LINCOLN POND

Technical Report

GREATER ADIRONDACK
R.C. & D. AREA
TECHNICAL WATER STUDY COMMITTEE
Theriot Avenue
Chestertown, New York 12217

ACKNOWLEDGMENTS

The various studies and reports dealing with Lincoln Pond have been carried out by a number of individuals from county, regional, state and federal agencies and organizations.

These groups have cooperated extensively during the past year in the planning, conducting and evaluating of the research contained in this technical report.

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A special thanks to Bonnie Monroe of SCS and Audrey Woods of Cooperative Extension for the typing of this project.

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Preface

In 1970, local residents in Warren, Washington, Hamilton, Essex and Clinton counties and the Soil and Water Conservation Districts in cooperation with the county governing bodies, met together to establish the Greater Adirondack Resource Conservation and Development (RC&D) Project. These people hoped to take advantage of federal technical assistance and funding through a locally initiated and sponsored program, to help solve community problems and promote wise use of soil and water resources.

Armed with the knowledge of some of the lake problems and the need for a cooperative effort, the Greater Adirondack RC&D Project Area Board of Directors, in late 1973, appointed a Technical Water Ad Hoc Committee and a supporting RC&D Water Study Committee. In part the task of the committee was to make whatever comprehensive studies were felt necessary on a pilot lake, to involve local support and to develop a report of the findings from the various studies. From the report recommendations, a Comprehensive Water Management Plan could then be developed.

In Essex County, because of the efforts of the Lincoln Pond Property Owners Association and their willingness to "pay their fair share," Lincoln Pond was chosen as a study lake. Hopefully, the study techniques and methods utilized here can be transferred to other lakes within the RC&D Project area with the result that other Comprehensive Water Management Plans could be developed.

I. Introduction

Throughout North America are hundreds of thousands of lakes ranging in size from less than an acre to the Great Lakes. These lakes constitute one of our greatest natural resources. As inland lakes increasingly have felt the impact of man, their natural environment has undergone change, and they have become susceptible to new and different pressures on the natural systems which create and sustain life in and around them. Out of a need to protect our valuable resources, the concepts of planning and management have developed. Used as effective tools, careful planning and rational management of natural resources such as lake areas, can lead to continued enjoyment for all current and future users.

The concept of "Comprehensive Water Management Planning" is not new. Plans have been prepared on national, regional, state and river basin levels. These plans, however, encompassed vast land areas and considered the overview of water conservation, quality and utilization, and generally, not specific problems on individual waters.

New York's lakes are one of its most important economic and recreational resources. Water management plans must be designed to carefully direct the preservation and improvement of specific lake areas. The Adirondack Region of New York State abounds with many beautiful and scenic fresh water lakes of all sizes and shapes. These lakes attract people for a wide variety of reasons:

- Recreation-swimming and boating
- Vacations
- Fish and Wildlife
- Peace and Quiet
- Wilderness
- Aesthetics
- Serenity
- Enjoyment of Nature
- Business

I. Introduction

The wide range of uses on Adirondack lakes are accompanied by a variety of problems:

-Demands--for various uses of the water; recreation to aesthetics
-Water Levels--that will benefit all users - on the lake as well as upstream and downstream
-Aquatic Weeds and Other Plants
-Fish and Wildlife Resources--for the enjoyment of all users
-Habitat Loss--for various fish and wildlife species
-Insects
-Lake Activity Conflicts--boating, fishing, swimming
-Shoreline Property--changes and uses in man-made and natural resources

To solve these many problems and to develop a water management plan, the combined efforts of many are needed. Lake associations, local governments and planning groups can reflect and provide the input of public needs and goals. To provide the technical research aspects of the resource base, county, regional, state and federal agencies provide invaluable knowledge, resource and manpower to community needs and problem areas.

The information contained in this technical report is designed to give the reader a broad understanding of the background data and information that is necessary to gather and analyze as a first step in developing a Comprehensive Water Management Plan. It is a result of cooperative efforts among various organizations and agencies during the period of August 1977 to July 1979.

Your comments, suggestions and reactions to the technical report are most welcomed and may be addressed to any member of the Technical Water Study Ad Hoc Committee or the RC&D Project Coordinator at Chestertown, New York 12817.

II. Location and Accessibility

Location

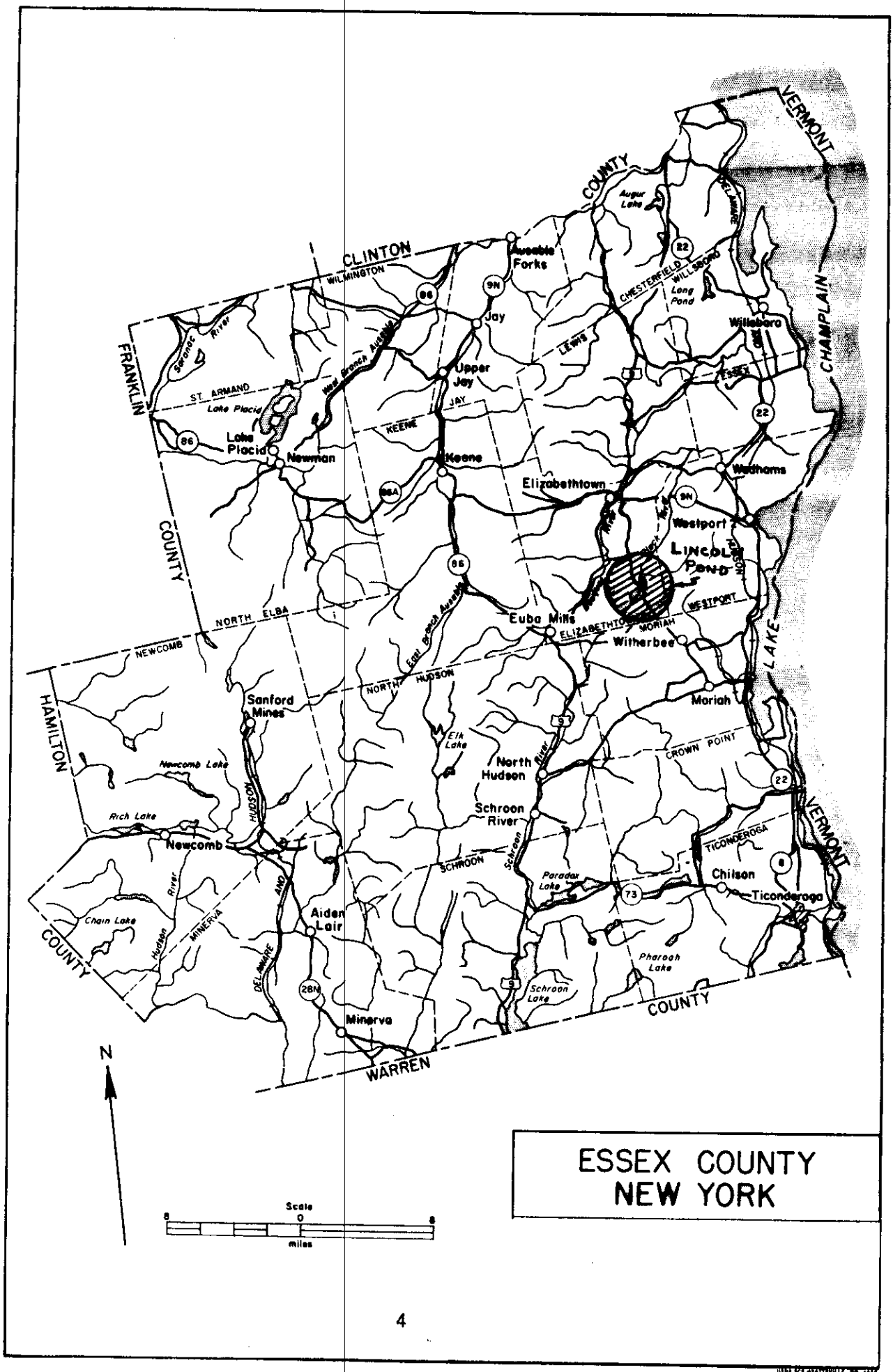
Lincoln Pond is located between Mineville and Elizabethtown on the eastern side of Essex County. The lake is located at a latitude of 44 09 54 N and a longitude of 73 33 20 N.

Lincoln Pond has approximately 0.73 surface square miles (600 acres) and 7.60 shoreline miles. The maximum depth is 29 feet. It lies at an elevation of 1031 feet above sea level.

Accessibility

Lincoln Pond is divided into an upper and lower lake by County Road No. 7 and the Causeway. The major accessibility to these two bodies of water is on the eastern side of each, with County Road No. 7 between Elizabethtown and Mineville being the major route.

Exit 31 of Interstate 87 (Adirondack Northway) provides access north from Albany and south from Plattsburgh. Route 9 provides similar access as it passes through Elizabethtown as does 9N west from Westport on Lake Champlain.


ESSEX COUNTY
NEW YORK
CLINTON
COUNTY
FRANKLIN
COUNTY
HAMILTON
COUNTY
WARREN
COUNTY
VERMONT
CHAMPLAIN
LAKE
VERMONT
WILMINGTON
Ausable Forks
Jay
Upper Jay
Lake Placid
Newman
Keene
Elizabethtown
Westport
Lincoln Pond
Willsboro
Wadhams
Euba Mills
Witherbee
Moriah
Sanford Mines
North Hudson
Elk Lake
Schroon River
Newcomb
Newcomb Lake
Rich Lake
Aiden Lair
Minerva
Chain Lake
Hudson River
Schroon Lake
Paradox Lake
Pharaoh Lake
Chilson
Ticonderoga
Augur Lake
Long Pond
Scale
miles
N

III. Climate Characteristics

Since specific climatic data is not easily available for Lincoln Pond, the general climatic data for the vicinity of Elizabethtown is used:

Minimum Temperatures

January mean minimum temperature	5^{o} - 10^{o}F
April mean minimum temperature	30^{o} - 35^{o}F
July mean minimum temperature	55^{o} - 60^{o}F
October mean minimum temperature	35^{o} - 40^{o}F

Maximum Temperatures

January mean maximum temperature	30^{o} - 35^{o}F
April mean maximum temperature	50^{o} - 55^{o}F
July mean maximum temperature	80^{o} - 85^{o}F
October mean maximum temperature	55^{o} - 60^{o}F
The lowest annual temperature recorded	-40^{o}F

Killing Frost

Average date of last killing frost in spring	May 10
Average date of first killing frost in fall	Sept. 30
Average length of the growing season	135 days

Precipitation

January mean precipitation	2 - 3"
April mean precipitation	2 - 3"
July mean precipitation	3 - 4"
October mean precipitation	under 3"
Mean precipitation during growing season	15 - 18"
Mean annual snowfall	60 - 80"

Sunshine

Mean January sunshine	40%
Mean July sunshine	60%
Mean sunshine for the growing season	60%
Mean relative humidity is	80%

IV. The Lincoln Pond Watershed Area

Geological History

The geologic history of Lincoln Pond is part of the history of the entire Adirondack Region. Originally formed more than a billion years ago, this area has been completely eroded, submerged, covered with sediments, uplifted, folded, faulted, and glaciated, only to be in the process of erosion again.

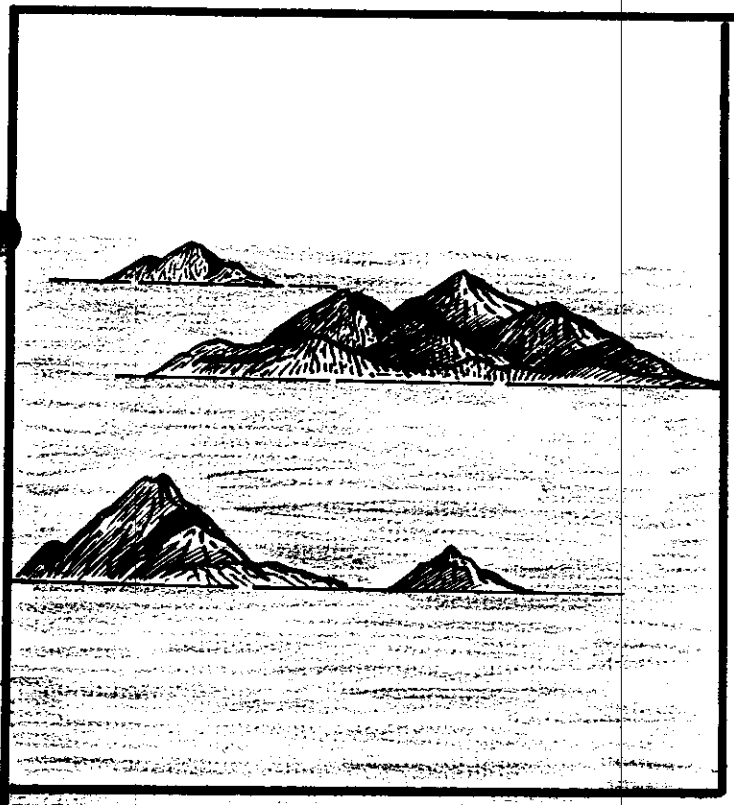
Between one million years ago and about ten and fifteen thousand years ago, the area was overlain by a glacier several thousand feet thick, which advanced generally from the northeast and proceeded to the southwest, gouging, grinding, and mixing the rocks and other mineral material into glacial till, and smoothing it out over the sides of rock-cored mountains and valley bottoms. After the glacier melted, it left deposits of glacial till that varied in thickness from less than one foot to over fifty feet in thickness over bedrock. This glacial till then evolved through the influence of climate, organisms, topography, and about ten thousand years of time into the soils as they exist today in the area adjacent to Lincoln Pond. The bedrock now exposed is granite, gneiss and sandstone, formed from some of the earliest sediments and igneous rock. The area south of Lincoln Pond was once heavily mined for its' iron ore.

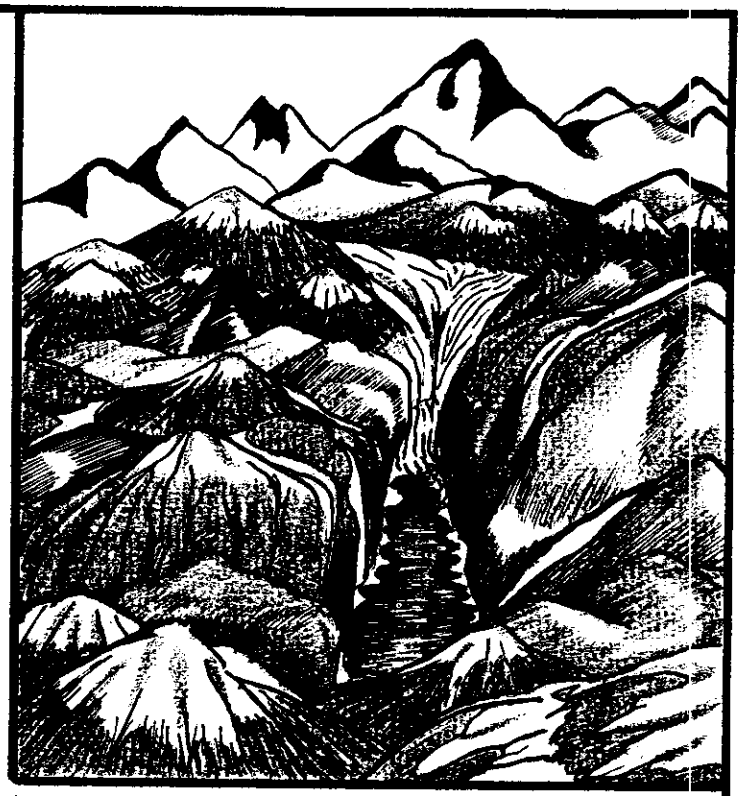
Lincoln Pond was originally named Kingdom Forge. The dam was built by Frederick Haasz in 1825 for Henry Noble. In 1869 Essex and Lake Champlain Ore and Iron Company purchased the dam and water rights. It has changed hands many times and in 1968 the dam was purchased by New York State. In the early 1900s it was used to produce electrical power for the village of Mineville and Witherbee. The dam at the outlet is 25 feet high which creates an impoundment of approximately 600 acres. It is relatively shallow with a maximum depth of 29 feet.

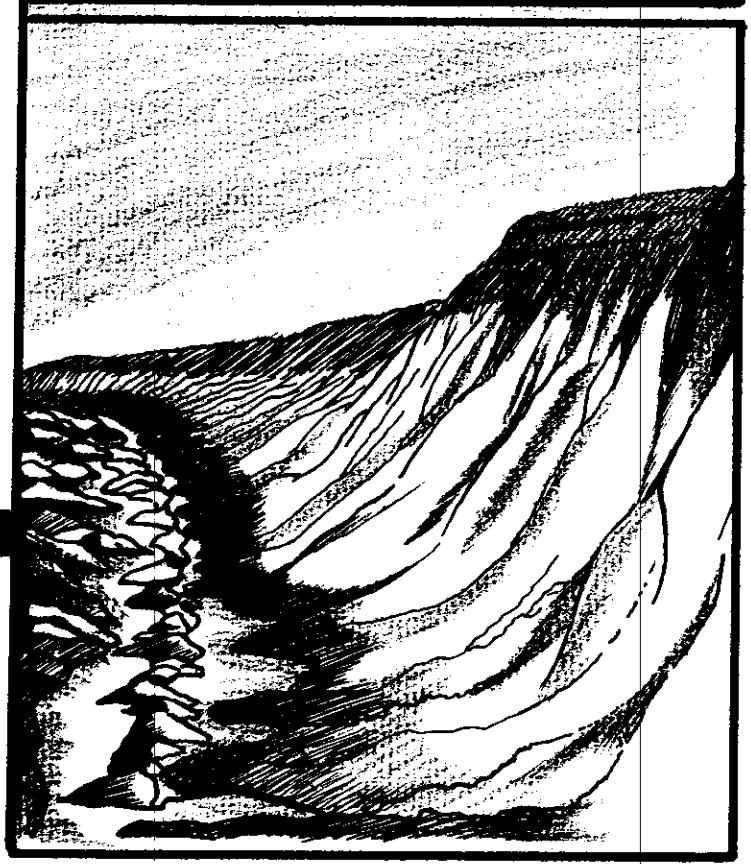
GEOLOGICAL HISTORY OF THE ADIRONDACK REGION

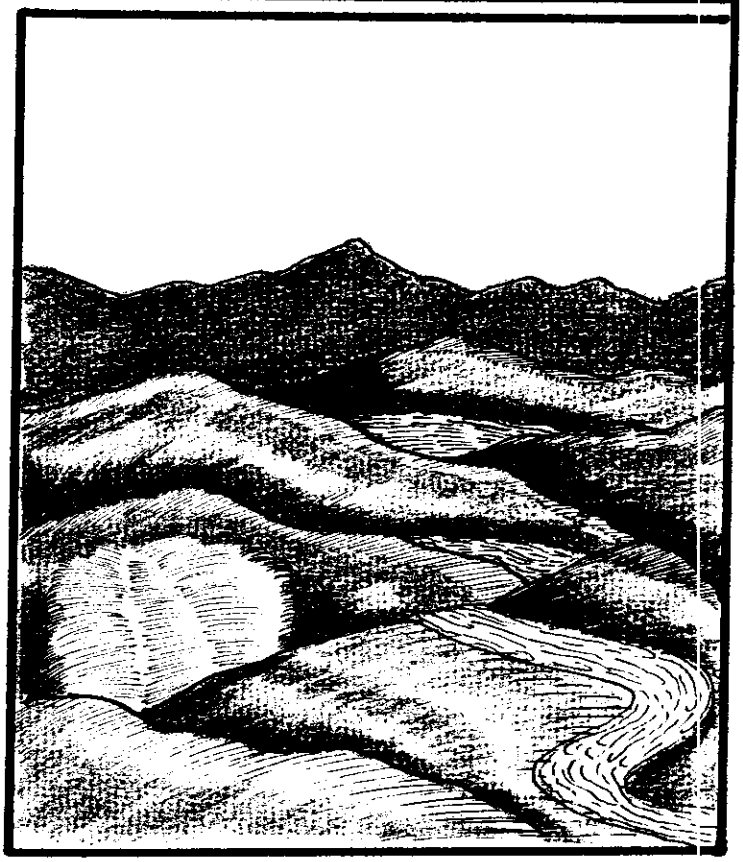
Precambrian Era -- 1100 Million Years Ago

