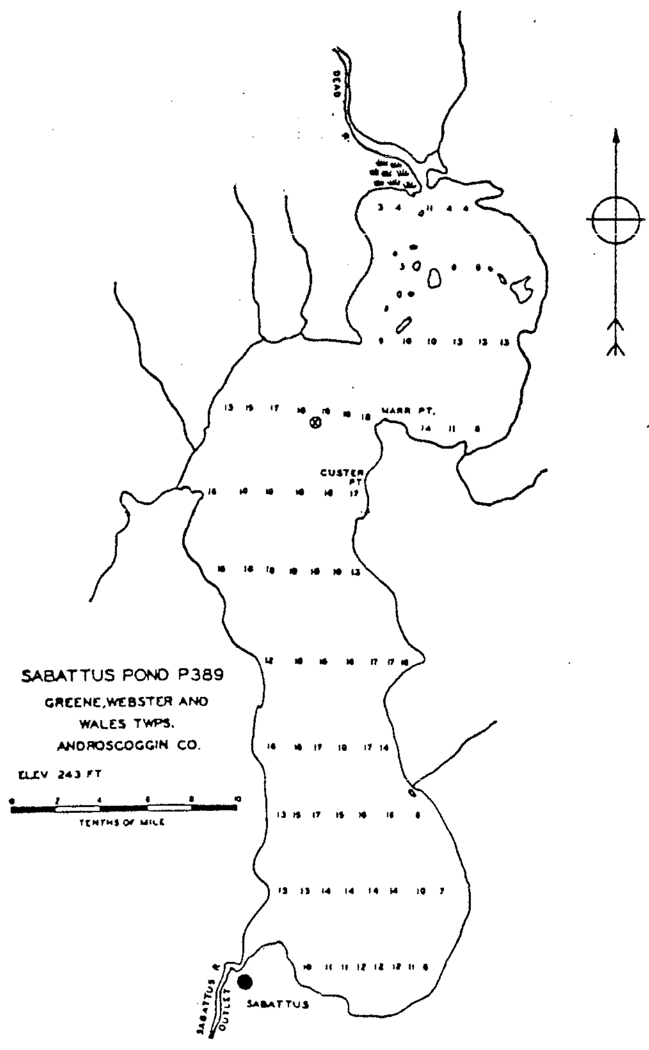
Transparencies fluctuate which may be due to weather or natural conditions. St. George Lake continues to have above average water quality for Maine lakes.

Chla and TP levels are low and have not changed significantly since 1977.

There is a discrepency between pH readings obtained by the monitor and D.E.P. The monitor has been getting values of 7.3, but this department's sampling of St. George Lake showed a pH value of 6.6, it is unknown at this time what is causing the wide difference. DEP will be studying the problem in 1983. A standard technique is being developed so that pH readings taken by monitors and this Department's staff will be consistent.

Sabattus Pond #3796

Surface area	723 ha (1787a)
Max. depth	5.8 m (19 ft)
Mean depth	3.5 m (12 ft)
Volume	$2.56 \times 10^7 m^3$ (20,750 acre-feet)
Drainage area	85.5 km^2 (53.1 mi^2)
Flushing rate	1.7 (flushes/year)



Sabattus Pond # 3796

	1977-78	1979	1980	1981	1982
Mean Secchi(m)	2.0	1.3	1.7	1.6	1.9
Min. Secchi(m)	0.8	0.5	0.7	0.6	1.0
Chla (ug/l)mean	26.8	43	28	22.8	14.7
TP (ug/l)mean	52	44	48	44	39
TSI	100 Chl	115 Chl	102 Chl	96 Chl	83 Chl
Color(SPU)	40				

Sabattus Pond has a long history of nuisance algal blooms. The DEP began to study Sabattus Pond intensively in 1977 to determine the sources of phosphorus to the lake and to develop a water quality restoration program. The study showed that most of the phosphorus was coming from agricultural land.

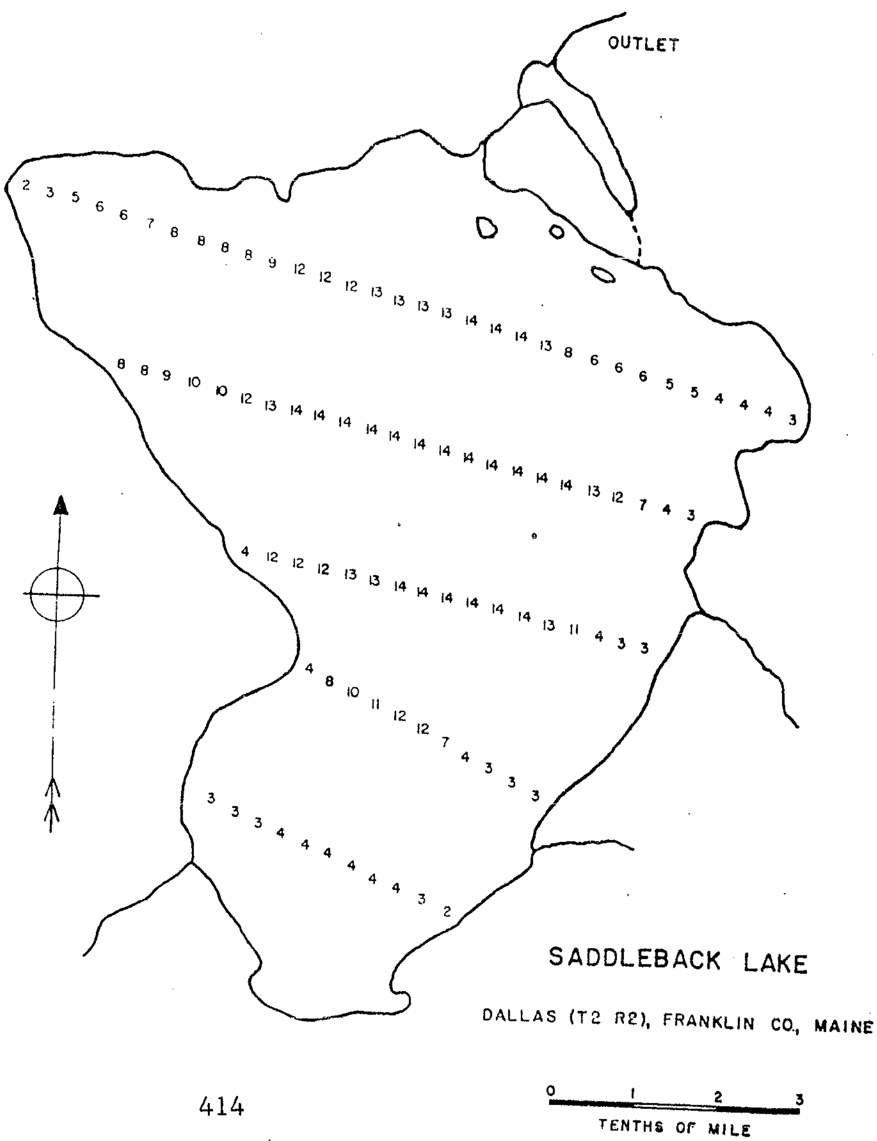
A fall lake water drawdown began the 15th of August, 1982. The lake was lowered 8 feet by mid-October. The total amount of phosphorus flushed from the lake was approximately 1000 kilograms.

. Best management practices (BMP's) were installed on 3 more farms in the watershed for a total of 6 out of the 10 farms icnluded in the project. Most of the manure storage facility construction is complete with only 2 remaining to be built in 1983. Monitoring of phosphorus input via major streams showed continued lower total phosphorus concentration in 1982-83 than in previous years, perhaps reflecting some positive effects of the BMP's. The study and part of the restoration program were funded through an Environmental Protection Agency, Clean Lakes grant and most of the agricultural program was made possible by the Agricultural Soil Stabilization Service and the Soil Conservation Service.

Algae production was lower in 1982 than in recent years. The algal bloom was delayed a couple of weeks later than usual until the beginning of August although full bloom conditions did not develop until mid-August. Minimum and mean Secchi disk transparency were improved over that of recent years and mean chlorphyll and total TP concentration were the lowest ever measured; however, monthly values in August and September were in the usual high range.

Saddleback Lake #3536

Surface Area	5.3 ha (13 a)
Max. Depth	4.3m (14.2 ft)
Mean Depth	2.1 m (6.9 ft)
Drainage Area	28.5 km^2 (110 mi^2)
Volume	3.21 X 10^6 m^3 (2602 acre-feet)
Flushing Rate	4.54 (flushes/year)



Saddleback Lake # 3536

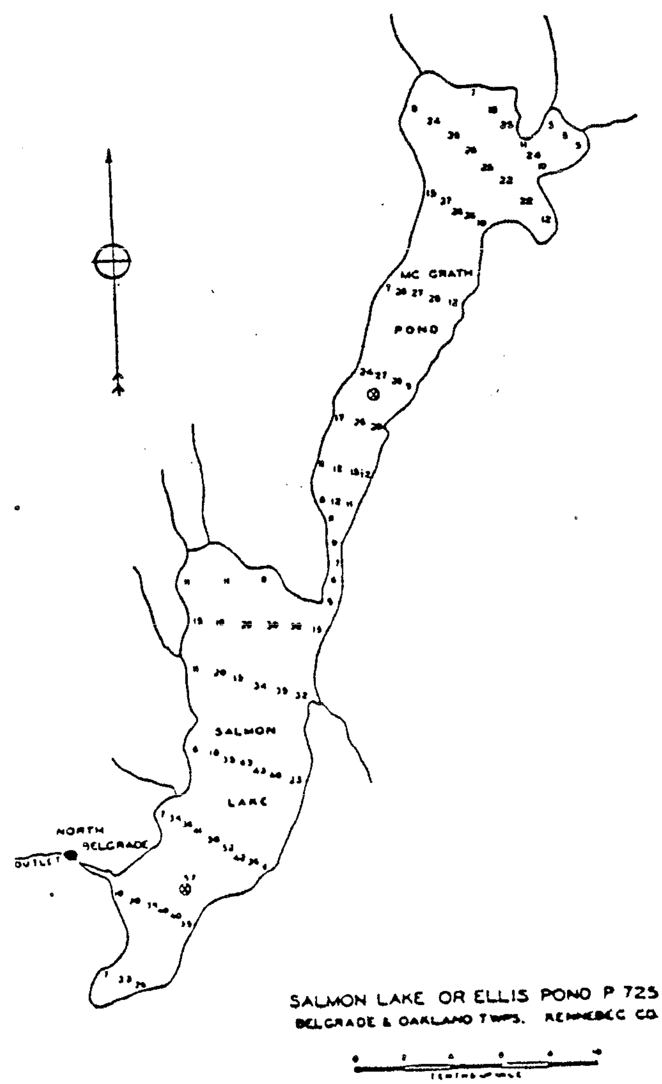
	1974@	1975@	1976@	1981	1982
Mean Secchi(m)	2.6	3.4	3.5	2.4	3.8+
Min. Secchi (m)	1.3	2.7	2.9	2.0	2.1
TSI	60	48	45	61	47
TSI Range	47-85	33-69	28-68	47-89	39-63
	TP SD	TP SD	CHL SD	CHL SD	CHL SD
Color(SPU)	40	30	35	45	25
pH	6.3mean	6.2mean	6.5mean	6.9mean	6.7
Chl<u>a</u>(ug/l)	4.2mean	3.3mean	1.8mean	4.0mean	2.9mean
TP(ppb)	12(s)mean	7(s)mean	9mean	12mean	9mean

+ some Secchi disk readings hit bottom
@ Data collected in a cooperative project between the D.E.P. and the U.S. Geeological Survey.

(s) surface

Salmon Lake #5352

Surface Area	270 ha (667 a)
Max. Depth	18 m (59 ft)
Mean Depth	7.3 m (24 ft)
Volume	20 X $10^6 m^3$ (2460 acre-feet)
Drainage Area	2287 ha (883 mi^2)
Flushing Rate	0.6 (flushes/year)



Salmon Lake # 5352

	1978	1979	1980	1981	1982
Mean Secchi(m)	4.9*(4)	4.9	4.3	6.1	5.6
Min Secchi(m)	4.6	3.0	2.0	4.3	4.0
TSI	49	49	60	42	47
TSI range	43 -54		54-71	38-46	42-52
	CHL-TP		TP-CHL	SD-CHL	SD TP
Color(SPU)				20	10
pH(core)	6.8mean	7.1*(4)		6.8	7.1
Chla(ug/l)	3.4mean	3.9mean	9.7mean	3.8mean	3.8mean
TP(ppb)	16mean	13mean	16mean	16*(4)	15mean

* inadequate sampling

Salmon Lake has clear water throughout the summer until September when there is a marked reduction in Secchi disk visibility. This reduction is due to the abundance of microscopic floating plants (algae). The blooms have been fertilized by phosphorus made available by fall overturn. During fall overturn, the whole lake mixes which brings phosphorus rich bottom water to the well lit surface water where the plants can thrive.

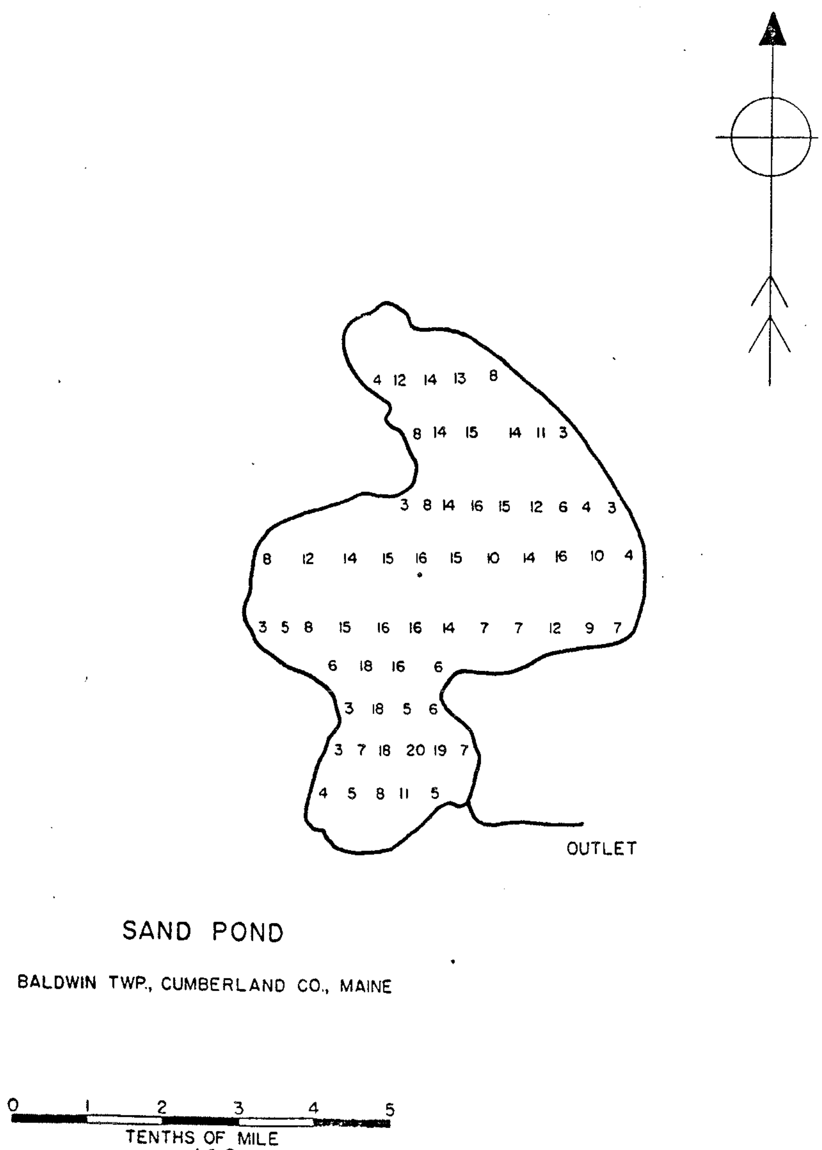
Efforts to avoid blooms of this nature are underway. In the summer of 1980, the State received an Environmental Protection Agency Grant to construct several measures to prevent phosphorus from draining into the lake.

The 1981 and 1982 open water season were free of phytoplankton blooms, unlike the 1980 season when water transparency was reduced to about 2 meters. This unpredictable nature of the algal blooms is actually a good sign since it means that Salmon Lake has not yet established itself as a eutrophic lake, however, nutrient levels are still high enough to support algae blooms.

This year (1983), final steps will be taken in the watershed to reduce the nutrient supply to Salmon Lake so that next year (1984) improvements in water quality will continue.

Sand Pond (Baldwin) # 3394

Surface Area	21 ha (52.5a)
Max. Depth	5.4m (18.0 ft)
Mean Depth	2.9m (9.6 ft)
Volume	6.10 X 10^5 m^3 (494.5 acre-feet)
Drainage Area	1.55 km^2 (.60 mi^2)
Flushing Rate	1.4 (flushes/year)



Sand Pond (Baldwin) # 3394

	1974	1975	1976	1977	1982
Mean Secchi (m)	2.6*(3)	4.9*(2)	3.8	3.7*(4)	4.5*+(3)
Min. Secchi (m)	0.9	4.8	2.6	2.7	3.7
TSI	NA	NA	63	NA	NA
Color(SPU)					12
Chl*a*(ug/l)	15 mean	3.4(ls)	2.2(ls)		2.3(ls)
TP(ppb)	17 mean	14(ls)	15(ls)	7	13(ls)
pH(core)					6.6

+ some readings hit bottom
* inadequate sampling season
(ls) late summer

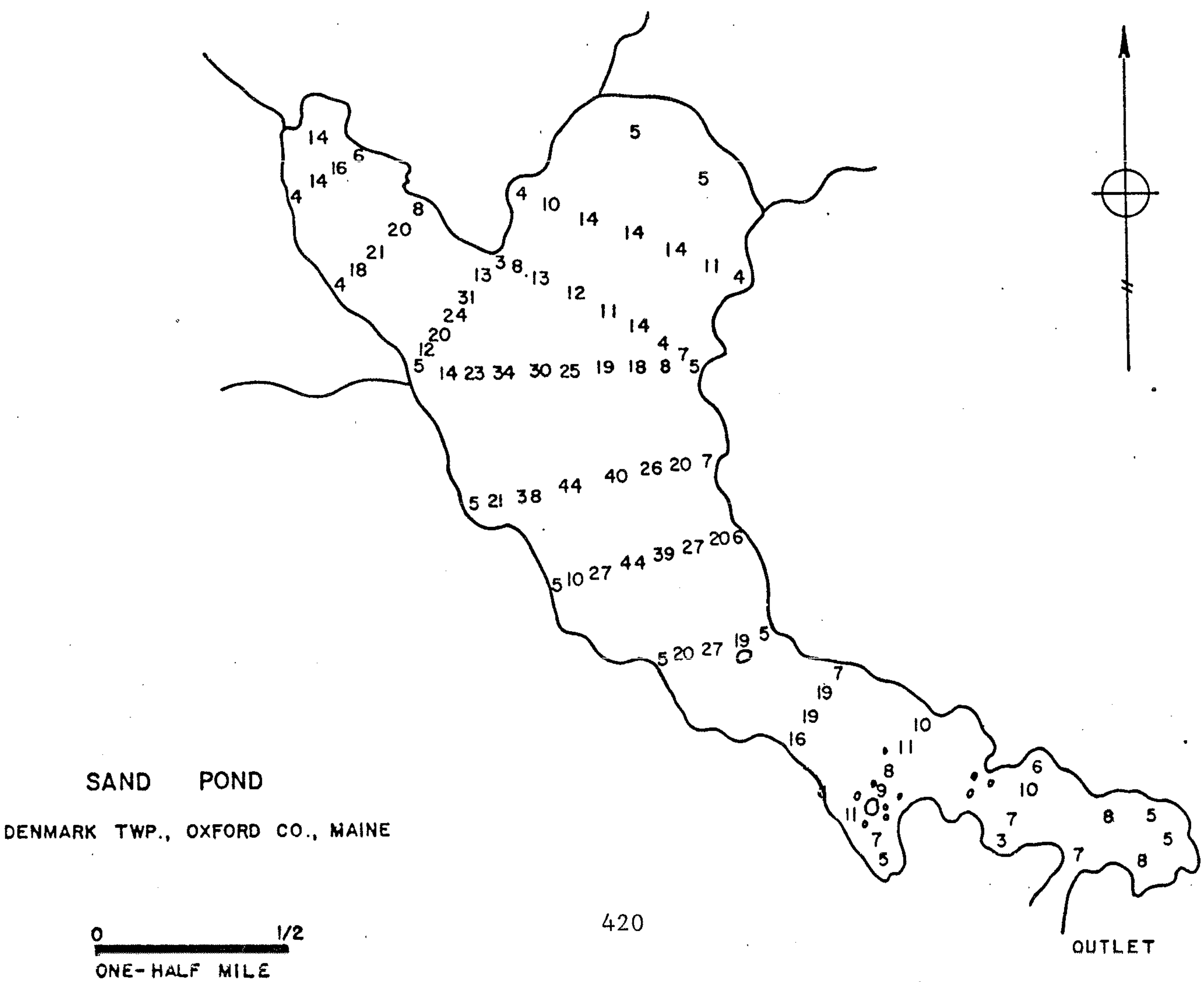
Sand Pond experienced a severe algal bloom in 1974. Secchi disk readings were very low (i.e.,0.9m) and TP and Chl*a* values were high. A septic system survey was conducted. Many systems were found to be in poor soils in close proximity to the lake, but the sudden appearance and severity of the algal bloom could not be satisfactorily explained by the poor soils alone. The rest of the explanation remains a mystery.

Since 1975 the Secchi disk readings have improved. Chl*a* and TP values have decreased although TP values are still moderately high. Sand Pond water quality is considered good. However, the pond is small and still very to sensitive nutrient loading, so camp owners should use caution in any land use changes or development that takes place in the watershed.

The pond is managed by the Department of Inland Fisheries and Wildlife for largemouth bass and perch.

Sand Pond (Denmark) # 3130

Surface Area	97 ha (242 a)
Max. Depth	13.2m (44 ft)
Mean Depth	4.7m (15.5 ft)
Volume	4.60 X 10^6 m^3 (3729 acre-feet)
Drainage Area	6.7 km^2 (2.6 mi^2)
Flushing Rate	0.9(flushes/year)



Sand Pond (Denmark) #3130

	1976	1982
Mean Secchi (m)	6.2*(1)	4.8
Min. Secchi (m)		4.6
TSI	NA	50
Color(SPU)	NA	
TP(ppb)	8(1s)	
Chla(ug/l)	4.1(1s)	

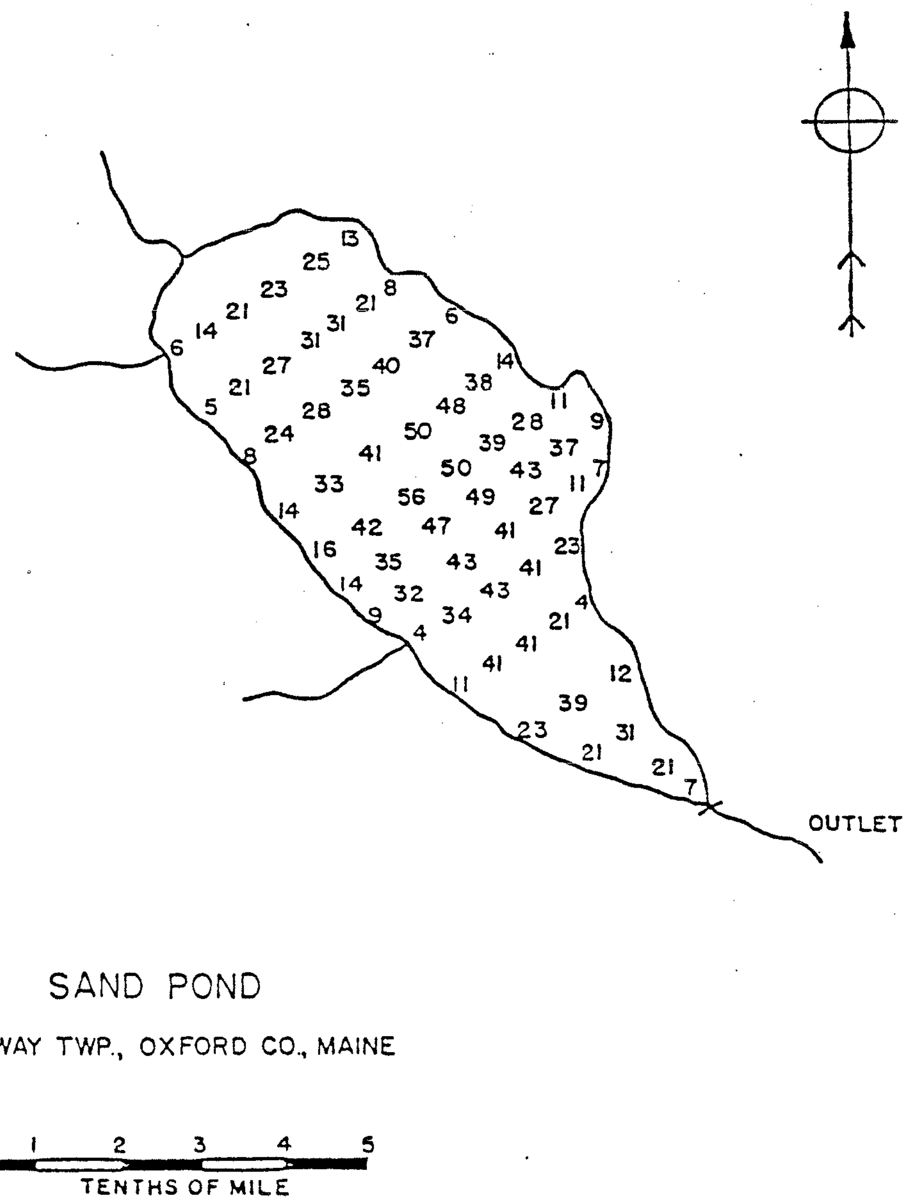
* inadequate sampling season
(1s) late summer

Sand Pond has good water quality. The transparencies are slightly below average for ponds in Maine. TP and Chla levels are moderate.

An oxygen deficiency exists below 35 ft, and improvement of the cold water fishery is doubtful for this reason. The Department of Inland Fisheries and Wildlife stocks brown trout annually. The pond has excellent smallmouth and largemouth bass habitat.

Sand Pond (Norway) #3432

Surface Area	55 ha (137 a)
Max. Depth	17 m (56 ft)
Mean Depth	8.2 m (27 ft)
Volume	4.5 X $10^6 m^3$ (3659 acre-feet)
Drainage Area	4.7 km^2 (1.8 mi^2)
Flushing Rate	0.5 (flushing/year)



Sand Pond (Norway) #3432

	1976-78	1979	1980	1981	1982
Mean Secchi(m)	6.1*	6.9	6.4	6.3	7.0
Min Secchi(m)	4.5*	5.5	3.3	4.3	5.5
TSI	NA	32	36	37	32
Color(SPU)				5	
pH(core)	6.3mean	6.4mean	6.4mean	6.6mean	6.3mean
Chl*a* (ug/l)	4.1(s)		3.2(ls)		
TP (ppb)	4(ls)		24(cls) 19(bls)		

* inadequate sampling season
(b) bottom, (ls) late summer, (c) core

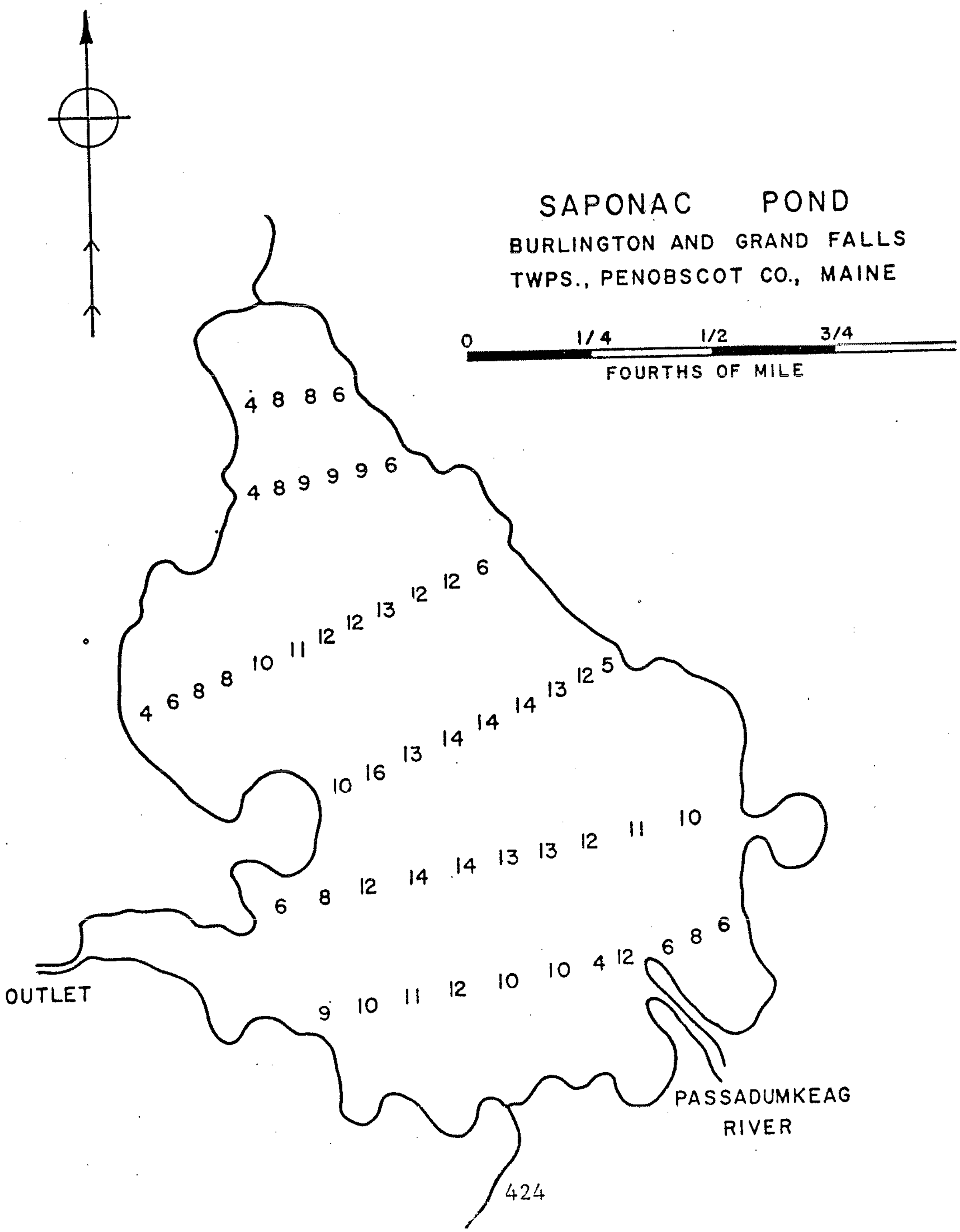
Dissolved oxygen is depressed (less than 1 ppm) below 13 m in late summer. The pond is best presently being managed for smallmouth bass and pickeral.

In 1980, TP values were high enough to indicate potential problems; however, on the same day transparency and Chl*a* results indicated no problems. Generally, TP values of 15 ppb are considered sufficient to support algal blooms. Transparencies remain relatively stable and are above average for Maine lakes. The Norway Lake Association conducts additional testing for bacteria, pH, and dissolved oxygen.

The flushing rate is fairly slow (0.5 flushes/year) which may make the pond vulnerable to water quality degradation. The pond is relatively undeveloped but residents of the drainage area should exercise care not to increase the phosphorus loading to the lake.

Saponic Pond # 4722

Surface Area	373 ha (922 a)
Max. Depth	4.2 m (14 ft)
Drainage Area	707.2 km^2 (273 mi^2)



Saponic Pond # 4722

	1982
Mean Secchi (m)	2.5
Min. Secchi (m)	2.2
TSI	87
Color(SPU)	NA

Saponic Pond is being managed as a warmwater fishery with smallmouth bass and white perch as the principal species. A large portion of the pond has become a settling basin for saw dust pollution from the Passadumkeag River. No remedy is available at this time to restore the pond to its original condition. (1)

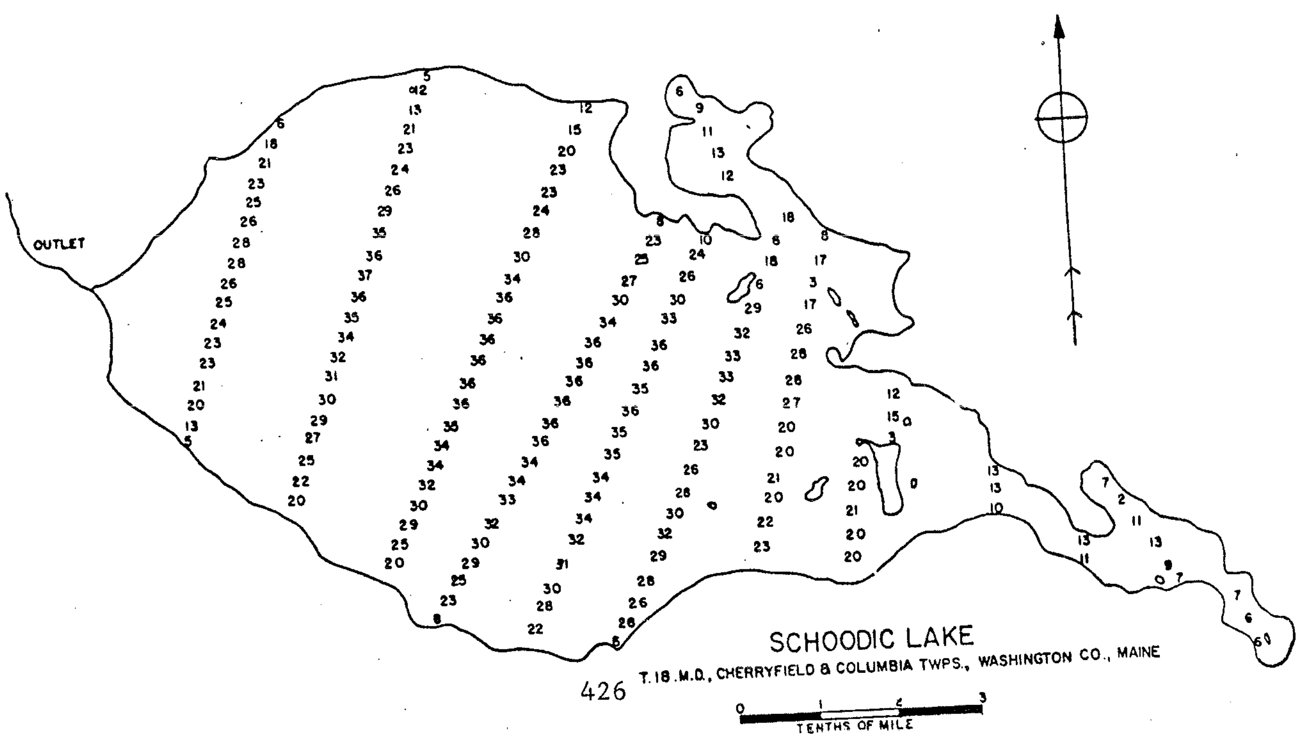
Transparencies are below average for lakes and ponds in Maine. This could be because the pond is shallow or possibly highly colored from the decaying material in the pond. Shallow ponds tend to be turbidfrom resuspended silt from the bottom sediments. Turbidity reduces Secchi disk readings but does not affect water quality. Additional testing in 1983 should help determine the cause of the low Secchi disk readings.

Water quality is considered good with no known problems.

(1) Taken from the Department of Inland Fisheries and Wildlife Survey, 1955

Schoodic Lake (Cherryfield) # 1230

Surface Area	357 ha (892 a)
Max. Depth	11.1 m (37 ft)
Mean Depth	2.9m (9.6 ft)
Volume	10.18 X 10^6 m^3 (8252 acre-feet)
Drainage Area	4.1 km^2 (1.6 mi^2)
Flushing Rate	0.3 (flushes/year)



Schoodic Lake (Cherryfield) #1230

	1977	1982
Mean Secchi (m)	4.2*(4)	4.9
Min. Secchi (m)	3.5	3.5
TSI	NA	38
TSI Range		27 - 49 CHL SD
Color(SPU)		10
Chla(ug/l)		1.7 mean
TP(ppb)		9 mean
pH(core)		6.9

* inadequate sampling season

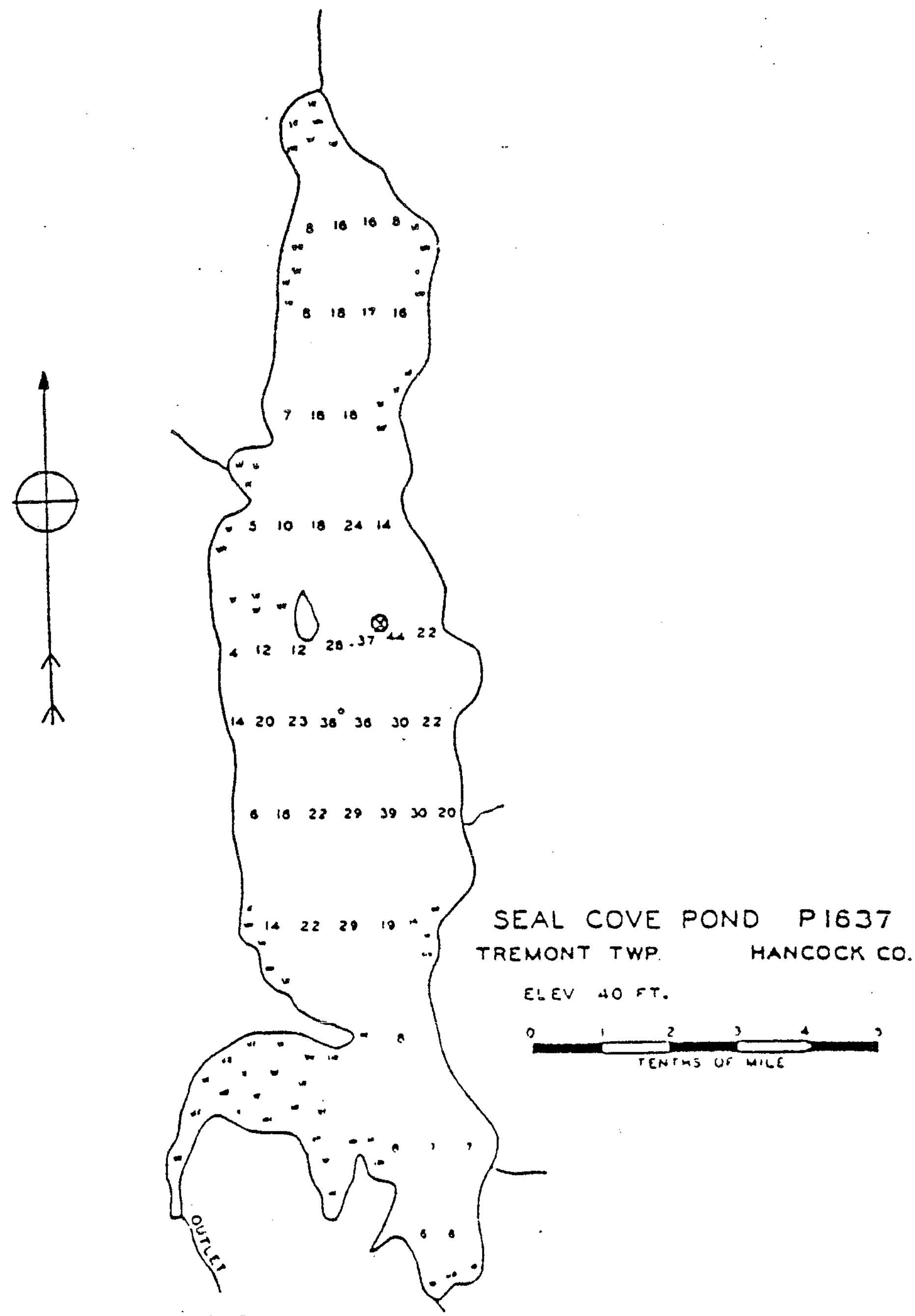
The Secchi disk readings for Schoodic Lake are about average for lakes in Maine. The Chla levels are low and TP levels are moderate. Water quality is good. The hypolimnion is well oxygenated.