From Primeval Sea to Ancestral Adirondack Mountains









Cenozoic Era -- 9000 Years Ago

Continental Glacier Recedes to Form Adirondack Landscape

The Watershed Area

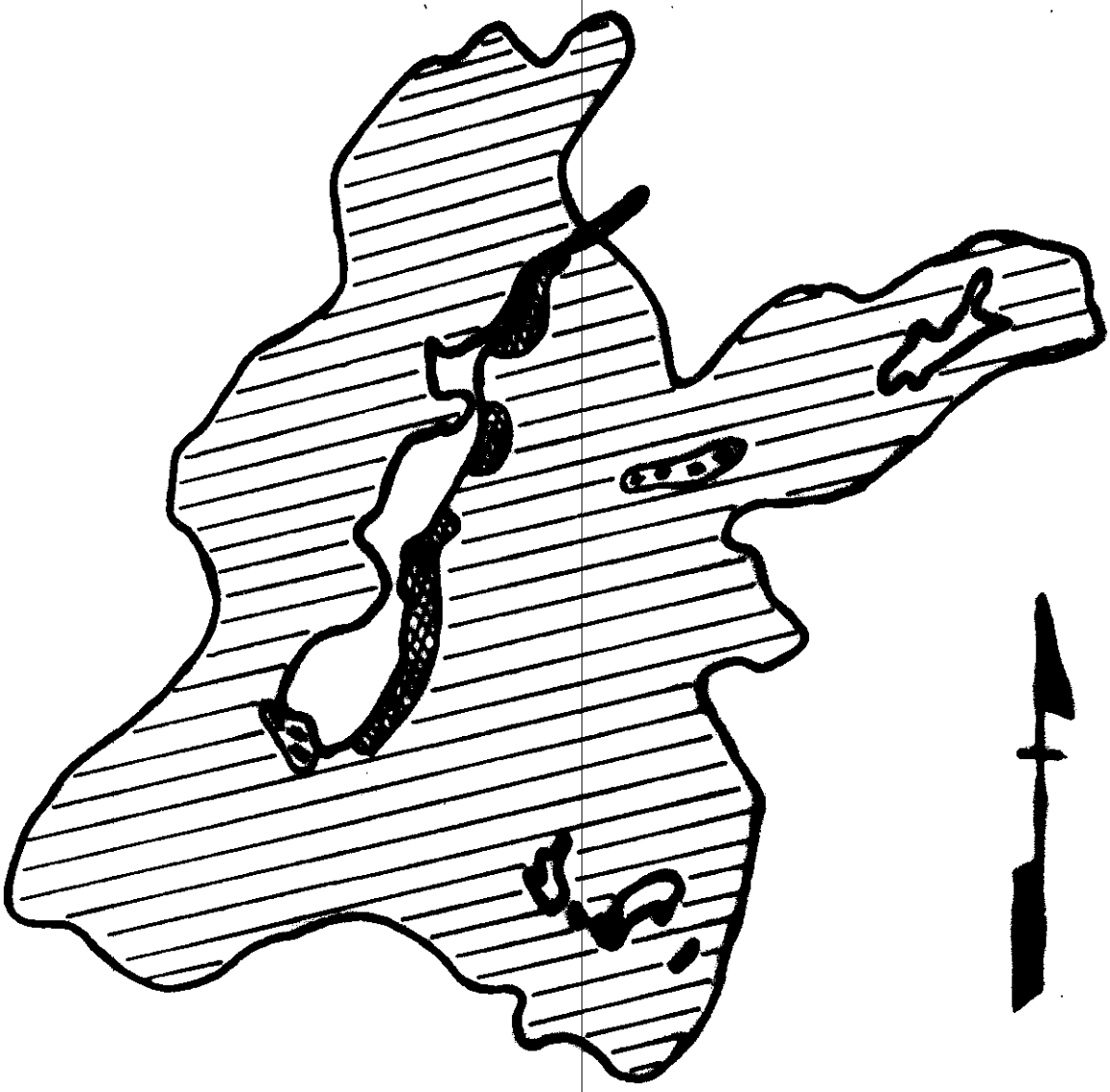
Each lake is part of a watershed, a drainage area made up of uplands, shorelands, and adjacent wetlands. The watershed or drainage basin is defined by topography (slope or steepness) which governs the path that runoff will follow as it moves from higher to lower elevations. The drainage basin for a single lake is only part of a larger hydrological system. What happens in a watershed area can and will effect natural processes not only in the lake but in the larger drainage systen of which a lake and its watershed are a part.

The Lincoln Pond watershed is part of a larger drainage system called the Lake Champlain Basin. In this system, the main channels of drainage follow a path oriented by its major rivers. These rivers begin in the mountains near the rim of the basin and usually flow in a north, northeast direction.

Watershed Characteristics	Acreage
Woodland Area	8635
Water Area	1000
Village/Residential	195
Adirondack Northway	170
TOTAL ACREAGE	10,000

The Lincoln Pond watershed is about 10,000 acres in size, and is located entirely within Essex County. The lake itself is the major body of water in the watershed and occupies approximately 600 acres. There are a number of small ponds within the Lincoln Pond watershed. Brandy Brook and Cold Brook are the major streams that empty into Lincoln Pond. The outlet, Black River, for Lincoln Pond empties into the Bouquet River, then into Lake Champlain. Most of the watershed is owned by International Paper Co., with small parcels belonging to New York State and individuals.

Map No 2



Legend

Woodland

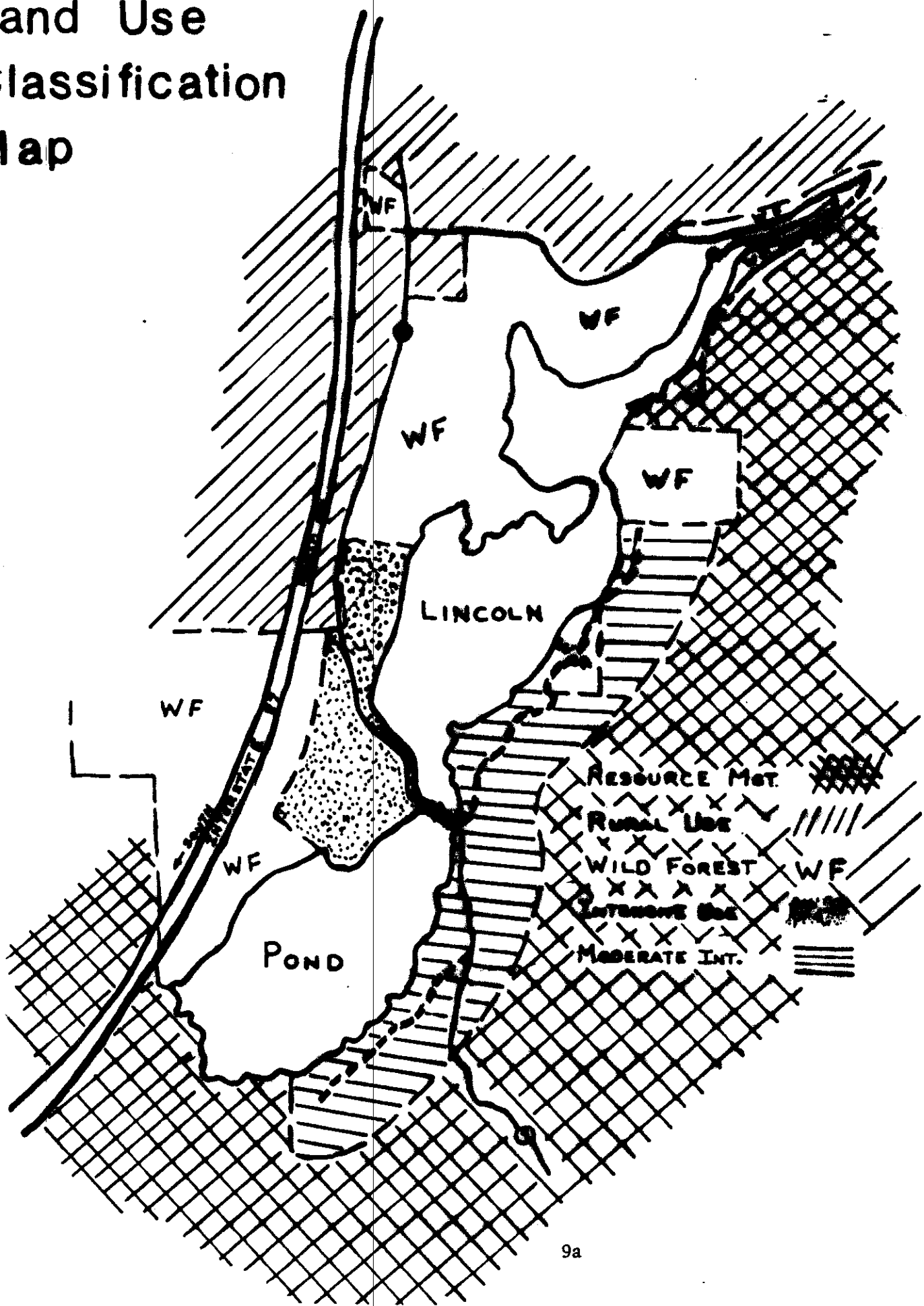
Wetland

Urban

Water

Lincoln Pond
Watershed

Land Use Classification Map



According to the Adirondack Park Land Use and Development Plan (1973), this land is classified as Intensive Use on the west side, the remainder, Moderate Intensity Use on the east and Resource Management on the north and south ends of the watershed.

Woodland covers approximately 8635 acres of the watershed area. Vegetation is primarily spruce-fir in the lower elevations with northern hardwood forest type covering the higher elevations.

Soils

The majority of the soils around Lincoln Pond is stony glacial till and sandy, gravelly, glacial outwash. It is derived mainly from granite, gneiss, syneite and anorthosite.

The soils of a region vary greatly from place to place, and the kinds of uses to which soils are best adapted change in relation to the soil characteristics. A brief description of the physical characteristics of the soils in the watershed is given in the appendix of this report. Also included are brief comments about the soils for uses such as buildings, drainage, septic tanks, roads and streets, picnic areas, playgrounds, and paths and trails.

Map No. 3 indicates the soils for the Lincoln Pond Watershed. Soil descriptions as per soil map number are defined in the appendix page.

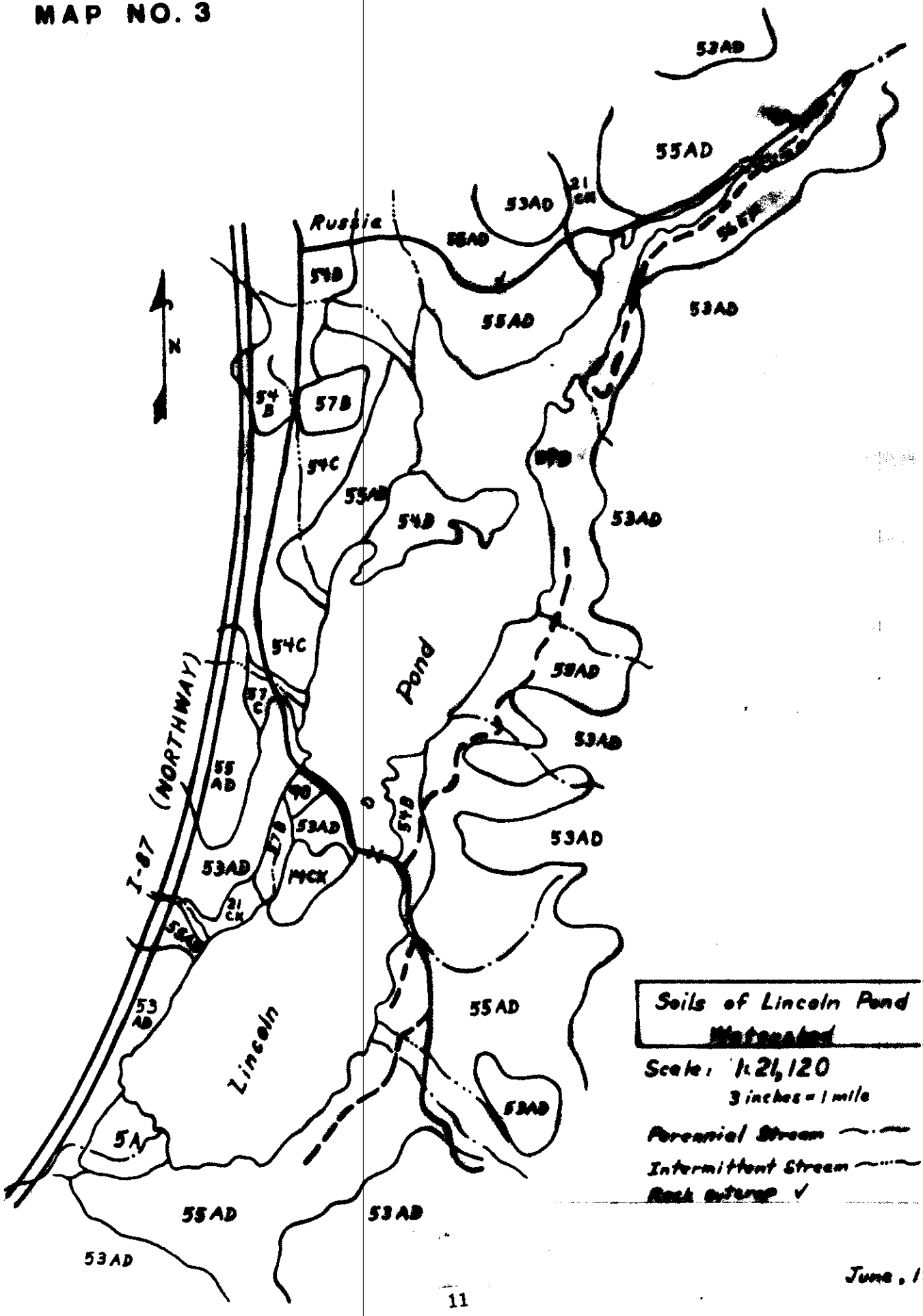
Topography

The suitability of land, whether it be for development or natural uses, is dependent largely upon the topography or slope of the land. (In this case"slope" means, the steepness of the land).

The topography of the area is mostly rough, mountainous land with steep slopes and narrow ridges and valleys. Outwash deltas and terraces surround the lake.

Map No. 4 illustrates the major categories of slope, along with the principle direction of drainage flow in and out of Lincoln Pond.

MAP NO. 3



June, 1979

The slope categories and the limitation to development caused by the slope are as follows:

Slope Category	Percent Slope	Limitations
Flat Land	0 to 3%	Possible restrictions depend on soil type
Low Slope	3 to 15%	Generally not restrictive
Steep Slope	15 to 25%	Development should be restricted in density and type
Excessive Slope	25% or over	No development - only open spaces should occur

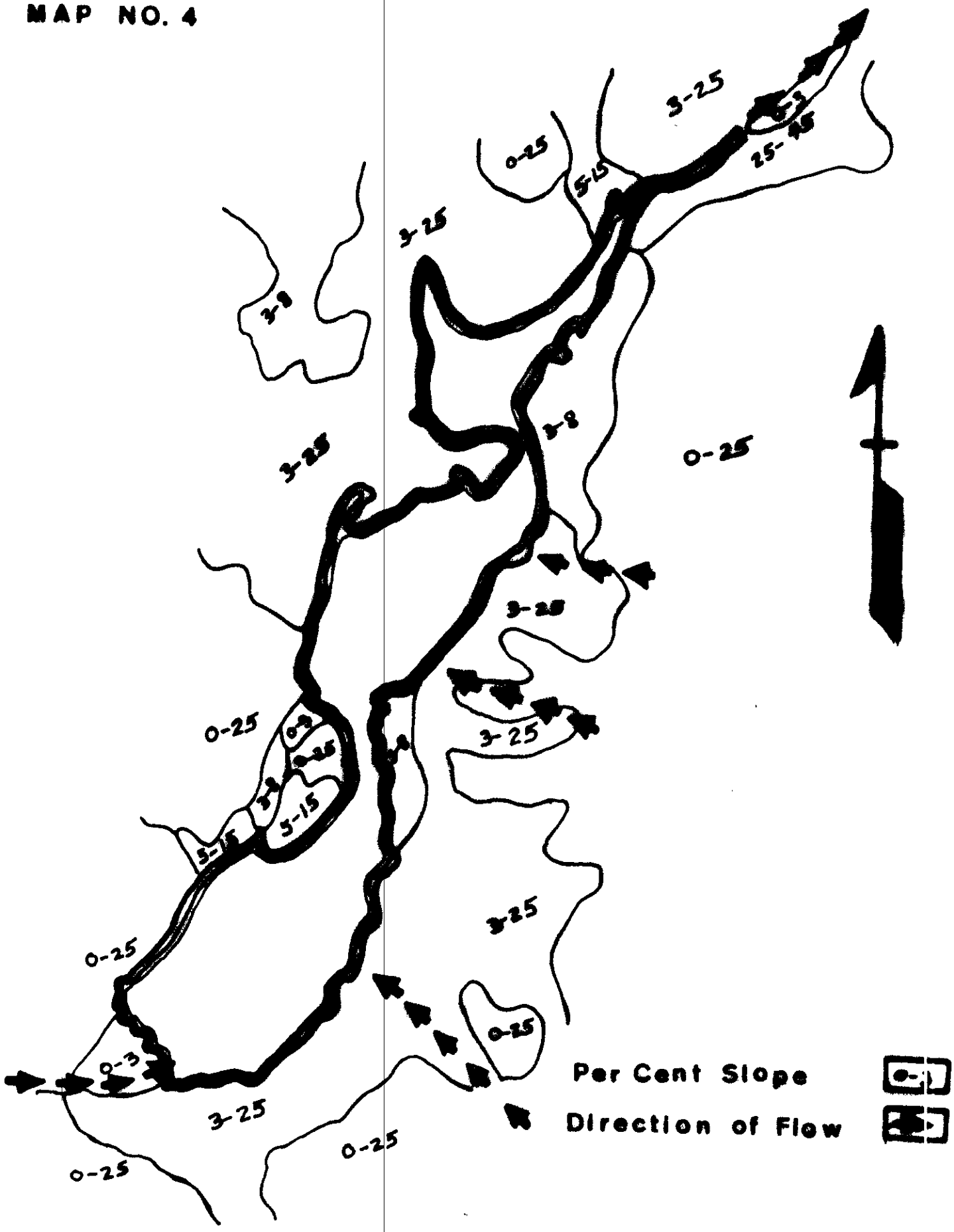
Developmental Limitations

Development around the lake is concentrated along the eastern shore. A portion of the lake shore is owned by New York State, and is classified as "Wild Forest" and "Intensive Use". The other areas are classified as Moderate Intensity, Rural Use and Resource Management. (See Appendix VII for descriptions & restrictions for each classification).

Additional development on Lincoln Pond must be examined in light of limitations that do exist. Generally, any slope from 0 to 15% is considered suitable for development. Limiting factors, such as ground water or stoniness, may exist. Other information from soil interpretations and wetland areas should be checked to determine if a developmental restriction exists. In areas of 15 to 25% slope, problems can arise. Such measures as proper site design, drainage control and erosion control techniques, need to be utilized when developing these lands to reduce environmental damage.

For any area where construction and development is planned, there should be on-site investigation, soil borings, test pits and other related studies to insure against any possible damage to the watershed. Accurate planning can only be done through on-site analysis.

MAP NO. 4


3-25
0-25
5-15
25-45
3-25
3-8
3-25
3-8
0-25
3-25
0-25
0-3
3-25
3-25
5-15
5-15
3-25
0-25
0-3
3-25
0-25
0-25
Per Cent Slope
Direction of Flow

VA. The Wildlife Resource

Wildlife is a product of the land. The distribution or mixture of forests, fields, and wetlands result in a variety of wildlife habitats. Geology, soils, and man have influenced the present vegetation surrounding Lincoln Pond. Because of the dominance of forested land, wildlife associated with northern forests are most common. Man has contributed to the diversity of habitats and wildlife through the harvest of forestry products and clearing the land for farms, housing and transportation.

A list of wildlife species is found in Appendix I and II. However, our focus will be upon wildlife associated with Lincoln Pond and its tributaries.

Mammals

Mammals are important ecologically as herbivores, carnivores or as prey species. Herbivores feed on vegetation, for example, deer can influence forest growth while waterfowl feed on many fruits and/or leaves of wetland plants. The carnivores perform the necessary function of removing weak, sick and diseased, as well as some healthy animals to help keep the animal populations healthy and for some species, within the carrying capacity of their habitat. Certain members of these species, such as the bear, fisher, raccoon and duck are omniverous, that is, they are both herbiverous and carniverous. Man also plays an important predatory role on game species to help keep some within the carrying capacity of their habitat.

Deer and bear are important big game resources throughout the Adirondacks. Although lake management decisions may not affect the abundance and distribution of big game, land use decisions for both public and private lands may change the local abundance of these species. The most critical habitats, for deer, are the winter yarding areas used for both food and shelter. Land use decisions that affect these areas will have a bearing on the deer resource in the future. Decision makers will need to consider this important resource and

the economic consequences (if any) of their decisions that affect upland forest habitat around Lincoln Pond. (see Appendix IV.)

Big game and furbearers are economically important to the region. Big game hunters and trappers spend money to purchase equipment and supplies in nearby communities.

Furbearers are the second most important wildlife resource, because of the economic value of their pelts. Therefore, decisions affecting their habitat should be of critical concern to planners. Common species include fisher, otter, red and grey fox, raccoon, striped skunk, mink, muskrat and beaver. The muskrat, otter and beaver are directly dependent on wetlands while the other game or furbearers primarily inhabit upland edge and forest habitats. With the lack of wetlands adjacent to Lincoln Pond muskrat, otter and beaver are not in abundance in the area.

According to New York State Department of Environmental Conservation's harvest figure muskrats, otter and beaver are considered to be uncommon in the area. This does not mean that there may not be a couple of families of each species in the area, but the species are not abundant enough to warrant serious trapping by the public.

Fisher are the most common of the furbearers for which a mandatory pelt tag is required, thus reporting the number the trappers harvest.

The greatest threats to the furbearer resource include the prohibition of trapping, extensive land clearing, and a decline in water quality in streams and lakes.

Non-Game Mammals

The variety of small, non-game animals contribute to the ecological balance of the area. Their abundance is partially regulated by the many larger predators. Their value lies in their important place in the food chain of furbearers and game animals. Small mammal populations need not be managed.

Birds

Upland game birds (ruffed grouse), birds of prey and many songbirds are also common in the area. However, game birds are widely distributed in the Lincoln Pond area resulting in little hunter interest.

Waterfowl and shorebirds represent other species of concern in developing a water management plan because of their relationshio to an aquatic habitat. Lincoln Pond wetland areas are not major nesting areas for waterfowl. They are more important for migratory waterfowl that stop over in fall and spring. The lake is not likely used by duck broods to its potential because of human summer activities and the limited number of wetlands on Lincoln Pond and in the surrounding area (see Appendix V) that offer protection and seclusion to the young ducklings.

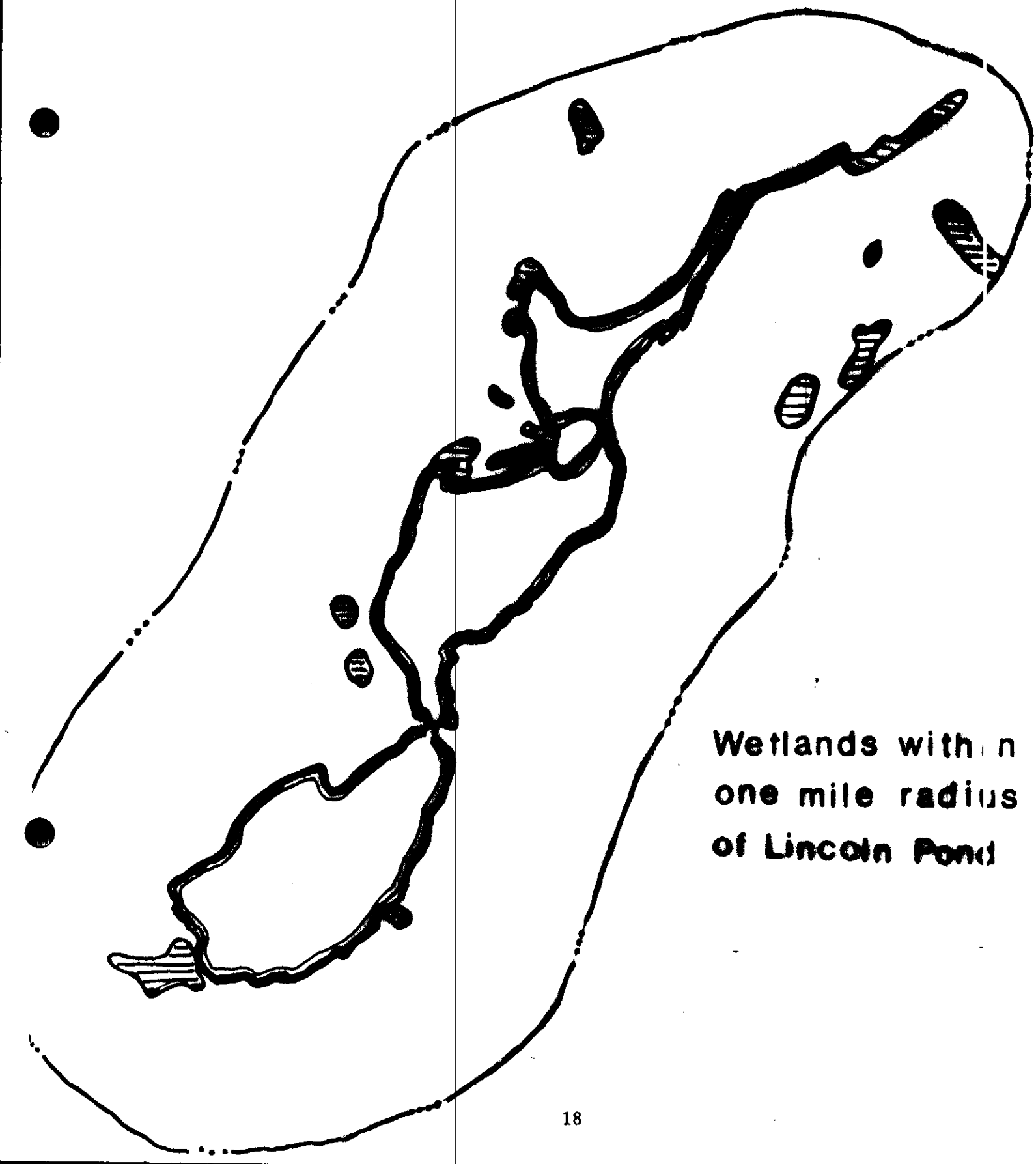
The Lincoln Pond wetlands require preservation to assure the presence of habitat for ducks as well as furbearers.

Songbirds

Non-game birds are an important part of a balanced ecosystem. They serve an important role in the control of insects and transportation of seeds.

Factors affecting avian abundance include changing habitat and food supplies. The use of insecticides and herbicides can alter habitat and food supplies for songbirds, therefore, affecting their variety, distribution and numbers.

MAP NO. 5



Wetlands within one mile radius of Lincoln Pond

VB. Wetlands

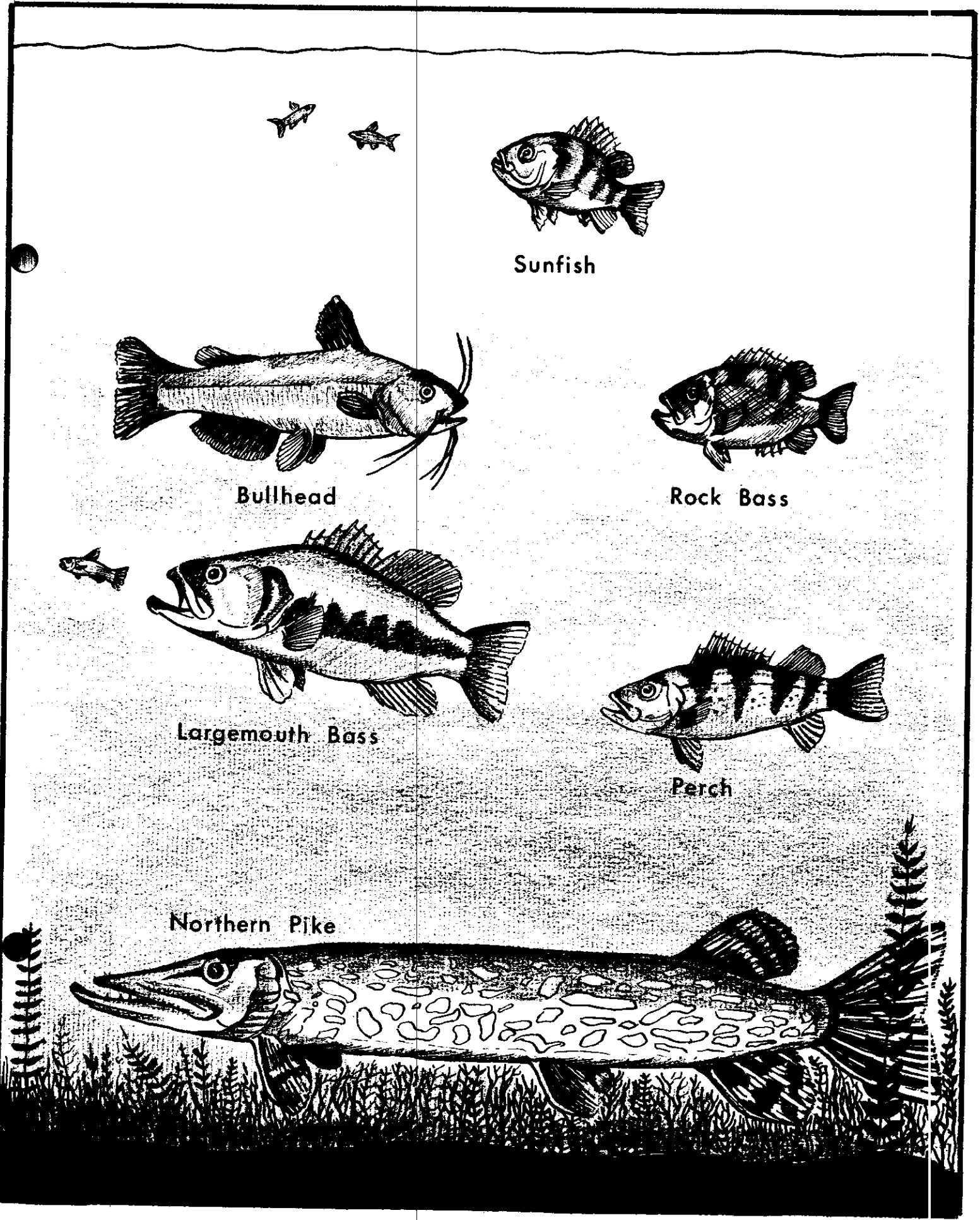
The Lincoln Pond Wetlands

There are several wetlands adjacent to Lincoln Pond, three of which serve as valuable habitat for fish and wildlife. Wildlife move from one wetland to another seeking the best conditions to meet their physical needs. They also serve to filter sediment and many nutrients from the waters flowing through each wetland.

Wetland Vegetation

The two major wetlands adjacent to Lincoln Pond are located on the opposite end of the Lake. The third wetland is located in the Cold Brook area of the watershed. This third area is used as a part-time deer wintering yard. A field check of these areas was made to determine the classification of wetland present. (see Map No. 5 for location of these areas) In all three cases these wetlands were classified as shallow marshes.

A shallow marsh is distinguished by water usually less than three feet in depth and the predominant vegetation is emergents with submergent vegation in deeper water. The species found in these areas were sedges, pickerel weed, rice cut grass and a few alders scattered throughout the wetland.


Sunfish
Bullhead
Rock Bass
Largemouth Bass
Perch
Northern Pike

VI. Fisheries Resource

Morphometry

Lincoln Pond is oriented basically in a north-south direction. It is a surface fed body of water with the average depth of water being 10-12 feet. The lower (southern) portion of the lake has the majority of deep water. Maximum depth has been recorded at 29 feet.

The shoreline slope is moderate to steep on the southeast and southwest side of the lake and slight to moderate around the remainder of the lake. See Map No. 6.

Shoreline Development and Substrate Type

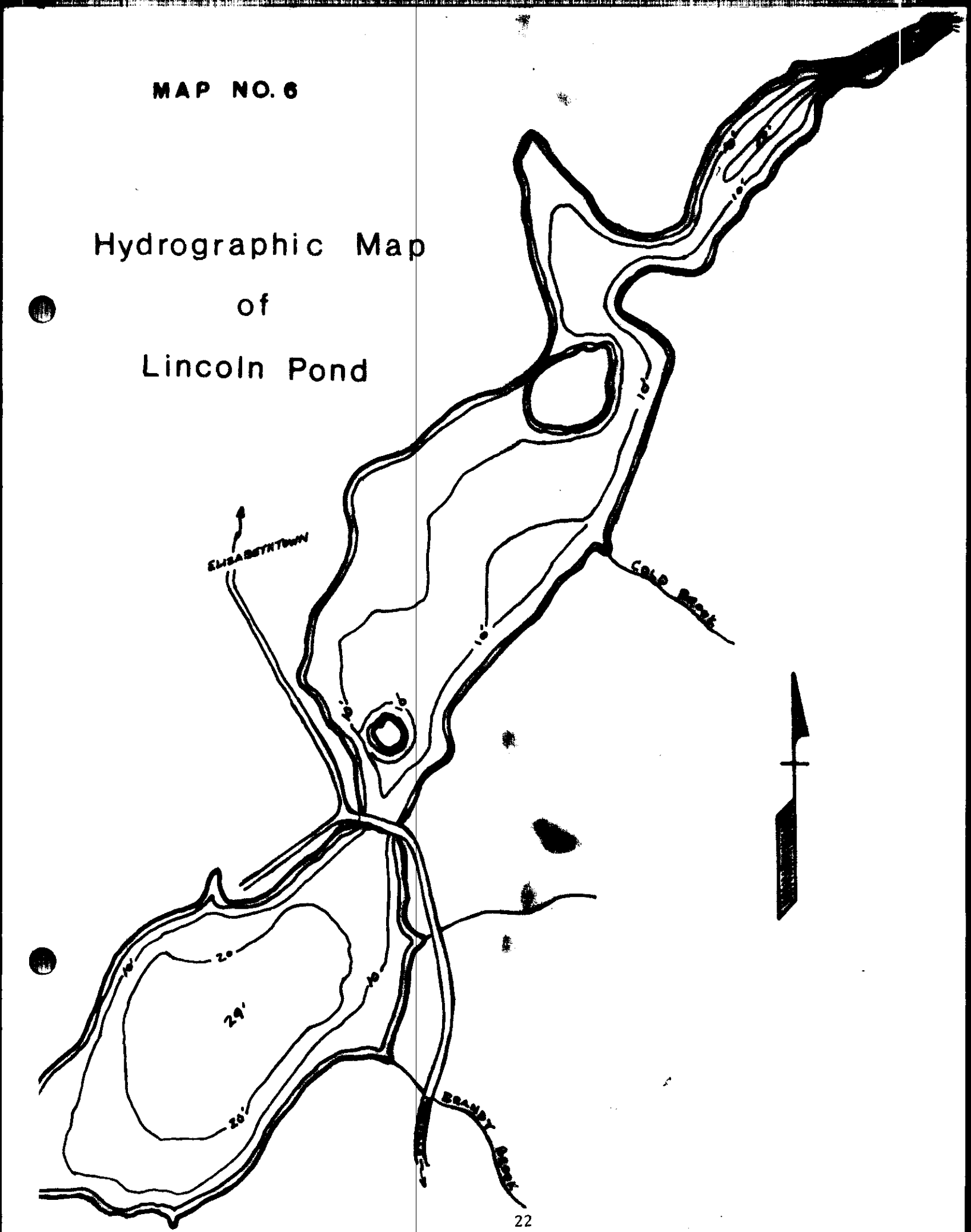
Shoreline development around the lake varies from intensive (on the southeast shore) to underdeveloped (on the northwest shore). Development on the rest of the lakeshore is non-existant except for a day-use area on the west shore that has been developed by New York State Department of Environmental Conservation. Those areas that have been developed have affected certain fish species' natural habitat. The clean up of areas for bathing, docks and the placement of sand caused immediate loss of bottom habitat. Over a period of time, translocation of sand by wave and current action spreads the effect of the fill over areas adjacent to the initial fill site.

Substrate Type

Predominant Substrate	Percentage of Shoreline
Muck	40%
Gravel	20%
Sand	20%
Rock	20%
TOTAL	100%

MAP NO. 6

Hydrographic Map of Lincoln Pond



A breakdown of the various bottom substrate types is given above. The bottom composition is mostly muck, some of which is deposited as a thin layer over gravel and rubble. There is a fair amount of aquatic vegetation, of which 90% is submerged and 10% floating which creates suitable habitat for northern pike, small mouth bass and other fish species.

Fish Species Survey

Fish Species Recorded	1963	1971	1977
Northern Pike	common	common	common
Largemouth Bass	common	common	- - -
Smallmouth Bass	common	common	fairly common
Yellow Perch	abundant	abundant	abundant
Pumpkinseed	abundant	abundant	common
Brown Bullhead	abundant	abundant	common
Golden Shiner	common	fairly common	- - -
Common Sucker	common	rare	present

- - - Not Recorded

1963

A complete investigation of Lincoln Pond was undertaken in July of 1963. Survey personnel report that pike perch were reported to be well established prior to 1950 and have subsequently disappeared. Natural reproduction of smallmouth bass and largemouth bass appears to be satisfactory judging by the young evident along the shore. However, few juvenile or adult bass were captured or observed and angling for all species of gamefish has allegedly deteriorated during recent years.

1971

This inventory of fish species in Lincoln Pond was carried out in late June and early July of 1971. It was done in conjunction with a mercury sample collection. A tagging study was established at the time of this survey. At the time of this survey only one largemouth bass was tagged, 5A1705, it was 20.6" long and weighed 5.0 lbs.

1977

In August of 1977, Lincoln Pond was surveyed again for an evaluation of the fishery. This evaluation was for the stocking of surplus brown trout.