The lake was frequently monitored by the Department of Inland Fisheries and Wildlife to study several different aspects of the salmon fishery. Salmon is the principal fishery for this lake along with brook trout, smallmouth bass, and some pickeral.

Schoodic Lake is situated in the blueberry barrens of Cherryfield. For this reason the lake was monitored for TP as well as Chla and Secchi disk transparency. From the results obtained new values for the amount of total phosphorus running off blueberry fields has been developed to improve this Department's understanding of the impact of different land uses on lakes.

Seal Cove Pond #4630

Surface Area	96 ha (237 a)
Max. Depth	13.2 m (43.3 ft)
Mean Depth	4.1 m (13.4 ft)
Volume	3.9 X $10^6 m^3$ (3171 acre-feet)
Drainage Area	11.65 km^2 (4.5 mi^2)
Flushing Rate	1.9 (flushes/year)



Seal Cove #4630

	1981	1982
Mean Secchi(m)	6.6*(3)	5.5*(2)
Min Secchi(m)	5.5*	5.5
TSI	NA	NA
Color(SPU)	10	
pH(core)	6.0	
Chla(ug/l)	2.3(ls)	
TP(ppb)	7(cls)	
	10(bls)	

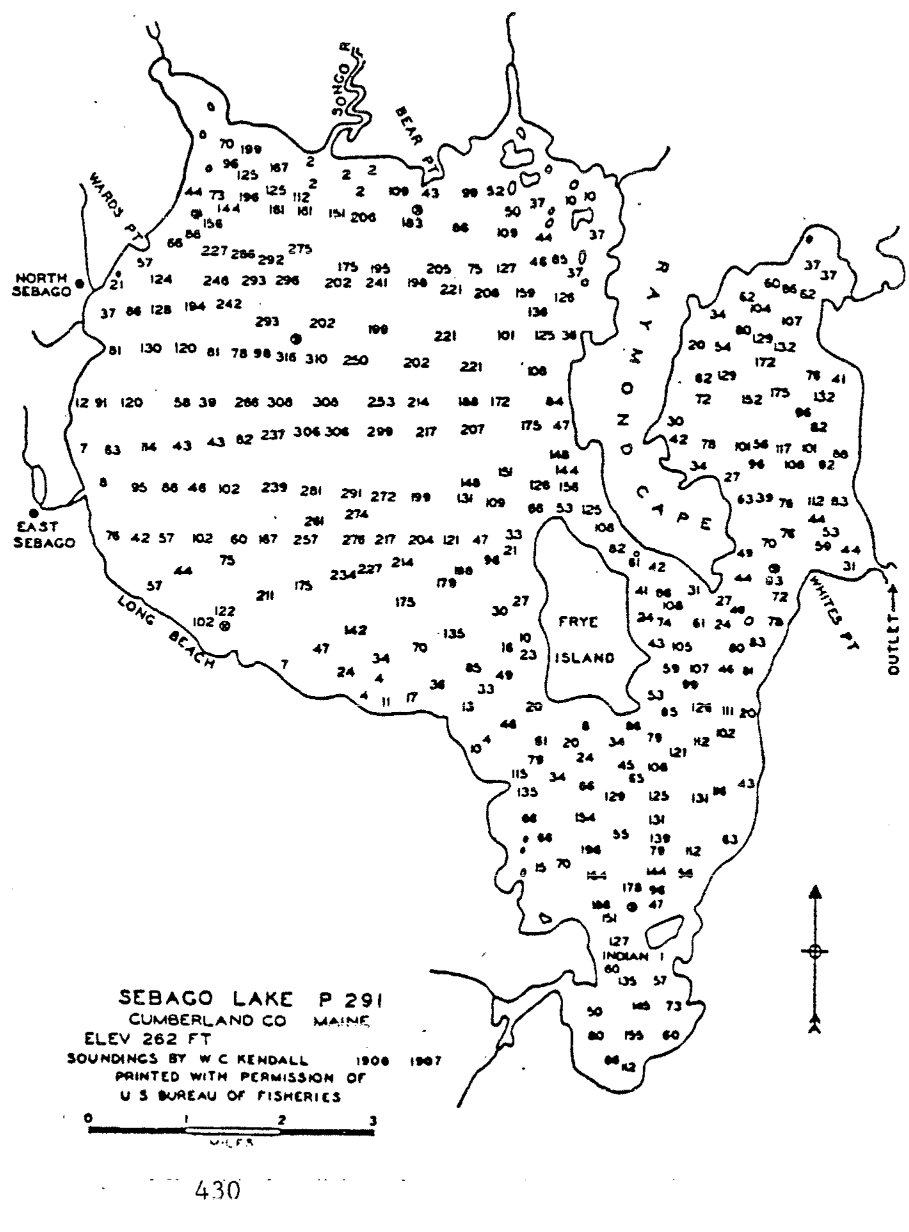
* inadequate sampling
(ls) late summer, (c) core, (b) bottom

Seal Cove Pond is suitable for both warm and cold water fish. It is presently being managed for hatchery brown trout.

Transparencies are above average for Maine lakes and Chla levels are low and TP values are moderate to low. An oxygen depletion exists (less than 2 ppm) in the lower hypolimnion. Present water quality is good to excellent. Complete sampling seasons are necessary to predict water quality trends.

Sebago Lake #5786

Surface Area	11,757 ha (28,771 a)
Max. Depth	94.8 m (316 ft)
Mean Depth	30.3 m (101 ft)
Volume	2.36 X $10^9 m^3$ (2,906,000 acre-feet)
Drainage Area	1164 km^2 (449 mi^2)
Flushing Rate	0.19 (flushes/year)



Sebago Lake #5786

	1977-78	1979	1980	1981	1982
Mean Secchi(m)	9.2*	9.1	11.1	9.8	9.4
Min Secchi(m)	7.4	7.5	7.6	8.7	6.0
TSI	NA	28	21	18	24
TSI range		21-32	13-26	18-27	19 - 33
		SD-Chl	SD-TP	SD-Chl	SD-TP
Color(SPU)			14	9	10
pH		6.9	6.9	7.0	6.8 mean
Chl*a*(ug/l)(1)	1.3*	2.2	1.4	1.7	1.3 mean
TP(ppb)(1)	2.8	6	5	5	7 mean

* inadequate sampling

(1) Analysis by Portland Water District for all data.

Sebago Lake, the original home of the landlocked salmon, is probably the most suitable lake in the country for the management of this species. The water quality is excellent with good oxygen content down to 300 ft., suitable water temperatures below 25 feet, and a good food supply. The lake is also managed for togue, brook trout, whitefish, cusk, smelts, largemouth bass, perch, and pickeral.

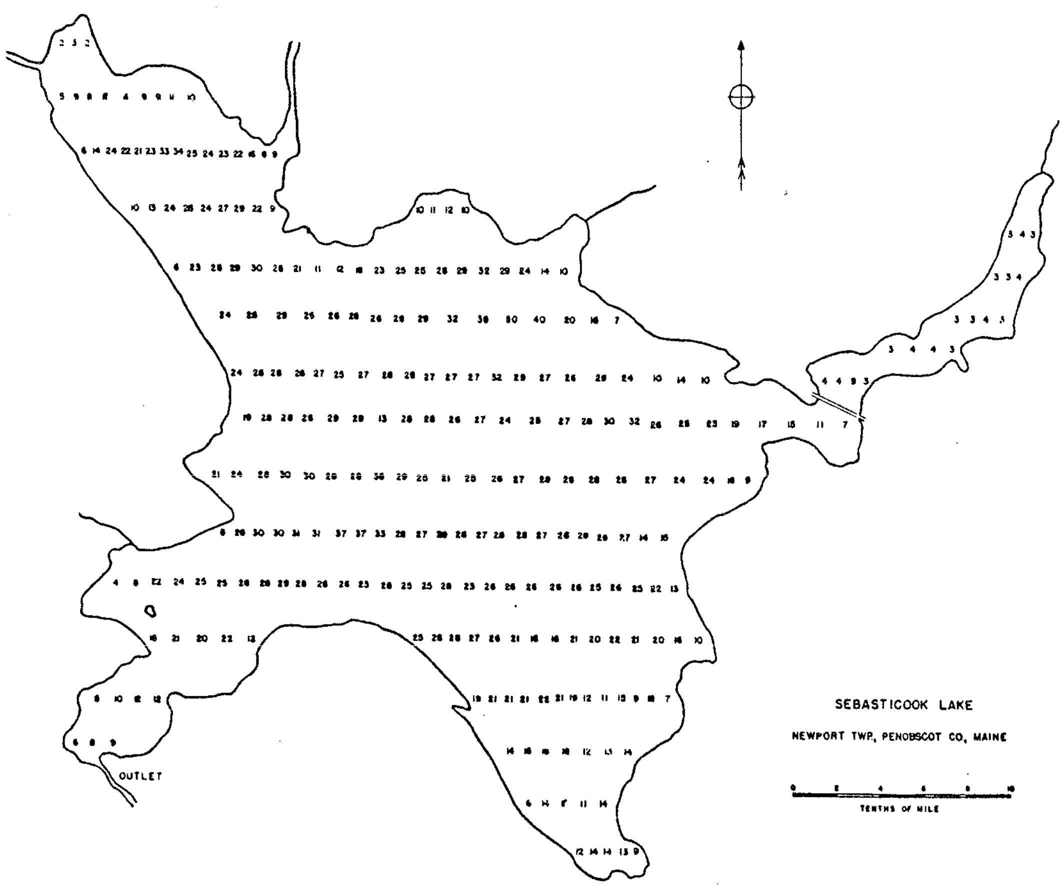
Transparencies are well above average for lakes in Maine. Transparencies for 1980 and 1981 were taken in the southern basin, previous readings and 1982 readings were taken in other basins as well. Water quality is above average for Maine lakes. Chl*a* and TP values are low.

Sebago lake is the water supply for Portland.

The lake was studied 1970-1973, (Descriptive and Comparative Studies of Maine Lakes, Ronald Davis, Bailey, Scott, Hunt, and Norton, 1978).

Sebasticook Lake #2264

Surface Area	1737 ha (4288 a)
Max. Depth	18.2 m (60 ft)
Mean Depth	6.2 m (20 ft)
Drainage Area	295 km^2 (114 mi^2)
Volume	110.6 X 10^6 m^3 (89652 acre-feet)
Flushing Rate	1.7 (flushes/year)



Sebasticook Lake # 2264

	1978	1979	1980	1981	1982
Mean Secchi (m)	0.9*(3)	1.8	1.8	2.7	1.4
Min. Secchi (m)	0.7	1.1	0.6	1.3	0.7
TSI	NA	104	105	86	106
TSI Range		101-106	104-106	82-92	94-121
		CHL SD	CHL SD	SD CHL	TP SD
Color(SPU)			30		
pH			7.0		
Chla(ug/l)	63mean	27mean	30mean	20mean	29mean
TP(ppb)				46mean	64mean

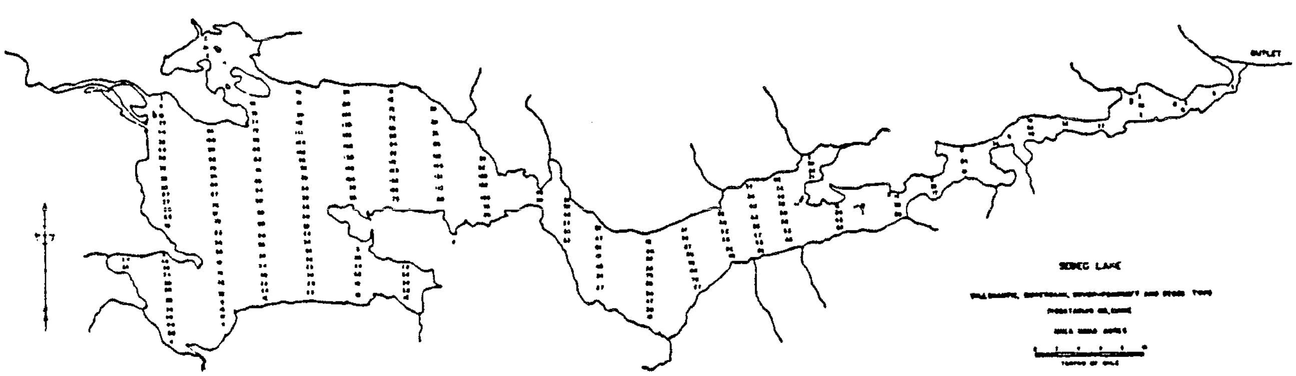
* inadequate sampling season

Sebasticook Lake is one of the most productive lakes in the state. The TP and Chla levels are extremely high for lakes in Maine and Secchi disk readings are well below average. The lake has severe algae blooms most of the summer months due to receiving munucipal and industrial waste since the early 1900's. The Sebasticook Lake Association became concerned with the water quality of Sebasticook Lake and has worked with DEP to try to improve the present water quality. After careful study of the lake and the sources of nutrient loading, a restoration plan was devised.

Today, Sebasticook Lake is the site of the largest lake restoration project in the state. Restoration will be accomplished through construction and improvements of wastewater treatment facilities in Corinna and Dexter,construction of agricultural runoff controls throughout the watershed, and reconstruction of the lake outlet dam to allow a 50% drawdown of the lake volume each fall. In 1982, construction of the drawdown facility was completed and the first drawdown occurred. Over a period of years it is planned that this will remove a portion of the phosphorus which has accumulated in the lake over the years.

Sebec Lake #0848

Surface Area	2753 ha (6803 a)
Max. Depth	47.2 m (155 ft)
Mean Depth	13.4 m (144 ft)
Volume	3.69×10^8 m^3 (299,349 acre-feet)
Drainage Area	841.1 Km^2 (326 mi^2)
Flushing Rate	0.54 (flushes/year)



Sebec Lake #0848

	1981	1982
Mean Secchi(m)	5.3	6.4
Min. Secchi(m)	3.2	4.6
TSI	45	36
Color(SPU)		20
pH		6.8
Chla(ug/l)		1.4(ls)
TP (ppb)		2(c)(ls)
		6(ls)

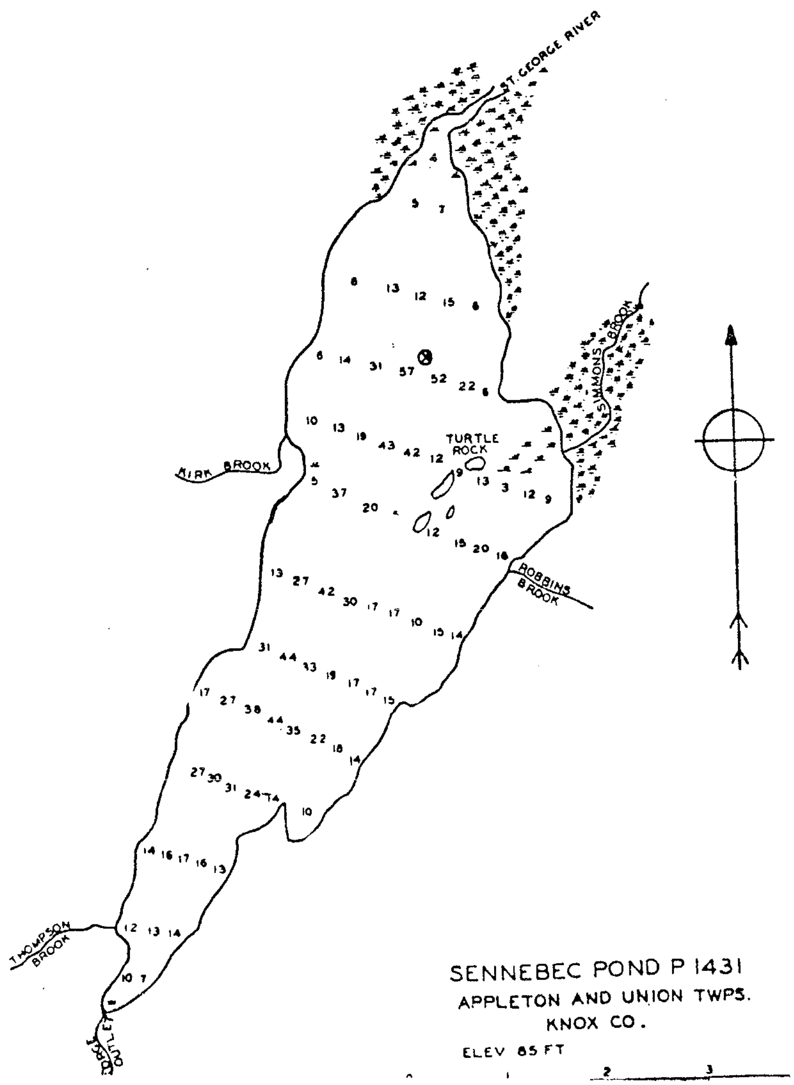
(ls) late summer, (b) bottom, (c) core

Sebec lake provides excellent habitat for cold water fish and is managed for salmon and togue.

Transparencies were average for Maine lakes in 1981 and above average in 1982. Chla and TP values are very low. The lake was well oxygenated (greater than 5 ppm) all the way to the bottom. All these factors indicate Sebec Lake is an oliotrophic lake with exceptional water quality which should be vigorously protected.

Sennebec Pond # 5682

Surface Area	215 ha (531 a)
Max. Depth	17.4 m (57.0 ft)
Mean Depth	5.4 m (17.8 ft)
Volume	11.53 X 10^6 m^3 (9346 acre-feet)
Drainage Area	292.9 km^2 (113.1 mi^2)
Flushing Rate	15.2 (flushes/year)



Sennebec Pond # 5682

	1982
Mean Secchi (m)	3.4*(3)
Min. Secchi (m)	3.0
TSI	NA
Color(SPU)	NA

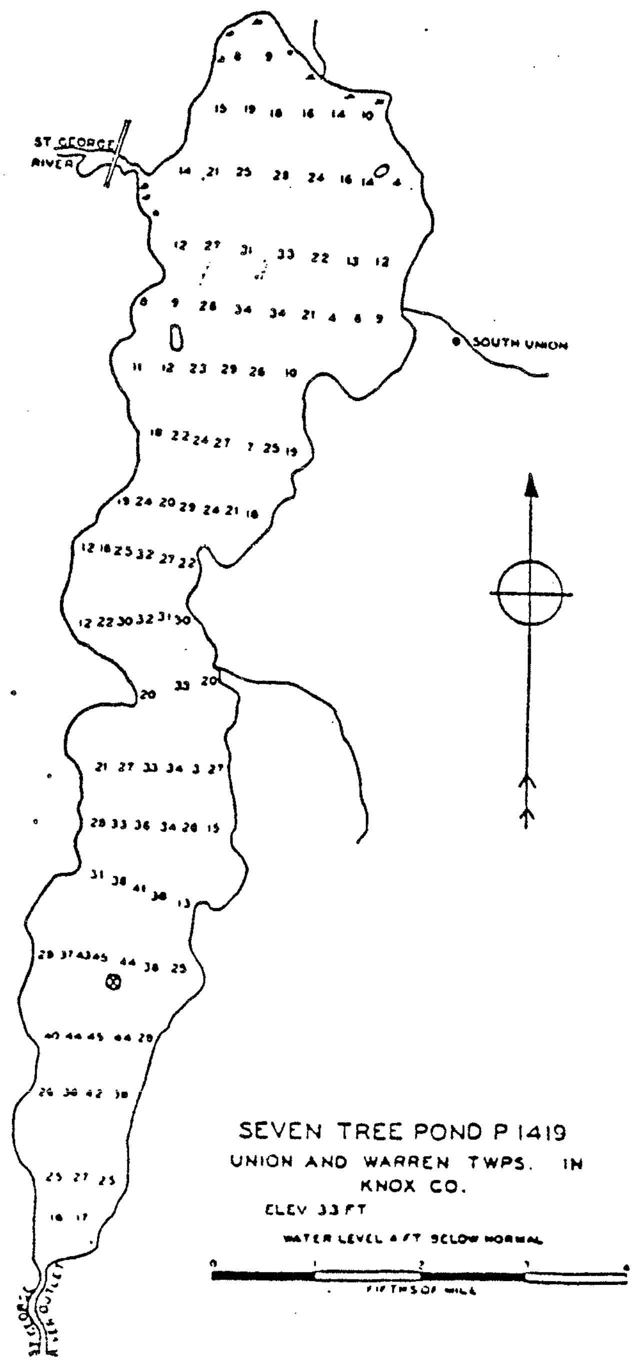
* inadequate sampling season

Sennebec Pond is managed for brown trout and warm water fish such as bass and perch.

Secchi disk transparencies are below average for ponds and lakes in Maine. The reasons for this are unknown at this time. It could be that color is high in this pond or that the sampling season is incomplete. Complete sampling seasons are needed to accurately determine the water quality and water quality trends. There have been no documented reports of water quality problems for this pond.

Seven Tree Pond #5686

Surface Area	212.3 ha (524 a)
Max. Depth	13.7 m (45 ft)
Mean Depth	6.4 m (21.1 ft)
Volume	13.64 X 10^6 m^3 (11,057 acre-feet)
Drainage Area	405.6 km^2 (156.6 mi^2)
Flushing Rate	18.1 (flushes/year)



Seven Tree Pond # 5686

	1980	1981	1982
Mean Secchi(m)	3.5*(3)	2.3*(4)	2.8
Min. Secchi(m)	3.0	1.8	2.3
TSI	NA	NA	60
TSI Range			41 CHL
Color(SPU)	35	55	32
pH(core)		6.3	6.3
Chla(ug/l)		6.6(ls)	3.2mean
TP(ppb)		17(c)(ls)	14(c)(ls)
		18(b)(ls)	23(b)(ls)

* inadequate sampling season
(ls) late summer, (c) core, (b) bottom

An oxygen depression (less than 3 ppm) exists below 6 m by midsummer.

Although the pond does support some brown trout the Department of Inland Fisheries and Wildlife recommends managing the lake for warm water fish due to the lack of oxygen in the hypoliminion.

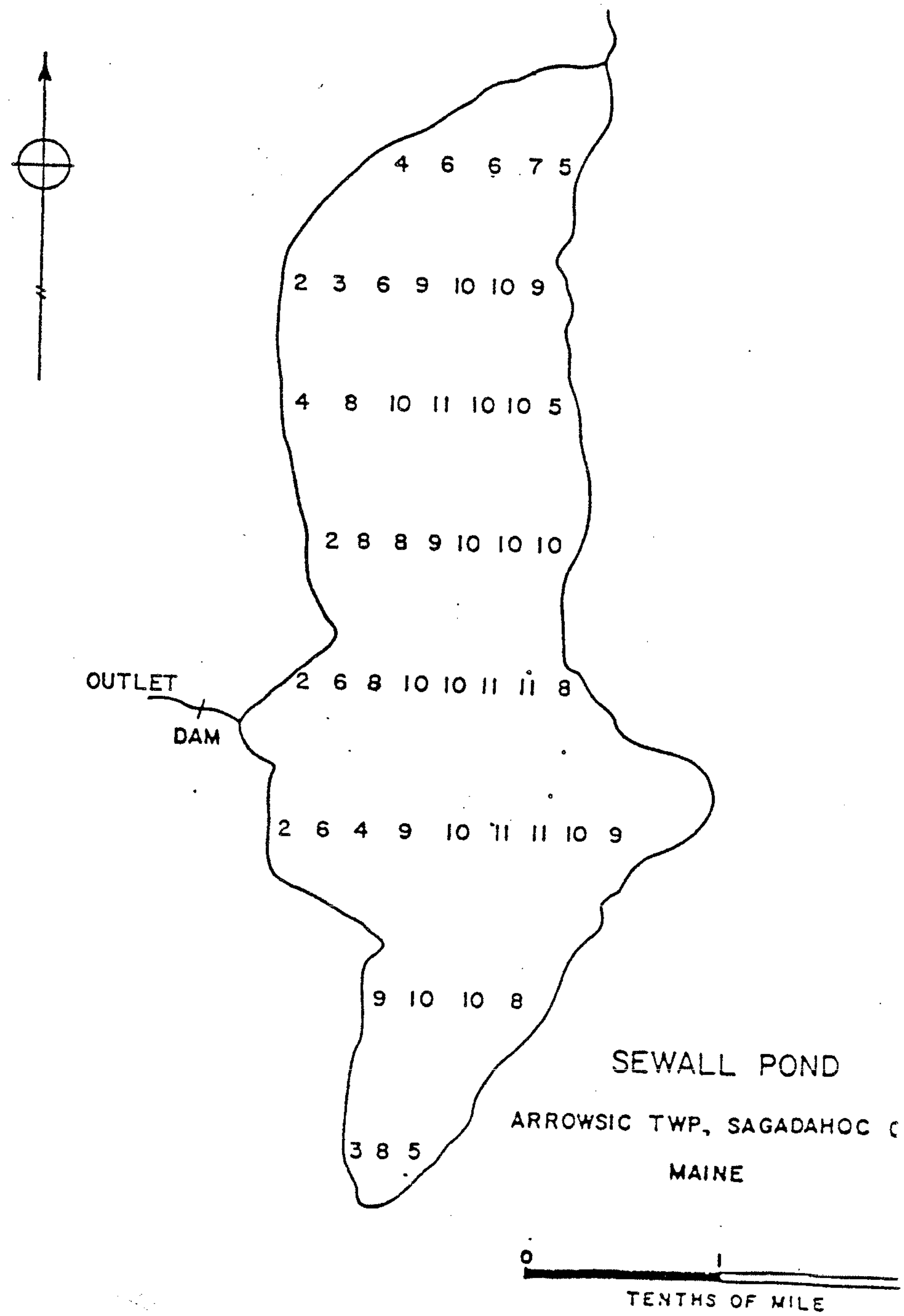
The transparency appears to have dropped significantly in 1981, but this is due to a change of monitors. The monitor participated in the Chla monitoring program which was started in 1980 to collect data on colored lakes, shallow lakes or lakes with downward water quality trends. From the differences in TSI calculated using both Chla and Secchi disk it is obvious that Secchi disk transparencies are not very accurate for calculating the TSI for this pond. Chla TSI is 41 and Secchi disk TSI is 80. Secchi disk TSI overestimates productivity because color interferes with transparency but does not affect water quality. Secchi disk transparency however, can be used to document trends in this pond.

Continued monitoring with adequate sampling seasons is necessary in order to predict any water quality trend.

The water quality is considered good. Chla values are moderate. TP values are moderate, but high water color can interfere with TP results causing the results to appear higher than is actually available to the algae.

Sewall Pond #9943

Surface Area	18 ha (44 a)
Max. Depth	3.4 m (11 ft)
Mean Depth	2.2m (7.3 ft)
Drainage Area	1.1 km^2 (.4 mi^2)
Volume	3.94 X 10^5 m^3 (3,194 acre-feet)
Flushing Rate	1.7 (flushes/year)



Sewall Pond # 9943

	1981	1982
Mean Secchi(m)	1.7*(3)	1.5
Min. Secchi(m)	1.5	1.0
TSI	NA	100CHL
Color(SPU)	100	100
pH(core)	6.7	6.4
Chla(ug/l)	19.8(f)	26mean
TP(ppb)	160*(c)(f)	52mean

* inadequate sampling season
(f) fall, (c) core

Sewall Pond is well suited for largemouth bass, and is a spawning site for alewives which sometimes enter in the spring.

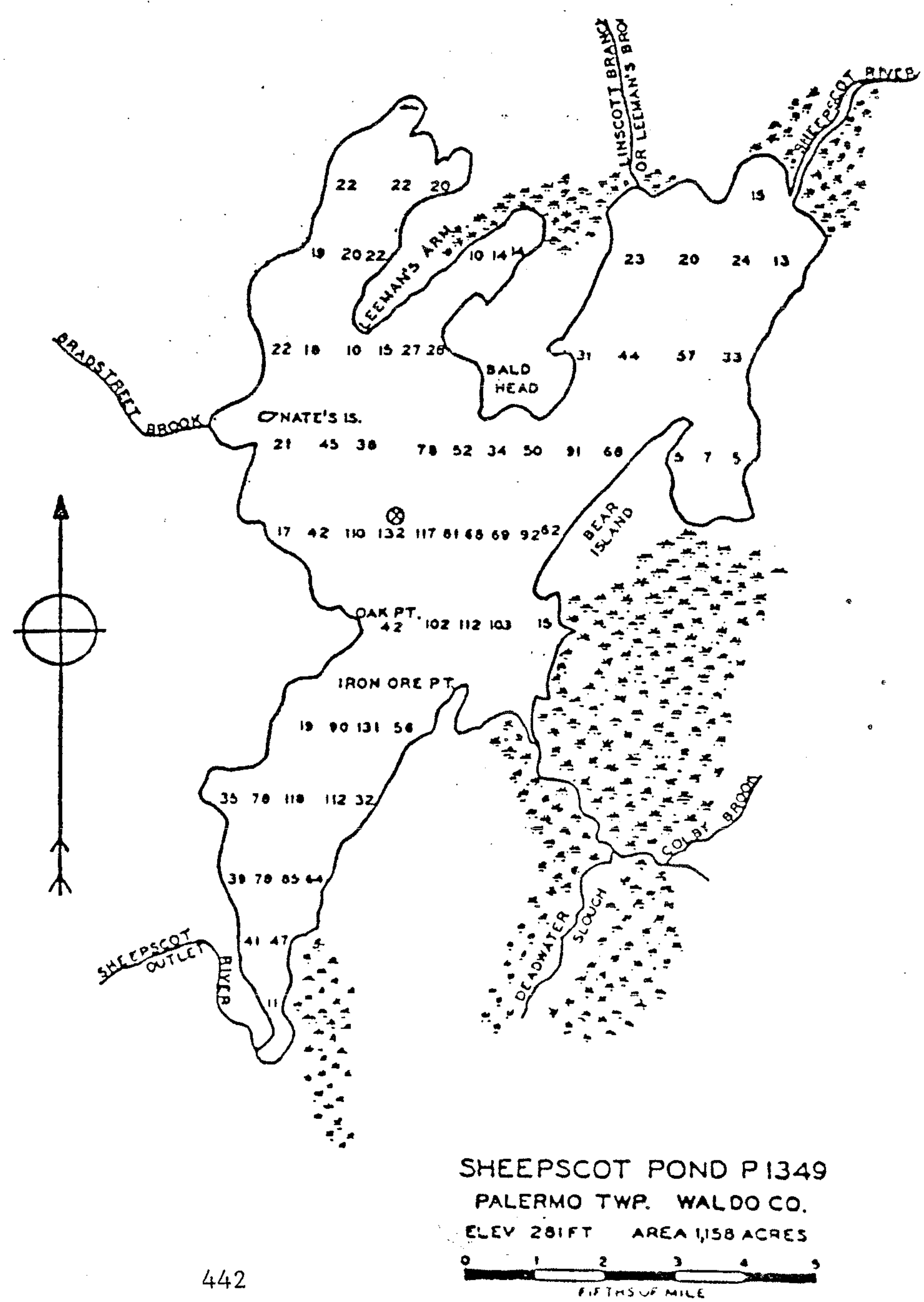
Transparencies were shallow for 1981 and 1982 and Chla and TP levels are high.

Color is extremely high in this pond which partly explains the low transparencies and high TP values, however, Chla values are also very high. High color affects transparency and TP but not Chla. The high Chla indicates that this pond is very productive. The cause of this productivity is unknown at this time. Continued investigation in 1983 should produce some answers.

The monitor participated in the 1982 Chla sampling program. This program was started in 1980 to gather additional water quality data on colored lakes, shallow lakes, and lakes with water quality problems.

Sheepscot Pond #4896

Surface Area	487 ha (1218 a)
Max. Depth	45.0 m (150 ft)
Mean Depth	13.5 m (44.3 ft)
Volume	65.6 X $10^6 m^3$ (5366 acre-feet)
Drainage Area	118.8 km^2 (45.9 mi^2)
Flushing Rate	1.0 (flushes/year)



Sheepscot Pond #4896

	1977-78	1979	1980	1981	1982
Mean Secchi(m)	4.8	4.4*(1)	5.2	4.8	4.8
Min. Secchi(m)	3.5		3.7	3.6	3.5
TSI	Colored	NA	Colored	34(Chl)	colored
Color(SPU)		40		50	
pH(core)		6.9		6.5	
Chla(ug/l)		4.6(ls)		2.4mean	
TP(ppb)	9 (spring)	5(cls)		10(cls)	
		7(bls)		14(bls)	

* inadequate sampling
(b) bottom, (ls) late summer, (c) core

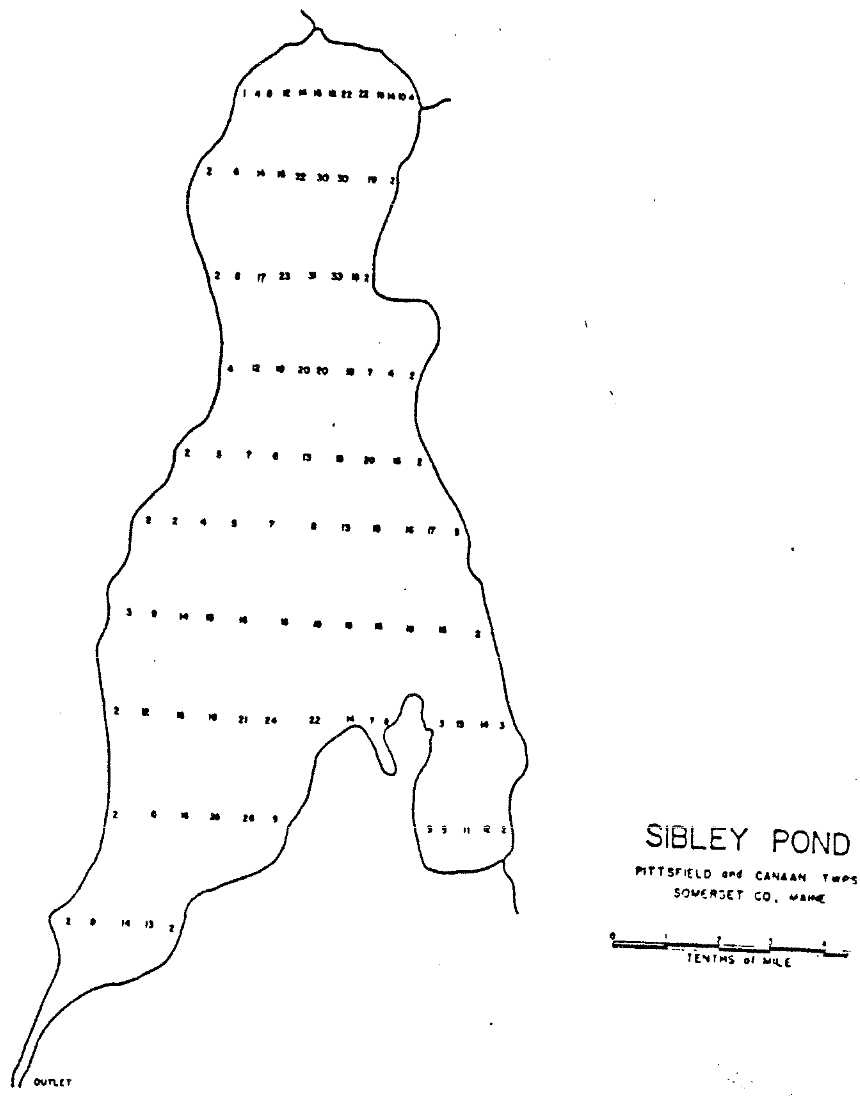
The hypolimnion is well oxygenated and provides good habitat for a cold water fishery. The pond is the water supply for the Palermo Fish Cultural Station.

Transparencies are average for Maine lakes despite the interference from moderately high water color. Transparencies indicate good, stable water quality. TP and Chla values for 1979 and 1981 are low to moderate.

In 1981 this monitor participated in the chlorophyll program. The program was established to gather additional data on lakes that were highly colored, shallow or had declining water quality. From the differences in TSI calculated using Chla and Secchi disk, it is obvious that transparency is not accurate for calculating the TSI for this pond. Chla TSI is 34 and Secchi disk TSI is 50. Secchi disk TSI overestimates pond productivity because color interferes with transparency but does not affect water quality. Chla is the best estimator of trophic state; however, Secchi disk transparency still can be used to document trends in this pond.