It has been determined that Lincoln Pond will not sustain a brown or brook trout fishery. This was determined when no trout showed up in the survey of 1977. Prior to 1977 brook trout and brown trout were stocked as the following figures show:

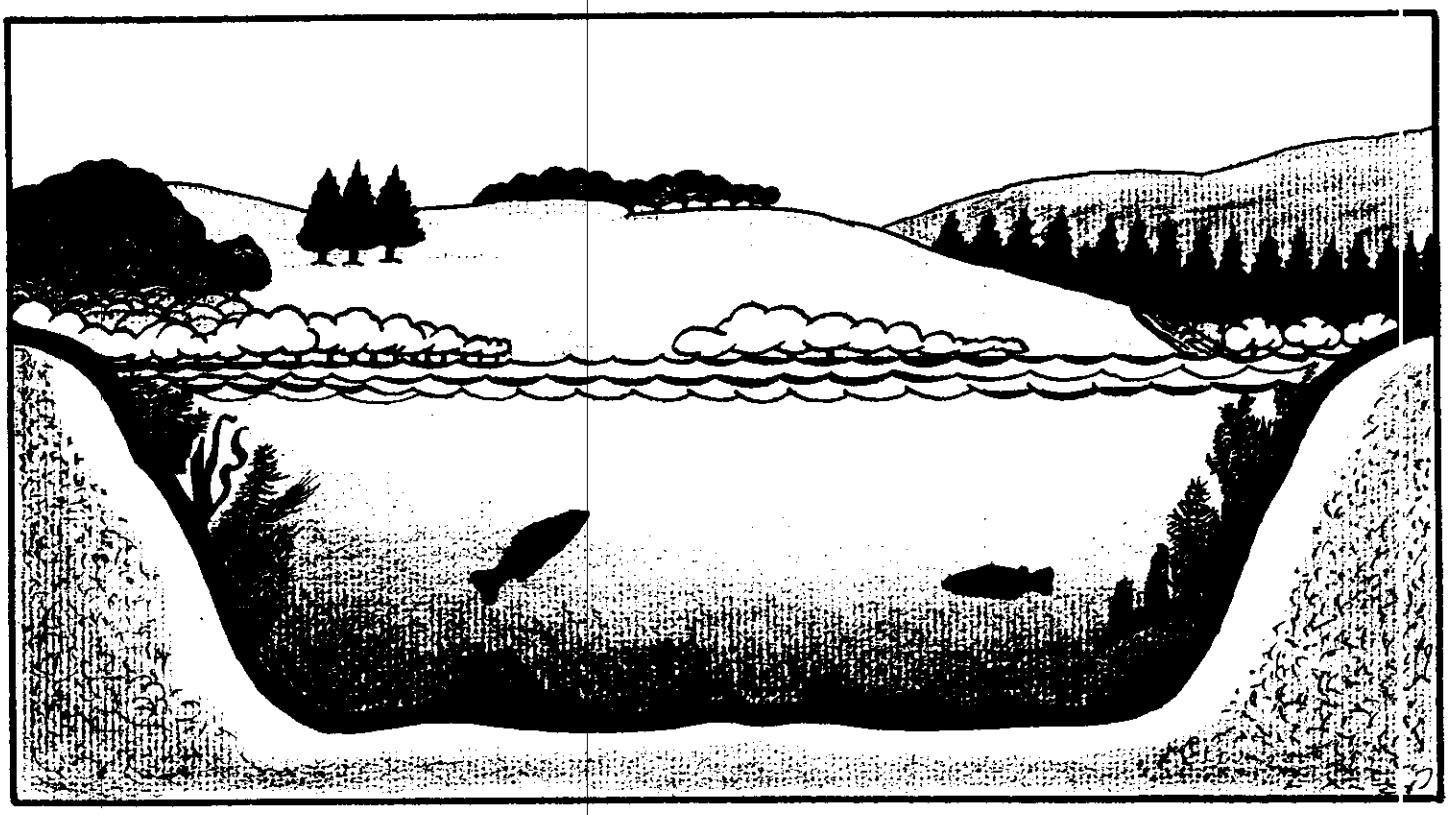
1974 - 2235 - 8.75" Brook Trout
1974 - 2000 - 4.5" Brown Trout
1974 - 54,944- 2.25" Brown Trout

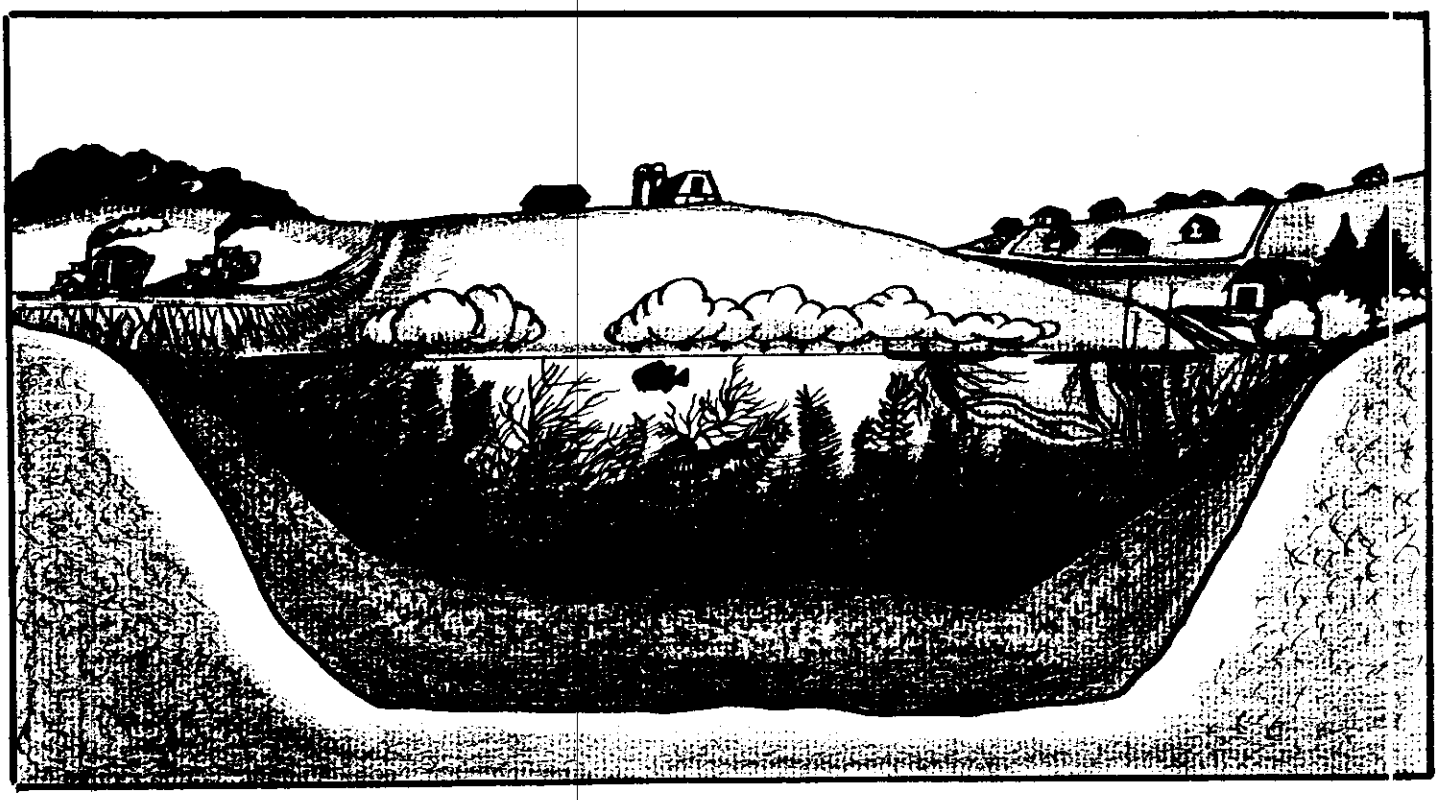
1975 - 5,000 - 4.5" Brown Trout
1975 - 25,000- 2.25" Brown Trout

This latest survey was conducted with the use of gill nets to determine the numbers, size range and average size of each species found in Lincoln Pond.

Fish Species Reported	Total No.	Size Range	Average Size
Northern Pike	2	22.3"-24.7"	23.5"
Yellow Perch	387	5.3"-7.3"	5.4"
Brown Bullhead	11	6.8"-11.5"	9.2"
Smallmouth Bass	1	- - - - -	13.1"
White Sucker	3	17.3"-19.0"	17.9"
Pumpkinseed	9	5.0"-6.5"	5.5"

The Department of Environmental conservation has no immediate plans for any stocking program for Lincoln Pond. It is considered by the Department as a warm water fishery and that the northern pike and smallmouth bass will sustain themselves without a supplemental stocking program.





VII. Water Quality

Lincoln Pond is a mesotrophic, warm water lake. It is characteristic of other lakes in the Adirondacks in that it is at a state between oligatrophic, pure and clear with little nutrient inflow and being eutrophic with an excess of nutrients. The present growth of aquatic weeds is valuable toward maintaining a mesotrophic lake condition.

Linclon Pond will never be a sandy bottom, deep, crystal clear, weed-free, resort type lake. This is not to say, however, that it cannot be managed and maintained so the greatest benefits can be obtained from this resource without affecting water quality.

Physical/Chemical Parameters

Dissolved Oxygen - The quality of water in a lake can be measured by various means. One measure is to determine the amount of dissolved oxygen in the water body. Dissolved oxygen refers to the amount of oxygen released through the process of photosynthesis by aquatic plants utilizing carbon dioxide.

The amount of dissolved oxygen in water usually varies. Since the amount of light can vary from depth to depth, the process of photosynthesis is limited to that depth of water having adequate light.

Oxygen levels at the bottom of lakes usually are lower than surface levels. Surface waters are oxygenated by absorption directly from the atmosphere and by plant photosynthesis. During respiration and decomposition, animals and plants consume oxygen and release carbon dioxide. Because decomposed plant and animal remains as well as their excretions and secretions sink, decomposition takes place on the lake bottom utilizing bottom supplies of dissolved oxygen. Over a period of time decomposition can deplete the supply of dissolved oxygen in the water leaving the lake virtually dead.

In our region we have what is described as the, "lake turning over". This turning over happens twice a year, once in the spring and once in the fall. Spring turnover is the condition in which the colder but lighter water is on top of warmer but heavier water at the bottom of the lake. With the coming of spring the air temperature rises and the ice begins to disappear, and the surface water rises in temperature. As the surface water rises in temperature, heavier water is now produced on top of lighter water immediately below, and the former tends to sink through the latter, thus mixing. In this process the underlying colder but lighter water tends to rise to the surface. This process is repeated until the entire depth of water is the same temperature from the surface to the bottom. When this happens the decaying matter that is on the bottom of the lake is "thrown into" suspension and can be seen on the surface as well as throughout the entire depth of the lake. The actual turning over of the lake may last several weeks, depending on spring weather conditions.

In the fall the water surface begins to cool, thus becoming heavier it sinks through the lighter water and the process starts all over again and continues until all of the water is at the same temperature, then the mixing process stops. Then the surface water continues to cool until it freezes.

Alkalinity

Alkalinity is basically a measure of plant and fish productivity. It is expressed as the amount of carbonates, bicarbonates and hydroxides present in water in terms of units of weight (parts per million). Dyes are used to determine levels of alkalinity. Methyl Orange (M.O.), Methyl Purple (M.P.) and Phenolphthalein are dyes that are commonly used.

Through the process of photosynthesis, aquatic plants utilize carbon dioxide to produce oxygen. This tends to decrease alkaline levels by producing weakly soluble calcium carbonate. During respiration and decomposition, plants and animals consume oxygen and

release carbon dioxide increasing the alkalinity by bringing back lost carbonates in the form of calcium bicarbonate. Carbon dioxide that is released can again be used by aquatic plants to produce oxygen.

The production and use of oxygen in aquatic environments must remain balanced to insure that the supply of oxygen is not diminished. An overly productive body of water can increase production of organisms to the point where dense areas of aquatic plants develop, depleting the supply of dissolved oxygen in the water.

pH

The pH, or positive concentration of hydrogen ions, is an indication of the alkalinity or acidity of a water body. A pH above 7.0 is considered to be alkaline, although most lake waters in the alkaline class have a range from pH 7.6 to 9.0. A pH below 7.0 is considered to be acidic. Each whole number on the scale above or below 7.0 represents a concentration 10 times the previous level.

Chemical conditions are satisfactory for all species present in the lake. The most recent bacteriological analysis performed on water samples taken from Lincoln Pond were on August 16, 1977. The results are listed below:

Date: 8/16/77 Weather: Partly cloudy, calm, light rain.

Time	Depth	Air Temp.	H_2O Temp.	Alkalinity MO p.p.m.	Dissloved O_2 p.p.m.	CO_2 p.p.m.	pH level
12:00 noon	surface	73°	71°	- - -	7.0	- - -	7.0
12:15 a.m.	5'	73°	70°	- - -	- - -	- - -	- - -
12:30 p.m.	10'	73°	70°	- - -	- - -	- - -	- -
12:45 p.m.	15'	73°	70°	- - -	- - -	- - -	- -
1:00 p.m.	20'	73°	70°	- - -	7.0	- - -	7.0
1:15 p.m.	25'	73°	64°	- - -	6.0	- - -	6.5

East Basin

Time	Depth	Air Temp.	H_2O Temp.	Alkalinity MO. p.p.m.	Dissolved O_2 p.p.m.	CO_2 p.p.m	pH level
2:00 p.m.	surface	73°	71°	- - -	7.0	- - -	6.9
2:05 p.m.	5'	73°	71°	- - -	- - -	- - -	- -
2:10 p.m.	10'	73°	71°	- - -	- - -	- - -	- -
2:15 p.m.	15'	72°	70°	- - -	- - -	- - -	- -

There have been other chemical analyses performed on water samples taken in previous years, such as 5/17/76, 7/31/74, and 7/1/71. In each study samples were taken from different depths in the pond with the following analyses: Dissolved oxygen (O_2) ran from 6.6 to 11 ppm. Carbon dioxide (Co_2) ran from .5 to 10.0 ppm, the alkalinity test using methyl orange dye ranged from 12 to 14 ppm, the pH ranged from 6.9 to 7.2.

This shows that Lincoln Pond is not a very fertile lake. More fertile waters often show alkalinity levels of 50 to 100 ppm with some as high as 200 ppm.

Acid Precipitation

The problem of "acid rain" and snow has had a tremendous impact on lake areas in the Adirondack region. Twenty-five percent of the cold water fishing in the Adirondacks has been destroyed by increasing lake acidity according to Department of Environmental Conservation estimates. This is continuing as more lakes are affected by acids in rain and snow. The consequences for the Adirondack recreational economy, already suffering from high unemployment, are serious, with potential losses of $15 million a year according to some estimates.

Adirondack lakes showing the greatest effect of acid precipitation are concentrated at higher elevations - over 2,500 feet - and along the western fringes of the Adirondack region. Since Lincoln Pond lies at an elevation of only 1031 feet, the severity of acid precipitation will not be as great as on lakes in higher elevations.

The acids originate as sulfuric and nitric oxides which are converted into acids by atmospheric processes which are not well understood. The sulfuric and nitric oxides are produced by fossil fuel combustion as well as natural sources. Power plants, smelters and automobile exhaust emissions are believed to be significant sources of sulfuric and nitric oxides. The use of tall stacks to relieve local pollution problems in the midwestern and northeastern regions appears to have resulted in the discharging of oxides into higher atmospheric circulation levels where they are transported long distances before being washed out as acid precipitation.

The Adirondack region, with over 2,300 lake areas, is most sensitive to acid precipitation. Its lake areas are characterized, in general, by thin soils and rocks resistant to chemical reactions, which reduces the natural capacity to neutralize acid precipitation. A survey of Adirondack lakes in 1975 revealed that more than half (52%) of the lakes were acidified to levels known to be critical for

fish survival (less than pH 5) and 82% of these acid lakes were found to be completely devoid of fish life.

Not only do fish face the hazards of acid water, they al · may be subjected to aluminum poisoning from acid snow melt runoff. Nitric acids accumulate in the snowpack during the winter months which quickly leaches out in concentrated amounts during the first major spring thaw. The nitric acid releases abnormal amounts of aluminum from the soil which poisons the fish. Lakes with higher pH levels and better fish populations do not have the capacity to neutralize concentrations of aluminum and are more affected than acidified waters that can neutralize the aluminum.[3]

In addition to fish losses, other forms of aquatic life are affected. The larger aquatic plants decline; green algae and fungal growths increase. Snails, insects and other organisms also decline or disappear. Frogs and salamanders have been threatened. Any drastic changes in the population of these organisms could have repercussions throughout the entire ecosystem.

Other effects of acid precipitation have been documented. There has been a 75% acceleration in rock weathering rates, increasing the rate at which the natural residues from this process enter streams and lakes. The corrosion of pipes in water supply systems is also increasing. As a result, levels of lead, copper and cadmium may exceed public health standards in some water systems.

Steps are now being taken to remedy the harmful effects of acid precipitation. The application of lime to acidic lakes has had significant success in raising the pH levels, although the amount of lime needed and difficulties in transporting it to remote lakes has not proven to be an ecologically or economically sound approach to dealing with this extensive problem.

In Sweden liming has encountered another problem, when chemical reactions resulting from the liming caused the release of toxic amounts of mercury. Evidence of this has not been found in the Adirondacks, perhaps due to differences in physical characteristics.

Development of acid-resistant fish strains is also being attempted. It has been found that some fish have greater resistance to acidity than others. By selecting those which exhibit the greatest resistance, it might be possible to restore and maintain fisheries in acidified regions of the Adirondacks.

Control of emissions sources responsible for acid precipitation will presumably require federal action, as the emissions are transported for great distances. The U.S. Department of Energy has recognized the problem and its relationship to the national energy program, and has begun a long-term atmospheric pollution research program with a national air monitoring network to obtain data. Sites in New York State for this sampling network are Cornell University, Whiteface Mountain and Brookhaven Laboratory on Long Island.

Aquatic Vegetation

Aquatic vegetation has been somewhat of a nuisance to the residents on Lincoln Pond for a number of years.

Aquatic plants, like other living things, require certain environmental conditions for growth and survival. Light, depth of water, water temperature, current, sediment type and the chemical status of the water all affect the growth of aquatic vegetation.

Possibly the most critical environmental factor affecting aquatic plant growth is nutrient supply. Excessive amounts of nutrients have been identified as the major cause of deteriorating water quality in lakes, ponds and streams.

Most sources of nutrients in lake areas can be traced to human activities. Inadequately treated sewage from improperly installed or maintained septic tank/leach field systems is the primary source of nutrients in lakes similar to Lincoln Pond. The destruction of natural shoreline vegetation or the excessive use of lawn fertilizers also increases the nutrient enrichment of a lake. Once the nutrient supply is controlled or kept to a minimum, the accelerated production of algae and other aquatic plants can be reversed.

Plant Types

Identifying the different types of vegetation in a lake area is an important first step in any program of aquatic vegetative control. Once identified, emphasis must be placed on controlling, not eradicating problem vegetation. A loss of one type of plant species from control measures could lead to the introduction or spread of a more troublesome species.

Aquatic plants belong basically to two groups: algae and vascular plants.