Sibley Pond #8555

Surface Area	154 ha (380 a)
Max. Depth	10.1 m (33 ft)



Sibley Pond #8555

	1981	1982
Mean Secchi(m)	3.1	3.5
Min Secchi(m)	2.3	3.0
TSI	Colored	colored
Color(SPU)	70	
pH(core)	7.1	
Chl<u>a</u>(ug/l)	3.0(ls)	
TP(ppb)	15(cls) 48(bls)	

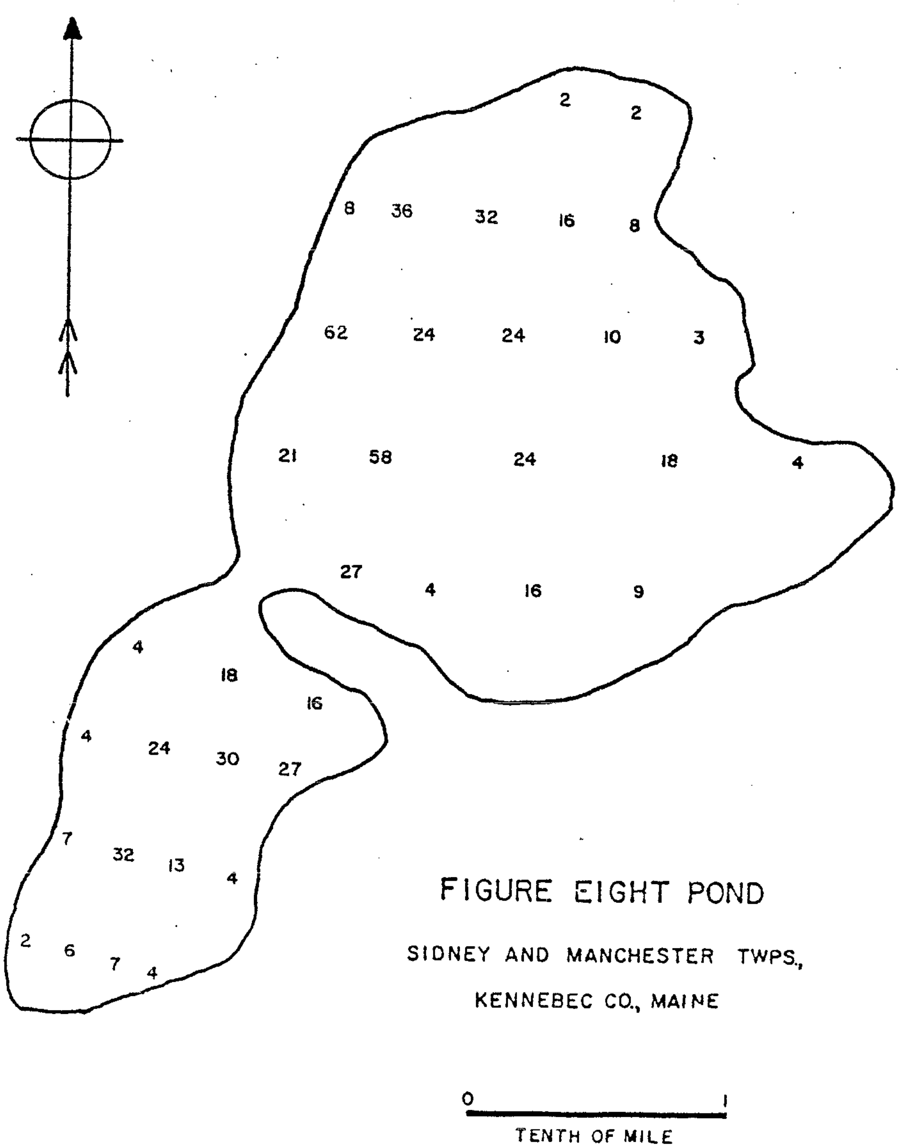
(c) core, (b) bottom, (ls) late summer

Sibley Pond is best suited for warm water fish. Smallmouth bass, white perch, and pickeral are established species. Largemouth bass also have been introduced.

Transparency is below average for Maine lakes, but is reduced due to high color. Color reduces transparencies but it does not affect water quality. Chl<u>a</u> is moderate. TP values are moderate to high, but TP is also affected by the high color. Water quality is good. No known water quality problems exist. Increased aquatic plant growth has been reported along the shores by the monitor.

Silver Lake (Figure Eight Pond) #5294

Surface Area	12 ha (29 a)
Max Depth	18.9m (62 ft)
Mean Depth	5.1 m (16.8 ft)
Drainage Area	1.6 km^2 (.6 mi^2)
Volume	6.1 X 10^5 m^3 (4953 acre-feet)
Flushing Rate	1.3 (flushes/year)



Silver Lake # 5294

	1979	1980	1981	1982
Mean Secchi (m)	5.4	5.7	5.5	6.2
Min. Secchi (m)	4.5	4.0	4.0	5.5
TSI	42	44	43	37
TSI Range	37-45 TP-CHL	42-46 SD-CHL		
Color(SPU)	13	9		
pH(core)	6.3	6.7		
Chl*a*(ug/l)	3.7	3.9		
TP(ppb)	8	11		

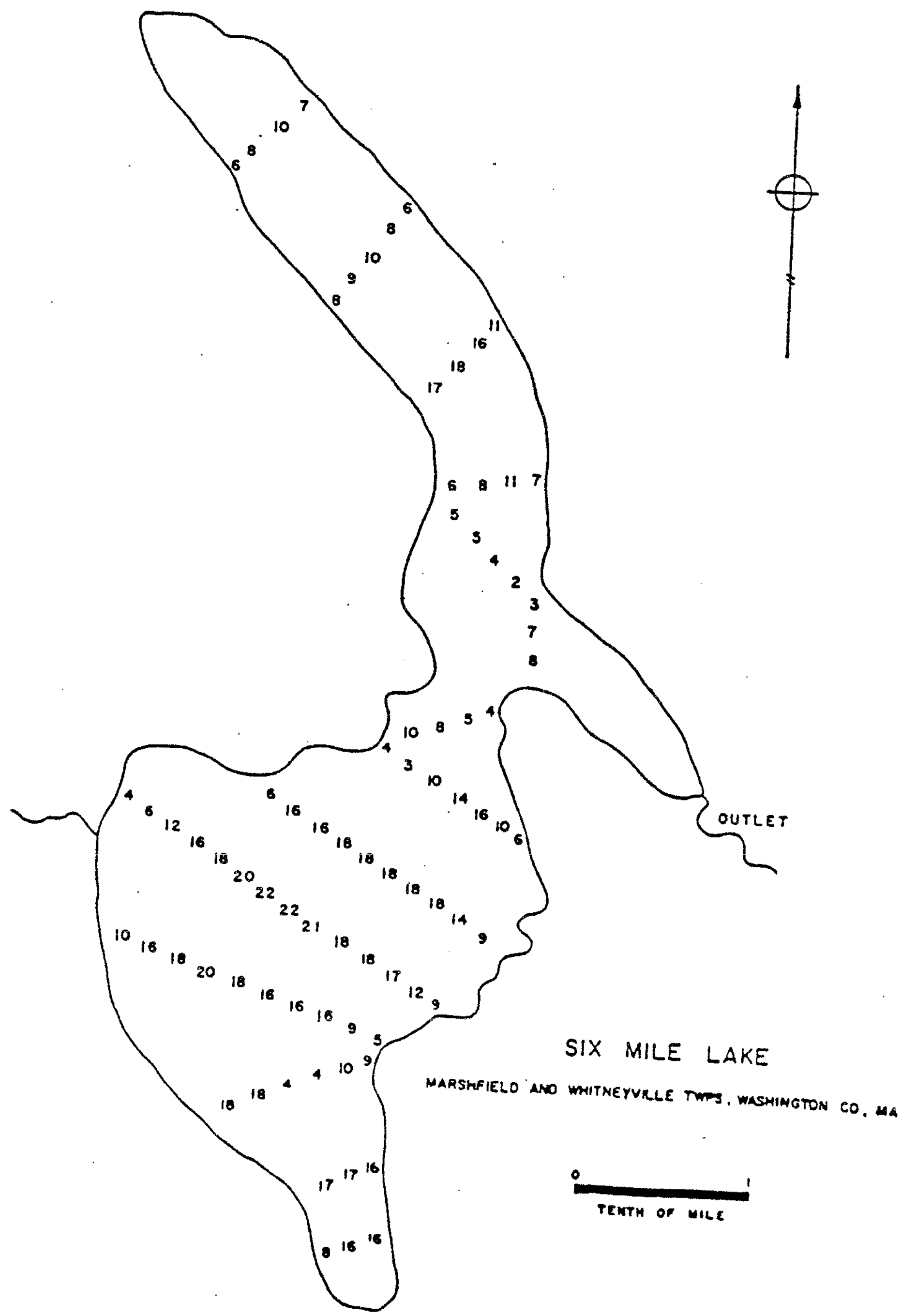
An oxygen deficiency (less than 1 ppm) exists below 10m. The lake is presently managed for brown trout and used to be managed for brook trout.

Transparencies have fluctuated but remain average to above average for lakes in Maine. Chlorophyll *a* and TP levels are moderate. Water quality is good.

Silver lake is a kettle hole lake, no inlet or outlet, which is fed by groundwater. Silver is at the head of the watershed of the Summerhaven lakes. Flushing is minimal which makes the lake very sensitive to water quality degradation. Residents of the watershed should exercise caution to avoid increasing the phosphorus load to the lake.

Six Mile Lake #1280

Surface Area	22 ha (54 a)
Max. Depth	6.6 m (21.6 ft)
Mean Depth	3.1 m (10.2 ft)
Volume	6.9 X $10^5 m^3$ (561 acre-feet)
Drainage Area	.78 km^2 (.30 mi^2)
Flushing Rate	0.7 (Flushes/year)



Six Mile Lake # 1280

	1979	1981
Mean Secchi(m)	5.5*(4)+	3.4*(4)
Min. Secchi(m)	4.7*	2.5*
TSI	NA	NA
Color	25	
pH	6.2	
Chl*a*	2.6(ls)	
TP	6(ls)	

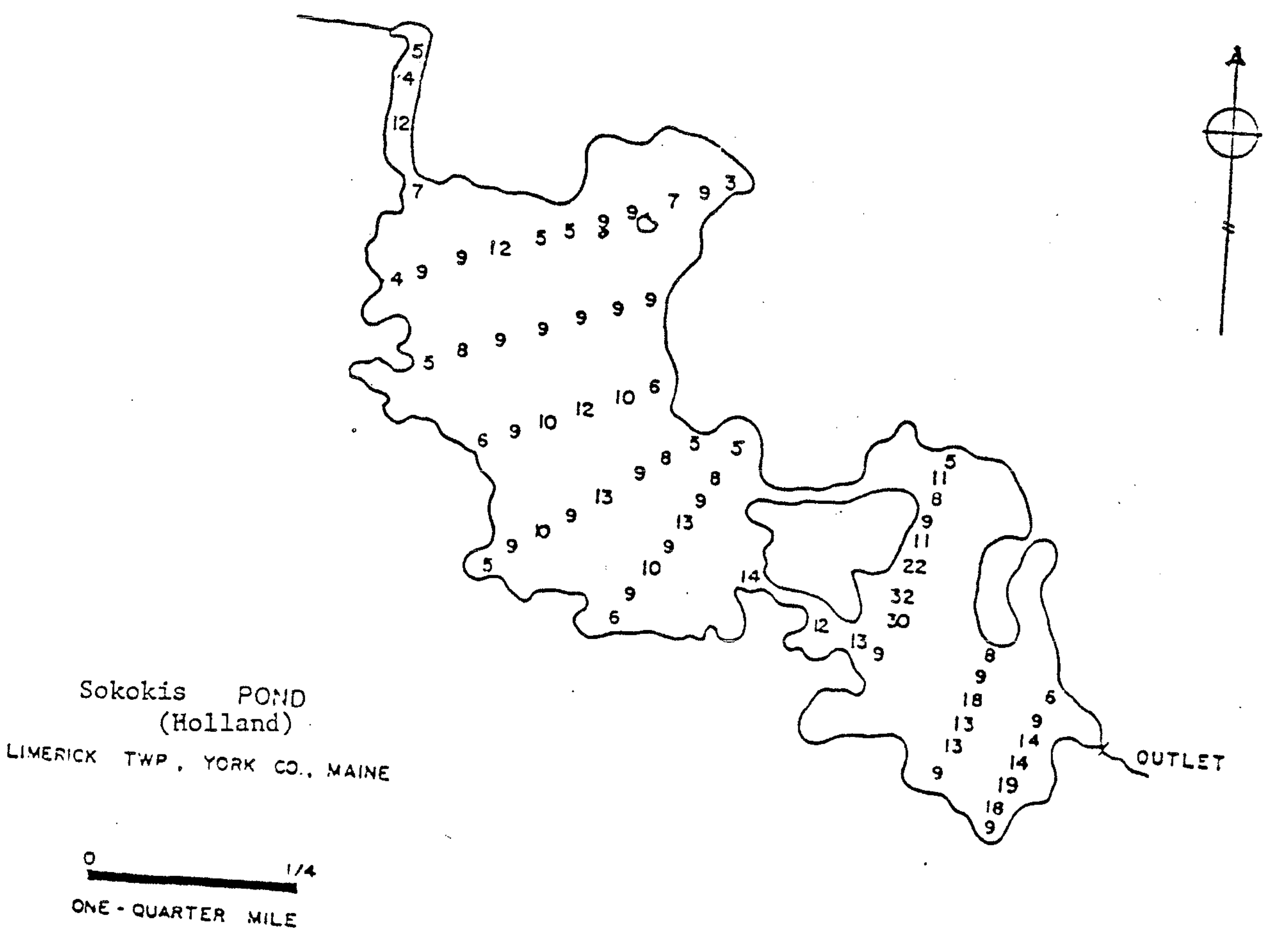
* inadequate sampling + Secchi disk readings hit bottom
(ls) Late summer

Six Mile lake is easily accessible and a public picnic area is maintained by the Town of Marshfield. The lake remains oxygenated to the bottom and does not stratify. It is managed for brook trout.

Transparencies dropped significantly in 1981 as compared to readings for 1979. This may be due to weather or natural conditions. Careful monitoring for a complete season is necessary in order to predict any water quality trend.

Sokokis Lake (Holland Pond) #3942

Surface Area	72 ha (182 a)
Max. Depth	9.6 m (32 ft)
Mean Depth	2.5 m (8.0 ft)
Volume	1.8 X $10^6 m^3$ (1463 acre-feet)
Drainage Area	33.4 km^2 (12.9 mi^2)
Flushing Rate	11.5 (Flushes/year)



Sokokis Lake # 3942

	1978	1979	1980	1981	1982
Mean Secchi(m)	3.4*	2.0	3.2	3.4	2.7
Min. Secchi(m)	3.3*	1.7	2.9	2.9	2.0
TSI	Colored	Colored	39(CHL)	Colored	Colored
Color(SPU)		45	30		
pH(core)		6.6			
Chla(ug/l)	5.0*	7.1(s) 3.6	2.9mean		
TP(ppb)	18(s)	19(f)	10(f)		

* inadequate sampling
(s) summer, (f) fall

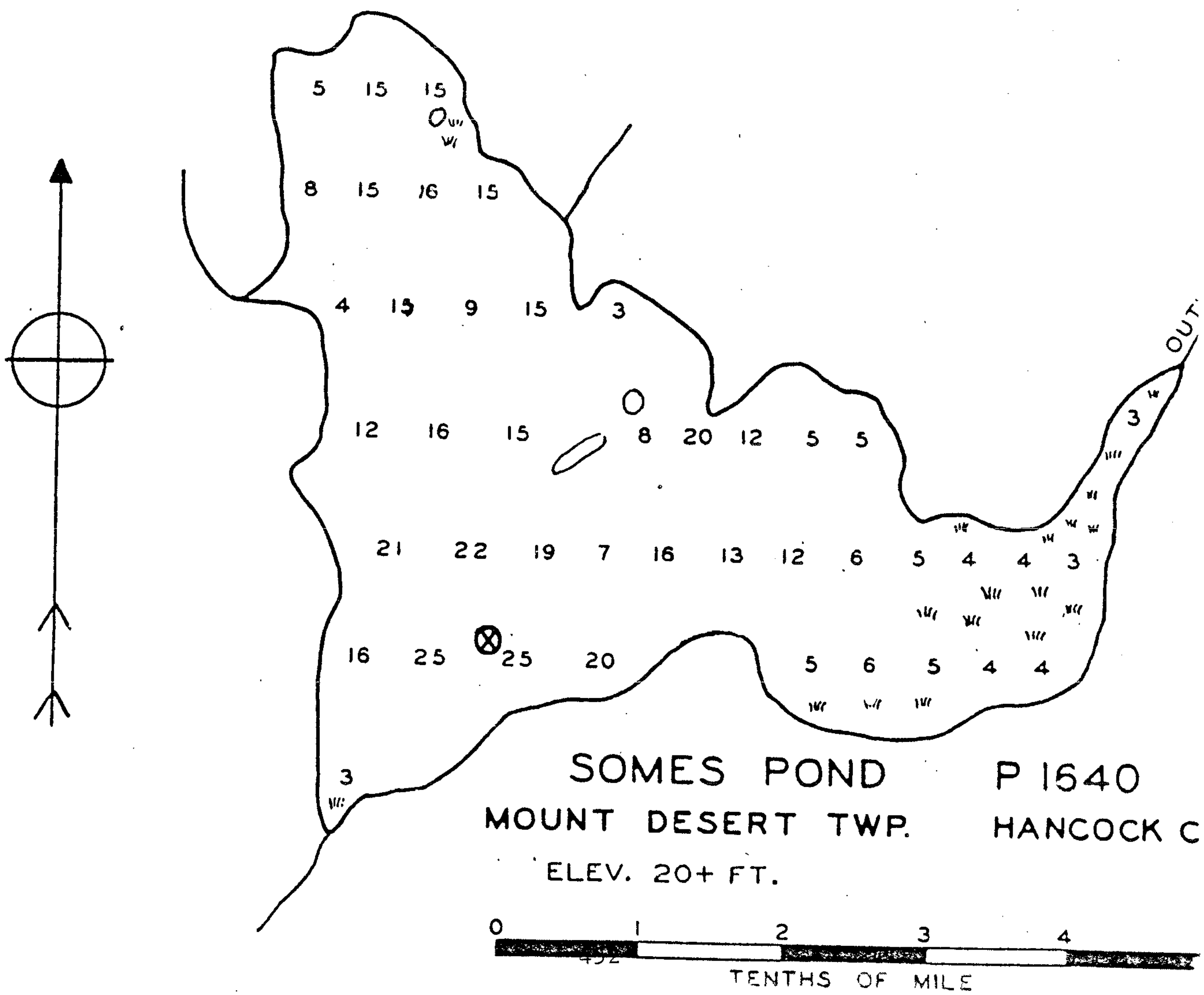
Chla and TP levels appear to be lessening. This is a good trend and should help alleviate some of the algae problems the lake has been experiencing. Transparencies have fluctuated but this may be due to the color increasing or decreasing from year to year or weather conditions rather than a change in water quality. Color reduces transparencies and causes a lake to be tea colored or brownish in color but does not affect the water quality.

The lake has abundant aquatic plant growth which concerns the lake association. In the past, they have applied 2-4 D, a pesticide to control the plants. The 2-4 D worked well on some of the plants but not on others. Applications of this type now require a permit which must be reviewed by DEP because pesticides can be hazardous to other forms of life in the lake.

In 1980 Sokokis Lake was one of twelve lakes that participated in an experimental Chla sampling program. The program was successful and is repeated each year on a different set of lakes. The program was established to collect additional data on lakes that were colored, shallow, or had declining water quality.

Somes Pond # 4614

Surface Area	42 ha (104 a)
Max. Depth	7.5 m (25 ft)
Mean Depth	3.3 m (11.1 ft)
Volume	1.42 X 10^6 m^3 (1154 acre-feet)
Drainage Area	22 km^2 (8.64 mi^2)
Flushing Rate	9.6 (flushes/year)



Somes Pond #4614

	1980	1981	1982
Mean Secchi (m)	5.3*(3)	3.0*(1)	4.2*(4)
Min. Secchi (m)	4.6		3.5
TSI	NA	NA	NA
Color(SPU)	45	45	32
pH(core)		6.3	
Chl<u>a</u>(ug/l)		5.2(ls)	
TP(ppb)		10(ls)	

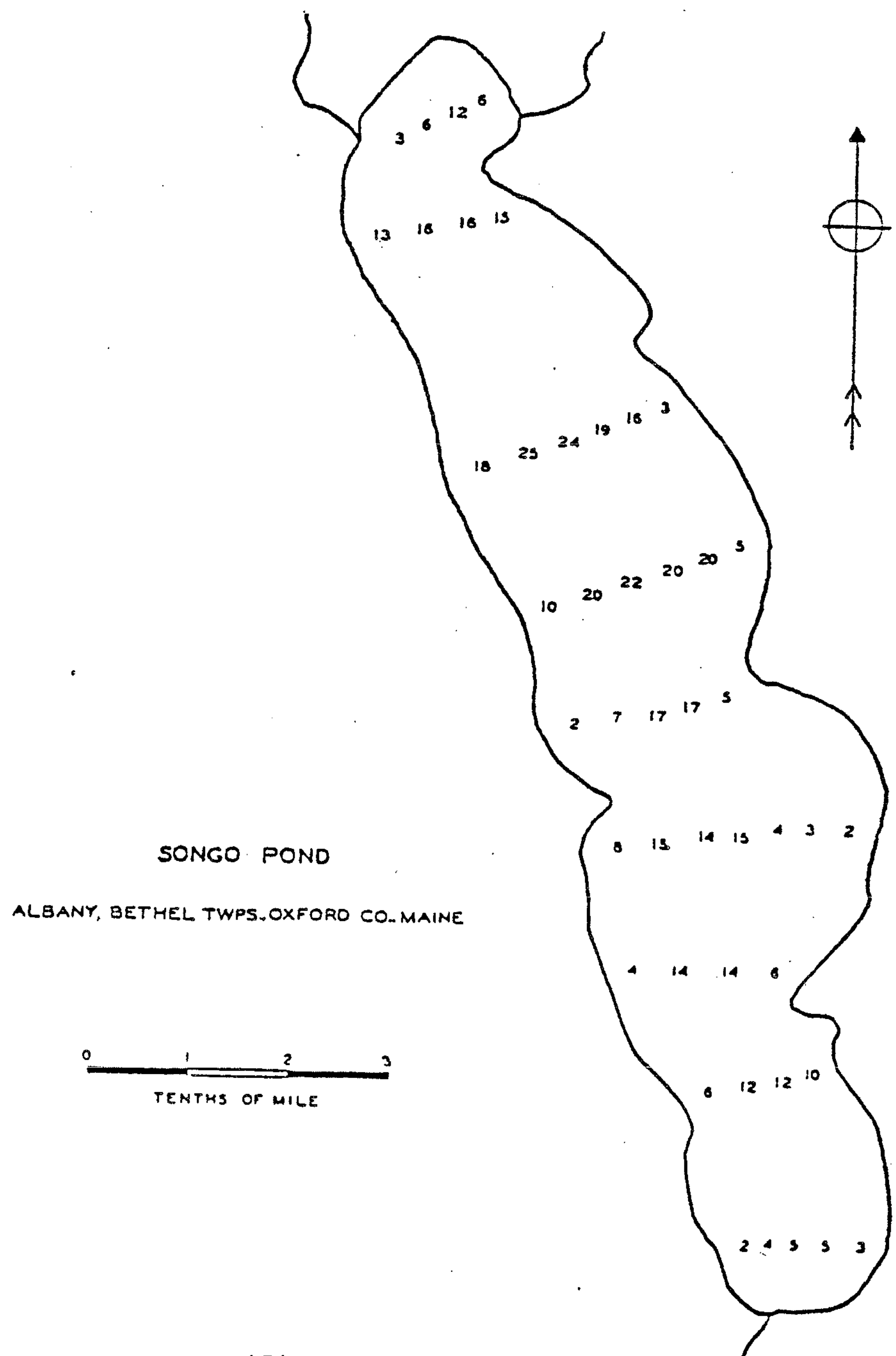
* inadequate sampling season
(ls) late summer

Transparencies have fluctuated over the last three years and are slightly below average for lakes and ponds in Maine. Color is moderate, however, and probably interferes with the Secchi disk readings. Color reduces transparencies and causes a pond to be tea colored or brownish in color due to dissolved organic material in the water but color does not affect the water quality. Chl<u>a</u> and TP levels are moderate, and indicate no water quality problems. Complete sampling seasons will be necessary to predict water quality trends.

Current fisheries management is for pickerel and smallmouth bass; salmon and brook trout migrate in through the tributaries from Long Pond.

Songo Pond #3262

Surface Area	80 ha (200 a)
Max. Depth	7.5 m (25 ft)
Mean Depth	3.1 m (10 ft)
Volume	$2.5 \times 10^6 m^3$ (2033 acre-feet)
Drainage Area	$8.29 km^2$ ($3.2 mi^2$)
Flushing Rate	2.0 (Flushes/year)



Songo Pond # 3262

	1974-75	1976	1980	1981	1982
Mean Secchi(m)	3.8*(2)	3.5*(2)	3.3	3.1*(3)	3.1
Min. Secchi(m)	3.5*	3.5*	2.4	2.5*	2.5
TSI	NA	NA	Colored	NA	46 Chl
Color(SPU)			50		45
pH(core)		6.3mean	6.2		
Chla(ug/l)		12.1(ls)	5.3(ls)		3.9mean
TP(ppb)		6(s)(ls) 20(b)(ls)	14(ls)		10(ls)

* inadequate sampling season
(s) Surface, (b) Bottom, (ls) Late summer

Songo is the first pond at the head of the Presumpscot River drainage. In spite of its shallowness, Songo Pond exhibits strong thermal stratification during the summer. A dissolved oxygen deficiency (less than 3 ppm) exists below 6 m.

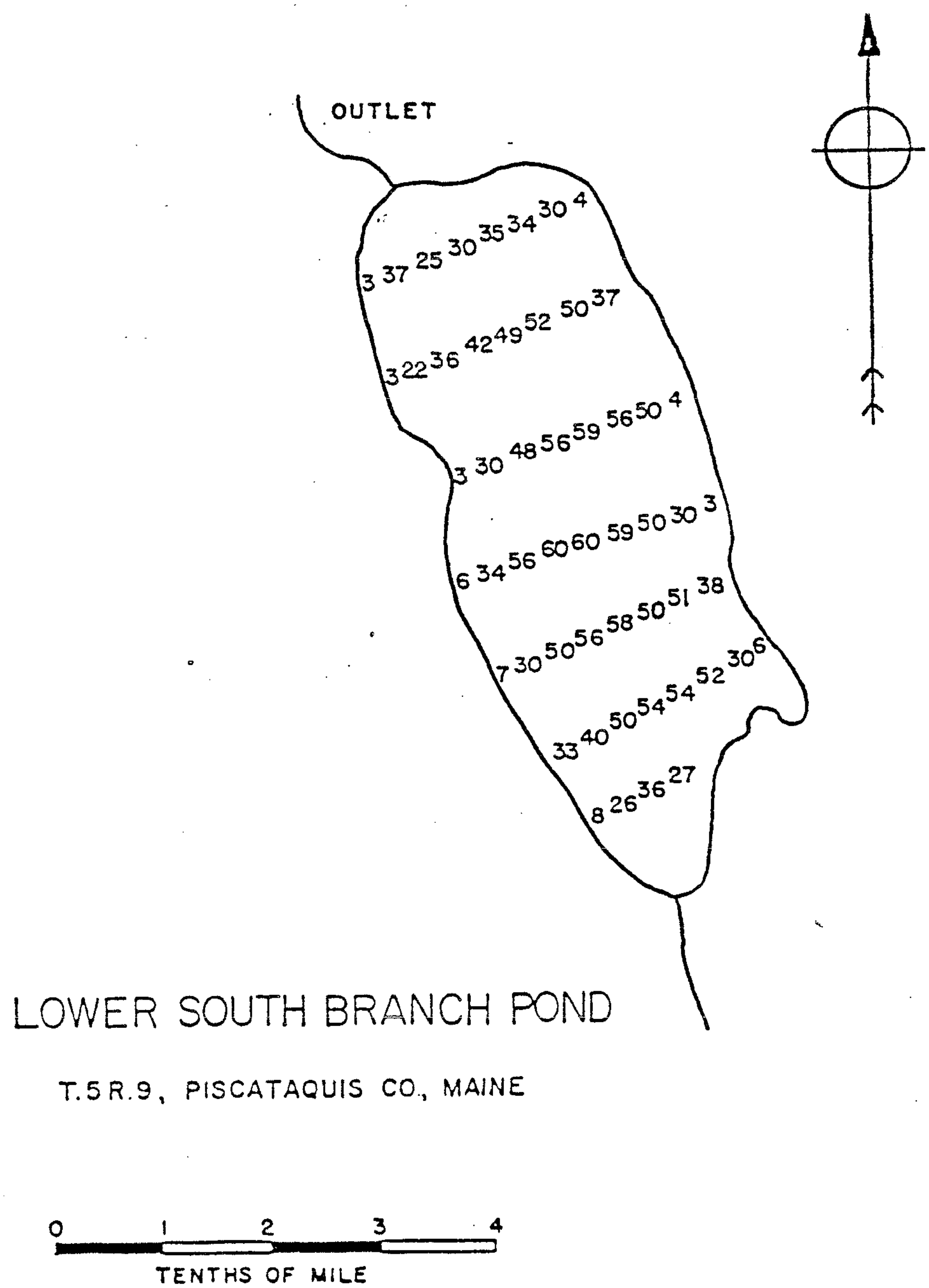
Songo is managed by the Department of Inland Fisheries and Wildlife for warm water game fish such as smallmouth bass, perch and pickeral and coldwater game fish of brook trout and smelts.

Chlorophylla and TP show fluctuation from moderate to high levels. Transparency readings are below average for lakes and ponds in Maine but the shallowness is probably particularly due to interference from color. Water quality is considered moderate.

The monitor on Songo Pond participated in the 1982 Chla program. This Chla program was started in 1980 to collect additional water quality information on colored lakes, shallow lakes or lakes with water quality problems. Color reduces transparencies but does not effect water quality. The TSI calculated from the Secchi disk readings was 74 which would indicate a very productive lake; the TSI calculated from the Chla was only 46. Chla is a more accurate method of calculating TSI on colored lakes. The Secchi disk can still be useful in indicating water quality trends for this pond, but should not be used to calculate TSI.

Lower South Branch Pond #4224

Surface Area 38 ha (93 a)
Max. Depth 18.3 m (60 ft)



Lower South Branch Pond # 4224

	1981
Mean Secchi(m)	8.3
Min. Secchi(m)	7.3
TSI	24
Color	10
pH	6.7
Chl<u>a</u>	
TP	8(cls)
	10(bls)

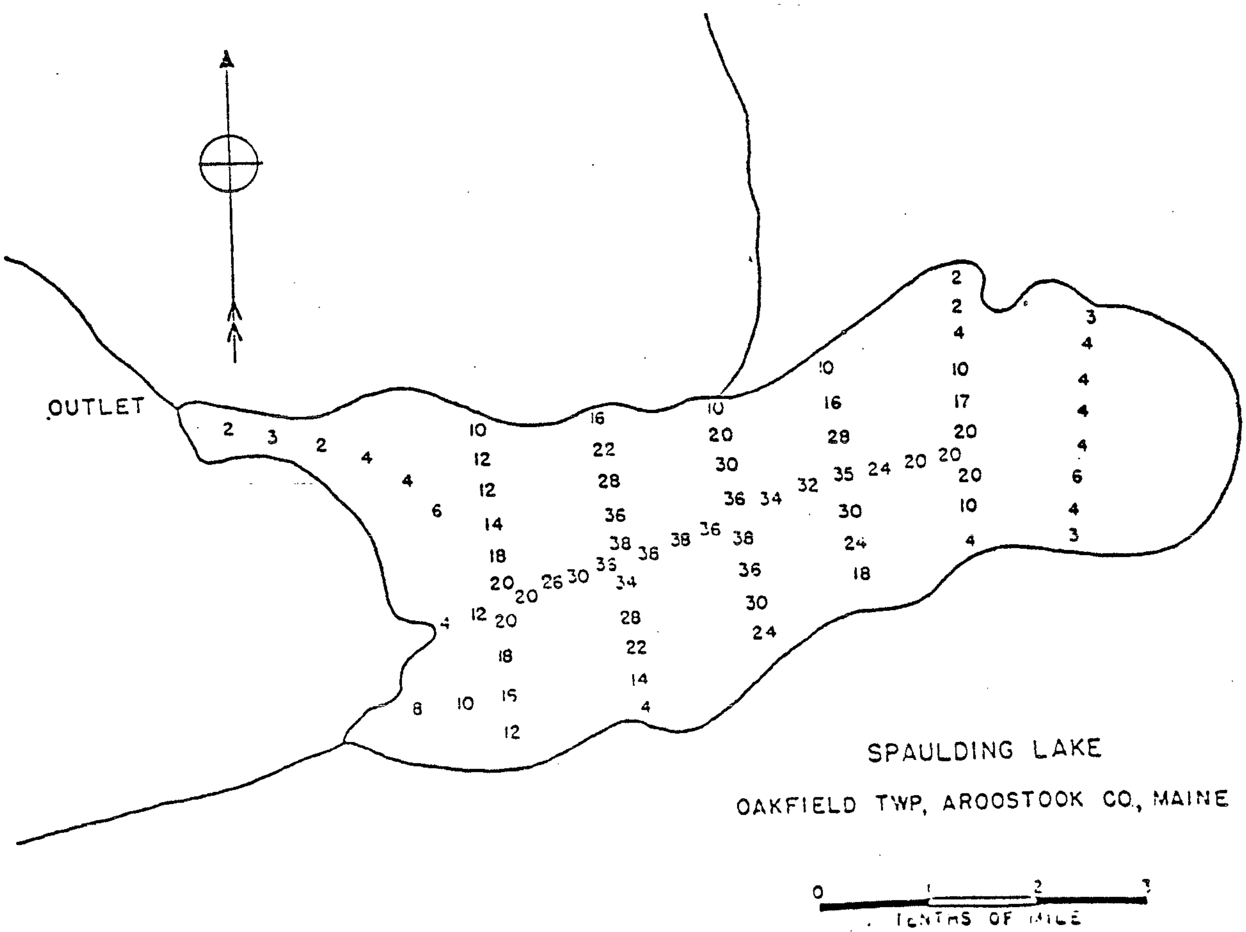
(c) Core (b) Bottom (ls) Late summer

The pond has well above average water quality for Maine lakes, as indicated by Secchi disk readings.

South Branch Pond lies within the boundaries of Baxter State Park. Inland Fisheries and Wildlife manages the pond for brook trout.

Spaulding Lake #1750

Surface Area	50 ha (125 a)
Max. Depth	11.6 m (38 ft)
Mean Depth	4.2 m (14 ft)
Volume	2.1 X $10^6 m^3$ (1707 acre-feet)
Drainage Area	15.0 km^2 (5.8 mi^2)
Flushing Rate	3.6 (Flushes/year)



Spaulding Lake # 1750

	1977-78	1979	1980	1981	1982
Mean Secchi(m)	3.0*	3.5*	3.7	4.4	4.3
Min. Secchi(m)	2.0*		2.9	3.7	3.7
TSI	NA	NA	65	55	56
Color(SPU)		25		15	
pH(core)		7.5			
Chl*a*(ug/l)	7.7(ls)	3.0(ls)		3.6(ls)	
TP(ppb)	8(s)(ls)	10(c)(ls)		13(c)(ls)	
	22(b)(ls)	25(b)(ls)		26(b)(ls)	

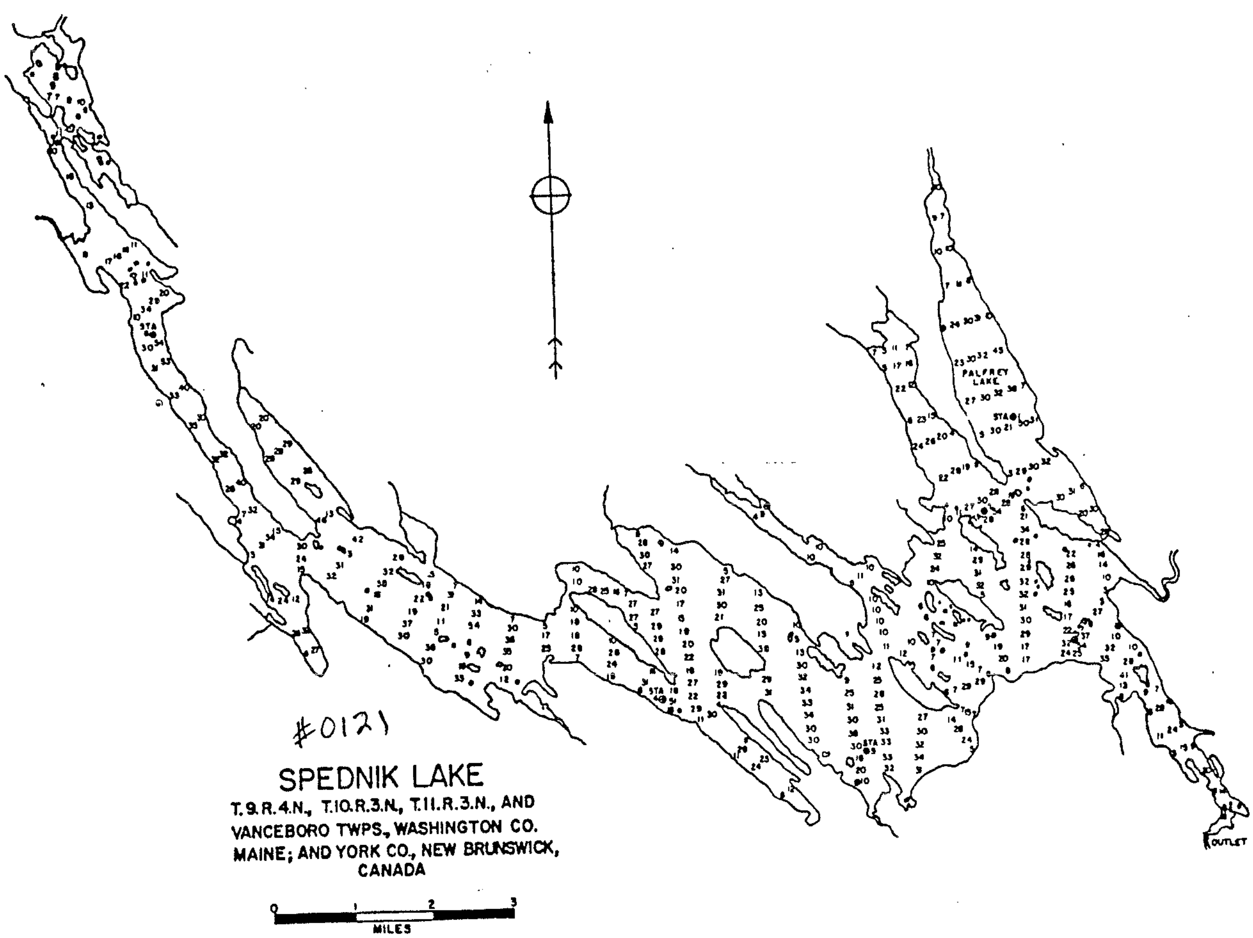
* inadequate sampling season
(c) core, (b) bottom, (ls) late summer, (s) surface

Transparencies are slightly below average for Maine lakes. TP and Chl*a* indicate moderate water quality. Water quality appears stable.

The lake is managed for warm water fish, species of white perch, pickerel and also cold water fish, of salmon and smelts. A severe oxygen depletion (less than 1 ppm) exists below 6 meters which does limit the cold water fishery.

Spednic Lake # 0121

Surface Area	7030 ha (17,219 a)
Max. Depth	16.2 m (54 ft)



Spednic Lake # 0121

	1978	1979	1981	1982
Mean Secchi (m)	5.2*	5.1*(3)	5.6*(1)	3.7*(2)
Min. Secchi (m)	4.3	5.0		3.5
TSI	NA	NA	NA	NA
Color(SPU)			15	
pH			7.1	
Chla(ug/l)			4.4	
TP(ppb)			7(ls)	

* inadequate sampling season
(ls) late summer

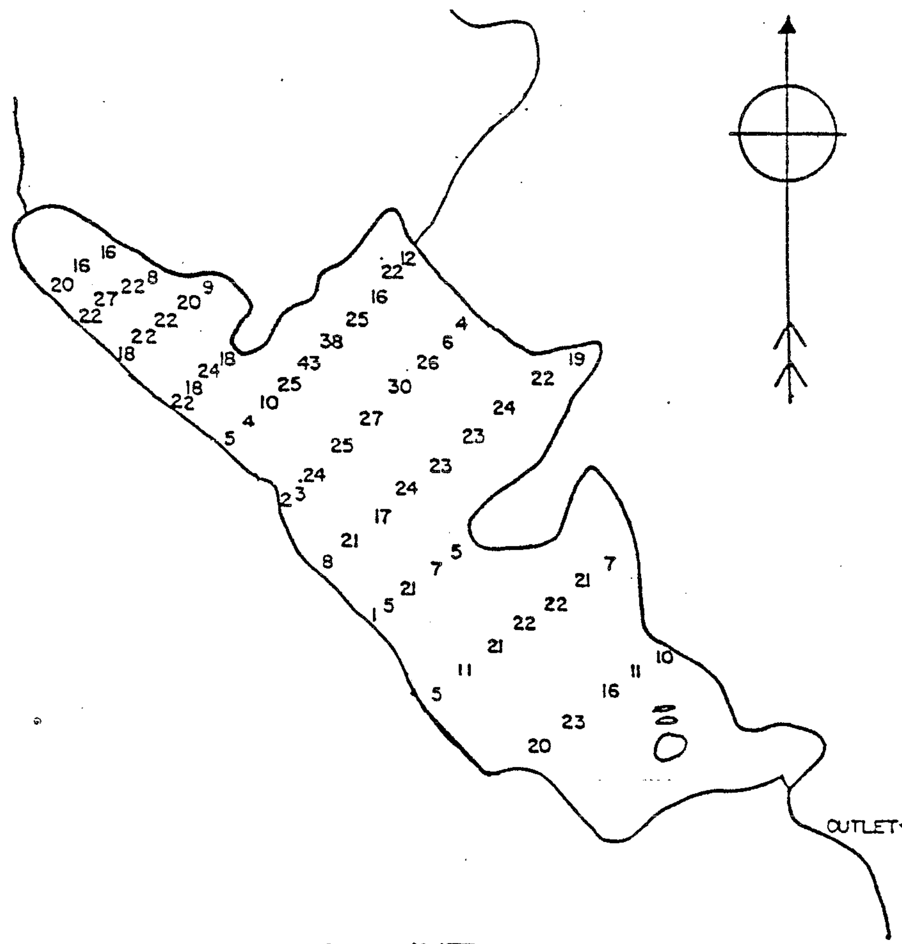
Transparency readings for 1978, 79 and 81 are about average for lakes in Maine, but the transparency for 1982 dropped to below average. Since all sampling seasons are incomplete, it is impossible to determine a water quality trend. The cause of the difference in readings is unknown. It could be caused by the change in monitors, change in basins being monitored or incomplete seasons. Continued monitoring with complete seasons is needed to adequately define water quality and water quality trends.

The 1981 Chla and TP levels are considered moderate.

The lake is managed as a warm water fishery. It has been especially noted for its smallmouth bass fishing. Some of the deeper sections of the lake do support salmon.

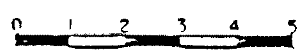
Spruce Mountain Lake #1228

Surface Area	166 ha (415 a)
Max. Depth	12.9 m (43 ft)
Mean Depth	4.8 m (16 ft)
Volume	7.9 X $10^6 m^3$ (6423 acre-feet)
Drainage Area	11.6 km^2 (4.5 mi^2)
Flushing Rate	0.9 (Flushes/year)



SPRUCE MOUNTAIN LAKE

BEDDINGTON TWP, WASHINGTON CO., MAINE



TENTHS OF MILE

Spruce Mountain Lake # 1228

	1976	1978-79	1980	1981	1982
Mean Secchi(m)	5.7	5.8	5.7	5.2	5.6
Min. Secchi(m)	4.9	2.9	5.3	4.3	4.5
TSI	42	39	42	46	42
Color(SPU)				25	
pH(core)	5.8mean			5.8	
Chla(ug/l)	2.7(summer)			3.8(ls)	
TP(ppb)	15(summer)			8(c)(ls) 26(b)(ls)	

* inadequate sampling season
(c) core, (b) bottom, (ls) late summer

This lake has an oxygen depletion in the hypolimnion during stratification. This probably is a natural occurrence because there are no known activities within the watershed that would add significant amounts of organic matter to the lake. The depletion is probably caused by the small volume of the hypolimnion and the moderate water color. Humic acid, a major component of water color, has a high biological oxygen demand (B.O.D.) and probably depletes the oxygen in the hypolimnion.

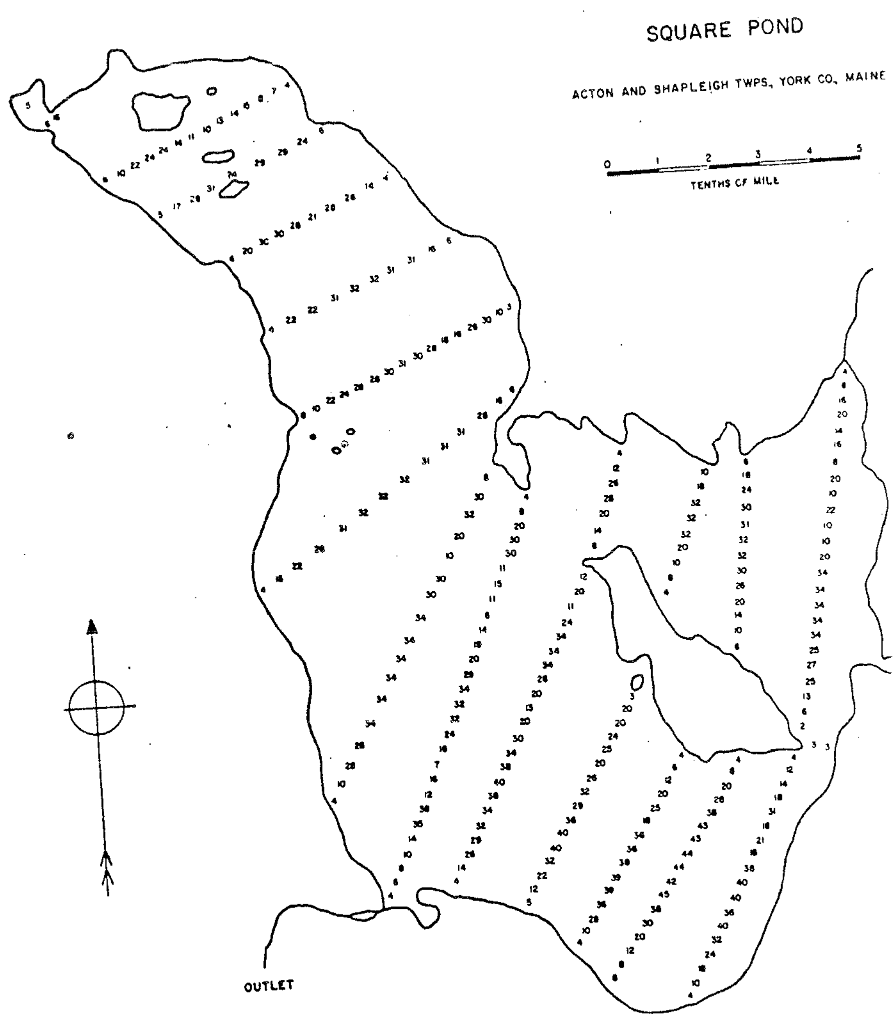
Spruce Mountain Lake has deposits on the bottom which are composed of iron oxides and manganese oxides.These deposits are known as stromatolites, which are fossil formations created by the interaction of sediments and the metabolic processes of blue-green algae. This lake has been recommended for inclusion on the Critical Area List in Maine.

Transparency readings fluctuate only slightly TP and Chla are moderate and transparencies average for Maine lakes. Water quality appears stable.

The lake is managed as a warm water fishery. No stocking of any additional sportfish is contemplated at this time.

Square Pond #3916

Surface Area	340 ha (850 a)
Max. Depth	13.2m (44 ft)
Mean Depth	6.5m (21.4 ft)
Volume	22.17 X 10^6 m^3 (19,066 acre-feet)
Drainage Area	10.4 km^2 (4.0 mi^2)
Flushing Rate	0.3 (flushes/year)



Square Pond # 3916

	1977	1980	1982
Mean Secchi (m)	7.9*(2)	8.2*(1)	6.6*(2)
Min. Secchi (m)	7.2		6.5
TSI	NA	NA	NA
Color(SPU)			10
Chla(ug/l)	3.5(ls)		2.0(ls)
TP(ppb)	10(ls)		9(ls)
pH(core)	6.7		6.9

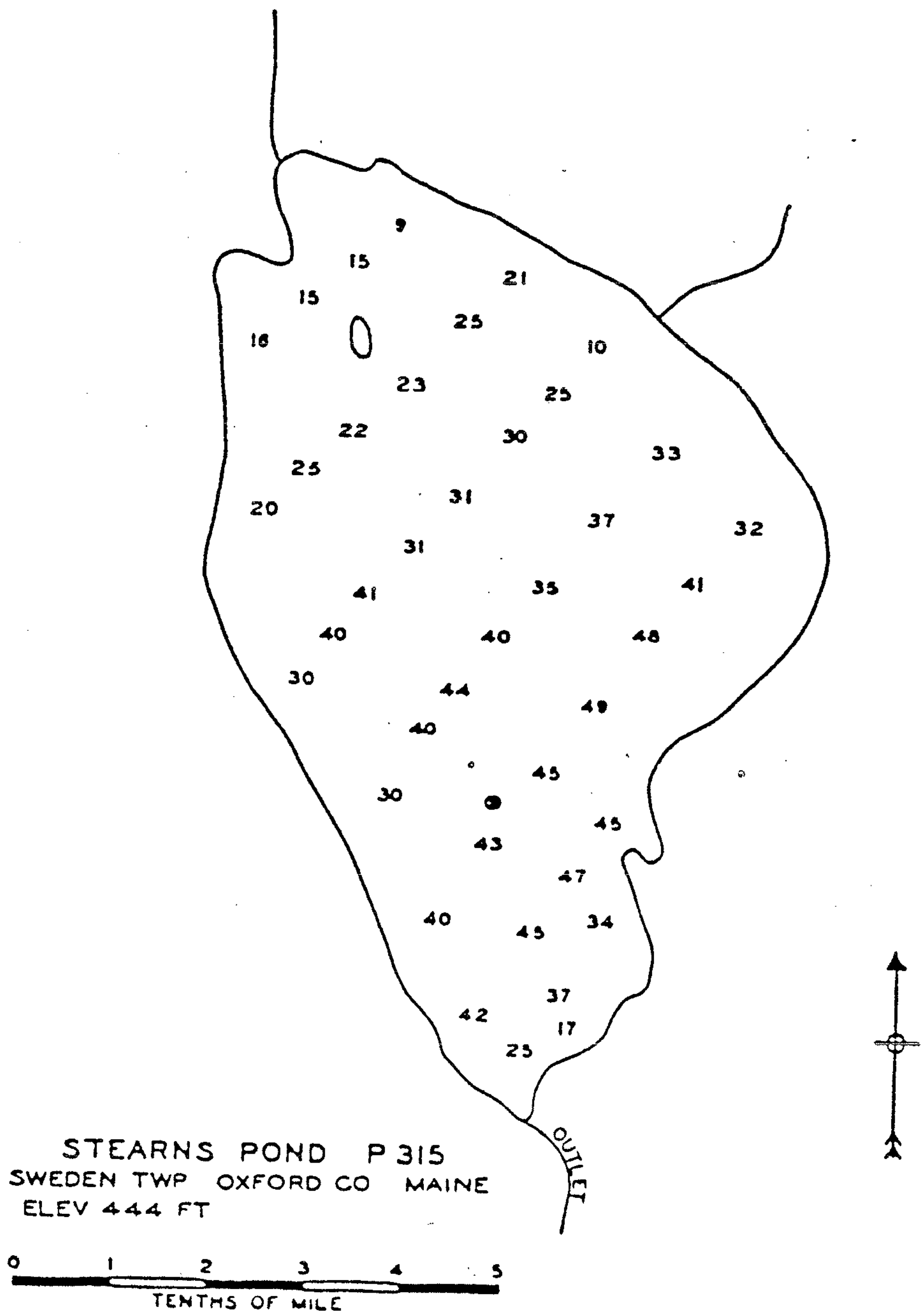
* inadequate sampling season
(ls) late summer

Square Pond has good to excellent water quality. The limited data available for transparency shows the clarity to be above average. Chla and TP results are low to moderate. Sampling has not been sufficient to predict water quality trends. Some oxygen depletion (less than 3 ppm) has been recorded in the bottom two meters of the lake.

The Department of Inland Fisheries and Wildlife has successfully introduced brown trout into Square Pond. Current fisheries management is for brown trout as well as large and smallmouth bass, perch and pickeral.

Stearns Pond #3234

Surface Area	100 ha (250 a)
Max. Depth	14.7 m (48 ft)
Mean Depth	8.1 m (26.6 ft)
Volume	8.1 X $10^6 m^3$ (6585 acre-feet)
Drainage Area	24.1 km^2 (9.3 mi^2)
Flushing Rate	1.6 (Flushes/year)



Stearns Pond # 3234

	1975	1977	1981	1982
Mean Secchi(m)	4.6*(1)	4.5*(1)	4.1	4.4
Min. Secchi(m)			3.3	3.5
TSI	NA	NA	59	55
Color(SPU)			15	36
pH(core)	6.7(surface)			6.7
Chla(ug/l)				3.5(ls)
TP(ppb)				10(c)(ls) 11(b)(ls)

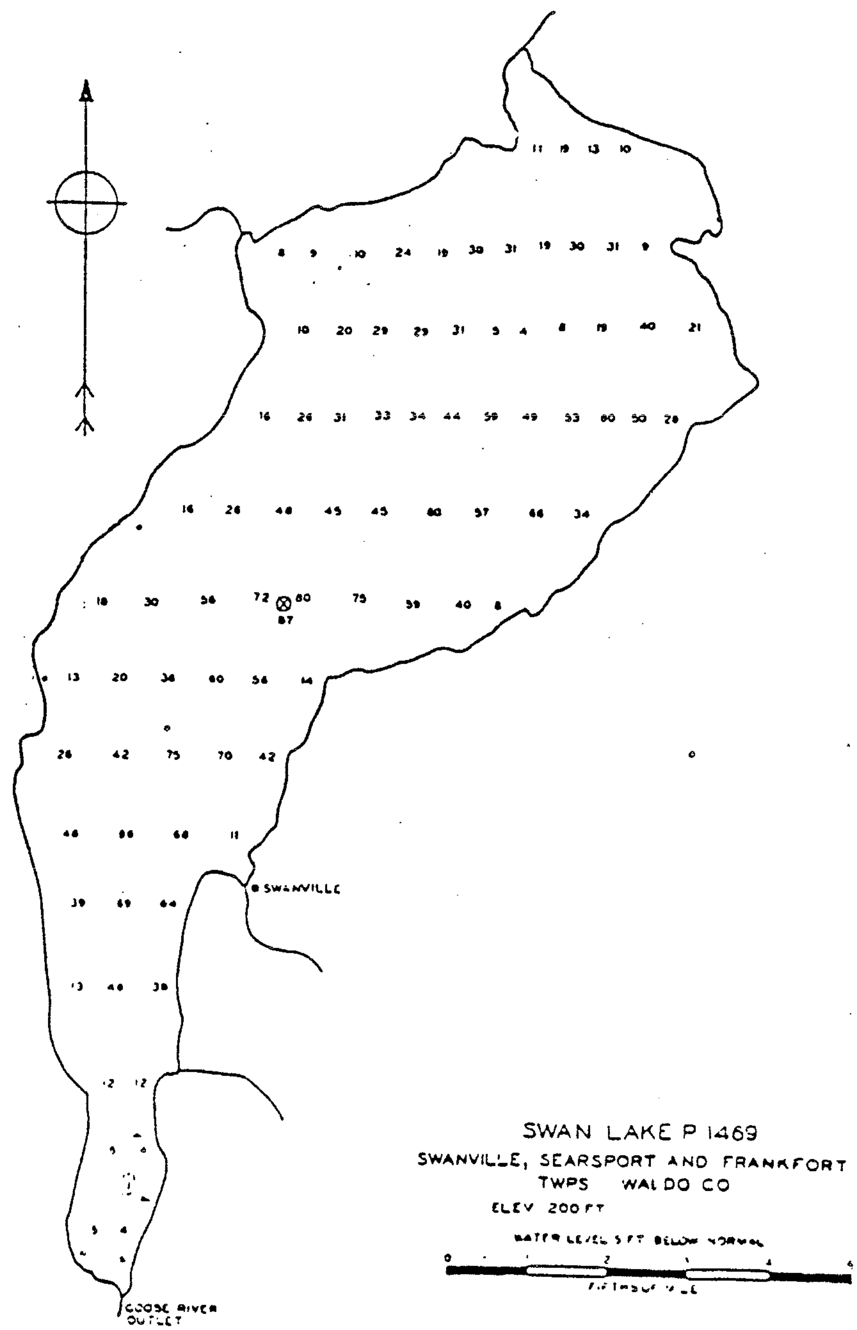
* inadequate sampling
(c) core, (b) bottom, (ls) late summer

Stearns Pond is managed for brown trout and warm water fish (bass and white perch).

Transparencies are slightly below average for Maine lakes. Color which fluctuates from slight to moderate may be effecting the transparencies. Color is cause by dissolved organic material in the water. Although it reduces transparency, it does not affect water quality. Chla and TP values are considered moderate indicating good water quality. Water quality appears stable.

Swan Lake #5492

Surface Area	547 ha (1351 a)
Max. Depth	28.2 m (87 ft)
Mean Depth	9.5 m (31.4 ft)
Volume	$5.19 \times 10^7 m^3$ (41,678 acre-feet)
Drainage Area	28.2 km^2 (10.9 mi^2)
Flushing Rate	0.3 (flushes/year)



Swan Lake # 5492

	1977-78	1979	1980	1981	1982
Mean Secchi	7.2*(3)	6.7*(1)	6.7	7.3	5.5*(1)
Min. Secchi	5.8*	5.5*	4.8	5.0	
TSI	NA	NA	34	30	NA
Color(SPU)		10			12
pH		6.9			6.9
Chla(ug/l)		2.6(ls			2.8(ls))
TP(ppb)		7(c)(ls)			9(c)(ls)
		12(b)(ls)			12(b)(ls)

* inadequate sampling season
(c) core, (b) bottom, (ls) late summer

By late summer, 1979, there was less than 5 ppm of oxygen in the hypolimnion. The lake is managed for cold and warm water fish.

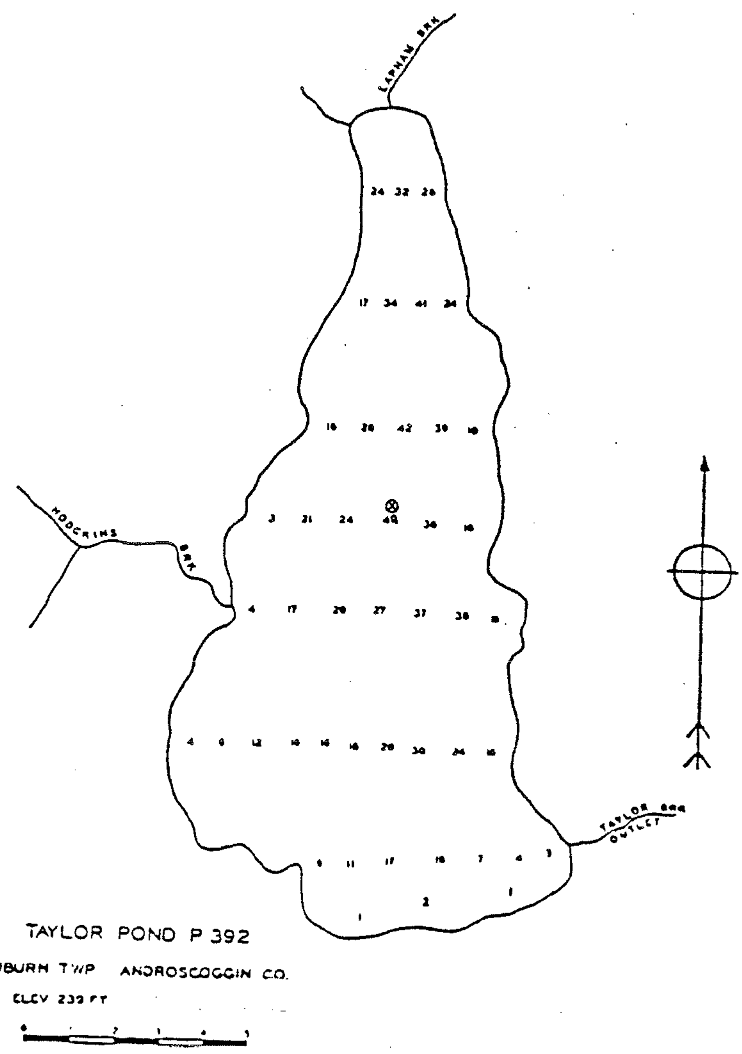
Transparency readings are better than average for Maine lakes. Chla levels are low and TP values are moderate to low.

Cottage owners have voiced concern about the increased draw down of the lake, because the dam now is being used to generate power. This is becoming a more common issue around the state with the increase in low head hydroelectric power generation. As long as the dam is being used for a beneficial purpose, (i.e. generation of electricity), the State of Maine has no control over the water levels. The owner of the dam may set whatever level he or she wishes.

Because of a slow flushing rate (0.3 flushes/year), the lake may be vulnerable to water quality degradation.

Taylor Pond #3750

Surface Area	259 ha (648 a)
Max. Depth	13.2 m (44 ft)
Mean Depth	5.5 m (18 ft)
Volume Area	1.44 X 10^7 m^3 (11669 acre-feet)
Drainage Area	38.1 Km^2 (14.7 mi^2)
Flushing Rate	1.3 (flushes/year)



Taylor Pond # 3750

	1975	1977-78	1979	1981	1982
Mean Secchi(m)	4.1	4.7	4.5*(2)	4.5*(1)	4.4
Min. Secchi(m)	2.9	4.0	2.8		3.8
TSI	59	52	NA	NA	55
Color(SPU)					23
pH	7.0	7.1	7.0(c)	7.1(sur)	6.8(c)
Chla(ug/l)	3.0(sum)	3.4(sum)			3.0(ls)
TP(ppb)	6(sum)	8(spr) 6(sum)			8(ls)

* inadequate sampling

(sur) surface, (c) core, (sum)summer, (ls) late summer, (spr) spring

---

In past years sampling has revealed high bacteria levels at the southern end of the pond. The source was considered to be a developed area that drains toward the pond. The D.E.P. requested that the City of Auburn extend sewer lines into this development. The City complied and the homes in this development are no longer a direct source of nutrients to the lake. Bacteria sampling done by Taylor Pond Association in the same area in 1976 yielded negative values at all sampling stations. All bacteria testing by the Taylor Pond Association in 1977, at eight locations, were negative; however, testing by D.E.P. showed several "hot" coves and tributaries.

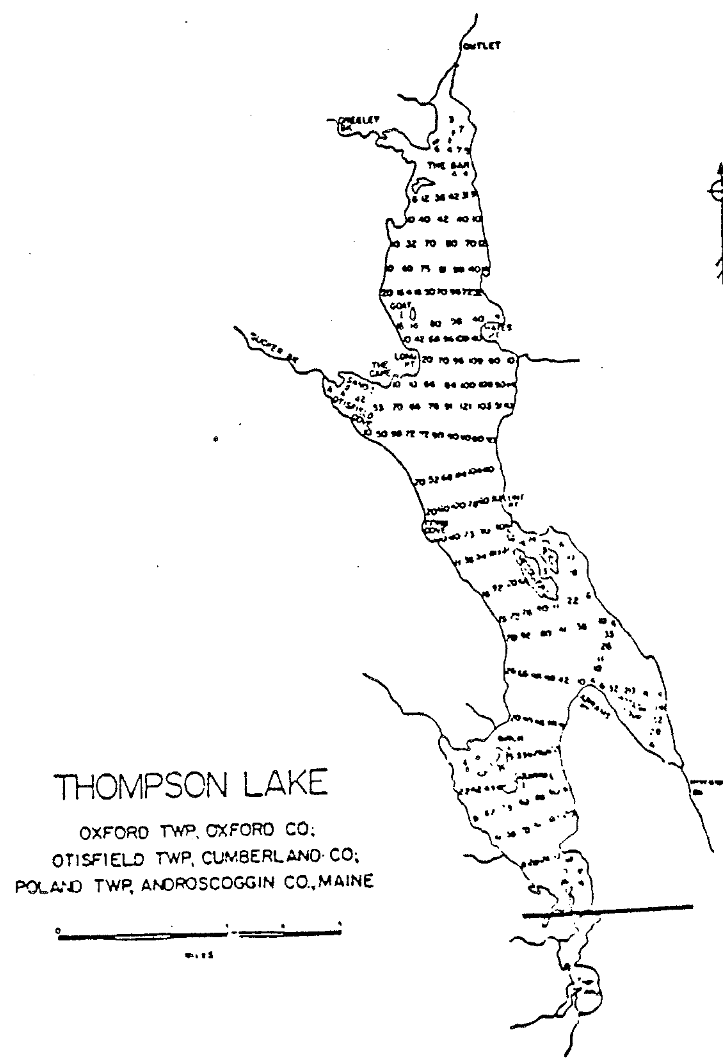
Construction has extended sewer lines up both sides of the pond. As Taylor Pond is heavily developed and many septic systems were inadequate, a sewer line may eliminate a source of nutrients to the lake. One should keep in mind, however, a sewer will encourage heavier development, sewer lines can suffer breaks, and other sources besides sewage can add to the nutrient load. Residents must still be cautious in land use practices.

The pond is managed for warm water fish. An oxygen deficiency exists below 8m.

Transparencies are slightly below average for lakes and ponds in Maine. Water color is moderate and may be effecting transparencies. Chla values are considered moderate and TP levels low to moderate. These levels have changed little since 1975 and this would indicate that water quality is stable.

Thompson Lake #3444

Surface Area	1710 ha (4275 a)
Max. Depth	36.3 m (121 ft)
Mean Depth	12.5 m (41 ft)
Volume	2.14×10^8 m^3 (173,984 acre-feet)
Drainage Area	122.8 Km^2 (47.4 mi^2)
Flushing Rate	0.3 Flushes/year)



Thompson Lake #3444

	1972-78	1979	1980	1981	1982
North Basin (Hayes Point)					
Mean Secchi(m)	8.2*	8.0*(2)	8.1*(2)	9.3*(4)	9.0*(4)
Min. Secchi(m)	6.3	7.5	7.5	8.3	8.0
TSI	NA	NA	NA	NA	NA
Color(SPU)	10			10	
pH(core)	7.0(surface)				
Chla (ug/l)	1.3			1.8(ls)	
TP(ppb)	5(spring)			5(c)(ls) 7(b)(ls)	
South Basin (Agassiz)					
Mean Secchi(m)	7.7*	8.6*(2)	7.8*(3)	9.5	7.9*(4)
Min. Secchi(m)	6.7	8.5	7.0	7.5	5.1
TSI	NA	NA	NA	19	NA

* Inadequate sampling

(ls) late summer, (c) core, (b) bottom

TP and Chla samples are low. Transparencies are above average for Maine lakes; however, complete sampling seasons are necessary in order to accurately predict overall lake water quality and water quality trends. The lake stratifies in the summer but does not suffer significant oxygen depletion (i.e., less than 5 ppm) in the hypolimnion.

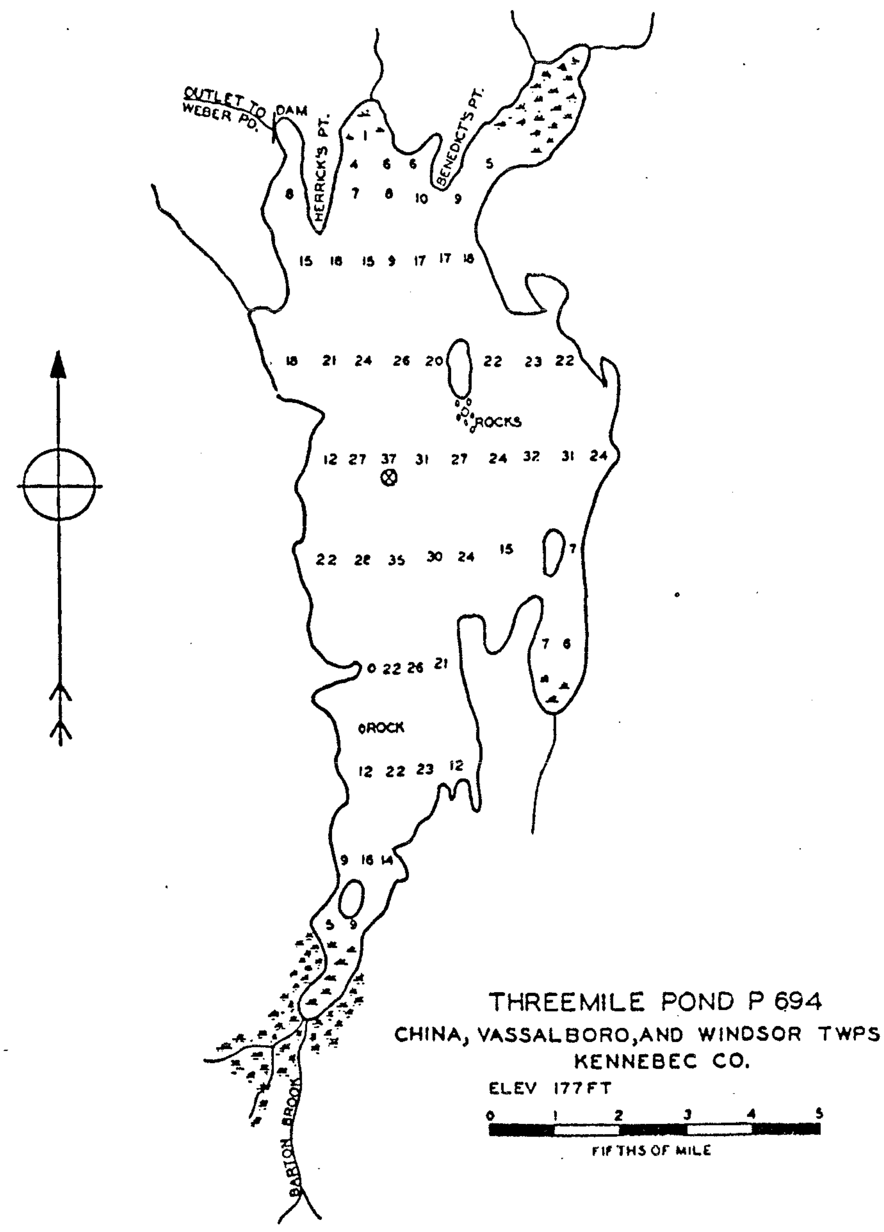
The Lake Association has been active in sampling the tributaries for bacteria and TP in order to locate and clean up nutrient sources to the lake. Controlling phosphorus loading now should preserve the water quality of Thompson Lake.

The lake supports a cold water and warm water fishery.

A more comprehensive report on the water quality of Thompson lake is available at D.E.P. or the Thompson Lake Environmental Association. The Association is doing an excellent job monitoring and protecting the lake. The approach of using volunteers to perform such extended testing is unique and laudable. D.E.P. highly recommends this approach to other interested lake associations.

Threemile Pond # 5416

Surface Area	458 ha (1131 a)
Max. Depth	11.3 m (37 ft)
Mean Depth	4.9 m (16.2 ft)
Volume	22.3 X 10^6 m^3 (18,563 acre-feet)
Drainage Area	45.6 km^2 (17.6 mi^2)
Flushing Rate	1.1 (flushes/year)



Threemile Pond # 5416

	1978	1979	1980	1981	1982
Mean Secchi (m)	1.8*(2)	4.2	2.4	3.5	3.1
Min. Secchi (m)	1.2	2.4	1.3	0.6	2.4
TSI	NA	63	80	69	68
TSI Range		58-66	69-86	68-71	62-75
		TP SD	TP CHL	SD CHL	TP SD
Chla(ug/1)	30.3*(2)	7.6	16.0	9.6	8.3
TP(ppb)		18.5	27		21
pH	7.1	6.7	6.7	6.6	
Color(SPU)	20	28		25	

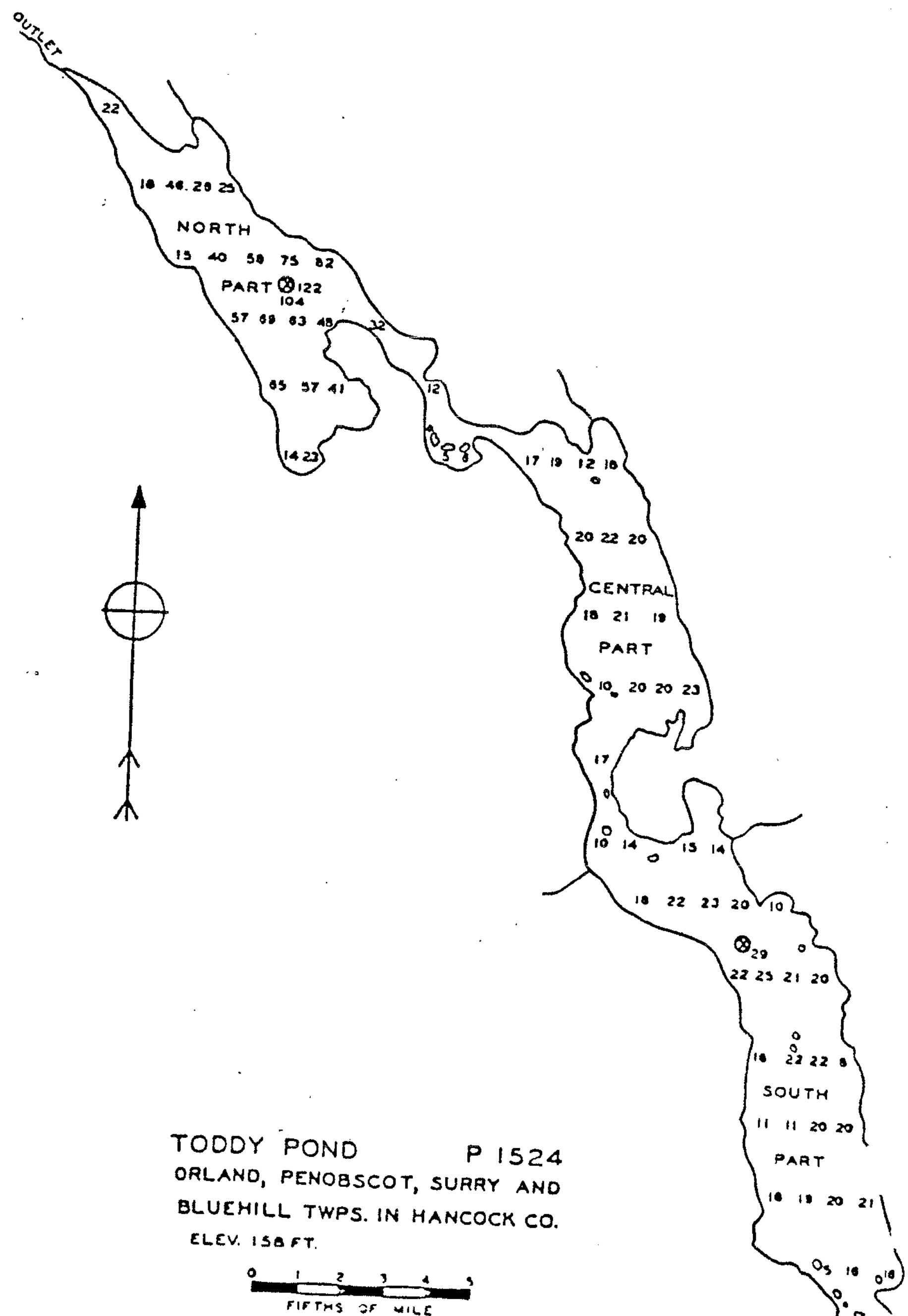
Threemile Pond has supported a blue-green algal blooms every year since 1978. The blooms usually did not begin until late August or early September, although the 1980 bloom started in mid July and continued into September. The comparatively good water quality in 1982 may have been due particulary to abnormally cold summer.