Algae are the most common and widely distributed of all aquatic plants. Nearly all waters contain many species of the three basic types of algae: plankton algae, filamentous algae and macroscopic algae. (see illustration)

Vascular or flowering plants, are the most conspicuous and troublesome aquatic plants. These plant types vary in size and shape and have characteristics similar to other plants. Vascular plants usually are divided into three categories based on their growth characteristics: submergents, floaters, and emergents. (see illustration)

The most troublesome aquatic plants found in Lincoln Pond are two species of submergent vegetation: Largeleaf pondweed (Potamogeton amplifolius), American elodea (Elodea canadensis) and waterlilies (Nymphaea sp.)

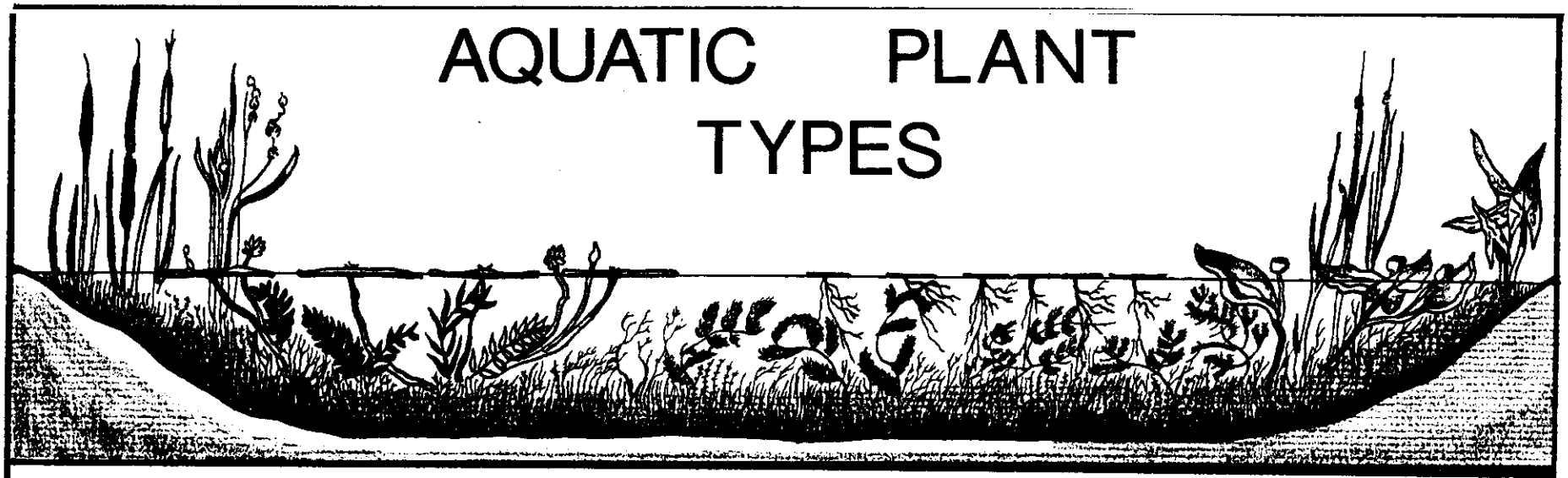
These submerged plants can be found in varing densities in Lincoln Pond.

The stems and leaves of the pondweed and elodea seldom appear above the water, although the tips of the plants do protrude a shore distance above the surface to pollinate. After pollination, the flowers and stalks may withdraw below the surface of the water where the fruits mature.

Control Methods

There are a number of methods to control aquatic vegetation. It is a proven fact that excessive amounts of nutrients have caused an in the growth of aquatic vegetation. Therefore, decreasing the nutrient supply will have a control effect on the growth of aquatic vegetation.

AQUATIC PLANT TYPES

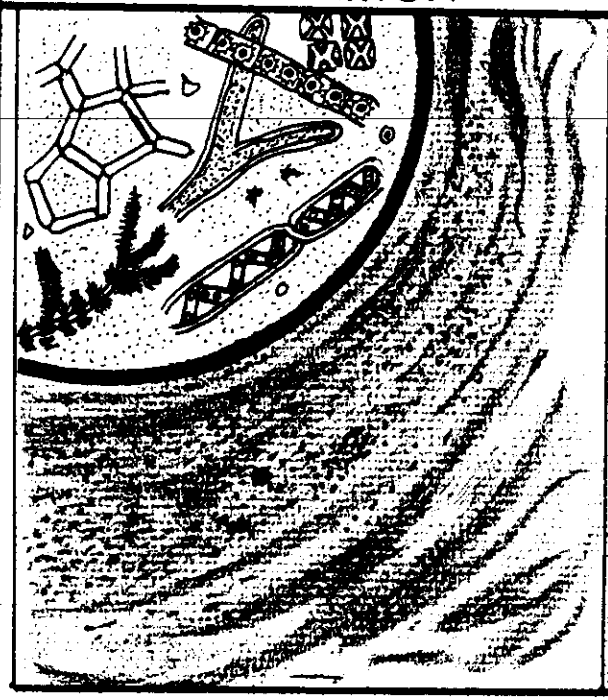


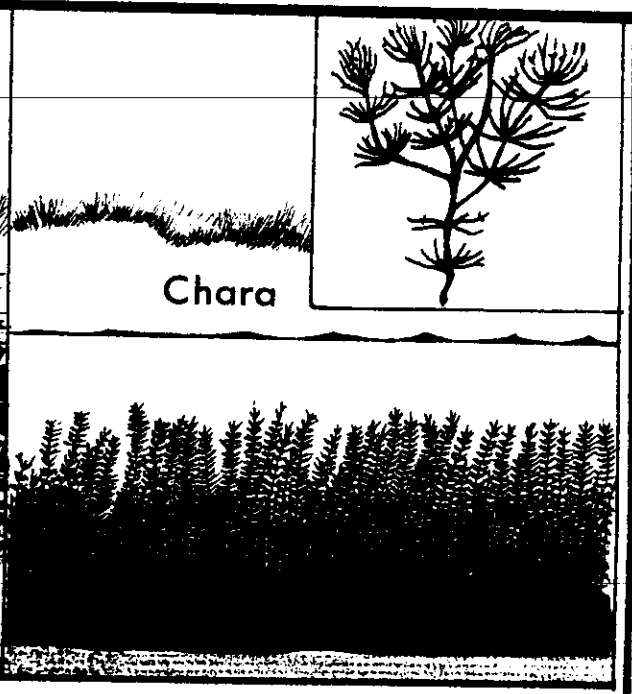
ALGAE

PLANKTON

FILAMENTOUS

MACROSCOPIC





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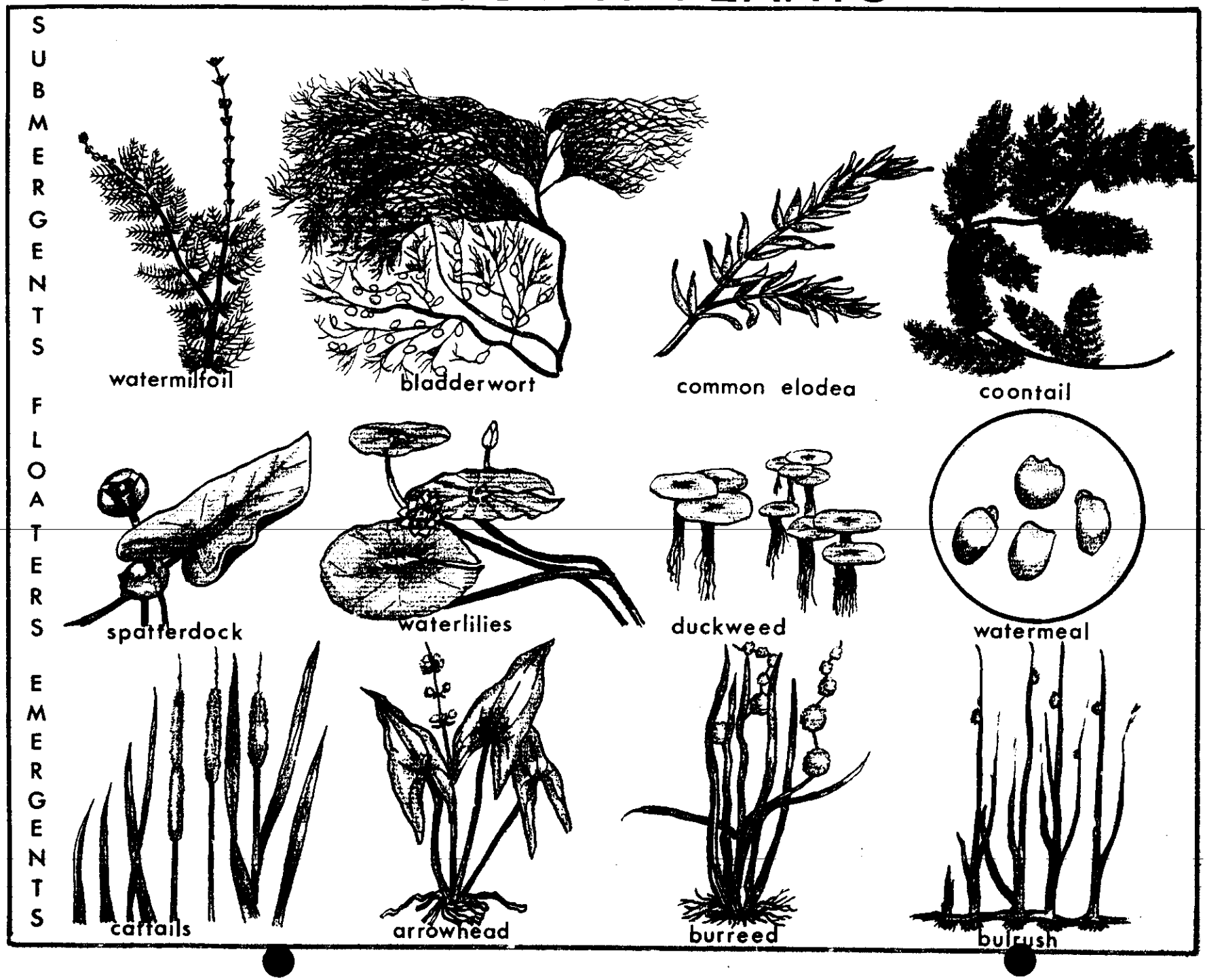
VASCULAR PLANTS

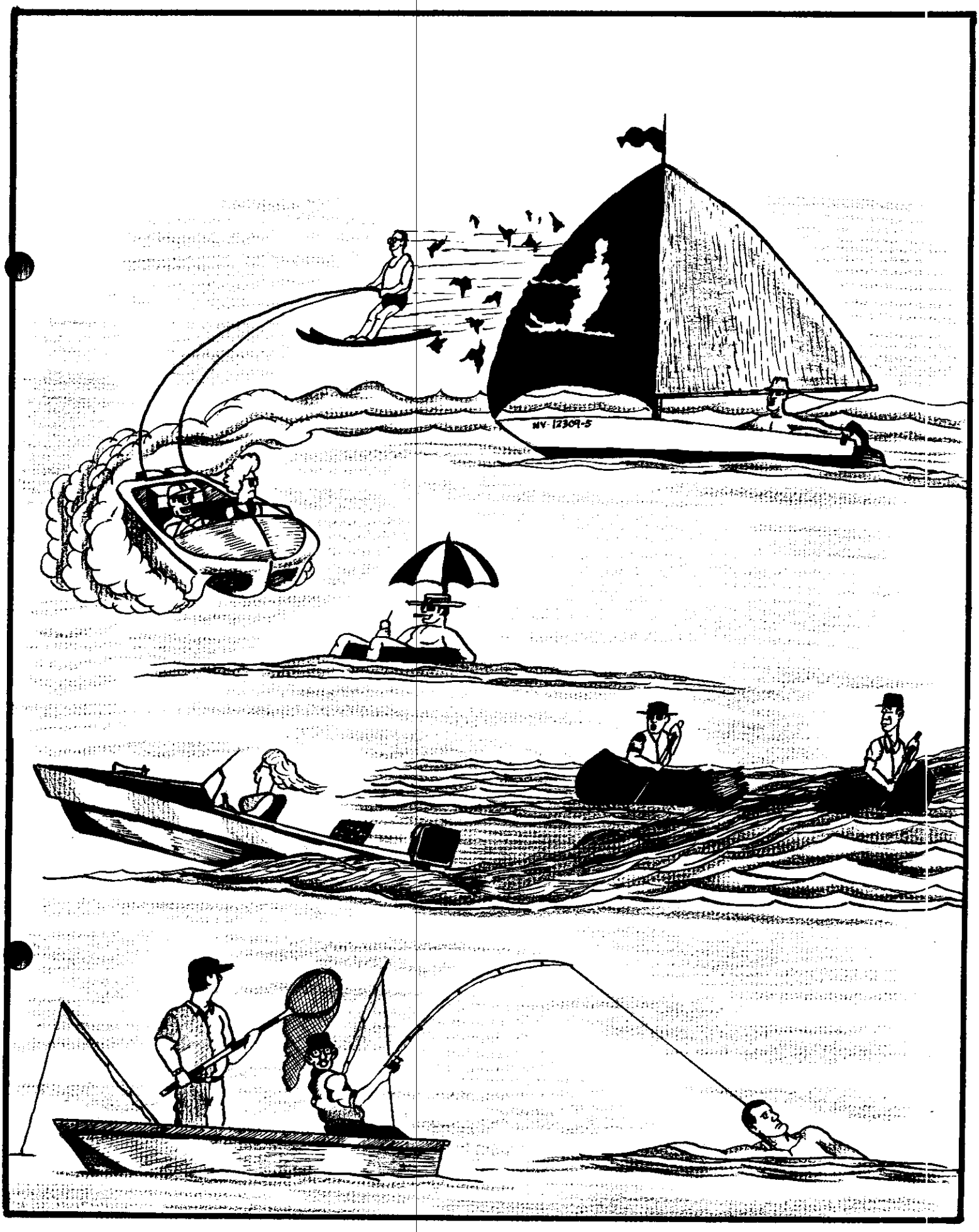


Another method of control is the physical removal of the vegetation. This can be done by several methods: (1) cutting; (2) raking; (3) pulling or (4) dragging a chain or bar through the water to detach the vegetation from the bottom. The most important part of this method is the clean-up afterward. It is essential that cut weeds be picked up and removed from the water since some species can resprout from a broken segment and form a new plant.

Another method is the chemical control method. With this method a number of limiting factors occur, swimming is interrupted, fish may not be edible for a period of time, or the chemical could be toxic to fish altogether. The chemical control does not have a lasting effect or carry over and if too much is used the results could produce a deficiency elsewhere in the system.

There are other techniques such as dredging, shading with black vinyl, or lowering of the water level at specific times of the year to control aquatic vegetation.

Whatever method is used on the aquatic vegetation the emphasis should be "control" not "eradication" of the vegetation. Some vegetation is a must in the lake.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VIII. Property Owner's Survey

The study of any lake would be incomplete without the input of the people who benefit from its variety of uses. The rationale behind a Comprehensive Water Management Plan is to determine the needs and concerns of the lake community, and to attempt to find reasonable standards for present and future enjoyment of the diversified activities lakes offer their users.

This section analyzes the people of Lincoln Pond and how they "use" or "misuse" the lake. More specifically, it identifies some of the characteristics of permanent and seasonal residents and their use of the lake, and what they consider present and future problems and concerns to be.

Study Procedure

The survey used for the Lincoln Pond study was basically the same as that used for the other study lakes in the RC&D area. The similarity would provide for an overview of some continuity when studying various lakes in the Adirondacks.

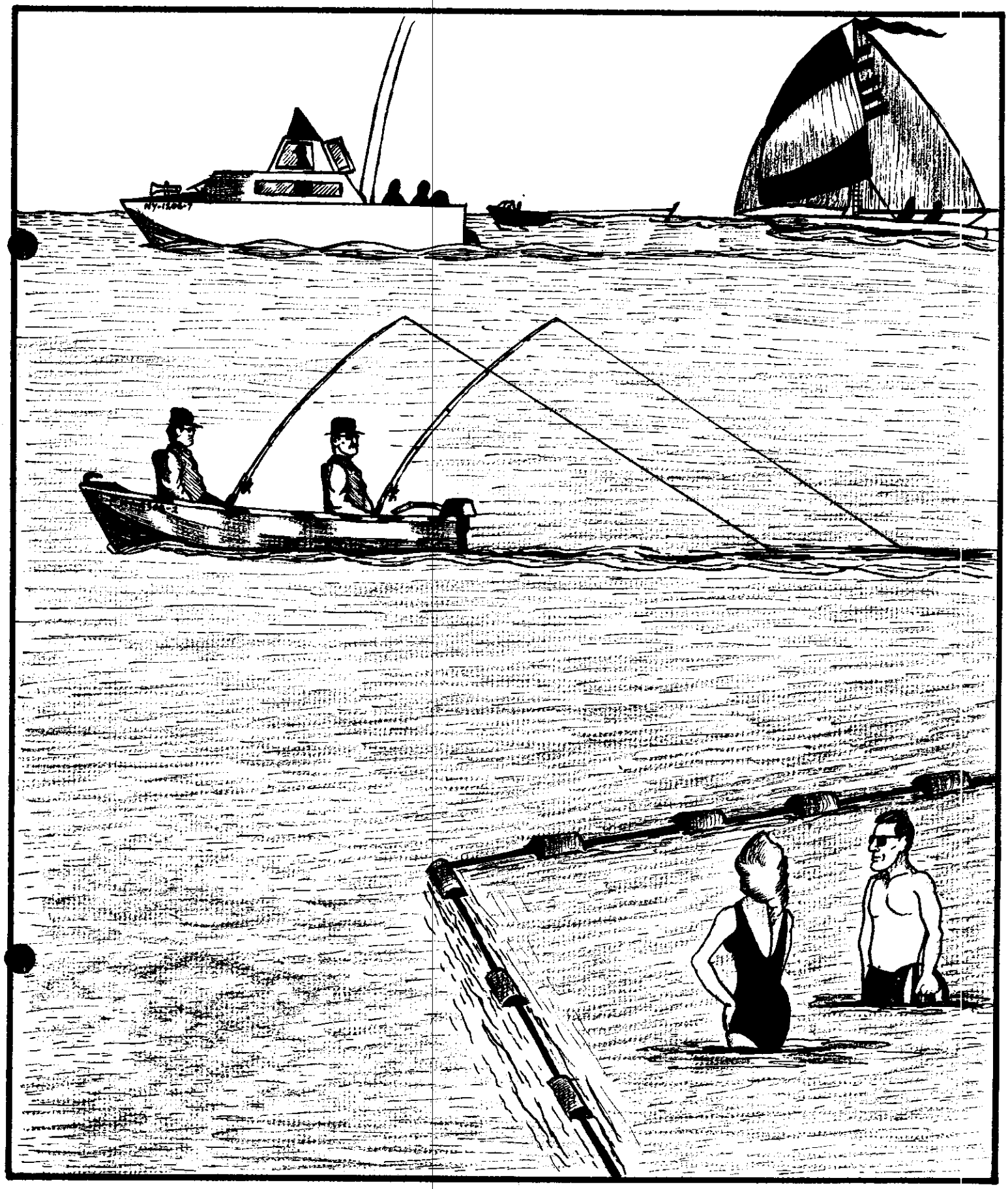
A list of property owners was compiled with the assistance of the Lincoln Pond Association that included all residents on the lake. Lake Association Directors through meetings and personal contacts alerted property owners about the study. Personal interviews were made with fifty-six residents in July 1978. Individuals not personally contacted were mailed a survey form. A total of 65 surveys were used in compiling this section of the report.

STUDY RESULTS

SECTION I - Physical Data

Property Ownership

All but two of the respondents indicated they owned property on Lincoln Pond. Of the 65 persons interviewed, 63 indicated they owned property. The two non-property owners rented cottages on the pond for periods of two and four weeks out of the year.



Four property owners indicated they rented out their cottage (or cottages) for periods of four, six, eight and eleven weeks throughout the course of the year.

Eighty-six percent (56) of those interviewed indicated there was only one cottage on the property while 14 percent (9) indicated there was more than one.

Residence

Residents on Lincoln Pond were asked to best describe the type of structure on their property. Eighty-one percent (53) indicated their residence was a seasonal cottage (used mostly during the summer months); six percent (4) considered their residences year-round; five percent (3) described their residence as a campsite; five percent (3) said their property was a vacant lot; and three percent (2) lived in mobile homes.

Residents were asked if they planned any major physical construction on their land within the next five years, or if they planned to subdivide their property. Only five responded that construction was planned, and only one individual planned to subdivide the property, probably within a year's time.

Lake residents were then asked how often they use their property each year. The majority indicated they lived, at Lincoln Pond, for three or more months a year (see Table 1).

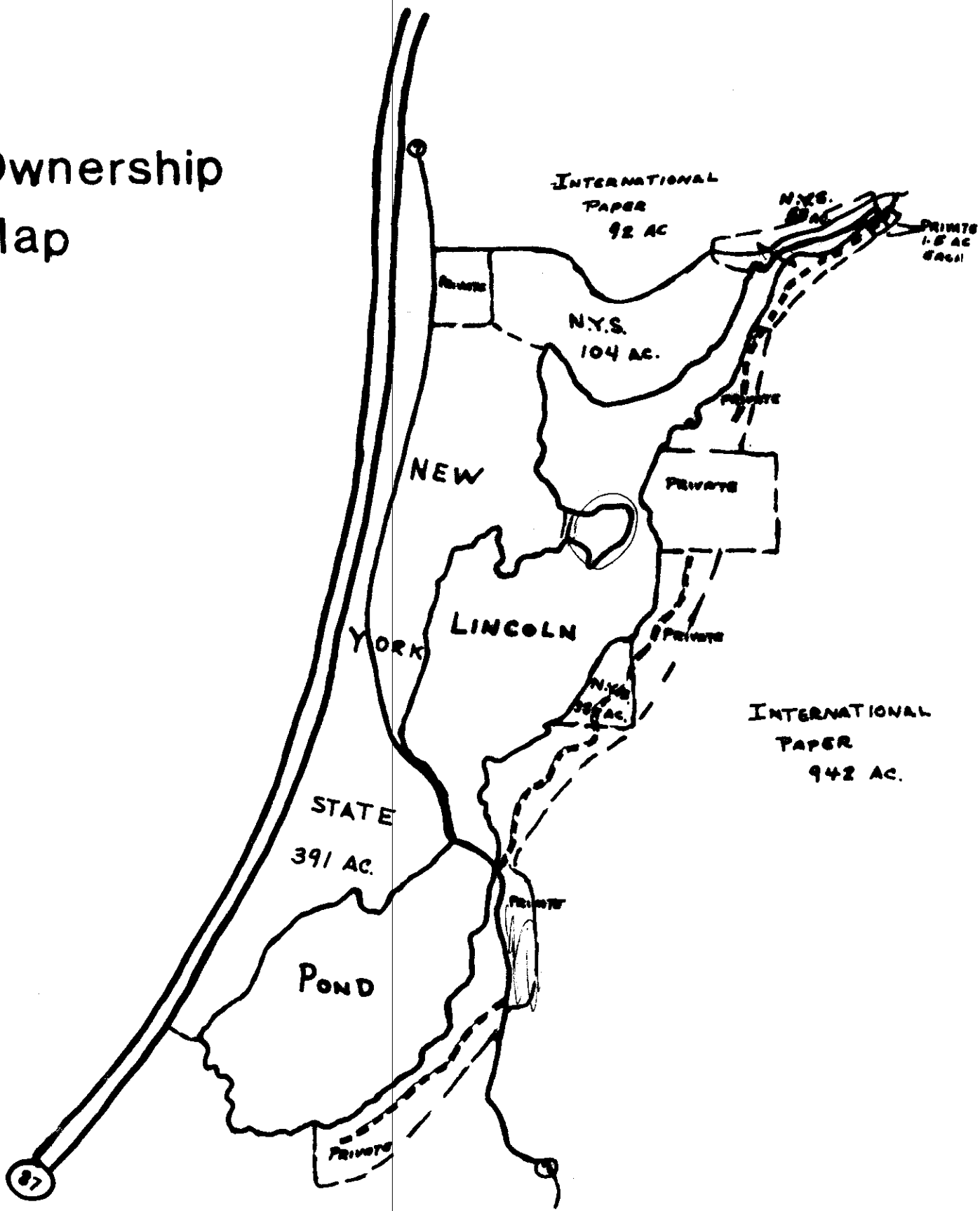
Table 1

Extent of Property Use

Length of Stay	No. of Responses	Percentage
Three months	14	22
*More than 3 months	12	19
*Weekends	11	17
Two Months	8	12
Year-Round	6	9
One Month	5	7
One or Two Weeks	4	6
Not at all	2	5
No Response	3	3
TOTAL	65	100

*See next page

Ownership Map



*Of those who indicated they spent weekends at the lake, the majority came from 6 to 10 weekends out of the year. Those spending more than three months, usually stayed at Lincoln Pond up to six months.

There is a total of 81 landowners, excluding New York State and International Paper Company around Lincoln Pond. Of these 55% (or 45 landowners) resided outside of Essex County. These non-resident landowners own a total of 7,452 feet of shoreline.

New York State owns 586 acres adjacent to or around Lincoln Pond. This acreage involves 26,255 feet of shoreline.

International Paper Company owns 1,285 acres in the area of Lincoln Pond. International Paper land borders the lake in two places only. The first is the land adjacent to the south end of the lake and then by a small strip on the northeast side of the north portion of the lake. International Paper owns approximately 3,584 feet of shoreline.

Shoreline Characteristics

Of the 60 residents indicating they owned shoreline, 28% (17) owned from between 50 and 100 feet. The majority of other residents owned from between 100 and 200 feet (see Table 4).

Three individuals did not own shoreline, but all answered they had lake access other than through the state-owned public beach.

Sixty-five percent (37) of those owning shoreline had not developed any of their shoreline into lawn. Thirty-five percent (20) noted that some of their shoreline had been developed. Most developed 100 feet or less into lawn.

Amounts of shoreline left in its "natural" state varied. Most indicated that 100 feet or less had been left natural. (see Table 2) (Page 43a).

Table 2

Amount of Shoreline Owned, Developed and Left Natural

Feet of Shoreline	Number of Respondents Owned	Developed	Natural
0	3	37	4
Less than 50	6	6	10
50 to 100	17	10	11
101 to 150	11	2	9
151 to 200	11	0	9
201 to 250	2	2	2
251 to 300	6	0	3
301 or more	7	0	4
No Response	2	8	13
Total	65	65	65

Waterfront Buildings

Only 25% (16) of those questioned indicated there were waterfront buildings on the property. Sixty-nine percent (45) had no buildings on the waterfront, and 6% (4) gave no indication either way. The majority of lake front buildings were cottages. However, other buildings such as sheds, boathouses and airplane hangar were also included as waterfront buildings.

Shoreline Permits

Residents were asked if they had ever applied for or obtained a shoreline work permit. Only one individual noted that a permit for shoreline work was obtained. No one who had ever applied for a permit had been turned down.

Lake residents were asked to describe the types of work needed on their shoreline. Eleven responded that repairs were needed due to erosion; five said rock walls needed fixing; two explained that a clean-up of the shoreline area was in order; one remarked that general improvements were necessary; and one other said dock repairs had to be made.

Drinking Water

The majority of residents obtain their drinking water from a fresh water spring. A considerable number also bring water from town for consumptive purposes. (see Table 3)

Table 3

Drinking Water

Source	No. of Respondents	% of Respondents
Spring	38	56
Brought from Town	21	32
Driven Well	2	3
Drilled Well	2	3
Dug Well	2	3
From the Lake	2	3
Total	65	100

Lake Water Use

Lake residents did indicate they used lake water for a variety of non-consumptive purposes. Of the 50 responses, 44% (22) indicated the lake water was used mainly to flush toilets, 26% (13) used the lake water as tap water for non-drinking purposes; and 22% (11) indicated the lake water was used in bathtub and/or shower.

Sewage System

The majority of residents indicated they used a septic tank and tile field as a means of sewage disposal. Sixty-two percent (40) used a septic tank and tile field, 20% (13) used outhouses, 6% (4) had installed a septic tank and dry well, while 3% (2) used a cesspool. Another 9% (6) did not answer this particular question.

Most residents noted that septic tanks were cleaned within the last three years, although a considerable number indicated that their tanks had never been cleaned. Leach fields, for the most part, were located between 51 and 75 feet from the lake.

SECTION II: Present Use of the Lake and Surrounding Area

In order to obtain an indication of the types of activities relating to lake use and the extent of use, those interviewed were asked to estimate the person days of use for various activities. Person days of use were estimated by multiplying the days of use for that activity by the number of people participating in the activity. Both summer and winter use activities of the lake were considered.

Most of the summer use activity centered around swimming, boating and fishing. A breakdown of the various person days shows most of the activities to be less than 100 days (see Table 4).

Table 4

Person Days for Summer Activities

	No. of Respondents					
Person Days	Swimming	Fishing	Row Boating	Power Boating	Canoeing	Sailing
Less than 50	13	14	12	7	4	3
50 to 100	6	6	7	9	4	4
101 to 150	5	7	2	4	2	1
151 to 200	4	2	3	0	1	0
201 to 300	7	2	1	3	0	0
301 to 400	1	1	0	2	0	0
401 to 500	2	0	0	1	0	0
501 or more	6	1	2	0	0	0
Total	44	33	27	26	11	8

Much of the winter activity centered around snowmobiling and skating. Most of the activities fell in the range of 10 to 20 person days. (see Table 5)

Table 5

Person Days for Winter Activities

Person Days	Snowmobiling	Skating	Cross Country Skiing	Ice Fishing	Seaplane Use
Less than 10	0	0	0	0	0
10 to 20	2	2	3	1	1
21 to 30	1	1	0	1	0
31 to 40	1	0	0	0	0
41 to 50	1	0	0	0	0
51 and over	1	1	0	0	0
Total	6	4	3	2	1

The total number of person days for all activities amounted to 24,453, as indicated by 165 responses for an average of 148 days per respondent (see Table 6).

The majority of person days occurred for summer activities, the time when most residents use their property most frequently. Thus, summer activities, which totaled 23,680, accounted for 97% of all person days.

Table 6

Total Person Days and

Number of Responses by Activity

Activity	Total Person Days	Person Days Range	Number Respondents	Average Use/Respondent
Swimming	11,190	10-2,016	44	254
Row Boating	4,222	2-1,680	27	156
Fishing	3,356	4- 630	33	102
Power Boating	3,251	2- 450	26	125
Canoeing	1,219	4- 200	11	111
Snowmobiling	555	15- 400	6	93
Sailing	442	4- 120	8	55
Skating	125	10- 70	4	31
Ice Fishing	50	20- 30	2	25
Cross Country Skiing	23	5- 12	3	8
Seaplane Usage	20	- - -	1	20
Total	24,453		165	148

The majority of lake users participated in five or more lake-related activities (see Table 7)

Table 7

Number of Activities Participated In

No. of Different Activities	No. of Respondents	% of Respondents
1 Activity	2	3
2 Activities	8	12
3 Activities	10	16
4 Activities	8	12
5 or More Activities	20	31
No Activities listed	17	26
Total	65	100

Fishing

Lincoln Pond appears to offer the angler a variety of warm-water game fish. Fishermen around the lake indicated that bass and pike were the top target species, although perch and bullhead were also often sought. When asked what species of fish they would like stocked, residents again favored more pike and bass. (see Table 8)

Table 8
Fish Species Survey

Species	No. of Responses Fished For	Prefer Stocked
Bass	32	35
Pike	21	24
Perch	12	3
Bullhead	11	2
Sunfish	2	--
Walleye	1	9
Trout	1	6
Anything that bites	12	--
Pickerel	--	1

Fishermen were also questioned about any noticeable changes in the size or amount of fish caught over the years. Of the 43 residents who responded to this question, 84% (36) felt there had been a change and 16% (7) had not noticed any. Most of those who had noticed a change felt that fishing on the whole had deteriorated over the years on Lincoln Pond.

Pond residents were closely divided on whether or not they would be willing to pay to stock the lake. Thirty-one percent (20) said "no" they would not be willing to pay to stock the lake, and 29% (19) said "yes" they would. Forty percent (26) did not respond to the question.

Economic Contributions

In an effort to obtain some indication of the money spent annually, those interviewed were asked to estimate amounts for various categories. Accurate figures for each category are hard to obtain as most people do not keep such records and often the amount indicated may be for the current year or that of the previous season.

It must be noted that the response to this question could affect any inferences made regarding the economic contributions of residents to the local economy. The most responsive question was only answered by 54% of the residents, while the least responsive question was answered by only 5% of those questioned.

A total of $49,474 was spent by residents for all twelve categories listed (see Table 9)

Table 9

Annual Expenditures in Dollars

Category	Total Dollars Spent	Range of Dollars	No. of Respondents
Food; at grocery	18,970	50-6,500	34
Building & Construction Materials	6,870	20-1,100	32
Utilities	6,115	15- 700	35
Food; at restaurant	5,365	10-3,800	16
Automotive (gas, oil, repairs)	4,685	25-1,850	23
Recreational Supplies (fuel, preservers, etc.)	2,090	10- 500	17
Clothing Stores	1,490	50- 500	7
Entertainment (movies, music, bars)	1,280	5- 500	10
Hired Labor	1,065	5- 300	9
Miscellaneous	930	10- 500	8
Motels for Guests	380	30- 300	3
Laundromat	234	4- 100	7
Total	49,474		

Expenditures for food at local grocery stores represented the largest category expenditure for residents, accounting for $18,970 or 38% of the total.

Guests and relatives of property owners also contribute to the local economy. They spend money on nearly all items except probably labor, utilities and building and construction materials. These dollars, along with those spent by other seasonal and permanent property owners and tourists all contribute to the economy and employment of the surrounding communities.

Travel Distance

Thirty-seven percent (24) of the residents on Lincoln Pond have permanent dwellings less than 10 miles from the lake. Only 12 responded that they commute to work, most traveling a distance of less than 10 miles.

Aquatic Vegetation

Residents were again evenly divided on whether or not they considered aquatic vegetation or "water weeds" a problem. Forty-two percent (27) said "yes" they were a problem and 42 percent (27) said "no" they were not. Sixteen percent (11) did not indicate either way.

Of the 27 who considered the weeds a problem, 67 percent (18) favored mechanical treatments, 15 percent (4) favored chemical treatments and 18 percent (5) did not favor any treatment whatsoever.

SECTION III

Problems and Needs

Those contacted were asked to give their opinion about various aspects of control or management of lake-related functions and activities. Since no one really "likes" to be controlled, answers to various questions regarding controls will vary with the respondent's perception of that control. Thus, individual answers have to be weighed separately, but collectively answers may give some indication of support for or against the control or managemnt aspect under consideration.

Because of the number of questions asked, the opinions residents expressed were grouped according to the amount of support each received. The percentage of support may be misleading in some instances because of the high percentage of residents that had "no opinion" regarding the control or management in question. What needs to be considered is the percentage of responses in "favor" of the proposed measure, as compared to the percentage of those who expressed a negative response.

Table 10

Measures Receiving 75% or More Support

Measure	% For	% Against	% No Opinion	Total
Regulating Disposal of garbage; trash	86	5	9	100%
Regulating Visual Pollution (junk cars, trash, etc.)	86	8	6	100%
Dye Test of camps along the lake	75	3	22	100%

Table 10 represents those measures that received support from three-quarters or more of the residents around the lake. These controls received support from more people than any other measures, although they are not necessarily the issues that concern most people.

Table II

Measures Receiving 74% to 50% Support

Measure	% For	% Against	% No Opinion	Total
Regulating Speed Boat distance from shoreline	71	15	14	100%
Present NYS Public day use area	62	11	27	100%
Present NYS public over-night campsite area	62	14	24	100%
Regulating roadside parking after dark	62	15	23	100%
Mechanical cutting of weeds	57	17	26	100%
Regulating boat speed	57	25	18	100%
Dropping Lake level to harvest weeds	55	25	20	100%
Regulating Motor size	55	26	19	100%
Regulating Pets (wandering dogs, barking)	54	29	17	100%
Regulating roadside parking during daylight	51	28	21	100%

Table II illustrates the support that over half the residents gave to specific control or management practices.

Table 12

Measures Receiving 49% to 25% Support

Measure	% For	% Against	% No Opinion	Total
Regulating end of roads parking	48	21	31	100%
Regulating swimming off bridge area	48	33	19	100%
Regulating open fires	48	37	15	100%
Raising level of bridge to row boat height	46	20	34	100%
Regulating music volume	46	32	22	100%
Raising level of bridge at all	45	35	20	100%
Control of lake use by property owners (Lake Association)	45	40	15	100%
Control of motor bikes	40	37	23	100%
Control of Shoreline Dev.	38	35	27	100%
Permits for altering shoreline	38	40	22	100%
Management Plan for lake	35	28	37	100%
Raising level of bridge to motor boat height	31	42	27	100%
Proposed public boat launching site	28	52	20	100%

Table 12 Continued

Measure	% For	% Against	% No Opinion	Total
Control of snowmobiles on the lake	25	42	33	100%
Time zoning for motor boats	25	49	26	100%

Table 12 gives an indication of the support for control or management measures given by 49% to 25% of those questioned. Only five of the 15 measures in this category did not receive more support "for" than "against" the measure.

Table 13

Measures Receiving Less than 25% Support

Measure	% For	% Against	% No Opinion	Total
Regulating party hours (quiet hours)	23	51	26	100%
Expanding NYS public use facilities	23	60	17	100%
Chemical control of weeds	17	54	29	100%
Control of lake use by town government	11	75	14	100%
Time zoning for sail boats	9	63	28	100%
Time zoning for fishing boats	9	66	25	100%
Control of lake use by state government	9	75	16	100%
Raising level of bridge to water skiing height	5	62	33	100%

Table 13 illustrates those measures that were favored by less than one quarter of Lincoln Pond residents. Although there were high percentages of "no Opinions" expressed, there appears to be little support for most of these.

Public Campground and Day Use Area

Forty-eight percent (31) of those questioned favored the fee charged for the public campground and day use area. Thirty-one percent (20) opposed the fee charge and 21% (14) did not respond to the question.

Only 34% (22) felt the fee charge served to keep people away; 25% (16) were not sure if it served that purpose and another 21% (14) said no it did not keep people away. Twenty percent (13) did not answer the question.

Water Quality

The majority (45%) of residents on Lincoln Pond had not noticed any change in the quality of the lake water in the last few years. Twenty-two percent (14) indicated some change; while 15% (10) noted moderate change and 3% (2) indicated extreme change in water quality.

Pollution Sources

Most residents indicated that pollution was evident at Lincoln Pond. Thirty-nine percent (25) said pollution was occurring at the lake, 29% (19) said there was no pollution and 32% (21) did not respond.

Lake residents were asked what they thought were the sources of pollution in the lake. Most felt that runoff from the Northway (I-87) and other roads contained salt and other nutrients that polluted the lake. Inefficient sewage systems were also thought to be a primary source of pollution. (see Table 14)

Table 14

Sources of Lake Pollution

Source	No. of Responses
Road Runoff	10
Sewage Systems	10
Motor Boats	7
Garbage	4
Detergents	3
Erosion	2
People	2

Lake Association

Of the 65 residents questioned, 51% (33) were members of the Lincoln Pond Association, 40% were non-members and 9% (6) did not respond to the question.