Transparencies are below average for lakes and ponds in Maine. Chla levels are moderate to high and TP values are high.

A recent diagnostic study of the pond has identified agriculture in the watershed as the most significant source of phosphorus. As a result of this study, the Soil Conservation Service has applied for federal funds to assist farmers in the watershed in construction of manure storage facilities and implementation of better land management practices. Assuming funds are available field planning and design on this project should begin in the summer of 1983, although construction of manure facilities may not begin until next year.

Toddy Pond #4340

Surface Area	804 ha (1987 a)
Max. Depth	37.2 (122 ft)



Toddy Pond #4340

	1977	1978	1980	1981
Mean Secchi (m)	6.2	6.8*(3)	4.3	6.3
Min. Secchi (m)	5.0	6.1*	2.5	5.0
TSI	37	NA	56	37
Color				25
pH				6.2
Chl*a*		3.2(ls)		2.6(ls)
TP	6(spr)	6(ls)		6(c)(ls) 6(b)(ls)

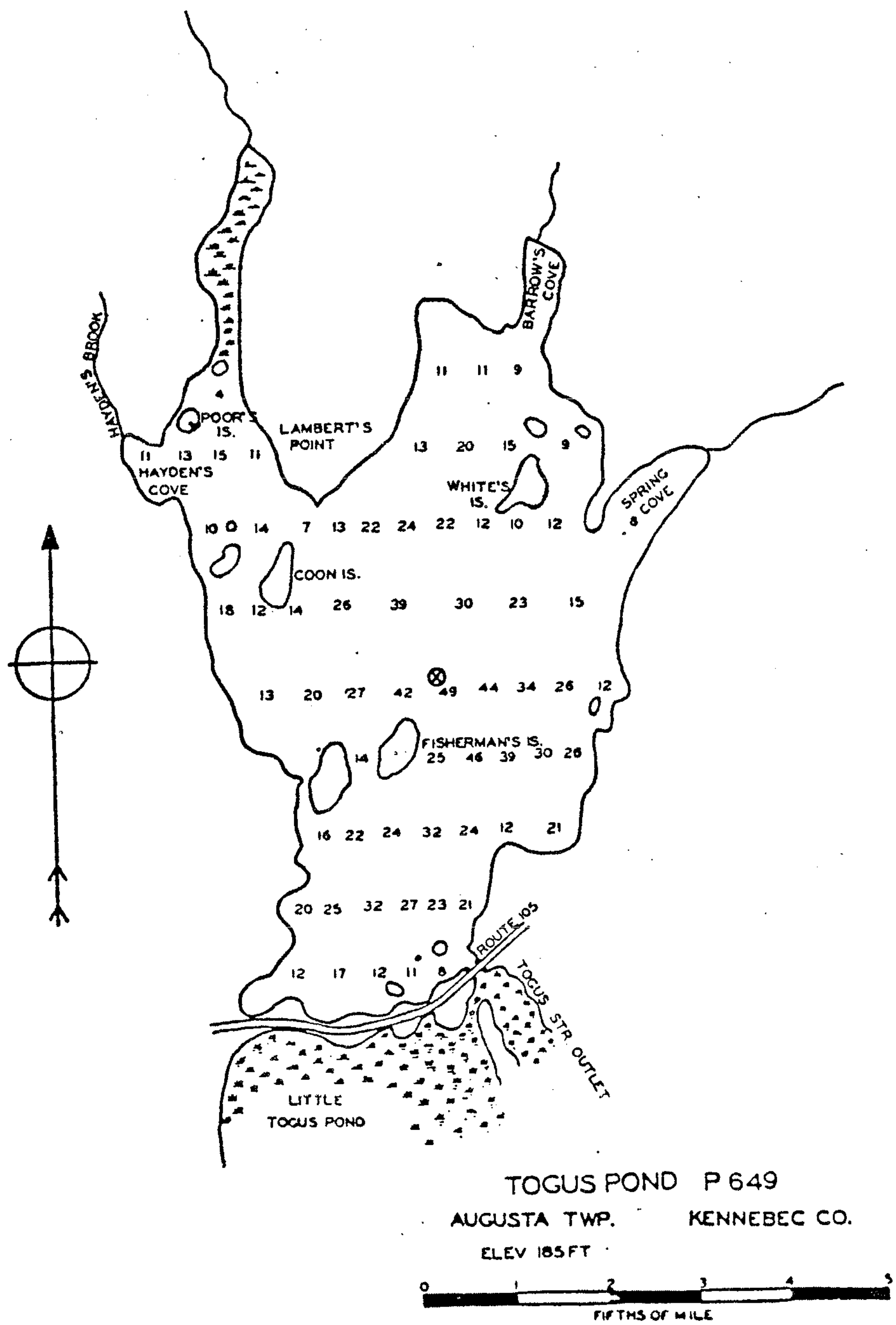
* Inadequate sampling season
(spr) Spring, (ls) late summer, (c) core, (b) bottom

The principal fishery is salmon, lake trout, and white perch.

Transparencies fluctuated significantly, especially in 1980. This may be due to weather, natural conditions or a change in monitors. The 1981 mean transparency was similar to 1977; these readings are slightly above average for Maine lakes. Chl*a* and TP values are moderate to low.

Togus Pond #9931

Surface Area	269 ha (642 a)
Max Depth	14.9 m (49ft)
Mean Depth	5.4m (6 ft)
Volume	13.9 x 10^6 m^3 (10400 acre-feet)
Drainage Area	12.3 Km^2 (4.8 mi^2)
Flushing Rate	0.5 (flushes/year)



Togus Pond #9931

	1976-78	1979	1980	1981	1982
Mean Secchi (m)	4.2	3.3	3.5	4.6	5.1
Min Secchi (m)	0.6	1.1	2.4	3.5	4.0
TSI	56	64	65	50	47
TSI Range	40-78	54-71	62-68	46-53	
	CHL-SD	TP-SD	TP-SD	CHL-SD	
PH(core)		6.9mean	6.6	6.5	6.9
Chla(ug/l)	5.2mean	8.4mean	8.2mean	3.8mean	3.3(ls)
TP(ppb)	16mean	16mean	21mean	18mean	
Color(SPU)				15	15

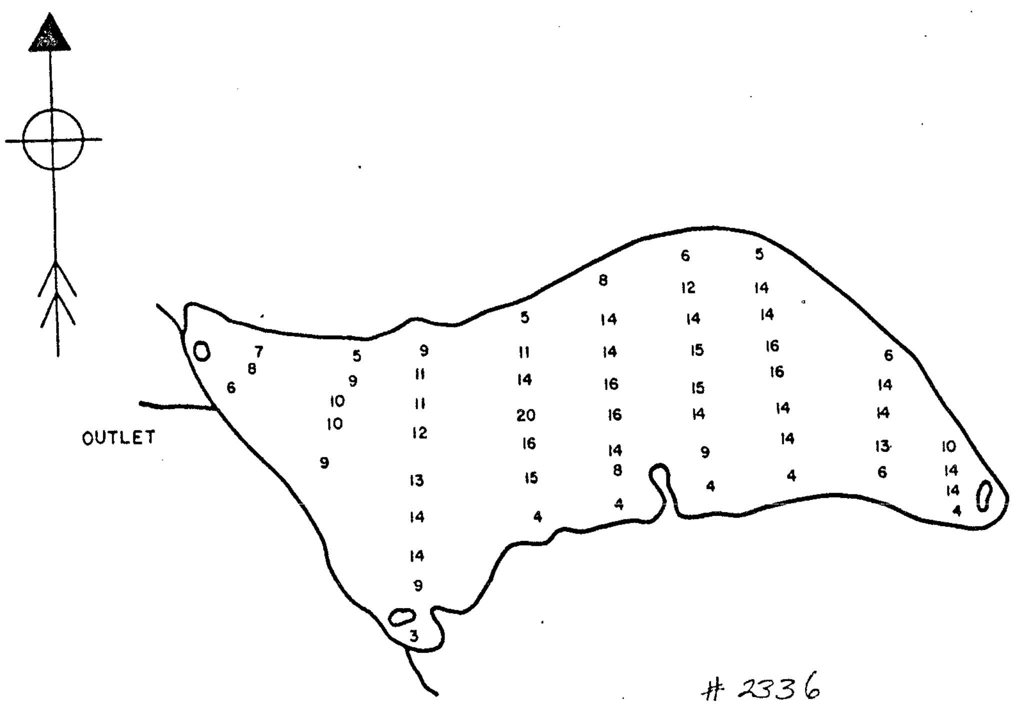
(ls) late summer

Togus Pond had documented algal blooms in 1976-1979. Since then, water quality seems to be improving. Transparency readings were about average for lakes and ponds in Maine during 1982. Chla values have decrease from a high of 8.4 in 1979 to 3.8 in 1981. TP values are still high, however, and a bloom could develop if weather conditions and other factors are right to promote a bloom.

The Togus Pond diagnostic study is complete and results show that property owners can do much to reduce the nutrient supply to Togus. Recommendations will be sent to all lake front property owners and any interested persons. Successful restoration depends on everyone's cooperation. Meanwhile, lake users should expect occassional blooms of algae, although hopefully not every year.

Toothaker Pond #2336

Surface Area	6 ha (15 a)
Max. Depth	6.1 m (20 ft)
Mean Depth	2.8 m (9.2 ft)
Drainage Area	2.3 km^2 (.9 mi^2)
Volume	1.6 X 10^5 m^3 (130 acre-feet)
Flushing Rate	0.7 (flushes/year)



2336

TOOTHAKER POND

PHILLIPS TWP., FRANKLIN CO., MAINE

0 1
TENTH OF MILE

Toothaker Pond # 2336

	1979	1980	1981	1982
Mean Secchi (m)	0.7*(1)	3.1	0.8*(2)	1.4
Min. Secchi (m)		2.3	0.6	0.9
TSI	NA	62CHL	NA	121
Color(SPU)		40		
pH	7.4	6.5	7.6	
Chla(ug/l)	18.6(s)	7.0mean	40*(2)	22*(3)
TP(ppb)	21(s)	29mean		34*(3)

* inadequate sampling season

(s) surface

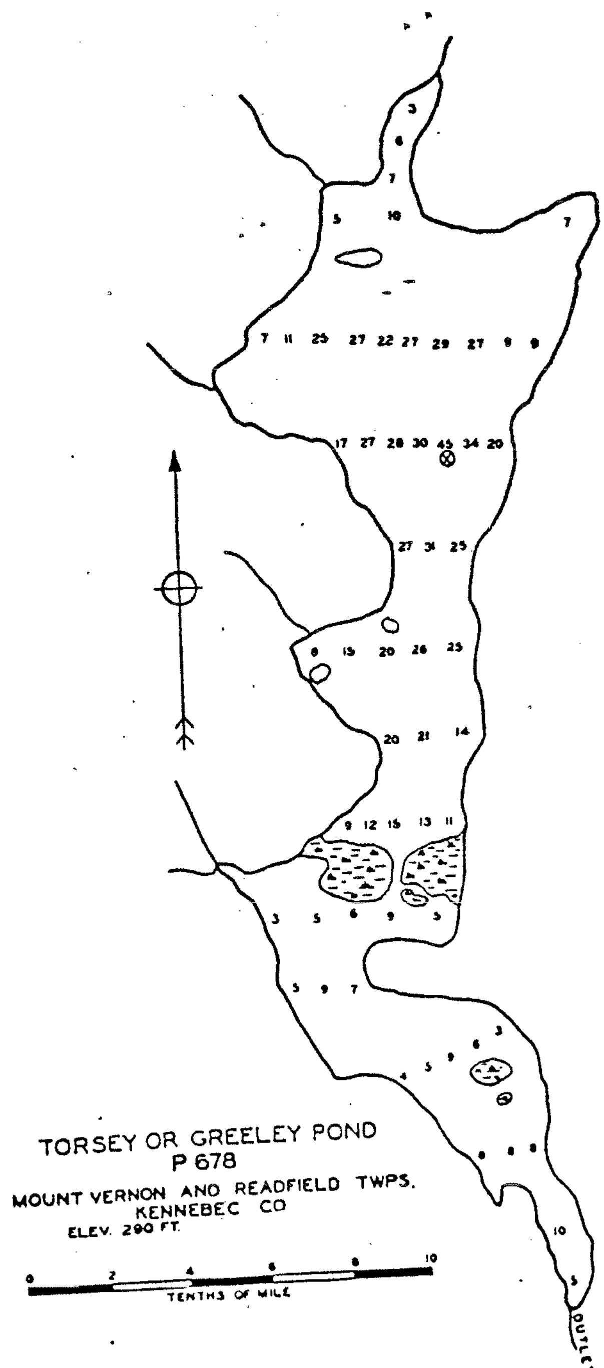
Ten to fifteen years ago it was not unusual for Toothaker Pond to bloom. Discharge from a fish hatchery was suspected to be the cause. The tributary which carried the hatchery effluent was diverted from the pond. Water quality seemed to improve for the next few years. But in August, 1979, an intense algal bloom occurred in Toothaker Pond. Cottage owners were alarmed.

Intensive sampling in 1980 documented that Toothaker is highly productive even though it did not bloom that year. Toothaker did bloom again in 1981 and 1982. The 1982 bloom lasted four months starting in June.

D.E.P. has attempted to find a feasible solution to restoring the water quality of Toothaker Pond. So far no practical answers have been found. Diversion of the hatchery effluent and stream should improve the water quality of the pond, but it will take much time since diverting the stream has seriously reduced the flushing rate and thereby the ponds' ability to recover from nutrient loading. D.E.P. will continue to try to find a reasonable solution.

Torsey Pond # 5307

Surface Area	230 ha (568 a)
Max. Depth	13.7m (45 ft)
Mean Depth	3.8 m (12 ft)
Volume	8.73×10^6 m^3 (9441 acre-feet)
Drainage Area	18.8 Km^2 (7.2 mi^2)
Flushing Rate	1.1 (flushes/year)



Torsey Pond # 5307

	1975-76	1978-79	1980	1981	1982
Mean Secchi (m)	5.5	5.1	4.3*(1)	5.5	5.8
Min. Secchi (m)	4.4	3.8		4.6	5.2
TSI	47	48		45	40
TSI Range	42-55	47-50	NA	43-47	39-41
	TP-CHL	SD CHL		SD-CHL	SD CHL
Color(SPU)		30			
pH(core)		7.1(surf)			
Chla(ug/l)	5.4mean	4.4*(3)		4.1mean	2.9mean
TP(ppb)	10mean	4.1mean		11(ls)	9(ls)

* Inadequate sampling season
(surf) surface, (ls) late summer

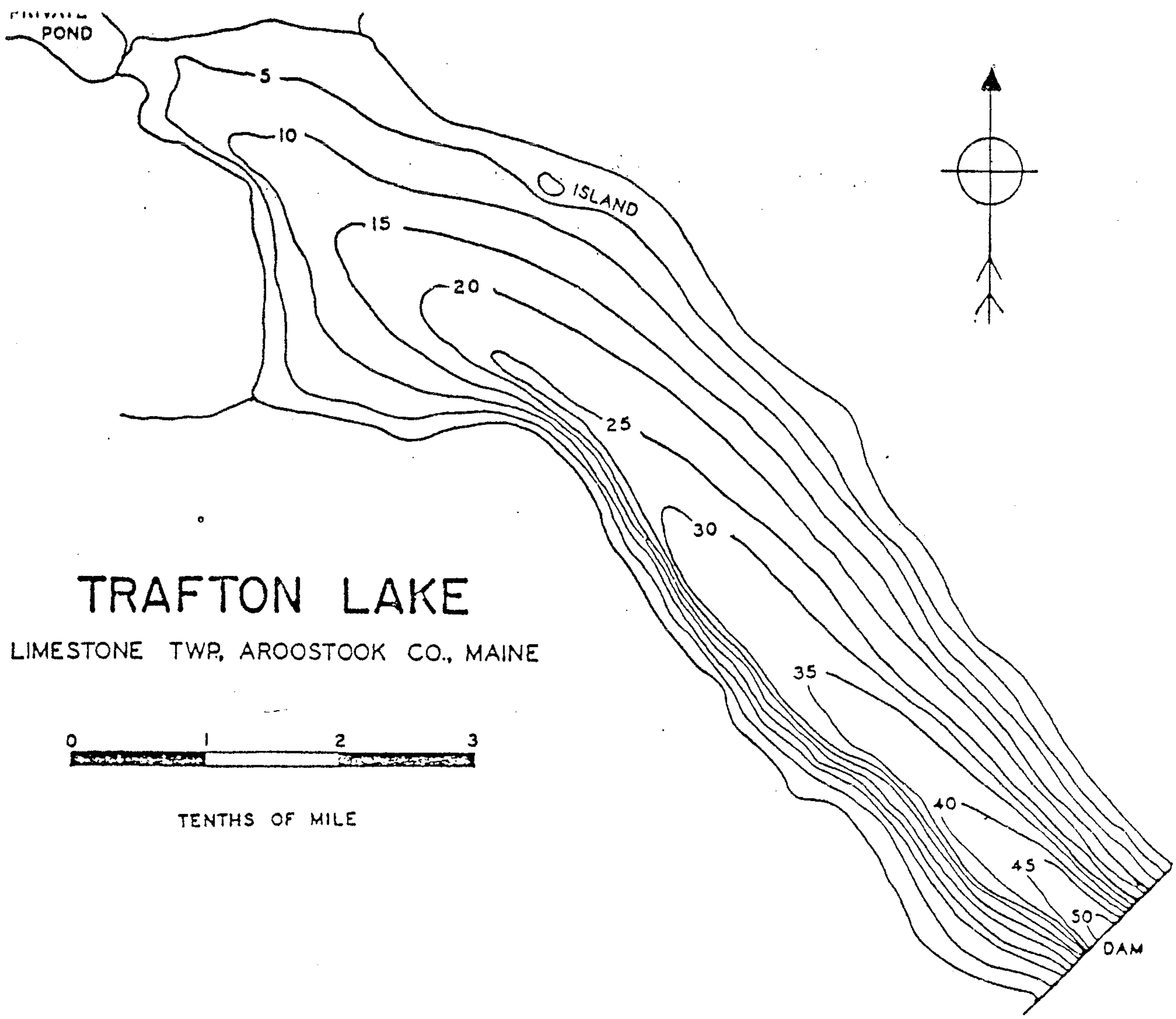
There is an oxygen deficiency below 5m during the summer. The lake is managed for warmwater fish and brown trout.

Transparencies are average for Maine lakes and appear to have improved. Continued monitoring is necessary in order to accurately predict any trend in water quality. Chla values are moderate and have improved since 1976 and TP values are moderate and have remained stable. Water quality seems to be improving.

Torsey has extensive rooted plant growth.

Trafton Lake #9779

Surface Area	26 ha (65 a)
Max. Depth	15.2 m (50 ft)
Mean Depth	4.8 m (15.7 ft)
Volume	1.2 X $10^6 m^3$ (976 acre-feet)
Drainage Area	11.1 km^2 (4.3 mi^2)
Flushing Rate	4.5 (flushes/year)



Trafton Lake # 9779

	1972	1979	1980	1981	1982
Mean Secchi (m)	2.6*(2)	2.1*(3)	3.5	3.2*(4)	2.1*(1)
Min. Secchi (m)	1.5	1.7	2.1	1.7	
TSI	NA	NA	68	NA	NA
Color(SPU)		20			
pH	7.7(surf)		8.4(c)		
Chla(ug/l)				4.6*(4)	17(s)
TP(ppb)			17(s)	2.7*(4)	43(c)(s) 100(b)(s)

* inadequate sampling season
(s) summer, (c) core, (b) bottom, (surf) surface

A dissolved oxygen deficiency (less than 1 ppm) exists in the hypolimnion during summer stratification.

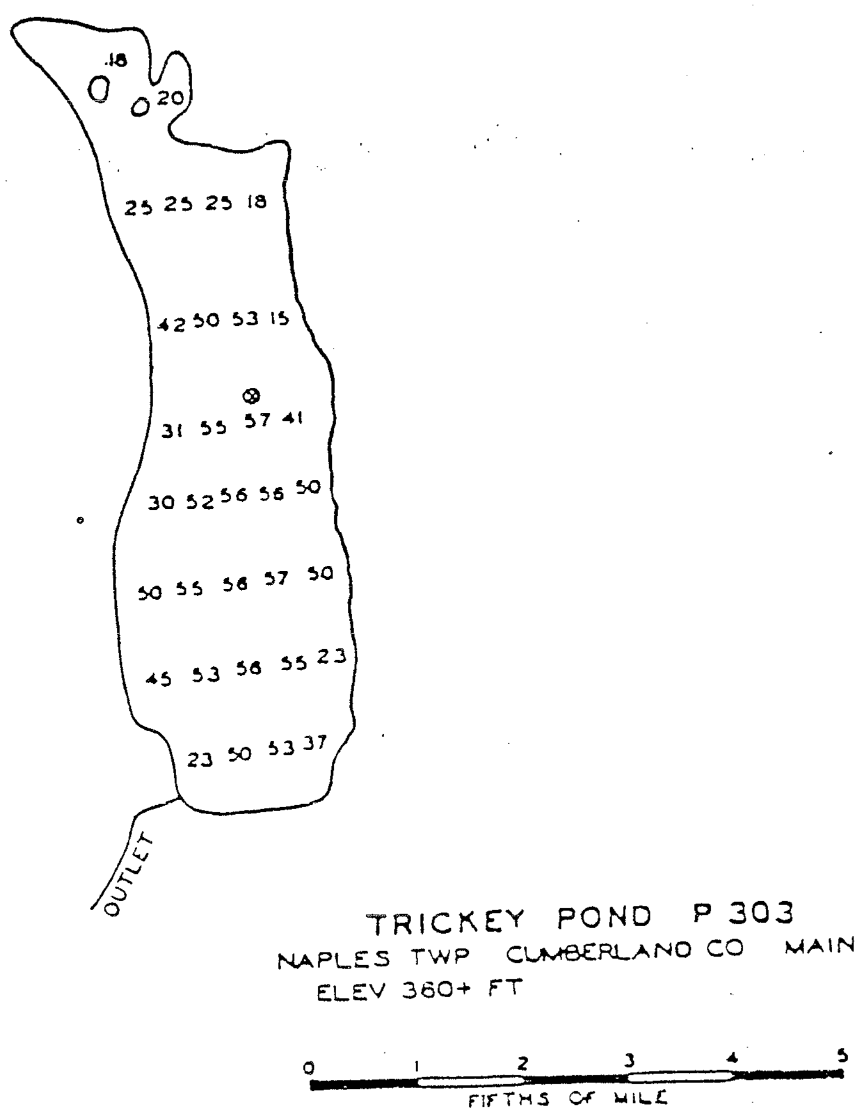
Trafton is a highly productive lake. Transparencies are below average for Maine lakes, and algal blooms have been reported. TP and Chl<u>a</u> values are high.

"Trafton Lake is a man-made, flood control recreation lake sponsored by the Town of Limestone and the U.S. Soil Conservation Service. It was created in 1969 by a large earth-fill dam constructed on Webber Brook. Vegetation and organic material left after clearing the impoundment are now decomposing and resulting in an oxygen deficiency in the deeper, cooler water". (1) Part of the lakes' productivity may be due to its being a young lake; it may be many years before the lake comes to equilibrium.

(1) Taken from Department of Inland Fisheries and Wildlife Survey.

Trickey Pond #3382

Surface Area	122 ha (301 a)
Max. Depth	17.4m (57 ft)
Mean Depth	10.2 m (33.7 ft)
Drainage Area	3.5 km^2 (1.34 mi^2)
Volume	12.47 X 10^6 m^3 (10,108 acre-feet)
Flushing Rate	0.1 (flushes/year)



Trickey Pond # 3382

	1976	1979	1980	1981	1982
Mean Secchi (m)	9.6*(2)	10.0*(1)	10.3	10.2	9.9
Min. Secchi (m)	8.8		8.0	8.0	5.0
TSI	NA	NA	15	16	17
TSI Range			14-16 CHL-SD		
Color(SPU)		10	5		
pH	6.4mean	6.6(c)			
Chla(ug/l)		1.7(ls)	0.9mean		
TP(ppb)		6(c)(ls) 14(b)(ls)	4(c)(ls) 13(b)(ls)		

* Inadequate sampling season
(ls) late summer, (b) bottom, (c) core

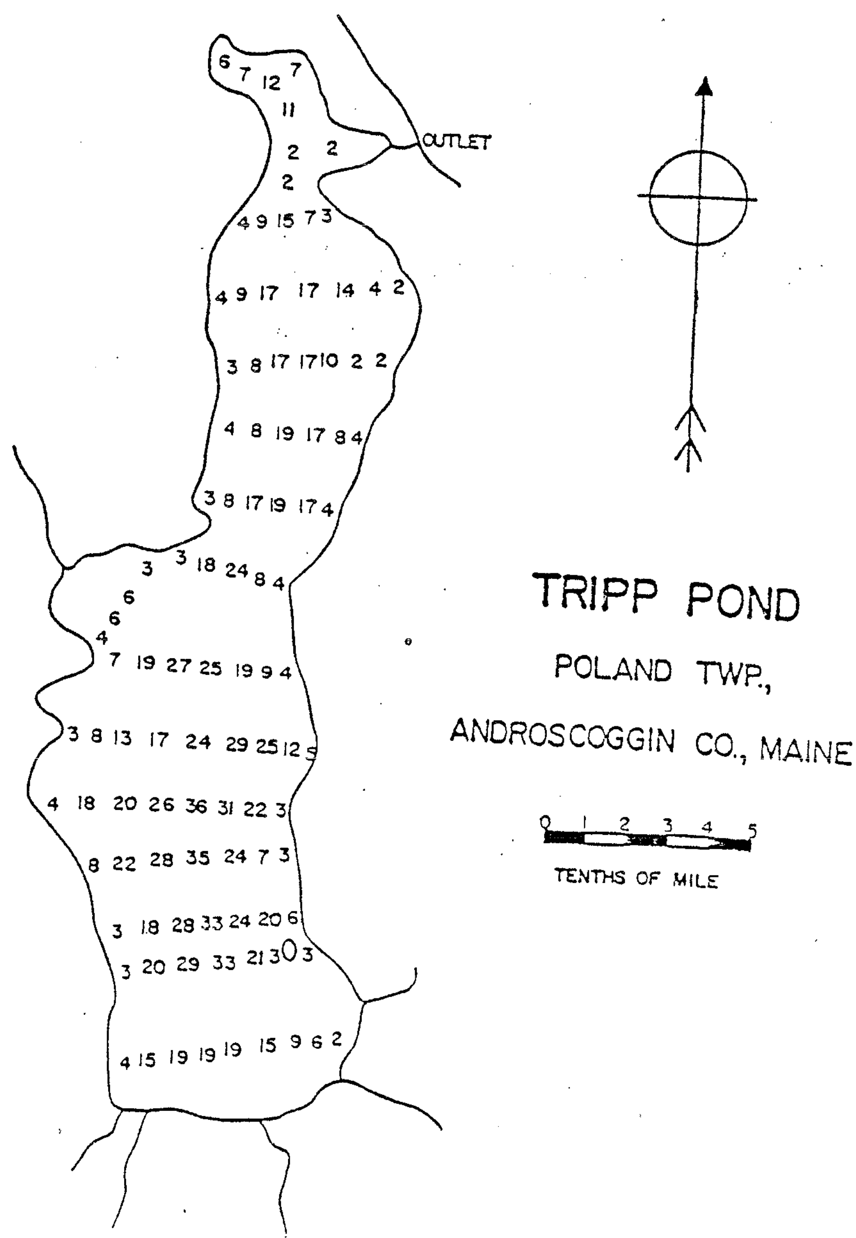
Transparencies are far above average for Maine lakes and ponds. TP and Chla values are low. The flushing rate is slow which makes Tricky sensitive to water quality degradation. Water quality is excellent and should be vigorously protected. Such high water quality is a rare and valuable natural resource.

Trickey Pond was one of twelve lakes that participated in an experimental Chla sampling program in 1980. The program was successful and is repeated each year on a different set of lakes. The program is designed to collect additional data on colored lakes, shallow lakes or sensitive lakes.

Trickey Pond is managed for brook trout and warmwater fish. The hypolimnion remains well oxygenated throughout the summer.

Tripp Pond #3758

Surface Area	296 ha (740 a)
Max. Depth	10.6m (35 ft)
Mean Depth	3.8 m (12.5 ft)
Volume	1.14 X $10^7 m^3$ (9268 acre-feet)
Drainage Area	19.2 km^2 (7.4 mi^2)
Flushing Rate	0.9 (Flushes/year)



Tripp Pond #3758

	1975-78	1979	1980	1981	1982
Mean Secchi (m)	4.8	4.8	5.4*(4)	4.9*(4)	4.4
Min. Secchi (m)	3.5	4.1	4.2	4.6	3.9
TSI	52	50	NA	NA	55
Color(SPU)	7.0		20		
pH	7.2mean		7.5mean	7.4mean	7.4mean
Chl*a*(ug/l)	3mean		0.3(ls)		
TP(ppb)	7(sur)(ls) 11(b)(sum)		7(c)(ls) 14(b)(sum)		

* Inadequate sampling season
(ls)late summer, (c) core, (b) bottom, (sur) surface, (sum) summer

---

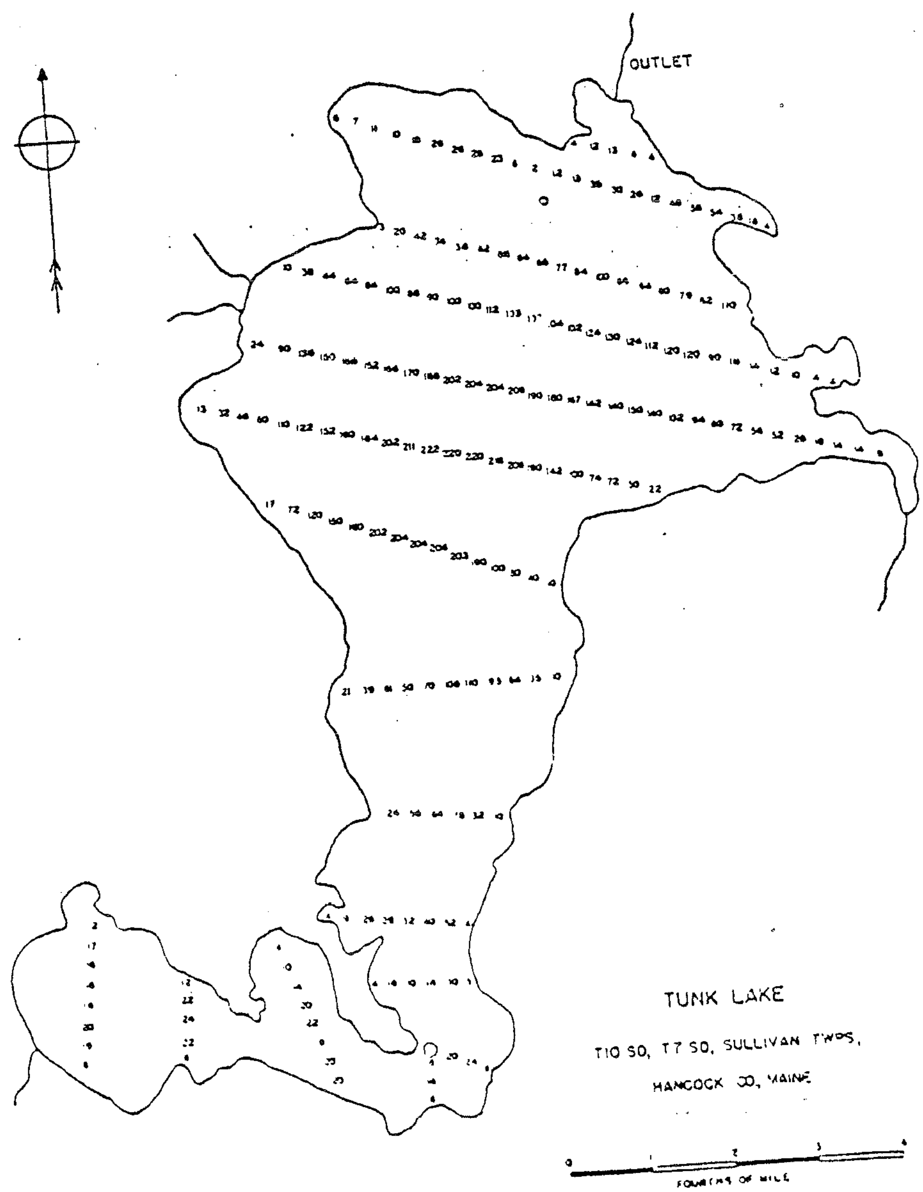
Tripp pond is managed primarily for largemouth bass. White perch and pickeral are also established species.

The pond has a moderate amount of aquatic vegetation along the shore, but this is mainly due to the shallowness of the shoreline and suitability of substrate and not the quality of the water. Much of the plant growth is pipewort, a plant with a long slender stem with a button on the top and is considered an indicator of good water quality.

Transparencies have remained stable and are slightly below average for Maine lakes and ponds. Chl*a* levels were very low in 1980 and moderate in 1976. Tp levels were low to moderate in 1976 and 1980. Water quality remains good. Continued monitoring with complete seasons is necessary in order to determine water quality trends.

Tunk Lake #4434

Surface Area	821 ha (2052 a)
Max. Depth	66.6 m (222 ft)
Mean Depth	20.8 m (68 ft)
Volume	1.7 X $10^8 m^3$ (138,211 acre-feet)
Drainage Area	36 km^2 (13.9 mi^2)
Flushing Rate	0.1 (Flushes/year)



Tunk Lake #4434

	1980	1981	1982
Mean Secchi (m)	12.9	12.5	12.6
Min. Secchi (m)	11.5	10.5	11.4
TSI	9	10	9
Color(SPU)		5	
pH(core)		6.0	
Chla(ug/l)		0.9(ls)	
TP(ppb)		4(c)(ls)	
		4(b)(ls)	

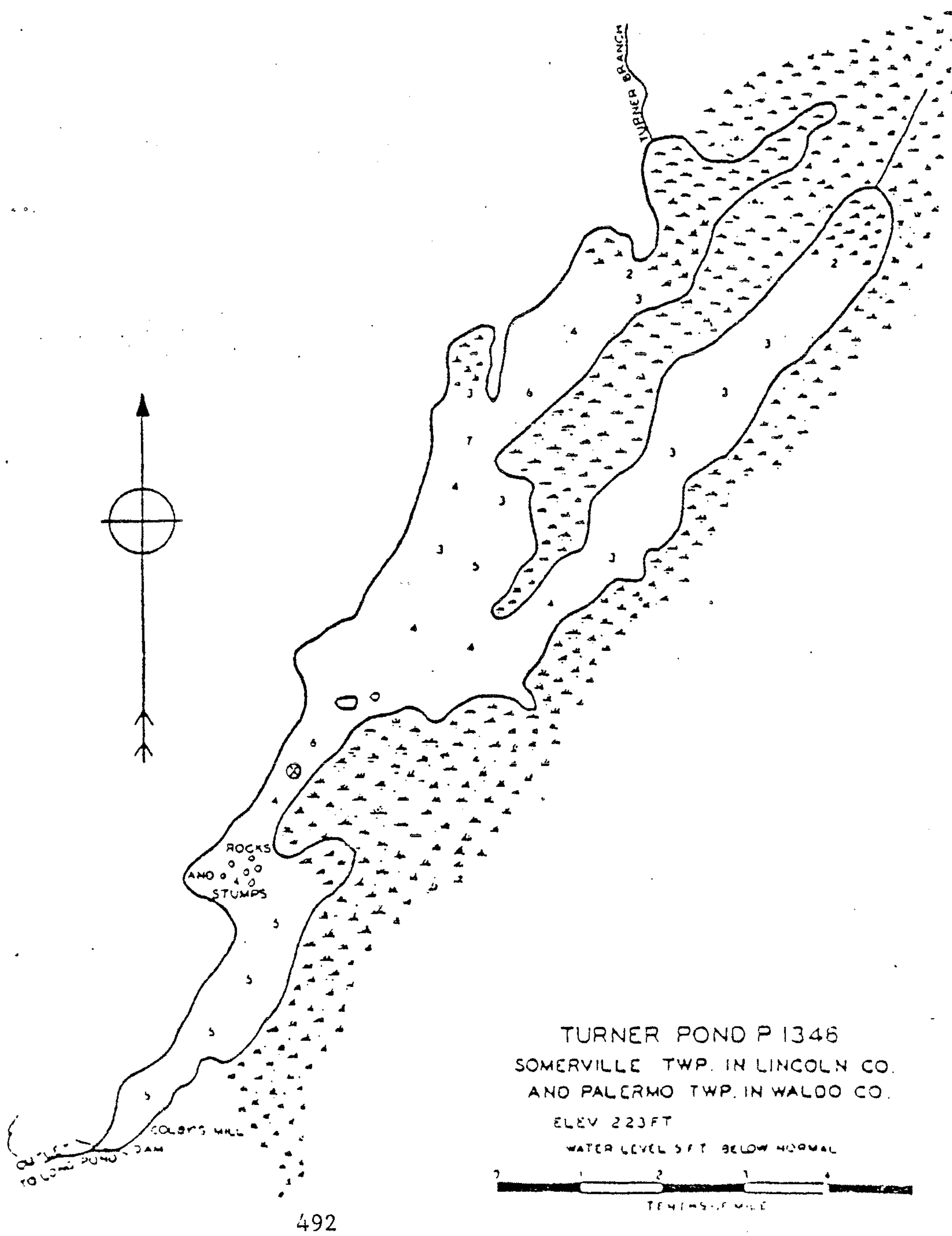
(ls) late summer, (c) core, (b) bottom

Tunk Lake has exceptional water quality. Tunk's water quality is a unique resource and should be vigorously protected. Transparencies are far above average for Maine lakes, and Chla and TP values are extremely low. The lake has a slow flushing rate (0.1 flushes/year) which may make it sensitive to water quality degradation.