Residents were asked to list any accomplishments made by the lake association that they felt were good. Most comments centered on the general improvement of the lake area as a result of lake association efforts. Examples of some accomplishments made by the lake association included developing a good working relationship with local and regional agencies, attempts at controlling the water level and the water study analysis.

Residents were also asked for suggestions that might help the lake association continue to work for the improvement of the lake area. Their suggestions are contained in Table 15.

Table 15

Suggestions for the Lake Association

Suggestion	No. of Responses
Take action on lake-related problems (water quality, weeds, water levels, pollution)	6
Fix and Improve the roads	4
Keep property owners informed	4
Initiate fish stocking program	3
Lower speed limit - post signs	2
Number the camps	1
Strive for 100% membership of all property owners	1
Initiate fire protection and emergency squad	1

SECTION IV

Future Use of the Lake

Future Use

The residents were asked how they planned to "use" the lake in the future. The majority (39) responded that they would use the lake as a summer retirement, while three said they would use it as their year-round home. The remainder of those interviewed had other uses in mind such as vacations, weekend use or developing the property.

The majority of the residents have owned property on Lincoln Pond for twenty years or less. Over 80% of the property owners on the lake are over forty years of age.

Major Problems

Those questioned were asked to identify the three major problems facing them as a property owner. The maintenance of roads and taxes were of most concern to residents on Lincoln Pond. (see Table 16)

Table 16

Major Problems of Lincoln Pond Residents

Major Problem	No. of Responses
Road Maintenance	25
Taxes	12
Shoreline Problems	6
Poor Fishing Conditions	6
Weeds	6
Water Levels	4
Insects	3
Pollution of the Lake	3
Stumps	2
Littering - Trash and garbage	2
Problems with trespassers	2
Problems with campers	2
Spring water contamination	2
User conflicts	2
Speeding on the roads	2
Motor boats	2
Winter access to camp	2
Lack of enforcement of controls	1
APA	1
No mail deliveries	1
Lack of electricity	1
Fire and emergency protection	

SUMMARY AND CONCLUSIONS

- Summer use of the lake is considerably heavier than winter use.
- Summer lake use activities are primarily: swimming, boating and fishing.
- Most people participate in five or more recreational activities.
- Anglers on Lincoln Pond consider bass and pike the top target fish species.
- About 38% of the total money spent by residents goes for groceries at the local food stores.
- Management and controls of lake-related functions and activities were favored on the whole, although many people have not made up their minds about what to do.
- Most residents have seen no change in the lake water quality in the past few years.
- Major problems and concerns centered around the maintenance and improvement of roads and taxes.
- Survey results on Lincoln Pond seem to indicate that residents are concerned about the future of the lake but need to be educated about what courses of action to take. As pressures (natural resources, social and economic) tend to increase in the future, the need for all property owners to work collectively together will also increase.
- The lake association is an important link in working with property owners and others to provide future recreationists with a well-managed natural resource. Involvement of other organizations, agencies and local governments will be necessary to bring about a lake environment capable of providing satisfying recreational opportunities.

IX. Recommendations

The problems that exist on Lincoln Pond are very real and very serious. The scenic tranquility of the lake and surrounding countryside is one of the desired effects which the residents hope to maintain. Results from the Lincoln Pond Property Owner's Survey indicate that most of the residents are concerned about the future of the lake and they agree that they (the residents) need to be educated about what courses of action to take.

The research contained in this technical report is designed to give the reader a better understanding of a lake environment. It is also the basis for the formulation of a Comprehensive Water Management Plan.

This section of the report deals with some possible ways of coping with lake related problems that have arisen now, or ones that may surface at some time in the future.

Land Development

Many important considerations must be taken into account before additional development occurs in the lake area. The first and foremost consideration is whether additional development is desired by the lake community, and second, what effect will additional development have on the lake and the surrounding area. It is recommended that a study be made of areas surrounding Lincoln Pond with the results being the carrying capacity or the amount of additional development that can take place. The results of the study could lead to land-use planning by the Town and the Lake Association that would be more restrictive than those guidelines already in existence. These restrictions would help preserve the land and the quality of the water for future generations.

Lake Activity Conflicts

As the intensity of recreational use increases on Lincoln Pond, conflicts between the different users are bound to occur. Since the majority of residents are against zoning for activities involving the water resource, it is recommended that the Lake Association list the New York State rules and regulations pertaining to the operation of power boats on a notice to be given to all residents and guests on Lincoln Pond.

The best course of action would be to avoid conflict whenever possible. Courtesy and common sense on the part of all users of the lake would enable everyone to enjoy the lake without the imposition of regulations and without irritation, hazard and damage which can result from lake users conflicts.

Water Quality

Maintaining the quality of water in Lincoln Pond is vital to each and every user. The livelihood of the lake as well as its recreational usuage is dependent upon clean pure water.

The only imminent danger to the water quality appears to be coming from sewage systems and so called runoff from the Northway (I-87) and other roads that contain salt and other nutrients. It is recommended that the Lake Association identify all sources of nutrients, natural and man-made. Since natural resources can seldom be controlled, corrective action must be taken to control nutrient sources that are man-made. This would mean the development of a sanitary survey of every home, cottage and trailer that could have an influence on the water quality of the lake. This would also mean the taking of water samples from various locations on the lake at various times throughout the year and having them analyzed for nutrient content. This also means working with N.Y.S. DOT as well as county and town highway department on reducing runoff from the highways.

Aquatic Vegetation Control

Lincoln Pond is typical of many Adirondack lakes in that it is progressing toward being a eutrophic lake. How rapidly this process takes place depends on the action of the Lake Association. The growth of aquatic vegetation depends upon the amount of nutrients and sunlight available to these plants. If the supply of nutrients is reduced, that will have an effect on the growth of the plants. If the amount of sunlight available to the plants is reduced either by shading or mixing material with the water the plant growth will be reduced also. It is recommended that an aquatic vegetation control program be set up in those areas of greatest concern.

Lake Association and Local Government

The Lake Association plays a key role in the decision-making, problem-solving processes on Lincoln Pond. Problems, when brought to the attention of the Lake Association, can be more easily dealt with by the Association, rather than by the individual. Support and involvement in Lake Association functions and activities by local government is crucial. It is recommended that the Lake Association of Lincoln Pond work with the local government to develop this kind of relationship. The reason for this relationship is that the extent of problems are generally more complex than what the Lake Association can handle, therefore, local government and the Association must work together if the job is to be completed.

It is also recommended the Association work with the local fire company to improve the system of protection and rescue in the area.

It is also recommended the Lake Association develop a newsletter or a facsimile for its membership.

Use of Technical Report Results

This technical report is but one part of the total input needed to formulate a Comprehensive Lake Management Plan. These results, however, are important to lake property owners, to Lake Association members and directors, and to local and regional government.

The results can be used to determine future research and study needs and to help guide a future course of action in the management of Lincoln Pond.

FOOTNOTES

[1]Welch, Paul S., "Limnology", University of Michigan, McGraw-Hill Company, Inc., 1935

[2]Schofield, Carl L., "The Acid Precipitation Phenomenon and its Impact in the Adirondack Mountains of New York State," Department of Natural Resources, New York State College of Agriculture and Life Sciences, Cornell University, Ithaca, New York, 1978

[3]Raymond, Lyle L., "Acid Rain/Acid Snows: A Growing Problem," Center for Environmental Research, Cooperative Extension, Cornell University, Ithaca, New York, 1978

APPENDIX I

Some mammals indicated as possibly occurring in the Lincoln Pond Area.

Hairytailed Mole
Starnosed Mole
Masked Shrew
Smoky Shrew
Pigmy Shrew
Short-tailed Shrew
Little Brown Bat
Big Brown Bat
Eastern Pepistral
Silver-haired Bat
Hoary Bat
Bobcat
Black Bear
Raccoon
Fisher
Short-tailed weasel
Mink
Striped skunk
Otter
Red Fox
Grey Fox
Coyote
Woodchuck
Eastern Chipmunk
Red Squirrel
Grey Squirrel
Northern Flying Squirrel
Deer Mouse
White Footed Mouse
Meadow Vole
Pine Vole
House Mouse
Norway Rat
Woodland Jumping Mouse
Meadow Jumping Mouse
Muskrat
Beaver
Eastern Cottontail
Varying Hare
White-tail Deer

APPENDIX II

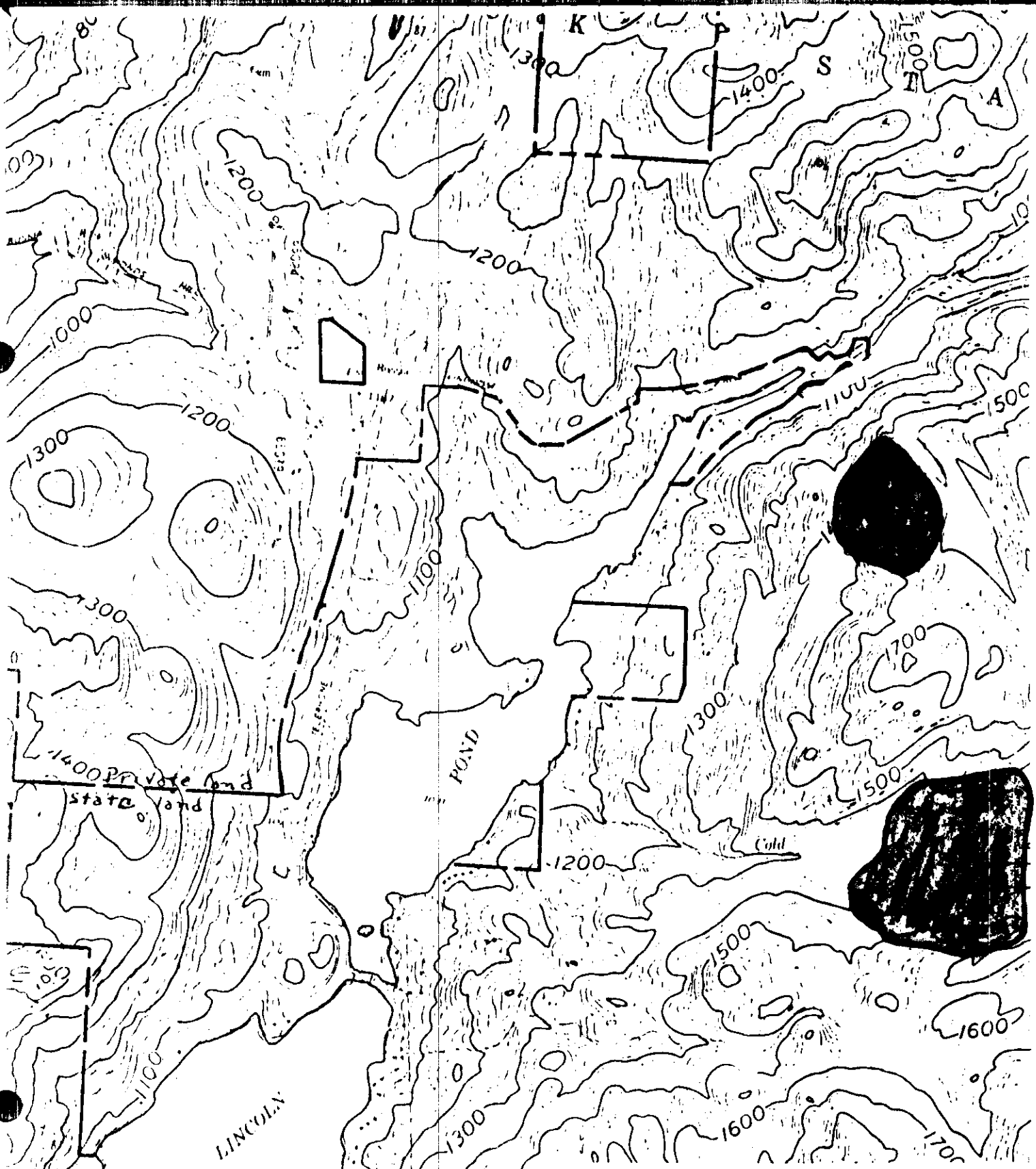
Some Avian species that may occur in the vicinity of Lincoln Pond.

Common Loon
Horned Grebe
Pie billed Grebe
Great Blue Heron
Green Heron
Cattle Egret
Black-crowned Night Heron
Least Bittern
American Bittern
Canada Goose
Brant
Snow Goose
Blue Goose
Mallard
Black Duck
Green Winged Teal
Blue Winged Teal
American Widgeon
Wood duck
Redhead
Ring-neck Duck
Canvasback
Greater Scaup
Lesser Scaup
Common Goldeneye
Bufflehead
Oldsqaw
Hooded Merganser
American Merganser
Red-breasted Merganser
Turkey Vulture
Goshawk
Sharp-shinned Hawk
Cooper's Hawk
Red-tailed Hawk
Broad-winged Hawk
Rough-legged Hawk
Pigeon Hawk
Sparrow Hawk
Osprey
Peregrine Falcon
Golden Eagle
Ruffed Grouse
Turkey
Common Gallinule
American Coot
Semipalmated Plover
Golden Plover
Killdeer
Woodcock
Common Snipe
Upland Plover
Spotted Sandpiper
Solitary Sandpiper
Greater Yellowlegs
Lesser Yellowlegs
Least Sandpiper
Great Black-backed Gull
Herring Gull
King-billed Gull
Common Tern
Black Tern
Mourning Dove
Yellow-billed Cuckoo
Black-billed Cuckoo
Barn Owl
Great Grey Owl
Screech Owl
Great Horned Owl
Barred Owl
Saw-whet Owl
Whip-poor-will
Common Nighthawk
Chimney Swift
Ruby throated Hummingbird
Belted Kingfisher
Yellow-shafted Flicker
Pileated Woodpecker
Yellow-bellied Sapsucker
Hairy Woodpecker
Downy Woodpecker
Eastern Kingbird
Crested Flycatcher
Eastern Phoebe
Eastern Wood Peewee
Tree Swallow
Bank Swallow
Barn Swallow
Rough-winged Swallow
Cliff Swallow
Purple Martin
Grey Jay
Blue Jay
Common Crow
Black-capped Chickadee
Tufted Titmouse
Red-breasted Nuthatch
Brown Creeper
House Wren
Catbird
Brown Thrasher
Robin
Wood Thrush
Hermit Thrush
Eastern Bluebird
Golden-crowned Kinglet
Ruby-crowned Kinglet
Cedar waxwing
Northern Shrike
Starling
Yellow-throated Vireo
Red-eyed Vireo
Black & White Warbler
Tennessee Warbler
Nashville Warbler
Parula Warbler
Yellow Warbler
Magnolia Warbler
Cape May Warbler
Myrtle Warbler
Chestnut-sided Warbler
Yellowthroat
Wilson's Warbler
Canada Warbler
Redstart
Ovenbird
House Sparrow
Redwinged blackbird
Rusty Blackbird
Baltimore Oriole
Bronzed Grackle
Cowbird
Scarlet Tanager
Evening Grosbeak
Common Redpoll
Pine Siskin
Red Crossbill
Pine Grossbeak
Purple Finch
Slate colored Junco
Vesper Sparrow
Tree Sparrow
Chipping Sparrow
Field Sparrow
White-crowned Sparrow
White-throated Sparrow
Fox Sparrow
Swamp Sparrow
Song Sparrow
Snow Bunting
Viery

APPENDIX III

Some reptiles and amphibians that may occur in the vicinity of Lincoln Pond.

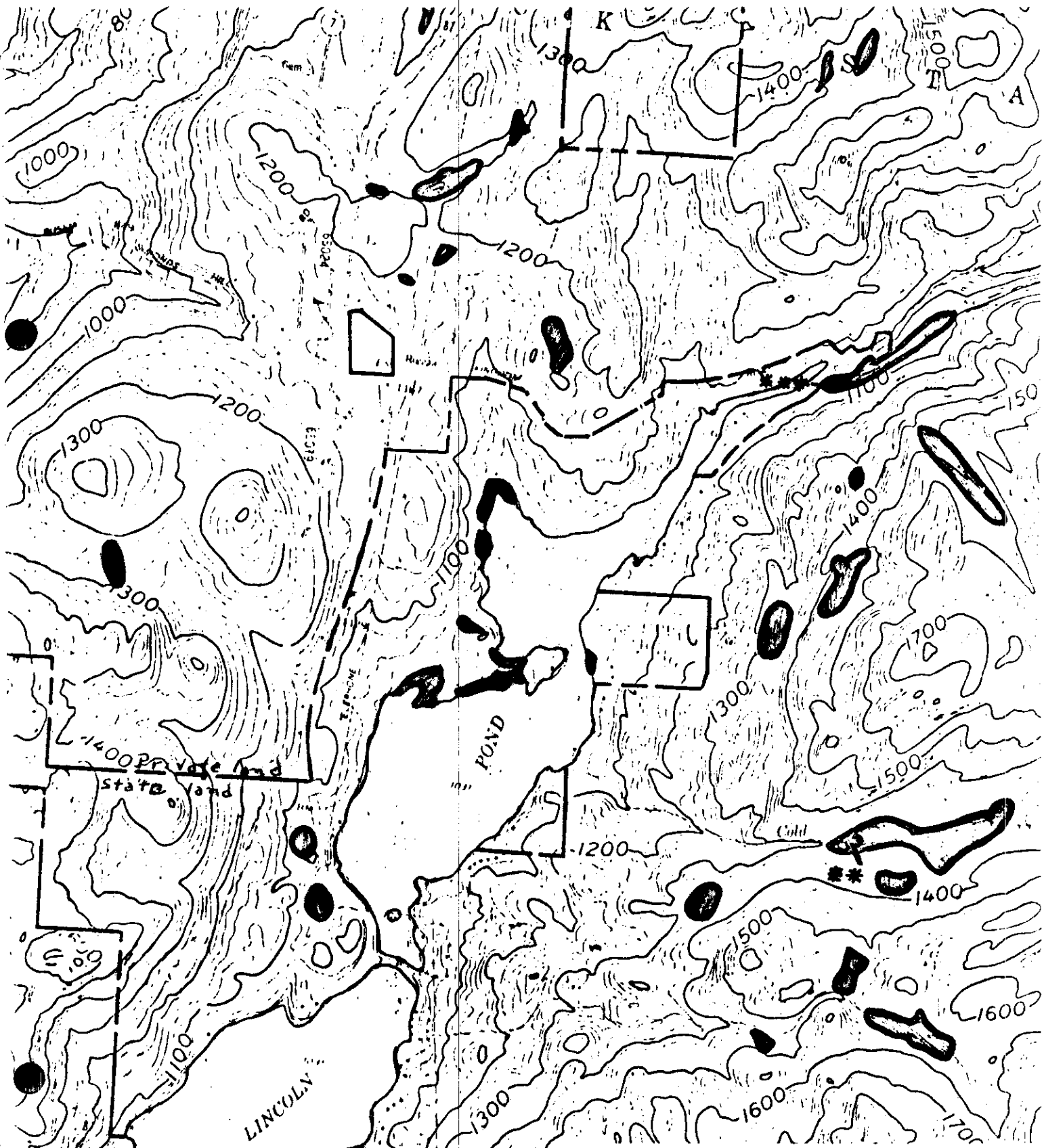
Snapping Turtle
Painted Turtle
Wood Turtle
Map Turtle
Red-bellied Snake
Brown (DeKay's) Snake
Eastern Water Snake
Smooth Green Snake
Garter Snake
Milk Snake
American Toad
Spring Peeper
Leopard Frog
Green Frog
Bull Frog
Red-spotted Newt
Spotted Salamander
Dusky Salamander
Red-backed Salamander
Spring Salamander
Two-lined Salamander



APPENDIX IV

Location of Deer Wintering Areas

Near Lincoln Pond



APPENDIX V

Lincoln Pond Wetland Areas

* Waterfowl Habitat
* * Beaver Meadows
* * * Woodcock Habitat

APPENDIX VI.