The lake supports a good cold water fishery but is limited by the lack of natural spawning area in the tributaries. The lake remains well oxygenated through out the hypolimnion.

Turner Pond #4906

Surface Area	79 ha (197 a)
Max. Depth	2.1 m (7 ft)
Mean Depth	0.6 m (2 ft)
Volume	4.8 X $10^5 m^3$ (390 acre-feet)
Drainage Area	22.5 km^2 (8.7 mi^2)
Flushing Rate	26.2 (Flushes/year)



Turner Pond #4906

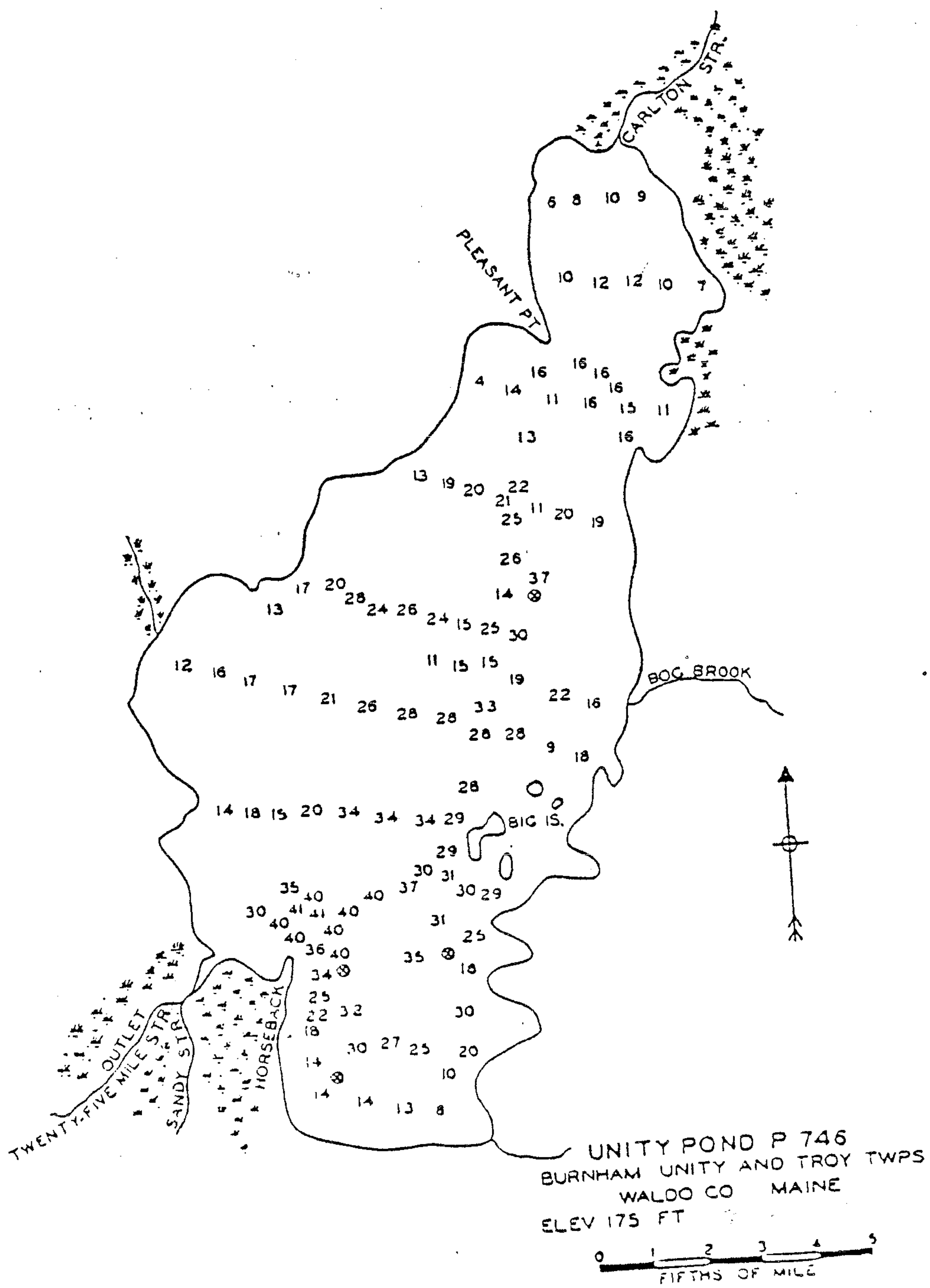
	1981	1982
Mean Secchi (m)	2.2	2.3
Min. Secchi (m)	1.7	2.0
TSI	colored	colored
Color(SPU)		80
Chla (ug/l)		5.7(1s)
TP(ppb)		18(1s)

Turner Pond is managed as a pickerel and yellow perch pond.

Transparencies are very shallow perhaps due to the pond being highly colored. High water color is common in lakes surrounded by boggy areas. As water coming into these lakes filters through the bog, it becomes tea colored from humic and tannic acids. Color reduces transparency but does not effect water quality. Color is cause by dissolved organic material. The Chla and TP values are moderate indicating no water quality problem at this time. Water quality appears stable.

Unity Pond #5172

Surface Area	1021 ha (2553 a)
Max. Depth	12.5 m (41 ft)
Mean Depth	5.7 m (18.7 ft)
Volume	5.8 X 10^7 m^3 (47121 acre-feet)
Drainage Area	151.59 Km^2 (58.53 mi^2)
Flushing Rate	1.3 (flushes/year)



Unity Pond (Lake Winnecook) # 5172

	1973	1977	1978	1981
Mean Secchi (m)	1.9	4.0*(2)	5.0*+	3.4
Min. Secchi (m)	1.8	3.7	4.0+	3.0
TSI	colored	NA	NA	colored
Color			30	42
pH			7.2	7.1
Chl*a*		3.7(sum)	5.2(1s)	6.0(1s)
TP		15(sum)	12(1s)	14(c)(1s)
		11(spr)		15(b)(1s)

+ Readings not taken at deep hole
* Inadequate sampling season
(sum) summer, (1s) late summer (spr.) spring

In 1973 the lake was studied by Rabeni of Unity College and an interesting report Winnecook, a Look at a Lake was published which I recommend. Rabeni reports that the lake underwent 2 algal blooms in 1973. The TP results appear to be unrealistic for July so no deductions were made based on TP.

There is considerable fluctuation in transparency. Continued monitoring with adequate sampling periods is necessary in order to predict any trends in water quality. There appeared to be a problem in 1973 as shown by the Secchi disk readings. The transparencies for 1981 were below average for Maine lakes, this is partly due to the pond having high color which reduces transparency. Chl*a* and TP values were moderate to high.

Upper Cold Stream Pond #2232

West Basin (#1)

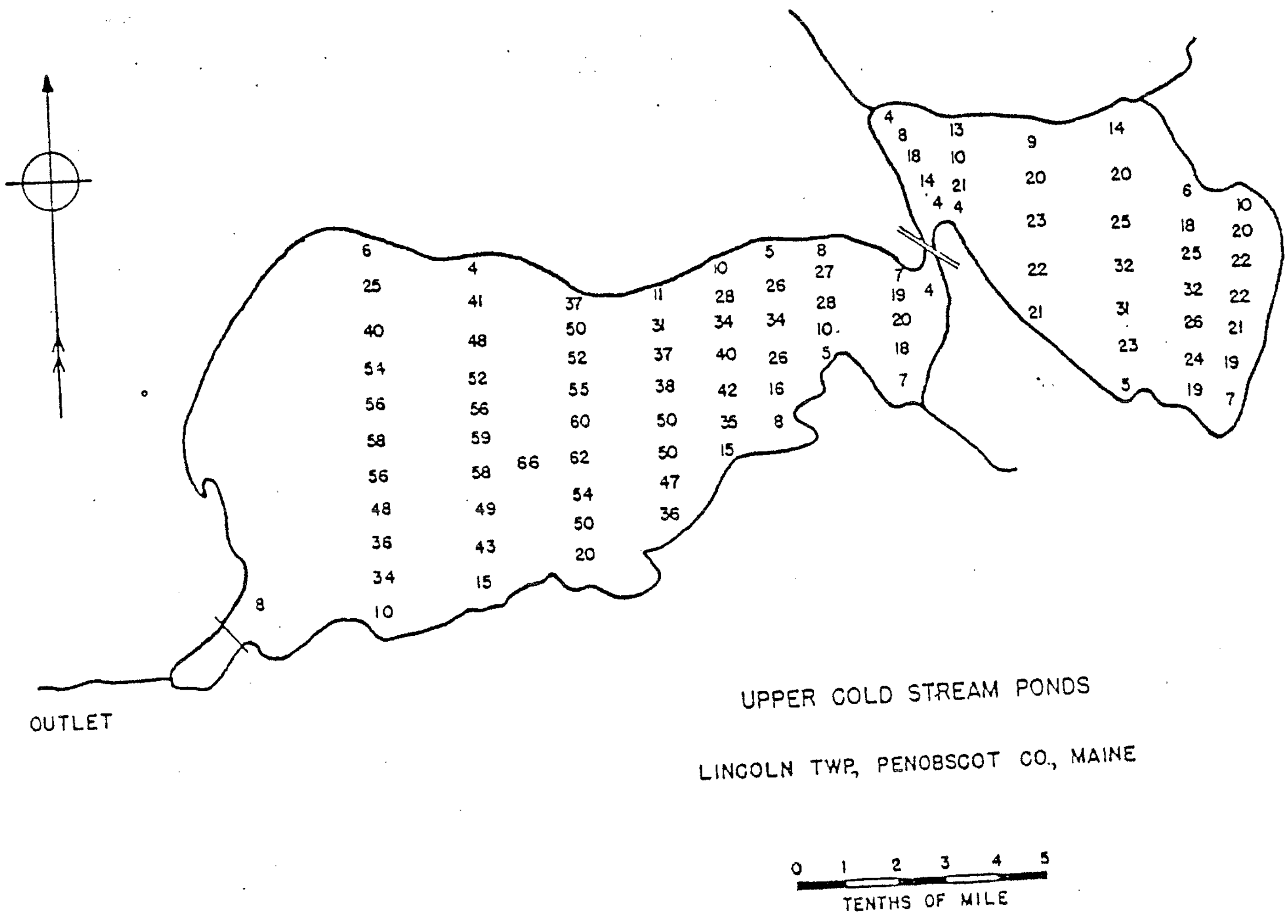
Surface Area	202 ha (499 a)
Max. Depth	20 m (66 ft)
Mean Depth	8.2 m (27 ft)

East Basin (#2)

Surface Area	75 ha (186 a)
Max. Depth	9.7m (32 feet)

Basin 1 and 2

Volume	2.27 X 10^7 m^3 (18381 acre-feet)
Drainage Area	14.7 Km^2 (5.7 mi^2)
Flushing Rate	0.32 (flushes/year)



Upper Cold Stream Pond # 2232

	1973-74	1975	1976	1981	1982
Basin (West) #1					
Mean Secchi (m)	8.8*(2)	10.4*(3)	10.5*(2)	7.3*(4)	
Min. Secchi (m)	8.2	10.2*	9.1*	5.5*	
TSI	NA	NA	NA	NA	
Color(SPU)	10				
pH	6.3	6.6	6.6	6.7	
Chl<u>a</u>(ug/l)				1.5(ls)	
TP(ppb)				9(c)(ls) 20(b)(ls)	
Basin (East)#2					
Mean Secchi (m)	6.2*	8.1*(3)	7.2*(2)	5.7*(4)	5.5
Min. Secchi (m)	5.0	7.8*	6.7*	5.0*	4.3
TSI	NA	NA	NA	NA	43
pH	6.6	6.5	6.6	6.6(c)	
Chl<u>a</u>(ug/l)				2.4(ls)	
TP(ppb)				6(c)(ls) 6(b)(ls)	
Color(SPU)				20	

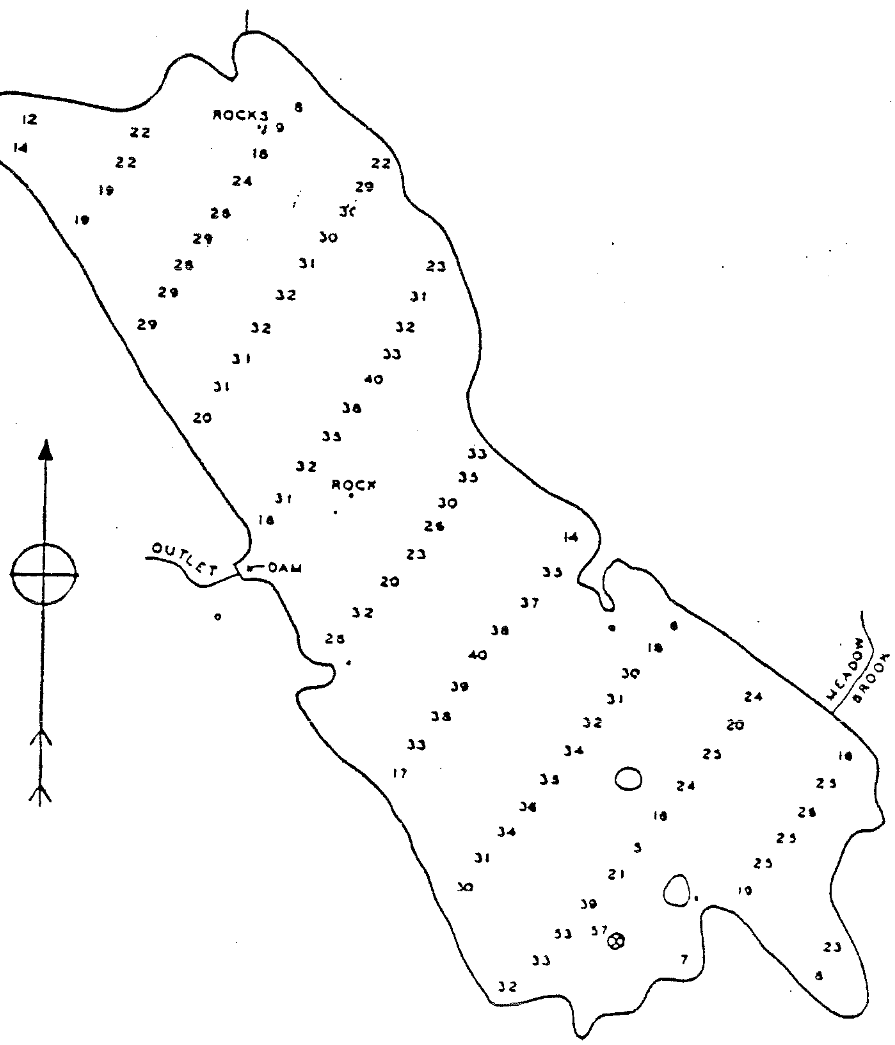
* Inadequate sampling season
(ls) late summer, (c) core, (b) bottom

Upper Cold Stream Pond is managed for lake trout and salmon and a warmwater fishery also exists.

Transparencies during 1981 and 1982 appear to have dropped from previous sampling years. This may be due to a change in monitors, weather, or natural conditions. Continued monitoring with adequate sampling seasons is necessary in order to accurately predict any trends in water quality. Chl<u>a</u> and TP values are low.

Upper Lead Mountain Pond #4482

Surface Area	413 ha (1021 a)
Max. Depth	17.4 m (57 ft)
Mean Depth	7.3 m (24 ft)
Volume	$3.08 \times 10^7 m^3$ (25,000 acre-feet)
Drainage Area	17.9 km^2 (6.9 mi^2)
Flushing Rate	0.4 (flushes/year)



UPPER LEAD MOUNTAIN POND P 1597

TOWNSHIPS NO. 28 AND 22 IN HANCOCK CO.

ELEV. 355 FT.

0 1 2 3 4 5

Upper Lead Mountain Pond # 4482

	1974-77©	1978-79	1980	1981	1982
Mean Secchi (m)	6.2	7.0*	6.8	6.6	6.8
Min. Secchi (m)	5.3	5.7	6.5	5.7	5.5
TSI	36	30	33	35	33
TSI Range	34-39 TP-CHL				
pH	6.7(s)		6.6(c)		
Chla(ug/l)	2.5mean		2.1(ls)		
TP (ppb)	7.2mean		7(ls)		
Color(SPU)			25		

* Inadequate sampling season
(ls) late summer, (c) core, (s) surface
© Data gathered 1974-1976 during a cooperative project between DEP and U.S. Geological Survey

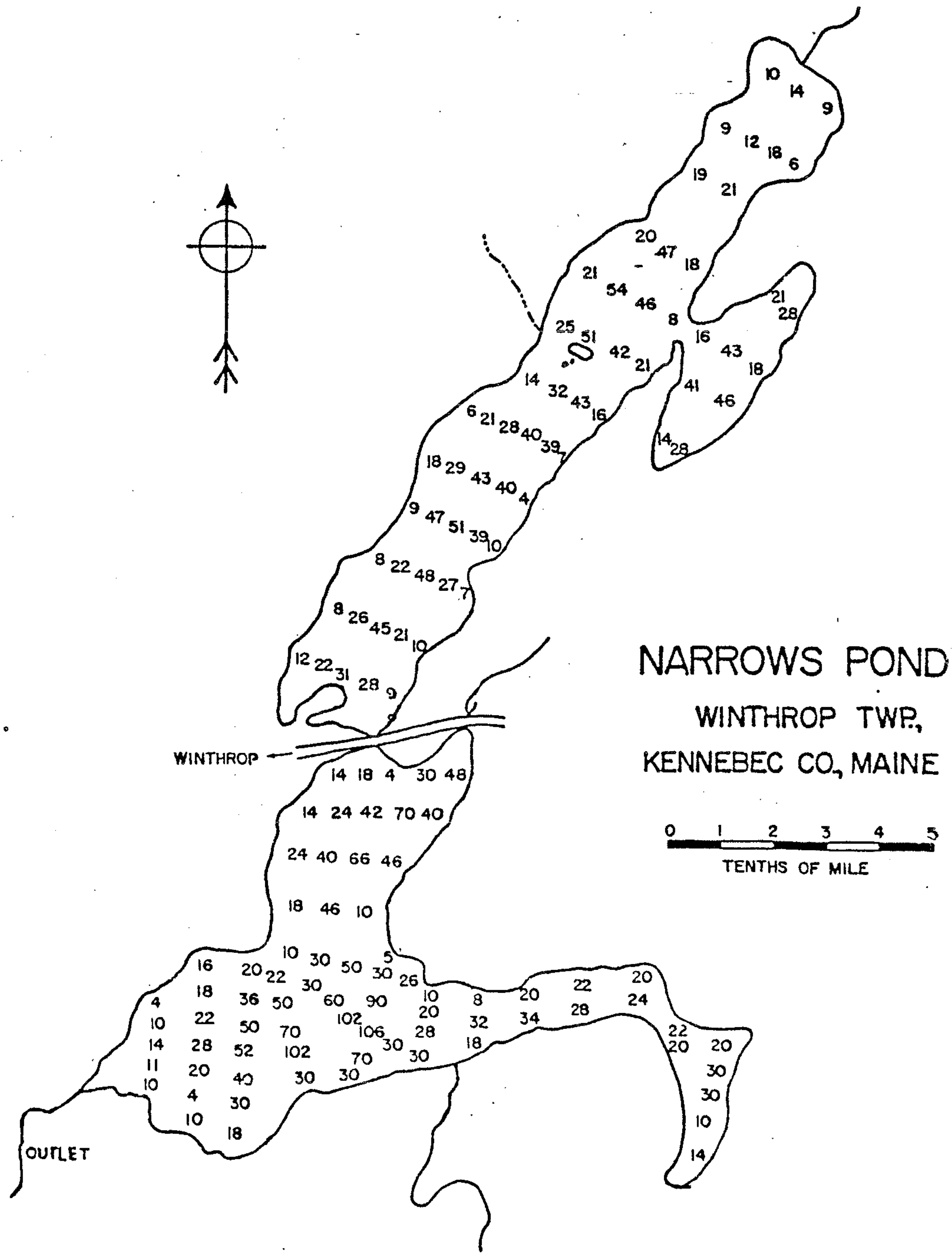
---

Water quality is excellent. Secchi disk readings exceed the average transparency readings for Maine lakes (5.5m) by over a meter. Although the transparency readings fluctuate they remain high and relatively stable. Chla and TP values are low and appear stable. The slow rate may indicate that Upper Lead Mountain Pond is sensitive to water quality degradation.

The lake has a cold water fishery of hatchery reared salmon. An oxygen depression (i.e. less than 5 ppm) exists below 13 meters, but anoxic conditions (i.e. less than 1ppm) are not present.

Upper Narrows Pond #0098

Surface Area	90 ha (222 a)
Max. Depth	16.5 m (54 ft)
Mean Depth	6.8 m (22 ft)
Volume	6.11×10^6 m^3 (6042 acre-feet)
Drainage Area	17.5 Km^2 (6.8 mi^2)
Flushing Rate	1.5 (flushes/year)



Upper Narrows Pond # 0098

	1976-78	1979	1980	1981	1982
Mean Secchi (m)	6.0	5.8	5.7	5.3	6.4
Min. Secchi (m)	4.7	5.4	5.0	3.4	4.5
TSI	40	44	38	45	35
TSI Range	38-44 TP-CHL	41-47 SD-CHL	33-42 CHL-SD		35 - 36 CHL SD
Color(SPU)			15		
pH(core)		7.2			
Chla(ug/l)	5.6(ls)	4.0mean	2.3mean	3.7*(4)	2.5 mean
TP(ppb)	5 (ls)			10(ls)	8(ls)

* Inadequate sampling season

(ls) late summer

The pond is the water supply for Winthrop. An algal bloom was reported in September, 1977 but an investigation revealed a 9.2m Secchi disk reading and moderate Chla and low TP levels. Green particles, a colonial blue-green algae, were visible in the water column but not to the extent of reducing transparency.

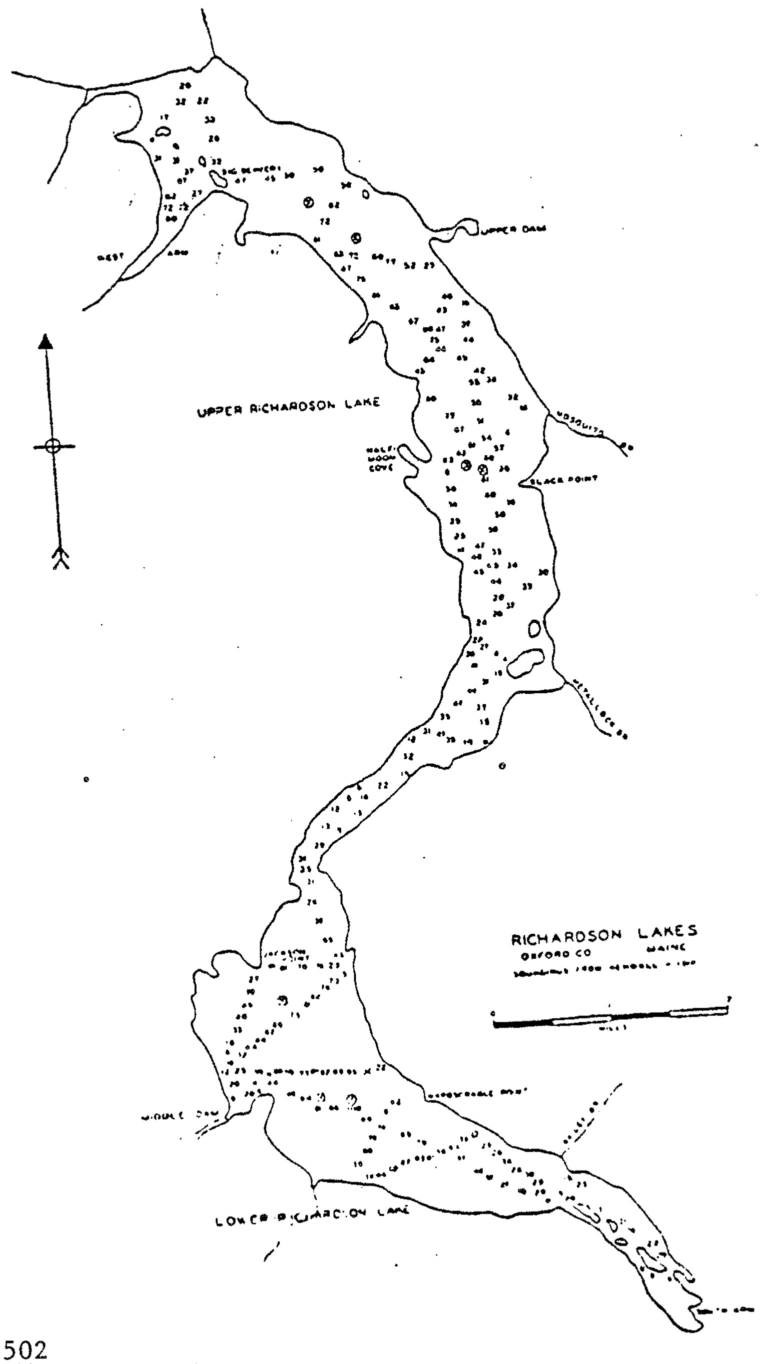
This algae appeared again in 1982 causing lake residents and biologists to worry; however, transparencies were good to excellent all summer and Chla and TP values remain low. The appearance of large amounts of blue green algae in the Narrows Pond is a matter for concern; lakeshore residents and residents of the watershed should exercise care to avoid increasing the phosphorus load to the pond.

By late summer there is less than 5ppm of oxygen in much of the hypolimnion. The bottom 8m has less than 1 ppm of oxygen.

The lake supports a salmon and brook trout fishery.

Upper Richardson Lake #3308

Surface Area	1824 ha (4560 a)
Max. Depth	24.9 m (83 ft)
Mean Depth	9.9 m (32.5 ft)
Volume	1.8 X $10^8 m^3$ (146,341 acre-feet)
Drainage Area	1186.2 km^2 (458 mi^2)
Flushing Rate	4.0 (Flushes/year)



Upper Richardson Lake (Moleshunkamunk Lake) # 3308

	1981	1982
Mean Secchi (m)	5.3	6.1
Min. Secchi (m)	4.5	5.5
TSI	45	38
Color(SPU)		18
pH		6.9
Chl*a*(ug/l)		3.3(ls)
TP(ppb)		18(c)(ls)
		4(b)(ls)

(c) core, (ls) late summer, (b) bottom

Transparencies fluctuate from average to above average levels for Maine lakes. Continued monitoring is necessary in order to predict trends in water quality.

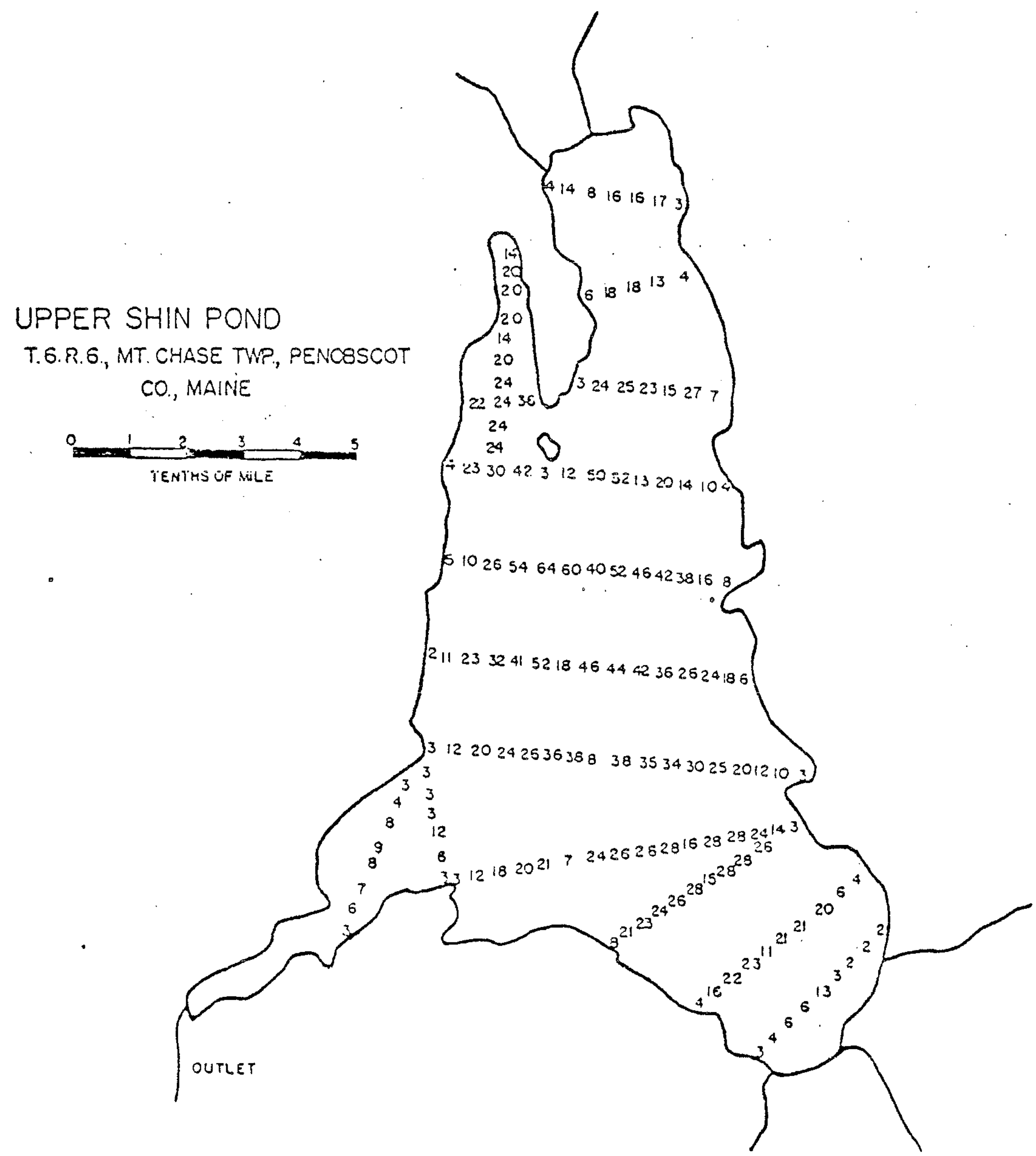
Chl*a* values are moderate and TP levels range from low to high. The hypolimnion remains well oxygenated throughout the summer months. Water quality is considered good to excellent.

There is a discrepency between pH readings obtained by the monitor and D.E.P. The monitor has been getting values of 5.5 but this Department's sampling of Upper Richardson Lake showed a pH value of 6.9. It is unknown at this time what is causing this wide difference in pH readings; it may be a difference in sampling techniques. D.E.P. will be studying the problem in 1983. A standard technique is being developed so that pH readings taken by monitors and this Department's staff will be consistent.

Richardson Lake is managed for salmon, brook trout and togue. Salmon are both stocked and reproduce naturally. Brook trout reproduce naturally but the abundance has dropped off in recent years. Togue are stocked every 4 to 5 years.

Upper Shin Pond #2202

Surface Area	264 ha (652 a)
Max. Depth	14.1 m (46 ft)
Drainage Area	44.3 km^2 (17.1 mi^2)



Upper Shin Pond # 2202

	1974[X]	1975[X]	1976[X]	1981	1982
Mean Secchi (m)	3.8	3.9	4.3	3.7*(4)	4.5*(1)
Min. Secchi (m)	3.1	3.2	2.8	3.5	
TSI	37 CHL	38 CHL	37 CHL	NA	NA
Color(SPU)			48		23
pH(core)			6.9(surf)		
Chl<u>a</u>(ug/l)	2.7mean	2.8mean	2.7mean		3.5(c)(ls)
TP(ppb)	11(surf)	9(surf)	9(c)		18(c)(ls) 10(b)(ls)

* Inadequate sampling season
(surf) surface, (c) core, (b) bottom, (ls) late summer

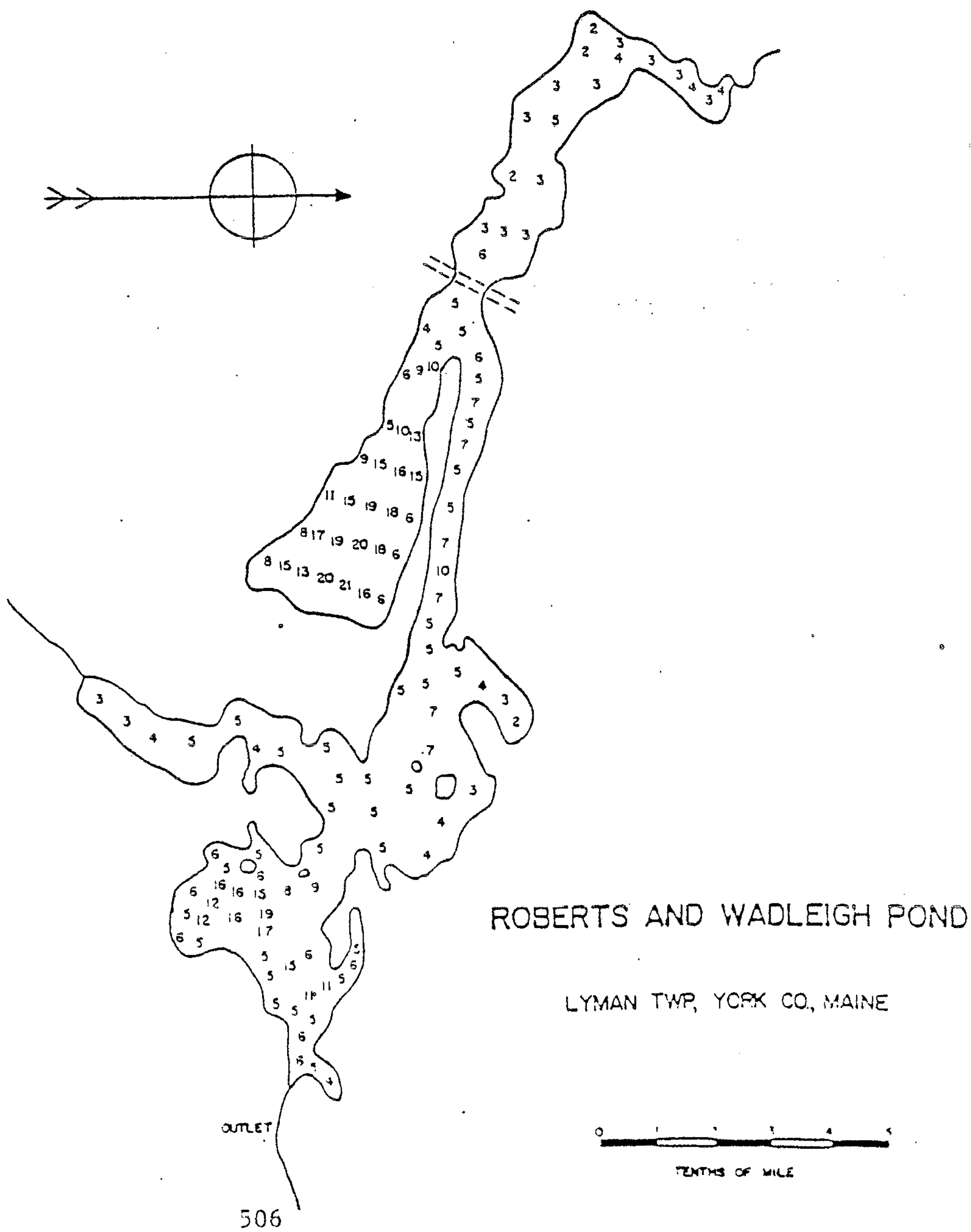
X From 1974-1976, Upper Shin Pond was part of a joint study of Maine lakes conducted by the DEP and US Geological Survey

Transparencies appear to be fairly stable, but continued monitoring with adequate sampling seasons is necessary in order to predict any water quality trends. The transparencies are below average for Maine lakes probably due to the high color which reduces transparency readings but does not affect water quality. Chl<u>a</u> levels are considered low to moderate. TP values are moderate to high but probably also are elevated due to high water color.

Dissolved oxygen is marginal below 45 feet in late summer. The pond is managed for salmon and brook trout.

Wadleigh and Roberts Pond #5034

Surface Area	85 ha (212 a)
Max. Depth	6.6 m (22 ft)
Mean Depth	1.7 m (5.6 ft)
Volume	1.4 X $10^6 m^3$ (1138 acre-feet)
Drainage Area	24.3 km^2 (9.4 mi^2)
Flushing Rate	10.1 (Flushes/year)



Wadleigh and Roberts Pond #5034

	1980	1981	1982
Mean Secchi (m)	1.5	1.5	1.2
Min. Sechi (m)	1.2	1.2	0.7
TSI	colored	colored	54(Chl)
Color(SPU)			25
Chla (ug/l)			5.3 mean
TP (ppb)			24(c)(ls) 9(b)(ls)

(c) core, (b) bottom, (ls) late summer

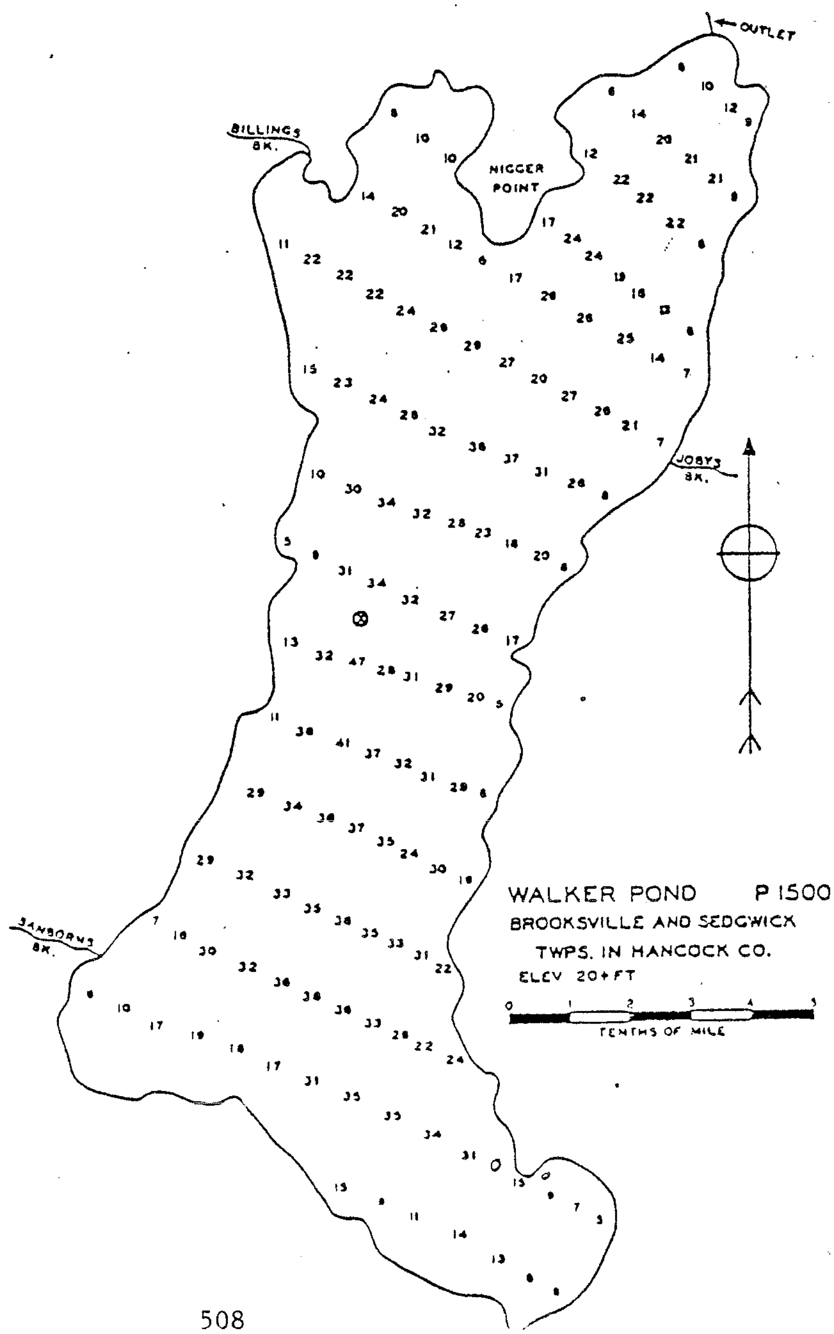
Roberts and Wadley Pond is shallow and does not stratify. It supports largemouth bass, smallmouth bass and a pickerel fishery.

Shallow transparencies are due in part to interference by high water color and shallowness of the pond. Color causes Secchi disk readings to be reduced but does not effect the actual water quality. The Chl<u>a</u> value is moderate and the TP value is moderate to high but color also interferes with the TP analysis. Chl<u>a</u> is the best indicator of water quality in this pond and shows that the water quality is good. Transparency is still useful to establish water quality and water quality trends within a particular lake, but it cannot be used to compare colored lakes to clear lakes or even colored lakes to other colored lakes.

In 1982 the monitor participated in the Chl<u>a</u> sampling program which was started in 1980 to collect more accurate water quality information on colored lakes and lakes with downward trends.

Walker Pond #4640

Surface Area	264 ha (660 a)
Max. Depth	14.1 m (47 ft)
Mean Depth	6.4 m (21 ft)
Volume	1.68 X $10^7 m^3$ (13,659 acre-feet)
Drainage Area	13.73 km^2 (5.3 mi^2)
Flushing Rate	0.5 (Flushes/year)



Walker Pond #4640

	1980	1981	1982
Mean Secchi (m)	6.7*(1)	5.1*(3)	5.8
Min. Secchi (m)	6.7*	5.0*	5.0
TSI	NA	NA	41
Color(SPU)	NA	NA	12
pH(core)	NA		
Chla(ug/1)	2.4(1s)		2.1(c)(1s)
TP(ppb)	9(1m)(1s) 10(7m)(1s)		7(c)(1s)

* Inadequate sampling season
(1s) late summer, (c) core

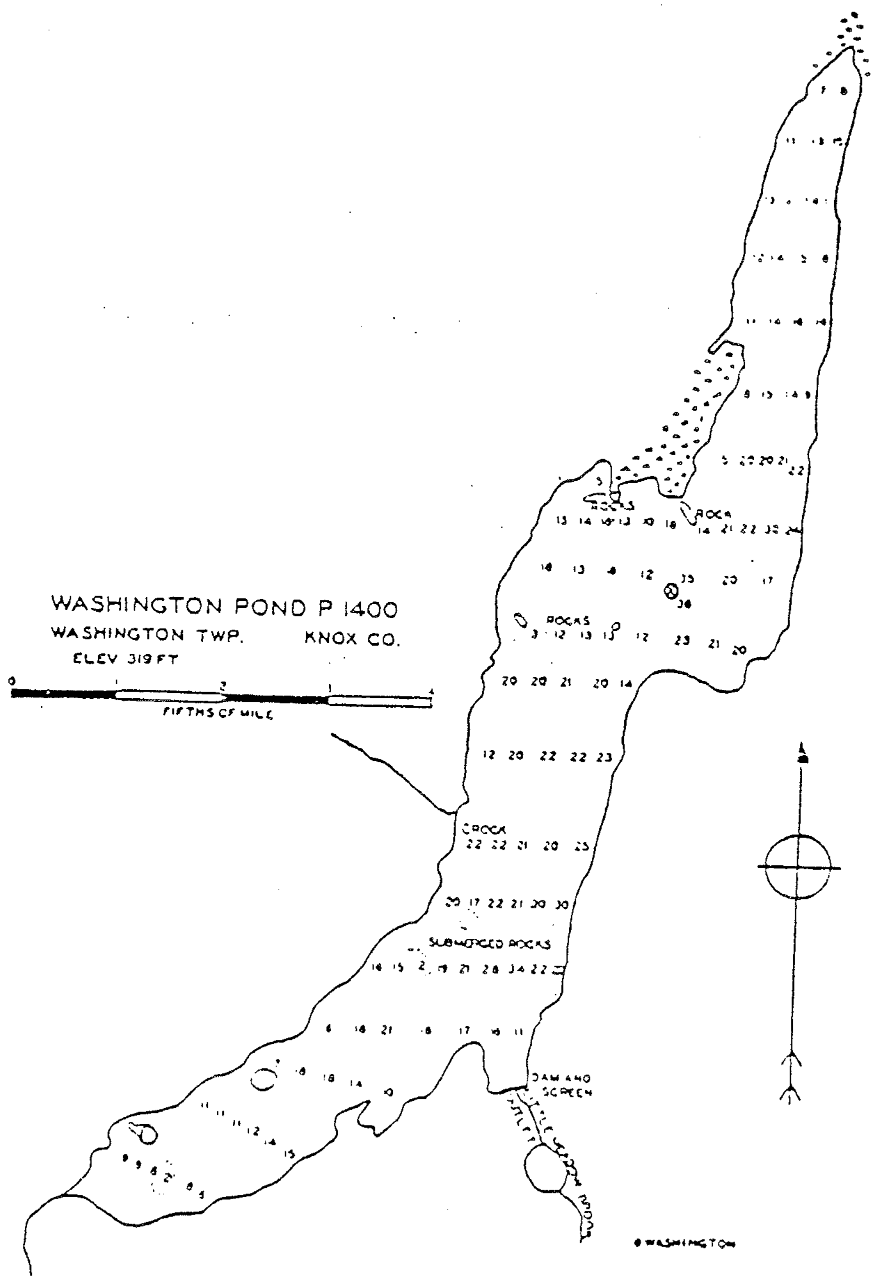
Walker Pond supports both coldwater and warmwater gamefish. It is not well suited for coldwater fish, however, since an oxygen deficiency exists below 30 feet. The pond is managed primarily for smallmouth bass and hatchery reared brown trout.

Continued monitoring with adequate sampling seasons is necessary in order to predict water quality trends. Chla levels are low and TP values were moderate to low. Transparencies in 1982 are slightly above average for ponds and lakes in Maine. The pond was not stratified when sampled in 1982, so the pond was well oxygenated to the bottom. Lack of stratification is unusual in a lake this deep. Data collected by Inland Fisheries and Wildlife in 1956 indicated the pond does stratify.

The pond has a fairly slow flushing rate (0.5 flushes/year) which may make it vulnerable to water quality degradation if care is not taken by surrounding landowners.

Washington Pond #4894

Surface Area	226 ha (558 a)
Max. Depth	11.0 m (36 ft)
Mean Depth	4.4m (14.5 ft)
Volume	9.88×10^6 m^3 (8010 acre-feet)
Drainage Area	11.4 km^2 (4.4 mi^2)
Flushing Rate	0.7 (flushes/year)



Washington Pond #4894

	1977-78	1979	1980	1981	1982
Mean Secchi (m)	6.5	7.1	7.8	6.8	7.4
Min. Secchi (m)	5.4	6.4	6.7	5.0	5.5
TSI	35	31	27	33	29
Color(SPU)		5			11
pH(core)		6.4			6.5
Chla(ug/l)		2.1(ls)			1.8(ls)
TP(ppb)		8(ls)			5(ls)

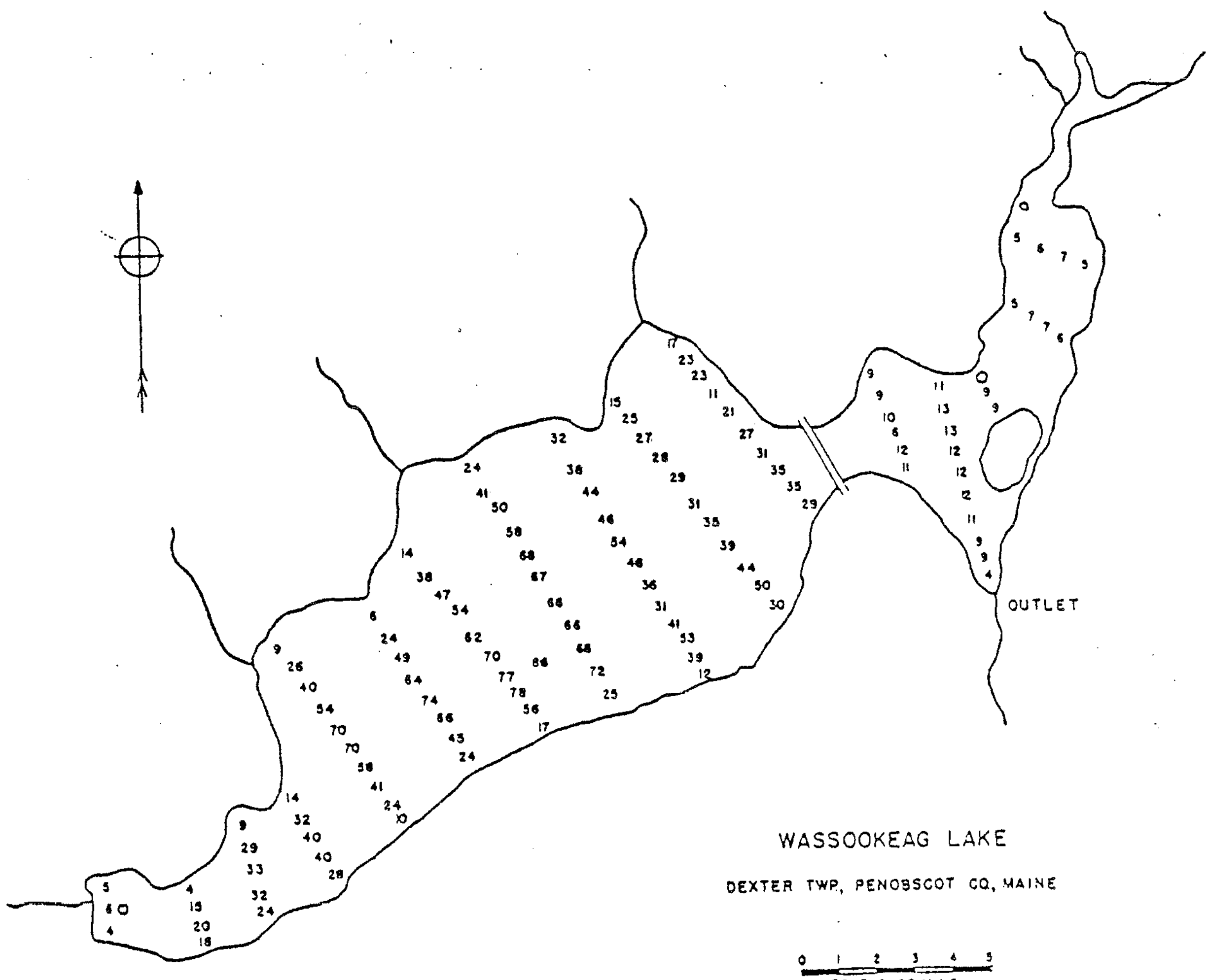
* Inadequate sampling season
(ls) late summer

Washington Pond is managed for warmwater fish. The pond is shallow and does not stratify.

Transparencies have fluctuated over the years but remain high and no trend is evident. The fluctuations may be due to varying weather patterns or changes in natural conditions. The transparencies are above average for Maine lakes. Chla and TP values are low.

Wassookeag Lake #0227

Surface Area	430 ha (1062 a)
Max. Depth	26.2 m (86 ft)
Mean Depth	3.8 m (29 ft)
Volume	3.73×10^7 m^3 (30,230 acre-feet)
Drainage Area	30.3 Km^2 (11.7 mi^2)
Flushing Rate	0.42 (flushes/year)



Wassookeag Lake # 0227

	1975	1976	1977	1981
Basin #1(West)				
Mean Secchi (m)	7.6	7.8	4.2*(1)	7.1
Min. Secchi (m)	4.4	5.3	4.2*	4.5
TSI	28	27	NA	31
TSI Range				23-40 CHL-TP
Color				5
pH				7.4
Chla		1.9*(2)		1.4mean
TP				9 mean
Basin #2(East)				
Mean Secchi (m)	4.4	4.6		
Min. Secchi (m)	3.7	3.0		
TSI	55	53		
Chla		2.7*(2)		

* Inadequate sampling season

Wassookeag is the water supply for the Town of Dexter. The lake has good water quality for coldwater fish.

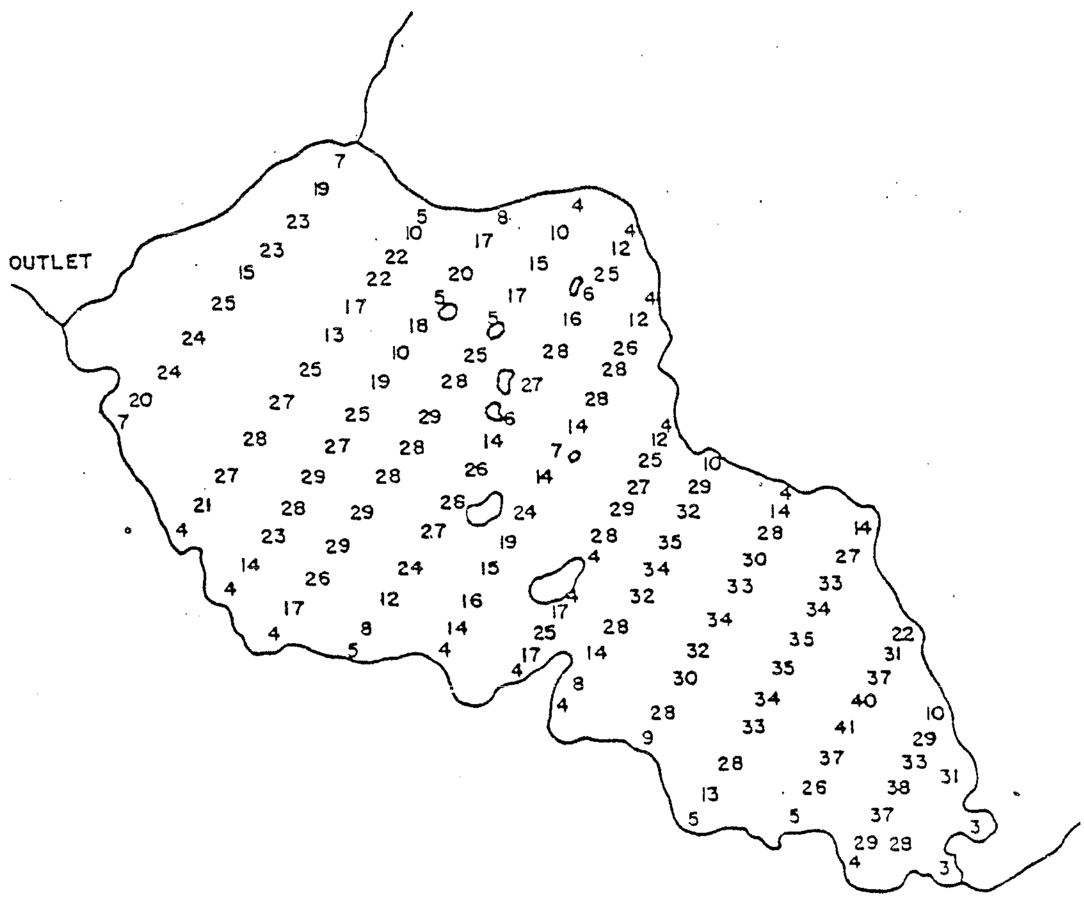
There is some fluctuation in transparency readings, but transparencies are above average indicating good water quality. TSI calculated by Chla and TP shows a large variation in values, but the explantion is not known.

The lake has a fairly slow flushing rate (0.42 flushes/year) which may make it vulnerable to water quality degradation.

Monitoring in 1981 was conducted by Penobscot Valley Regional Planning Commission.

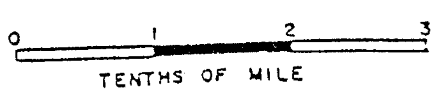
Watchic Lake #5040

Surface Area	176 ha (435 a)
Max. Depth	12.5 m (41 ft)
Mean Depth	6.1 m (26 ft)
Volume	10.67 X 10^6 m^3 (8650 acre-feet)
Drainage Area	10.5 km^2 (4.1 mi^2)
Flushing Rate	0.6 (Flushes/year)



WATCHIC POND

STANDISH TWP., CUMBERLAND CO., MAINE



Watchic Lake # 5040

	1977-78	1979	1980	1981	1982
Mean Secchi (m)	5.8*	5.3	5.7	5.8	5.2
Min Secchi (m)	4.0	3.8	4.9	4.7	4.3
TSI	43	45	42	41	46
Color(SPU)	20			15	
pH	6.3(mon)	6.3(mon)	6.5(mon)	6.4	6.6(mon)
Chla(ug/l)	2.4(ls)			1.7(ls)	
TP(ppb)	21(c)(ls)			7(c)(ls)	
	19(b)(ls)			7(b)(ls)	

* Inadequate sampling season
(mon) monitor, (c) core, (ls) late summer, (b) bottom

Watchic Lake is heavily developed. In 1982, the Watchic Lake Association began a 3 year plan called Watchic Watch to clean up defective septic systems and reduce other phosphorus runoff from cottages around the lake. The plan will be accomplished by volunteers conducting an educational program and septic survey. The Association will help with the improvement of poor systems if necessary. Such an approach is excellent and recommended for other interested lake associations.

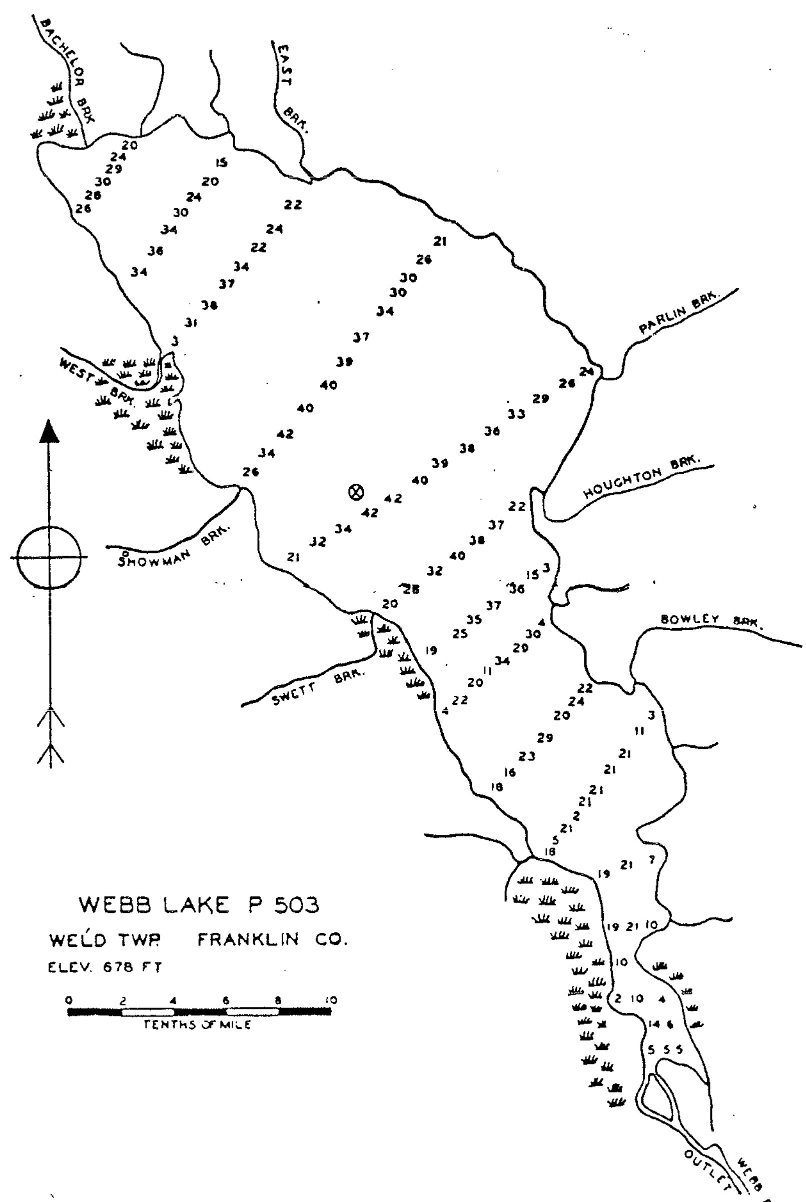
A dissolved oxygen depression (i.e. less than 5 ppm) occurs in the hypolimnion in late summer. If the depletion becomes more severe with time it would be an indication that water quality is adversely being affected by shoreline development. Cottage owners would be well advised to maintain good septic systems and follow sensible land use practices.

Transparency is about average for Maine lakes. Secchi disk readings have remained stable indicating stable water quality. Chla and TP values for 1981 were low. In 1978 Chla was low but TP levels were high.

The lake is managed for a largemouth bass fishery by the Dept. of Inland Fisheries and Wildlife.

Webb Pond #3672

Surface Area	878 ha (2146 a)
Max. Depth	12.8 m (42 ft)
Mean Depth	7.9m (26 ft)
Volume	6.76 X 10^7 m^3 (55,000 acre-feet)
Drainage Area	196.1 Km^2 (75.7 mi^2)
Flushing Rate	1.6 flushes/year



Webb Pond # 3672

	1974-76[X]	1979	1980	1981	1982
Mean Secchi(m)	4.8	4.1	3.5*(4)	3.4*(4)	5.1
Min. Secchi (m)	2.4	3.5	3.0	3.2	4.5
TSI	42	59	NA	NA	47
TSI Range	36 - 58 TP - SD				
Color(SPU)	27	25			15
pH					
Chla(ug/l)	2.9mean	3.6 (ls)			2.6*(4)
TP(ppb)	8.3mean	17 (ls)			9(ls)(c) 10(b)(ls)

(ls) late summer, (c) core, (b) bottom

* Inadequate sampling season

(X) Data collected in a cooperative project between the D.E.P. and the U.S. Geological Survey.

A cold water fishery exists in the lake.

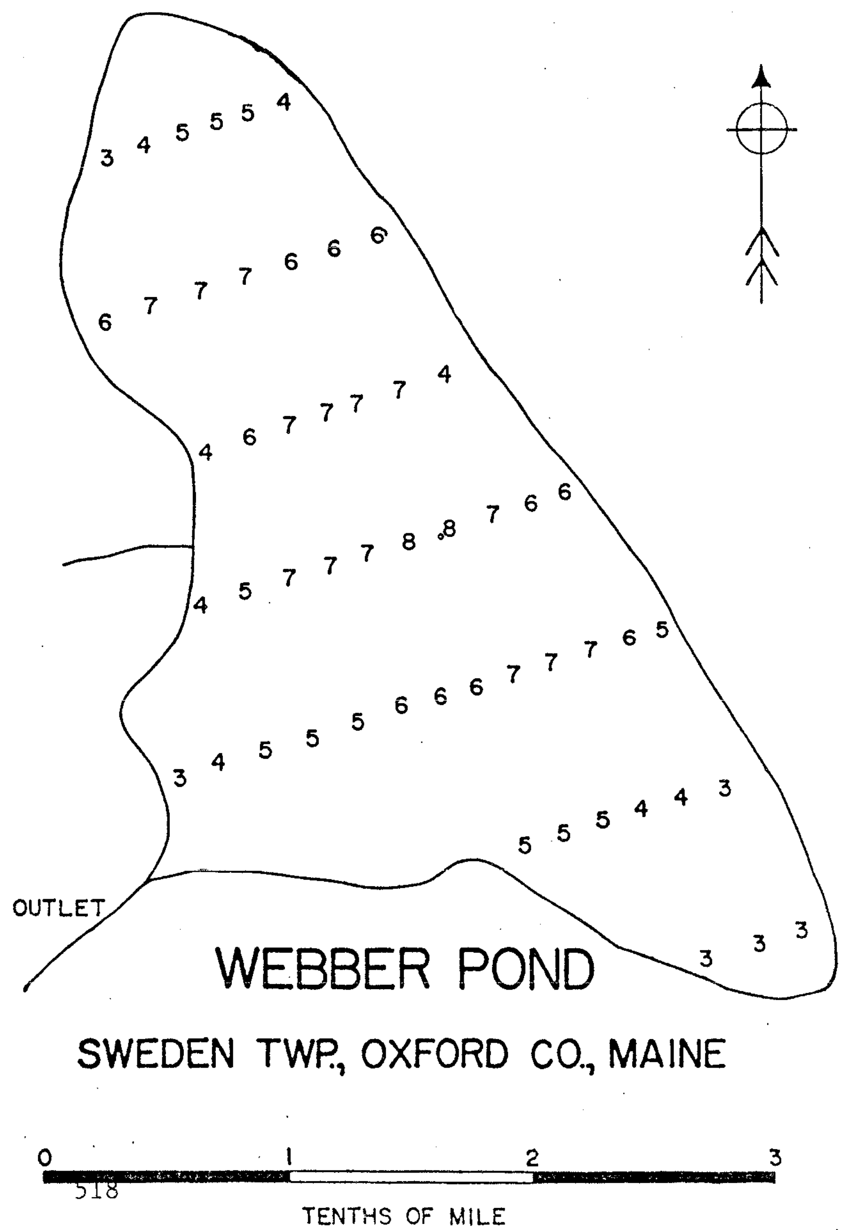
The data shows some fluctuation in the various parameters from year to year, but not an abnormal amount. The TSI in 1979 appears far higher than the other 3 years which are based on all three parameters. If one considers the TSI range; it becomes obvious that TP and Chla give consistently lower TSI's (in the high 30's) than Secchi disk (in the high 40's and 50's). Webb's water quality appears to be more accurately measured by Chla and TP than Secchi disk. The lake is shallow and has a saucer shaped bottom; this, combined with its exposed nature, cause silt to re-suspend on windy days interfering with the transparency.

Transparency was about average in 1982 for lakes and ponds in Maine. The Chla value was low and TP levels are moderate. A severe oxygen depletion (less than 1 ppm) below 10 meters occurred in 1982. Water quality is good but continue monitoring with complete seasons is necessary to predict water quality trends.

In 1982, the monitor participated in the Chla sampling program which was started in order to collect additional water quality data on lakes with moderate to high water color, shallow lakes and lakes with declining water quality.

Webber Pond (Sweden) # 3236

Surface Area	13.0 ha (32.5 a)
Max. Depth	2.4 m (8.0 ft)
Mean Depth	1.4 m (4.6 ft)
Volume	1.86 X 10^5 m^3 (151 acre-feet)
Drainage Area	1.0 km^2 (.4 mi^2)
Flushing Rate	3.2 (flushes/year)



Webber Pond (Sweden) # 3236

	1982
Mean Secchi (m)	2.1*(1)+
Min. Secchi (m)	2.1
TSI	NA
Color(SPU)	

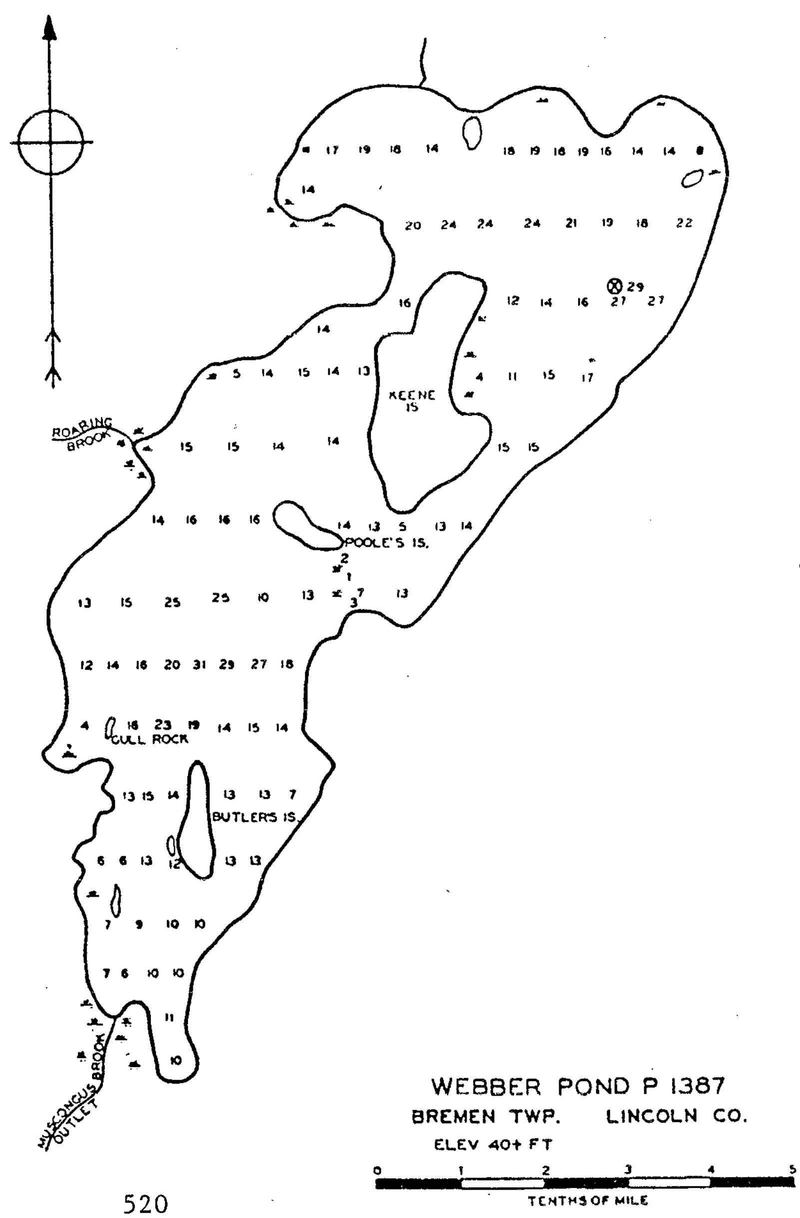
* inadequate sampling season
\+ Secchi disk hit bottom

Webber Pond is a shallow, weedy pond that is managed for pickeral.

Transparency is not a good indicator of water quality for this pond since the Secchi disk always hits bottom. There are no known water quality problem with this pond.

Webber Pond (Bremen) # 4857

Surface Area	93.0 ha (229.7 a)
Max. Depth	9.4 m (31.0 ft)
Mean Depth	4.1 m (13.5 ft)
Volume	3.84 X 10^6 m^3 (3113 acre-feet)
Drainage Area	7.6 km^2 (2.9 mi^2)
Flushing Rate	1.2 (flushes/year)



Webber Pond (Bremen) #4857

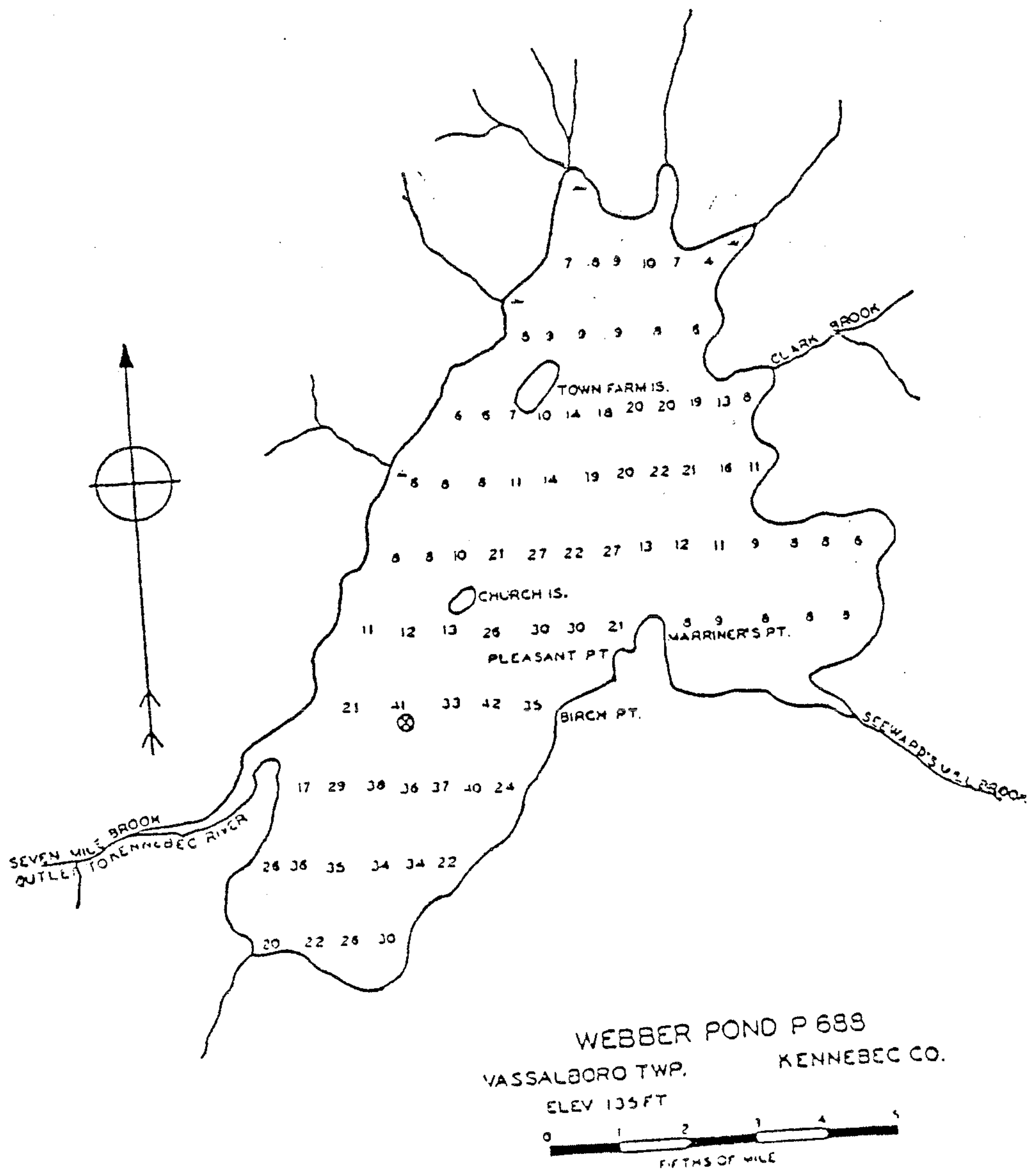
	1982
Mean Secchi (m)	3.6
Min. Secchi (m)	3.0
TSI	68
Color(SPU)	40

Webber Pond is managed as a warm water fishery. Smallmouth bass were successfully introduced in the 1950's; white perch and pickeral are also present.

Transparencies are below average for lakes and ponds in Maine. Color is part of the explanation for reduced transparencies. Color reduces the Secchi disk transparency but does not affect water color. Continued monitoring will be necessary to determine trends.

Webber Pond (Vassalboro) #5408

Surface Area	485 ha (1120 a)
Max. Depth	12.5 m (41 ft)
Mean Depth	4.8 m (16.4 ft)
Volume	2.31 X $10^7 m^3$ (19,512 acre-feet)
Drainage Area	71.5 km^2 (27.6 mi^2)
Flushing Rate	1.6 (Flushes/year)



Webber Pond (Vassalboro) #5408

	1976-78	1979	1980	1981	1982
Mean Secchi (m)	2.9	2.3	1.8	3.0	2.6
Min. Secchi (m)	0.8	0.8	1.0	0.4	1.5
TSI	78	78	97	76	75
TSI Range		65-97 TP-SD	93-106 CHL-SD		64-85 TP SD
Color(SPU)		30			
pH(core)		7.2			
Chla(ug/l)	4.5(ls)	11.8mean	20.6mean	4.8*(4)	10.9(mean)
TP(ppb)	24(surf)(ls) 56(b)(ls)	24mean	62mean	21*(4)	23(mean)

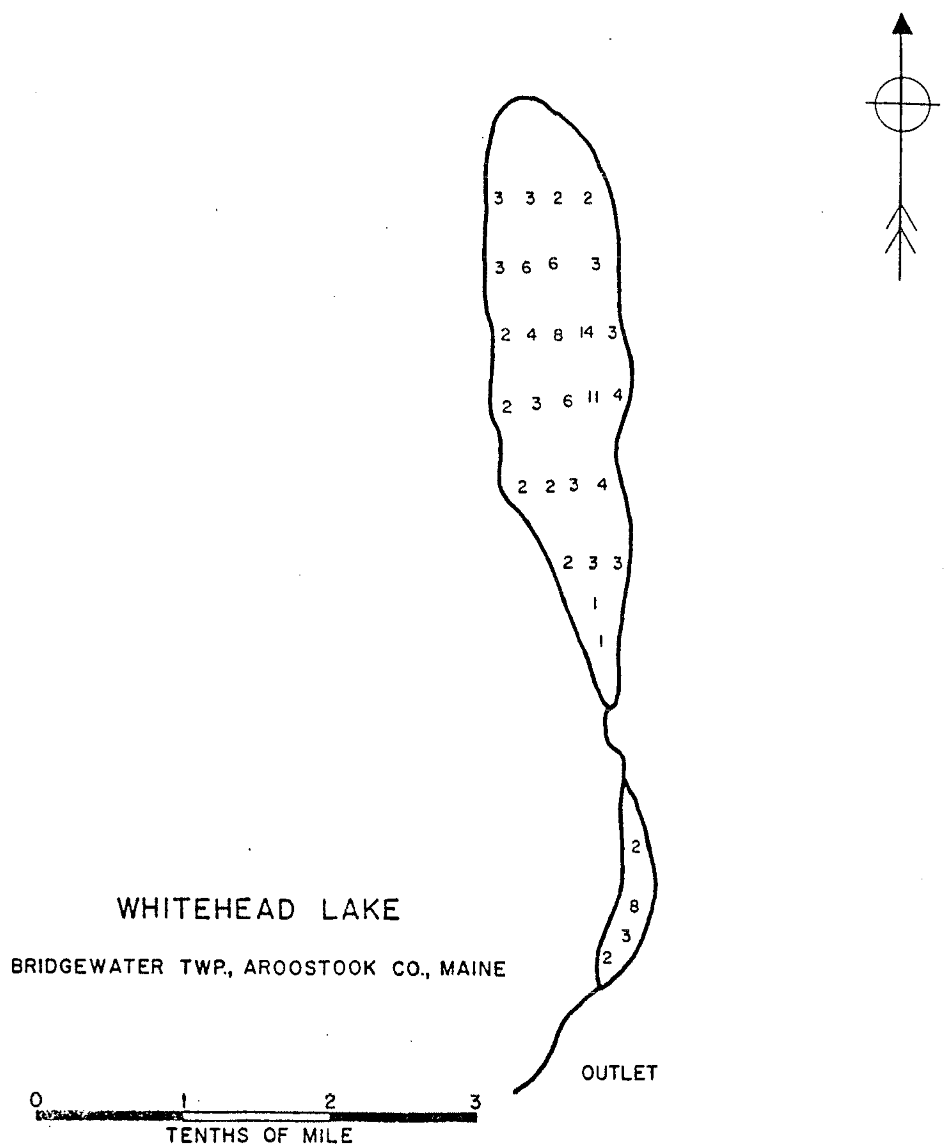
* Inadequate sampling season
(ls) late summer, (surf) surface, (b) bottom

Webber Pond is a eutrophic lake which supports dense blue-green algal blooms (*Anabaena* and *Aphanizomenon*) in July and August which reduce transparencies to 1m. or less. Chla levels are moderate to high and TP values are high.

The lake is directly affected by agricultural sources in its immediate watershed and indirectly by agricultural sources upstream in the Three Mile Pond watershed. A recent diagnostic feasibility study completed the winter of 1981-82 identified agriculture as the source of 63% of the lake's annual phosphorus load. The Kennebec Soil and Water Conservation District has developed a watershed management plan to address these problems and has applied for funding under the Watershed Protection and Flood Prevention Act to implement this plan. Assuming funds are available, field planning and design should begin in the summer of 1983, although actual construction of manure storage facilities and implementation of improved management practices may not begin until 1984.

Whitehead Lake # 1006

Surface Area	10 ha (25 a)
Max. Depth	4.2 m (14 ft)
Mean Depth	0.9m (3.0 ft)
Drainage Area	1.55 km^2 (.6 mi^2)
Volume	9.37 X 10^5 m^3 (760 acre-feet)
Flushing Rate	8.4 (flushes/year)



Whitehead Lake # 1006

	1982
Mean Secchi (m)	1.3*(2)
Min. Secchi (m)	1.2
TSI	NA
Color	NA

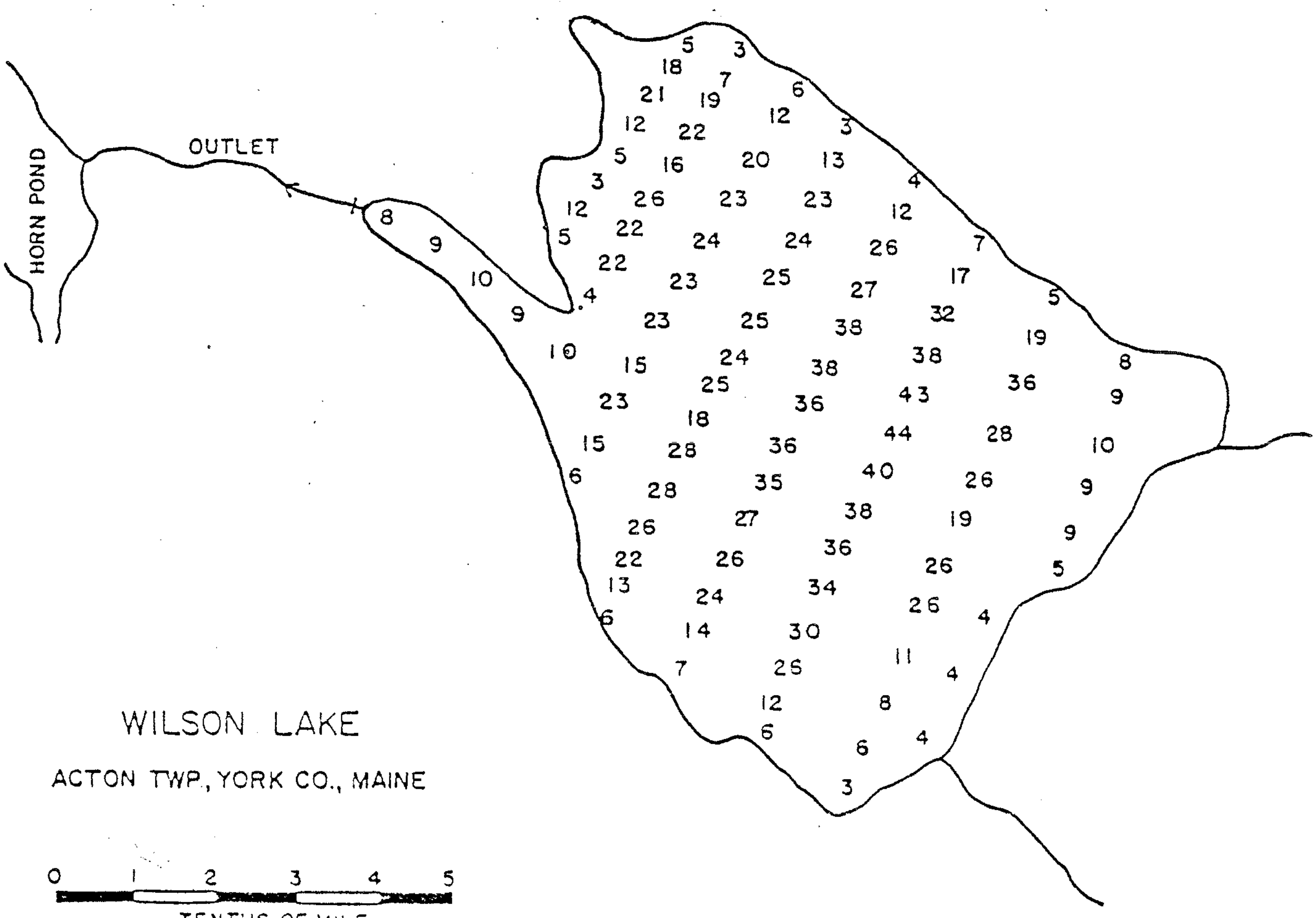
* inadequate sampling season

Whitehead Lake is shallow and does not stratify during the summer. Habitat for brook trout is limited to a few springs that enter along the shoreline. Fisheries management at this time is for baitfish.

Transparencies are below average for lakes in Maine. The reasons for this are unclear at this time. Perhaps it is due to the shallow nature of the pond; shallow ponds can have reduced transparencies because bottom sediment become resuspended in the water column. High water color also may be a factor; it can reduce transparency but not affect water quality. Continued monitoring with adequate seasons will be necessary to accurately predict water quality.

Wilson Lake (Acton) #3920

Surface Area	119 ha (298 a)
Max. Depth	13.2 m (44 ft)
Mean Depth	5.7 m (18.7 ft)
Volume	$6.7 \times 10^6 m^3$ (5447 acre-feet)
Drainage Area	$9.8\ km^2$ ($3.8\ mi^2$)
Flushing Rate	0.8 (Flushes/year)



Wilson Lake (Acton) #3920

	1977-78	1979	1980	1981	1982
Mean Secchi (m)	5.8	5.9	5.6	6.6	5.2
Min. Secchi (m)	4.5	5.5	5.0	5.7	4.0
TSI	41	40	43	35	46
Color(SPU)		20			20
pH(core)		6.7(ls)			6.8
Chl(ug/l)a	1.4(f)	2.5(ls)			3.0(ls)
TP(ppb)	13 (spr)	6(ls)			13(c)(ls) 13(b)(ls)

(f) fall, (spr) spring, (ls) late summer, (c) core, (b) bottom

---

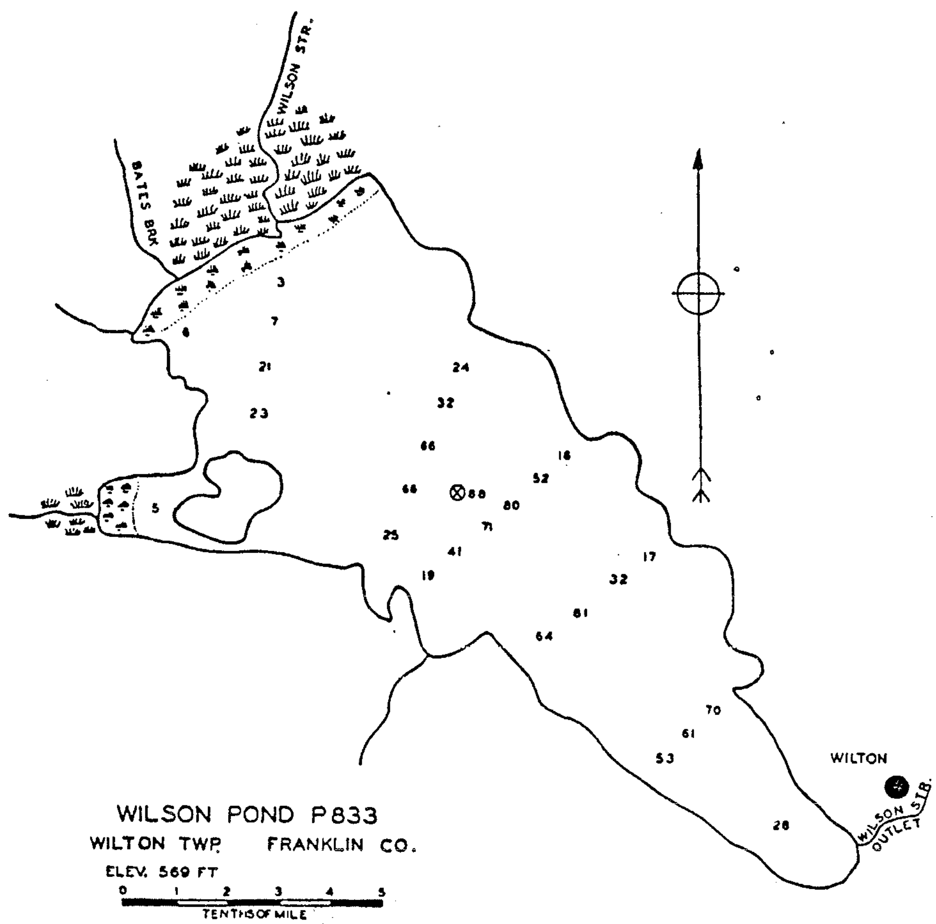
Wilson Lake became involved with the Volunteer Monitoring Program in 1977 when the association realized the shoreline of the lake would face heavy development pressure in the coming years. The association decided that a lake monitoring program which would establish trends was one way to protect their lake. The other needed step was to be sure that all development was in strict accordance with regulations.

Transparency has fluctuated the past several years but has always remained average to above average for lakes in Maine. Chl*a* and TP values in 1982 are slightly higher than those taken in 1979 but are still moderate. Water quality is good. Continued monitoring will be necessary to determine if a downward trend in water quality has started or if 1982 was just another year of fluctuation.

The lake is managed for brown trout. A dissolved oxygen deficiency (less than 4 ppm) exists in the hypolimnion by late summer.

Wilson Pond (Wilton) # 3682

Surface Area	194.2 ha (480 a)
Max. Depth	26.8 m (88 ft)
Mean Depth	8.2 m (27 ft)
Drainage Area	69.9 km^2 (27.0 mi^2)
Volume	6.8 X 10^6 m^3 (5,500 acre-feet)
Flushing Rate	2.56 (flushes/year)



Wilson Pond (Wilton) #3682

	1974[X]	1975[X]	1976[X]	1980	1982
Mean Secchi (m)	4.6	5.0	4.4	5.3	5.2*(4)
Min. Secchi (m)	2.4	4.0	2.7	3.0	5.0
TSI	44	41	45	45	NA
TSI Range	37 - 53	32 - 48	38 - 55		
	TP SD	TP SD	TP SD		
Color(SPU)	12	15			
pH	6.2				
Chl*a*(ug/l)	3.2mean	3.5mean	3.1mean		
TP (ppb)	8.1mean	6.6mean	8.5mean		

* inadequate sampling season

(X)Data collected through a cooperative project between D.E.P. and U.S. Geological Survey.

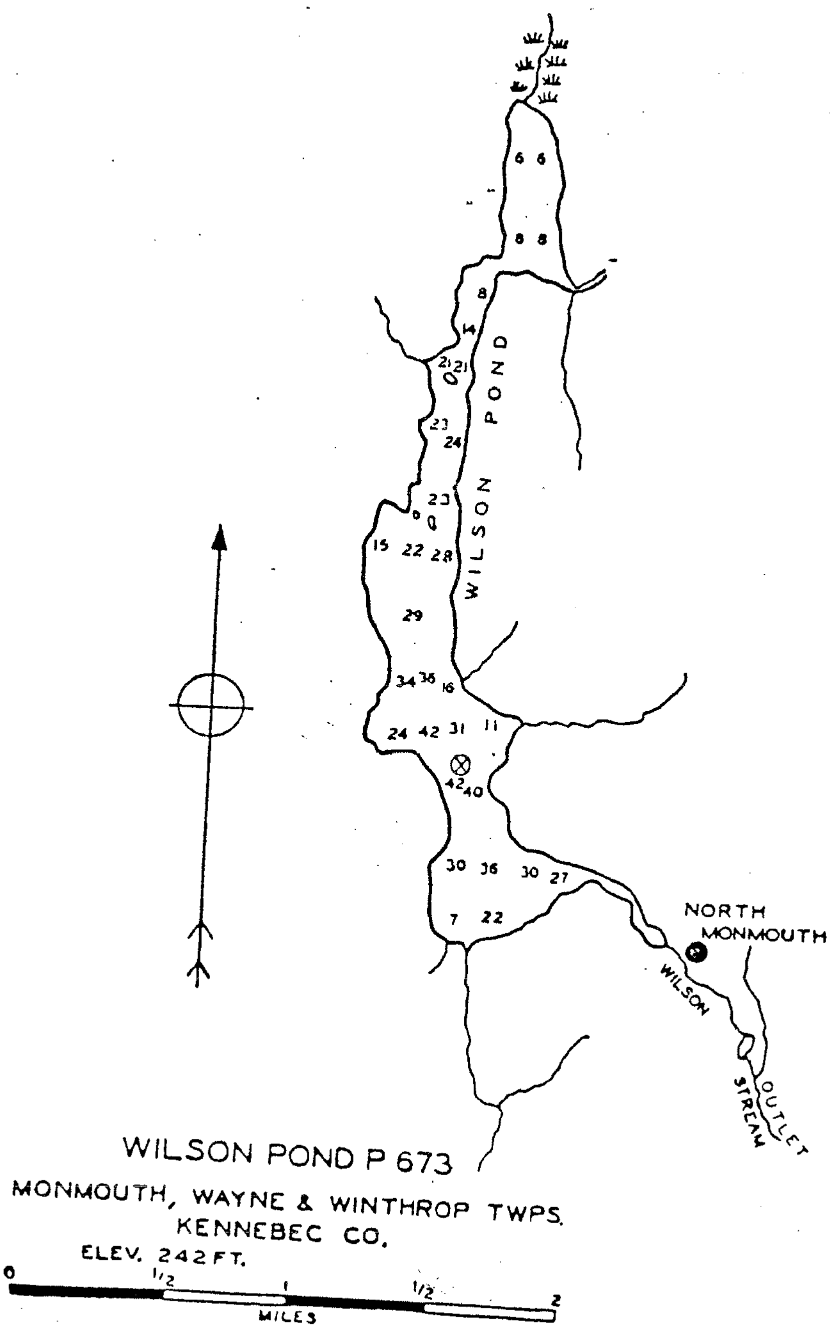
Wilson Pond is primarily managed for lake trout (togue) which reproduce naturally. Salmon are stocked every year. Smallmouth bass are also present in large numbers.

Wilson Pond has good water quality. Transparencies are about average for lakes and ponds in Maine and are relatively stable. Chl*a* levels are moderate and TP values are low to moderate.

TSI calculated by Secchi disk readings are higher than TSI values calculated by TP or Chl*a* values, as indicated in the data collected from 1974 through 1976. TP values consistently give the lowest TSI value. Usually, in lakes with low water color (i.e. less than 20) the TSI's calculated from TP values, Chl*a* values and Secchi disk readings are very similar. The reasons for the difference in Wilson Pond are not known.

Wilson Pond (Wayne) #3832

Surface Area	223 ha (551a)
Max. Depth	12.8m (42 ft)
Mean Depth	5.3 m (17.5 ft)
Volume	11.73×10^6 m^3 (9510 acre-feet)
Draniage Area	42.5 km^2 (16.4 mi^2)
Flushing Rate	1.8 (flushes/year)



Wilson Pond (Wayne) # 3832

	1976	1978-79	1980	1981	1982
Mean Secchi (m)	4.3	5.5*	5.0*(2)	5.8	5.8
Min. Secchi (m)	1.7	4.5	3.9	4.0	4.9
TSI	49	NA	NA	44	42
TSI Range	56-41 SD-CHL			41-48 SD-CHL	41 - 44 SD CHL
Color(SPU)		20			
pH(core)		6.9			
Chla(ug/l)	3.2mean	3.2mean	2.3(spr)	4.1mean	3.5mean
TP(ppb)				14(ls)	7(ls)

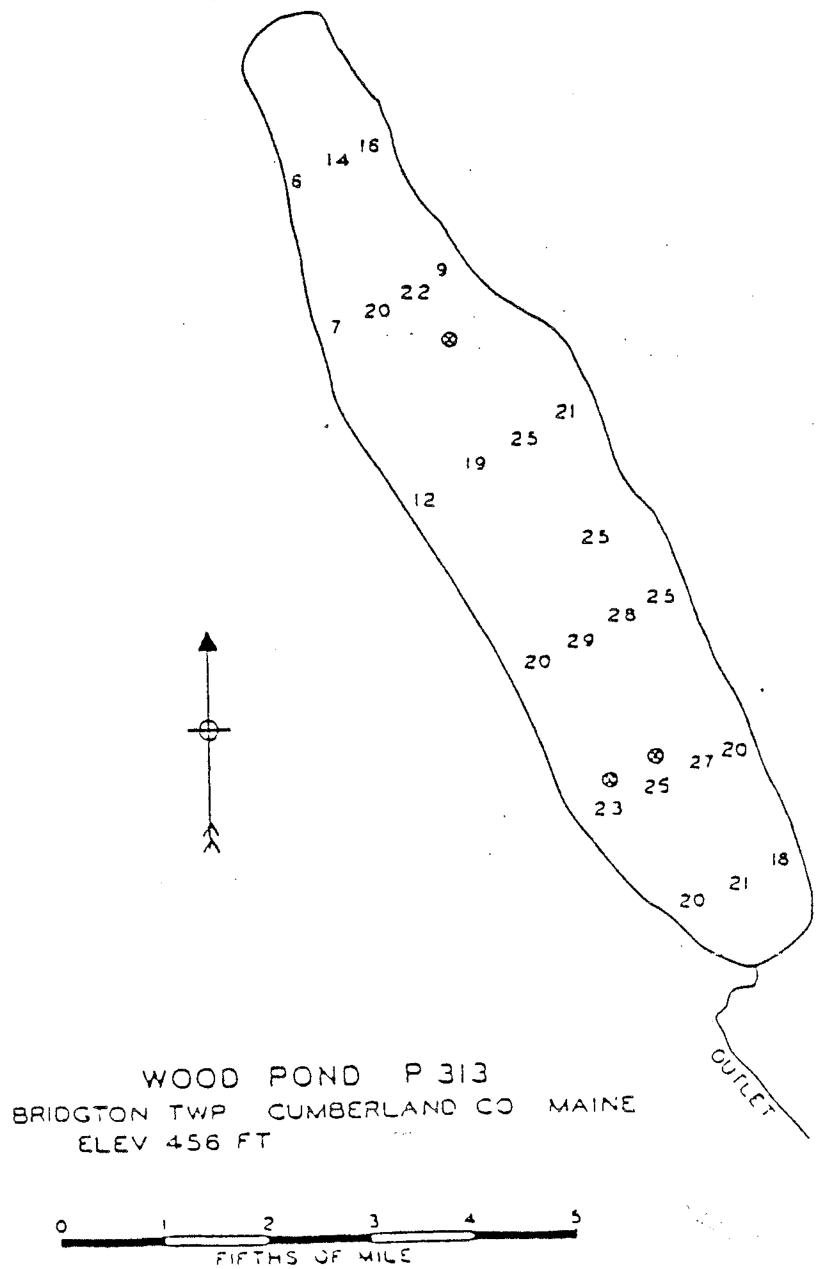
* Inadequate sampling season
(spr) spring, (ls) late summer

Wilson Pond is managed for warmwater fish and brown trout. A dissolved oxygen deficiency exists in Wilson Pond below 7 meters in late summer.

1981 and 1982 transparencies are average for lakes and ponds in Maine indicating good water quality. Transparency appears to have improved but continued monitoring with adequate sampling seasons is necessary in order to confirm this water quality trend. Chla values are moderate, and TP values are moderate to high. Generally, 15 ppb TP is considered sufficient to support nuisance algal blooms.

Wood Pond (Bridgton) #3456

Surface Area	183 ha (452 a)
Max. Depth	8.8 m (29 ft)
Mean Depth	5.3m (17.5 ft)
Volume	9.73×10^6 m^3 (7890 acre-feet)
Drainage Area	14.0 km^2 (5.4 mi^2)
Flushing Rate	0.8 (flushes/year)



Wood Pond (Bridgton) # 3456

	1976-78	1979	1980	1981	1982
Mean Secchi (m)	4.4*	4.5*(1)	5.0*(4)	4.9	3.8
Min. Secchi (m)	4.1		4.0	3.5	3.0
TSI	NA	NA	NA	49	63
Color(SPU)				25	30
pH	5.7mean			6.4(c)	6.0(c)
Chl<u>a</u>(ug/l)	3.7(ls)			2.8(ls)	2.8*(4)
TP(ppb)	4 (sur)(ls) 4(b)(ls)			10 (ls)	6(ls)

* Inadequate sampling season
(ls) late summer, (b) bottom, (sur) surface, (c) core

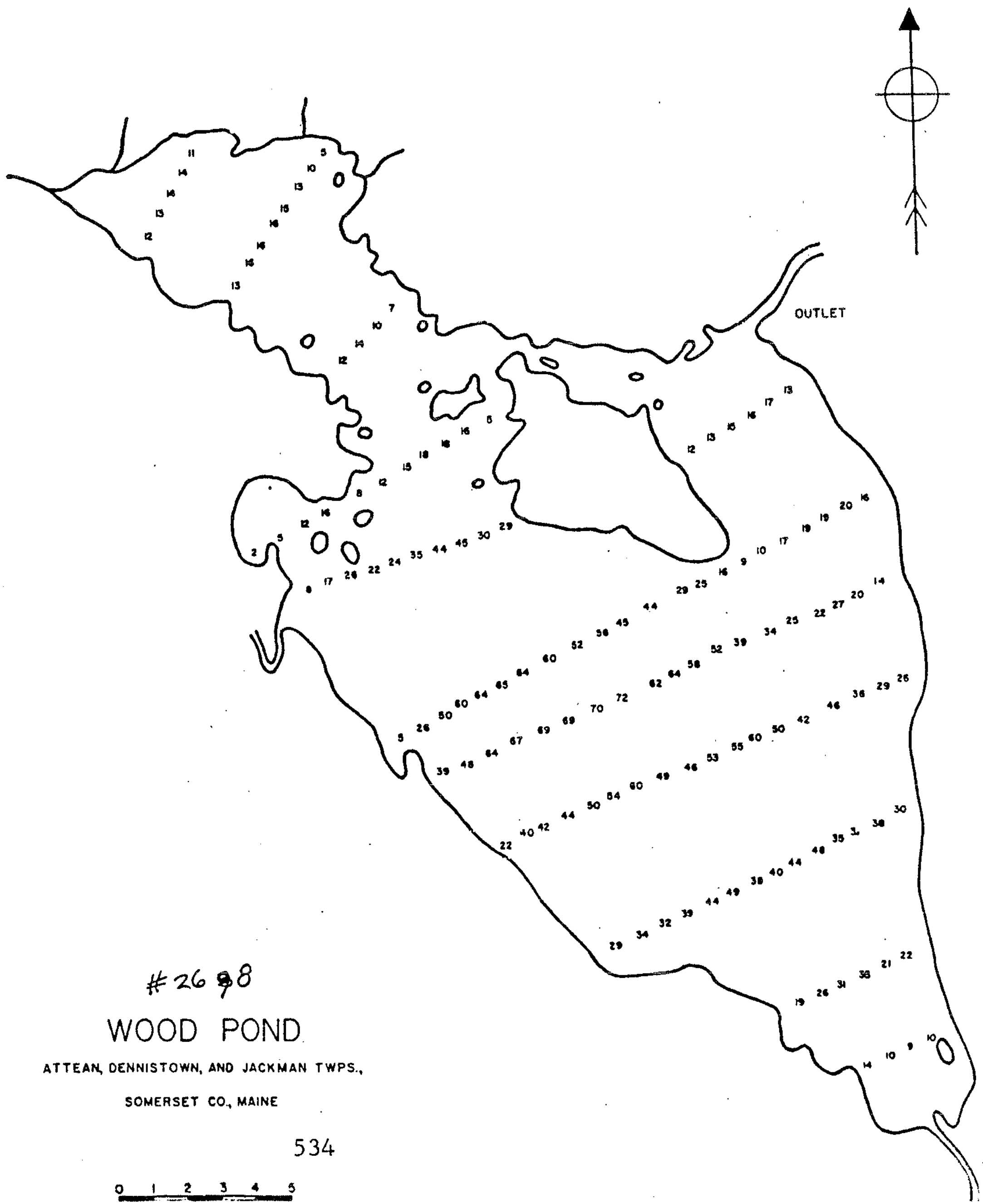
The pond is managed for largemouth bass by the Department of Inland Fisheries and Wildlife. Experimental stocking of brown trout has started.

Inadequate sampling seasons prior to 1981 make it difficult to accurately predict water quality trends. Transparency is slightly below average for Maine lakes but is affected by the moderate color which interferes with transparency. Chl<u>a</u> and TP values are low to moderate. The pond doesn't stratify and remains well oxygenated.

In 1982 the monitor participated in the Chl<u>a</u> sampling program. This program was set up to gather additional water quality data on lakes that are colored, shallow or are showing a downward trend in water quality.

Wood Pond (Jackman) # 2698

Surface Area	821 ha (2052 a)
Max. Depth	21.6 m (72 ft)
Mean Depth	8.2 m (27.1 ft)
Volume	67.6 X 10^6 m^3 (54,796 acre-feet)
Drainage Area	883.7 km^2 (341.2 mi^2)
Flushing Rate	5.3 (flushes/year)



#2698

WOOD POND

ATTEAN, DENNISTOWN, AND JACKMAN TWPS.,

SOMERSET CO., MAINE

Wood Pond (Jackman) #2698

	1977	1979	1982
Mean Secchi(m)	4.4*(1)	3.6*(1)	3.4
Min. Secchi (m)			2.6
TSI	NA	NA	colored
Color(SPU)		50	40
Chla(ug/l)		1.9(ls)	2.0
TP(ppb)		12(ls)	10(c)(ls) 9(b)(ls)
pH(core)			

* inadequate sampling season
(ls) late summer, (c) core, (b) bottom

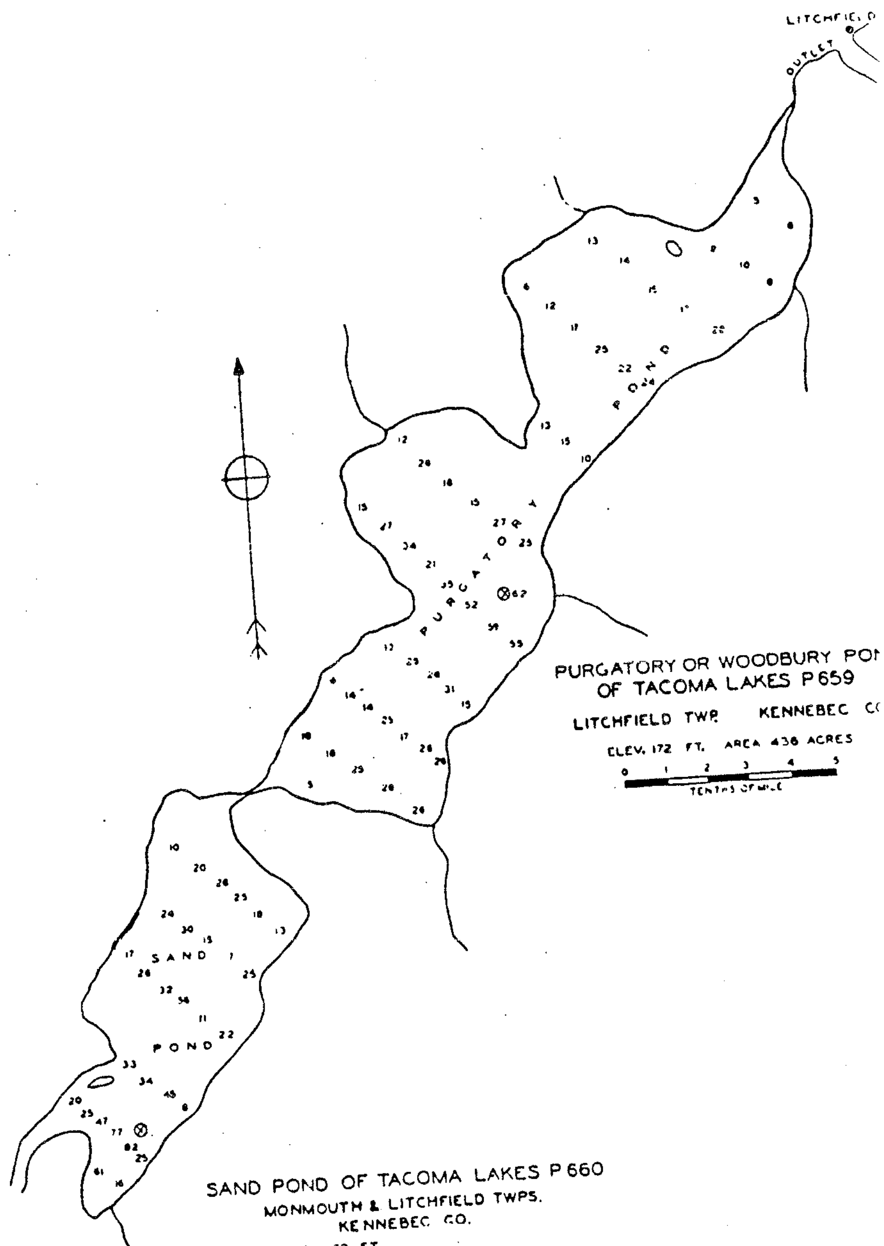
Transparencies are below average for lakes and ponds in Maine. Color is high and is probably interfering with the transparency readings. Color is caused by dissolved, decaying organic material in the water. Color does not affect water quality; it just interferes with Secchi disk readings.

Chla values are low. TP values are moderate but can also be affected by water color. The pond remains well oxygenated during the summer. Water quality is considered good.

The pond is managed for salmon, lake trout and brown trout. Competition from perch has hurt the trout fishery.

Woodbury Pond #5240

Surface Area	176.6 ha (436 a)
Max. Depth	18.9 m (62.4 ft)
Mean Depth	5.2 m (17.2 ft)
Volume	9.0×10^6 m^3 (7295 acre-feet)
Drainage Area	39.9 km^2 (15.4 mi^2)
Flushing Rate	2.3 (flushes/year)



Woodbury Pond # 5240

	1974-76@	1977	1978	1979	1982
Mean Secchi (m)	5.8	5.3*(2)	6.0*(1)	5.9*(4)	5.7*(3)
Min. Secchi (m)	3.9	4.5		5.0	3.8
TSI	40	NA	NA	NA	NA
TSI Range	37 - 44 TP CHL				
Color(SPU)	20				15
pH	6.6			7.1(mo)	
Chla(ug/l)	3.6mean			3.3mean	
TP(ppb)	8mean				

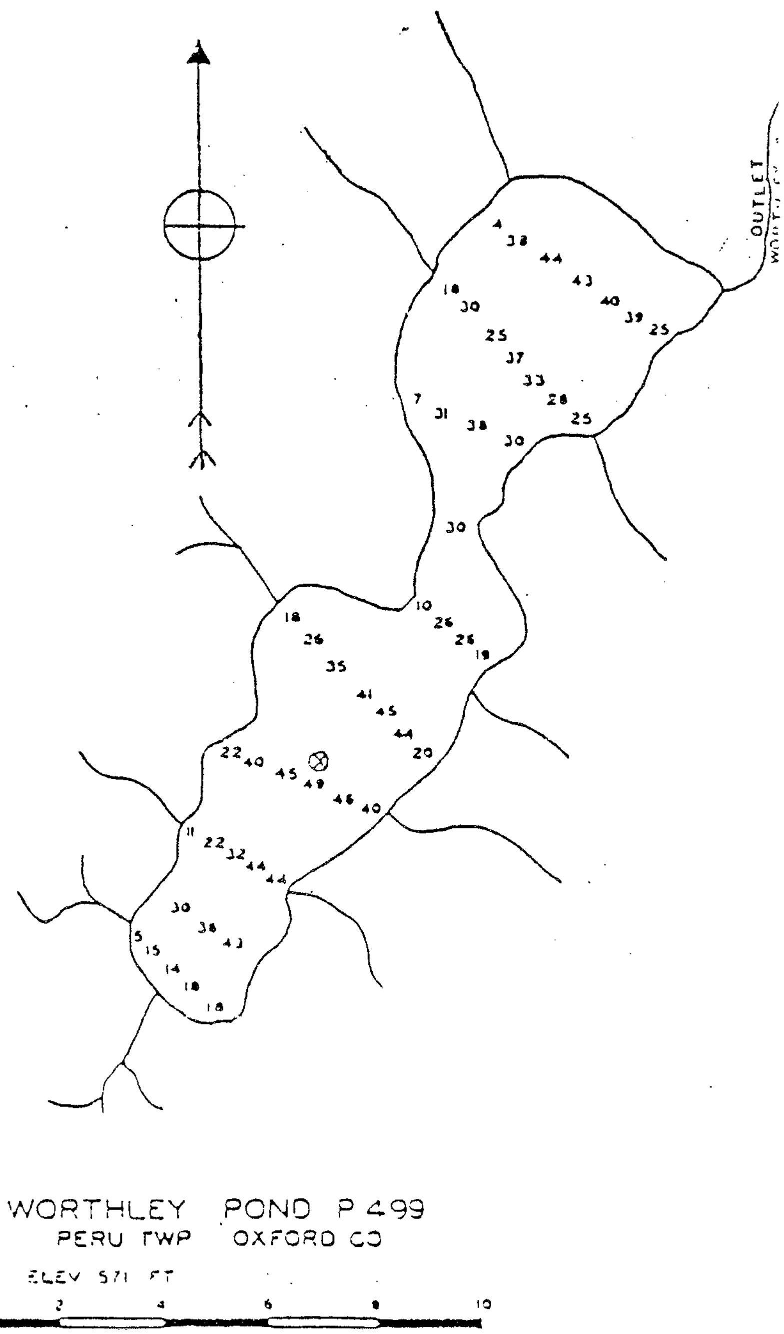
* inadequate sampling season
(mo) monitor,
@ Data collected in a cooperative project between DEP and the U.S. Geological Survey.

Transparencies are about average for lakes and ponds in Maine indicating good water quality. Chla and TP values are moderate. There is an oxygen depletion (i.e. less than 5 ppm) in the hypolimnion by late summer. Continued monitoring with adequate sampling seasons is necessary to predict water quality trends.

The pond is managed for brown trout and brook trout. Competition from warm water species such as perch, pickeral, and bass necessitate continued stocking of trout to maintain a cold water fishery.

Worthly Pond #3594

Surface Area	143.2 ha (354 a)
Max. Depth	14.9 m (49 ft)
Mean Depth	7.8 m (25.6 ft)
Volume	1.18 X $10^6 m^3$ (959 acre-feet)
Drainage Area	15.8 km^2 (6.1 mi^2)
Flushing Rate	0.8 (Flushes/year)



Worthly Pond #3594

	1980	1981
Mean Secchi (m)	6.2	6.7*(4)
Min Secchi (m)	3.4	5.2*
TSI	37	34CHL
Color		15
pH	6.6	6.2
Chla	2.7(sum)	2.4(mean)
TP	10(c)(sum)	6(c)(1s)
	21(b)(sum)	14(b)(1s)

* Inadequate sampling season
(sum) summer, (1s) late summer, (c) core, (b) bottom

Worthly Pond supports a principal fishery of brown trout, smallmouth bass and pickerel.

Transparency is slightly above average for Maine lakes. Chla levels are low and TP values are low to moderate.

The town of Peru voted not to take part in a plan which would sewer Worthly Pond as well as part of the town. Many cottage owners voiced alarm that this lack of action would lead to the deterioration of the lake water quality. The DEP will investigate conditions at Worthly Pond. Further action by DEP or the Town or both concerning Peru's sanitary problems will be necessary.