Soils of the Lincoln Pond Watershed

The soils of a region vary greatly from place to place, and the kinds of uses to which soils are best adapted change in relation to the soil characteristics. Therefore, there may be pockets of soils which differ from the soil mapped included within a mapping unit. As a result, specific uses require on-site inspections to determine the suitability of the soil.

Definition of Ratings

Slight: These soils have few or no limitations that restrict their use for selected community and agricultural purposes.

Moderate: These soils have limitations which reduce to some degree their desirability when used for selected community and agricultural purposes. These may require some corrective measures.

Severe: These soils have unfavorable soil properties that severely restrict their use and desirability for community and agricultural purposes. A severe rating does not mean the soil can not be used for a specific use. It does indicate problems during and after construction. Costs are usually greater than soils rated as slight or moderate and many times costs are prohibitive.

Soils of the Lincoln Pond Watershed

4A Limerick silt loam (0 to 3 percent slopes).
Deep, poorly drained soil on floodplains.
Strongly acid to neutral, fine textured soil.
Floods frequently.
Permeability is moderate.
Available water capacity is moderate to high.

Limitations

1. Septic tank absorption fields - severe due to flooding and wetness.
2. Local raads and streets - severe.
3. Dwellings with basements - severe.
4. Dwellings without basements - severe.
5. Paths and trails - severe.
6. Picnic areas - severe.
7. Playgrounds - severe.

5A Saco silt loam (0 to 3 percent slopes).
Deep, very poorly drained soil on flood plains.
Strongly acid to medium acid, fine textured soil.
Floods frequently.
Permeability is moderate.
Available water capacity is moderate to high.

Limitations

1. Septic tank absorption fields - severe due to wetness and flooding.
2. Local roads and streets - severe.
3. Dwellings with basements - severe.
4. Dwellings without basements - severe.
5. Paths and trails - severe.
6. Picnic areas - severe.
7. Playgrounds - severe.

14CK Hinckley loamy sand, (5 to 15 percent complex slopes).
Deep, excessively drained soil formed in water sorted material.
Extremely acid to medium acid, sandy and gravelly soil.
Permeability is rapid or very rapid.
Available water capacity is very low to moderate.
Good source of sand and gravel.

Limitations

1. Septic tank absorption fields - slight, but excessive permeability rate may allow pollution of ground water.
2. Local roads and streets - slight.
3. Dwellings with basements - slight.
4. Dwellings without basements - slight.
5. Paths and trails - slight.
6. Picnic areas - slight.
7. Playgrounds - slight.

21CK Windsor loamy sand, (5 to 15 percent complex slopes)
Deep, excessively drained soil formed in sandy glacial outwash material.
Very strongly acid to strongly acid, sandy soil.
Permeability is rapid or very rapid.
Available water capacity is very low to moderate.
Good source of sand.

Limitations

1. Septic tank absorption fields - slight, but excessive permeability rate may allow pollution of ground water.
2. Local roads and streets - slight.
3. Dwellings with basements - slight.
4. Dwellings without basements - slight.
5. Paths and trails - moderate - too sandy, erodes easily.
6. Picnic areas - moderate - too sandy.
7. Playgrounds - severe - too sandy.

53AD Shapleigh very rocky soils, 10 to 25 percent slopes.
Shallow, well drained soils and rock outcrop, formed in glacial till in the uplands.
Strongly acid, coarse textured soil and granite bedrock.
Permeability is rapid.
Available water capacity is low.

Limitations

1. Septic tank absorption fields - severe, due to shallow bedrock and slope over 15 percent.
2. Local roads and streets - severe, shallow bedrock.
3. Dwellings with basements - severe, shallow bedrock.
4. Dwellings without basements - less than 15% slopes moderate, steeper than 15% severe.
5. Paths and trails - slight to moderate.
6. Picnic areas - severe.
7. Playgrounds - severe.

54B Essex stony fine sandy loam, 3 to 8 percent slopes.
Deep, well drained soil in the uplands. Formed in glacial till.
Has a firm, compact layer at a depth of 15 to 35 inches.
Extremely acid to medium acid, medium textured soil.
Permeability is moderately rapid above the firm layer and slow in it.
Available water capacity is very low to moderate.

Limitations

1. Septic tank absorption fields - severe, due to slow permeability in the firm, compact layer.
2. Local roads and streets - slight.
3. Dwellings with basements - moderate - due to wetness above the firm layer.
4. Dwellings without basements - slight.

5. Paths and trails - slight.
6. Picnic areas - slight.
7. Playgrounds - moderate - due to slow drying after wet periods.

54C Essex stony fine sandy loam, (8 to 15 percent slopes). Same as 54B, except for slope.

Limitations

1. Septic tank absorption fields - severe, due to slow permeability in the firm, compact layer.
2. Local roads and streets - moderate - slope.
3. Dwellings with basements - moderate, due to wetness above the firm layer.
4. Dwellings without basements - moderate - slope.
5. Paths and trails - slight.
6. Picnic areas - moderate - slope.
7. Playgrounds - severe - slope.

54D Essex stony fine sandy loam, (15 to 25 percent slopes). Same as 54B, except for slope.

Limitations

1. Septic tank absorption fields - severe - slope.
2. Local roads and streets - severe - slope.
3. Dwellings with basements - severe - slope.
4. Dwellings without basements - severe - slope.
5. Paths and trails - moderate - slope.
6. Picnic areas - severe - slope.
7. Playgrounds - severe - slope.

55AD Essex and Scituate very stony soils, (3 to 25 percent slopes). Deep, well drained and moderately well drained, very stony soils in the uplands. Formed in glacial till. Has a firm, compact layer at a depth of 15 to 35 inches. Extremely acid to slightly acid, medium textured soil.

Permeability is moderately rapid above the firm layer and slow in it. Available water capacity is very low to high.

Limitations

1. Septic tank absorption fields - severe, due to slow permeability in the firm, compact layer.
2. Local roads and streets - severe, frost heaving in wetter areas.
3. Dwellings with basements - severe - due to wetness, and slope over 15 percent.
4. Dwellings without basements - severe, due to wetness and slope over 15 percent.
5. Paths and trails - slight to moderate - slope.
6. Playgrounds - severe - slope, irregular slopes.
7. Picnic areas - slight to severe - slope.

56EF Essex very stony soils, (25 to 45 percent slopes).

Deep, well drained, very stony soils in the uplands. Formed in glacial till. Has a firm, compact layer at 15 to 35 inches. Extremely acid to medium acid, medium textured soil. Permeability is moderately rapid above the firm layer and slow in it. Available water capacity is very low to moderate.

Limitations

1. Septic tank absorption fields - severe - slope.
2. Local roads and streets - severe - slope.
3. Dwellings with basements - severe - slope.
4. Dwellings without basements - severe - slope.
5. Paths and trails - severe - slope, large stones.
6. Picnic areas - severe - slope.
7. Playgrounds - severe - slope.

57B Scituate stony fine sandy loam, (3 to 8 percent slopes).

Deep, moderately well drained soil in the uplands. Formed in glacial till. Has a firm, compact layer at a depth of 18 to 34 inches.

Extremely acid to slightly acid, medium textured soil.

Permeability is moderately rapid above the firm layer and slow in it.
Available water capacity is low to high.

Limitations

1. Septic tank absorption fields - severe, due to slow permeability in the firm layer.
2. Local roads and streets - severe - frost action and heaving.
3. Dwellings with basements - severe - wetness.
4. Dwellings without basements - severe - frost action.
5. Paths and trails - slight.
6. Picnic areas - slight.
7. Playgrounds - moderate - dries out slowly after wet periods.

57C Scituate stony fine sandy loam, (8 to 15 percent slopes)
Same as 57B, except for slope.

Limitations

1. Septic tank absorption fields - severe - due to slow permeability in the firm layer.
2. Local roads and streets - severe - frost action and heaving.
3. Dwellings with basements - severe - wetness.
4. Dwellings without basements - severe - frost action.
5. Paths and trails - slight.
6. Picnic areas - moderate - slope.
7. Playgrounds - severe - slope.

90 Muck and peat, strongly acid to neutral.
Deep, very poorly drained, organic soil. Most of the organic material is well decomposed, but some parts of plants are present.
Formed in bogs and swamps.
Strongly acid to neutral.
Permeability is moderate in the organic material and very slow in the underlying material.
Available water capacity is high.

Limitations

1. Septic tank absorption fields - severe - wetness
2. Local roads and streets - severe.
3. Dwellings with basements - severe
4. Dwellings without basements - severe.
5. Paths and trails - severe
6. Picnic areas - severe
7. Playgrounds - severe.

APPENDIX VII.

The descriptions or definitions of the land use classifications designated around Lincoln Pond are explained below:

1. MODERATE INTENSITY USE AREAS

Moderate intensity use areas are those areas where the capability of the natural resources and the anticipated need for future development indicate that relatively intense development, primarily residential in character, is possible, desirable and suitable.

These areas are primarily located near or adjacent to hamlets to provide for residential expansion. They are also located along highways or accessible shorelines where existing development has established the character of the area.

Those areas identified as moderate intensity use where relatively intense development does not already exist are generally characterized by deep soils on moderate slopes and are readily accessible to existing hamlets.

Purposes, Policies and Objectives: Moderate intensity use areas will provide for development opportunities in areas where development will not significantly harm the relatively tolerant physical and biological resources. These areas are designed to provide for residential expansion and growth and to accommodate uses related to residential uses in the vicinity of hamlets where community services can most readily and economically be provided. Such growth and the services related to it will generally be at less intense levels than in hamlet areas.

Guideline for Overall Intensity of Development: The overall intensity of development for land located in any moderate intensity use area should not exceed approximately 500 principal buildings per square mile.

Classification of Compatible Uses

Primary Uses in Moderate Intensity Use Areas

1. Single family dwellings.
2. Individual mobile homes.
3. Open space recreation uses.
4. Agricultural uses.
5. Agricultural use structures.
6. Forestry uses.
7. Forestry use structures.
8. Hunting and fishing cabins and hunting and fishing and other private club structures.
9. Game preserves and private parks.
10. Cemeteries.
11. Private roads.
12. Private sand and gravel extractions.
13. Public utility uses.
14. Accessory uses and structures to any use classified as a compatible use.

Secondary Uses in Moderate Intensity Use Areas

1. Multiple family dwellings.
2. Mobile home courts.
3. Public and semi-public buildings.
4. Agricultural service uses.
5. Commercial uses.
6. Tourist accommodations.
7. Tourist attractions.
8. Marinas, boatyards and boat launching sites.
9. Campgrounds.
10. Group camps.
11. Golf courses.
12. Ski centers.
13. Commercial seaplane bases.
14. Commercial or private airports.
15. Sawmills, chipping mills, pallet mills and similar wood using facilities.

16. Commercial sand and gravel extractions.
17. Mineral extractions.
18. Mineral extraction structures.
19. Watershed management and flood control projects.
20. Sewage treatment plants.
21. Major public utility uses.
22. Industrial uses.

2. RURAL USE AREAS

Rural use areas are those areas where natural resource limitations and public considerations necessitate fairly stringent development constraints. These areas are characterized by substantial acreages of one or more of the following: fairly shallow soils, relatively severe slopes, significant ecotones, critical wildlife habitats, proximity to scenic vistas or key public lands. In addition, these areas are frequently remote from existing hamlet areas or are not readily accessible.

Consequently, these areas are characterized by a low level of development and a variety of rural uses that are generally compatible with the protection of the relatively intolerant natural resources and the preservation of open space. These areas and the resource management areas provide the essential open space atmosphere that characterizes the Adirondack Park.

Purposes, Policies and Objectives: The basic purpose and objective of rural use areas is to provide for and encourage those rural land uses that are consistent and compatible with the relatively low tolerance of the areas' natural resources and the preservation of the open spaces that are essential and basic to the unique character of the Park. Another objective of rural use areas is to prevent strip development along major travel corridors in order to enhance the aesthetic and economic benefit derived from a Park atmosphere along these corridors.

Residential development and related development and uses should occur on large lots or in relatively small clusters on carefully selected and well designated sites. This will provide for further diversity in residential and related development opportunities in the Park.

Guidline for Overall Intensity of Development: The overall intensity of development for land located in any rural use area should not exceed approximately 75 principal buildings per square mile.

Classification of Compatible Uses

Primary Uses in Rural Use Areas

1. Single family dwellings.
2. Individual mobile homes.
3. Open space recreation uses.
4. Agricultural uses.
5. Agricultural use structures.
6. Forestry uses.
7. Forestry use structures.
8. Hunting and fishing cabins and hunting and fishing and other private club structures.
9. Game preserves and private parks.
10. Cemeteries.
11. Private roads.
12. Private sand and gravel extractions.
13. Public utility uses.
14. Accessory uses and structures to any use classified as a compatible use.

Secondary Uses in Rural Use Areas

1. Multiple family dwellings.
2. Mobile home courts.
3. Public and semi-public buildings.
4. Agricultural service uses.
5. Commercial uses.
6. Tourist accommodations.
7. Marinas, boatyards and boat launching sites.

8. Golf Courses.
9. Campgrounds.
10. Group camps.
11. Ski centers.
12. Commercial seaplane bases.
13. Commercial or private airports.
14. Sawmills, chipping mills, pallet mills and similar wood using facilities.
15. Commercial sand and gravel extractions.
16. Mineral extractions.
17. Mineral extraction structures.
18. Watershed management and flood control projects.
19. Sewage treatment plants.
20. Waste disposal areas.
21. Junkyards.
22. Major public utility uses.
23. Industrial uses.

3. RESOURCE MANAGEMENT AREAS

Resource management areas are those lands where the need to protect, manage and enhance forest, agricultural, recreational and open space resources is of paramount importance because of overriding natural resource and public considerations. Open space uses, including forest management, agriculture and recreational activities, are found throughout these areas.

Many resource management areas are characterized by substantial acreages of one or more of the following: shallow soils, severe slopes, elevations of over 2,500 feet, flood plains, proximity to designated or proposed wild or scenic rivers, wetlands, critical wildlife habitats or habitats of rare and endangered plant and animal species.

Other resource management areas include extensive tracts under active forest management that are vital to the wood using industry and necessary to insure its raw material needs.

Important and viable agricultural areas, particularly in the

Champlain Valley, are included in resource management areas, with many farms exhibiting a high level of capital investment for agricultural buildings and equipment. These agricultural areas are of considerable economic importance to segments of the Park and provide for a type of open space which is compatible with the Park's character.

Purposes, Policies and Objectives: The basic purposes and objectives of resource management areas are to protect the delicate physical and biological resources, encourage proper and economic management of forest, agricultural and recreational resources and preserve the open spaces that are essential and basic to the unique character of thr Park. Another objective of these areas is to prevent strip development along major travel corridors in order to enhance the aesthetic and economic benefits derived from a Park atmosphere along these corridors.

Finally, resource management areas will allow for residential development on substantial acreages or in small clusters on carefully selected and well designated sites.

Guideline for Overall Intensity of Development: The overall intensity of development for land located in any resource management area should not exceed approximately 15 principal buildings per square mile.

Classification of Compatible Uses

Primary Uses in Resource Management Areas

1. Agricultural uses.
2. Agricultural use structures.
3. Open space recreation uses.
4. Forestry uses.
5. Forestry use structures.
6. Game preserves and private parks.
7. Private roads.
8. Private sand and gravel extractions.
9. Public utility uses.
10. Accessory uses and structures to any use classified as a compatible use.

Secondary Uses in Resource Management Areas

1. Single family dwellings.
2. Individual mobile homes.
3. Hunting and fishing cabins and hunting and fishing and other private club structures.
4. Campgrounds.
5. Group camps.
6. Ski centers.
7. Agricultural service uses.
8. Sawmills, chipping mills, pallet mills and similar wood using facilities.
9. Commercial sand and gravel extractions.
10. Mineral extractions.
11. Mineral extraction structures.
12. Watershed management and flood control projects.
13. Sewage treatment plants.
14. Major public utility uses.

4. WILD FOREST

A wild forest area is an area where the resources permit a somewhat higher degree of human use than in wilderness, primitive or canoe areas, while retaining an essentially wild character. A wild forest area is further defined as an area which lacks the sense of remoteness of wilderness, primitive or canoe areas and which permits a wide variety of extensive outdoor recreation.

To the extent that state lands classified as wild forest were given or devised to the state for silvicultural or wildlife management purposes pursuant to statutory provisions specifying that these lands will not form part of the forest preserve, the following guidelines are not to be interpreted so as to prevent silvicultural or wildlife management practices on these lands, provided the other guidelines for wild forest land are respected.

Guidelines for Management and Use

Basic Guidelines

1. The primary wild forest management guideline will be to protect the natural wild forest setting and to provide those types of outdoor recreation that will afford public enjoyment without impairing the wild forest atmosphere.

2. In wild forest areas:
   a) No additions or expansions of non-conforming uses will be permitted;
   b) Non-conforming uses which may exist will be phased out as rapidly as possible and in all cases by December 31, 1975 on a scheduled basis to be determined by the Department of Environmental Conservation.

3. Effective immediately, no new non-conforming uses will be permitted in any designated wild forest area.

4. Public use of motor vehicles will not be encouraged and there will not be any material increase in the mileage of roads and trails open to motorized use.

5. Care should be taken to designate separate areas for incompatible uses such as snowmobiling and ski-touring or horseback riding and hiking.

6. When public access to and enjoyment of wild forest areas is inadequate, appropriate measures may be undertaken to provide improved access to encourage public use consistent with the wild forest character.

Structures and Improvements

1. All structures and improvements permitted under the guidelines covering wilderness areas will be allowed in wild forest areas. In addition, the structures and improvements listed below will be allowed and their maintenance, rehabilitation and construction permitted:

-small groupings of Adirondack lean-tos and individual tent sites with fire rings below 3,500 feet in elevation.

-nature and interpretive trails;

-trailhead construction and related parking facilities adjacent to public highways;

-minor diking, cribbing or stream deflectors for fish management purposes;

-cartop boat access sites (i.e. fishing access sites) adjacent to public highways;

-horse trails.

The maintenance and rehabilitation of the following structures and improvements will be allowed but new construction will not be encouraged:

-horse barns;

-small scale dams constructed of natural materials wherever possible;

-boat docks constructed of natural materials wherever possible;

-storage sheds and similar rustic buildings for use of administrative personnel;

-small scale electronic communication and relay facilities for official communications;

-telephone and electrical lines to service permitted administrative structures;

-buoys;

-small scale water supply facilities under permit from the Department of Environmental Conservation;

-ranger stations as set forth below;

-roads, jeep trails and state truck traiks as set forth below;

snowmobile trails as set forth below;

-fire towers and observer cabins as set forth below.

Ranger Stations

Existing ranger stations may be retained and new ranger stations constructed, but only where necessary for administration of the area and

in such a way that will not result in deterioration of the wild forest area involved.

Motor Vehicles, Motorized Equipment and Aircraft

1. All uses of motor vehicles, motorized equipment and aircraft permitted under wilderness guidelines will also be permitted in wild forest areas.

2. In addition, the use of motor vehicles, motorized equipment and aircraft will be allowed as follows:

a) by administrative personnel where necessary to reach, maintain and construct permitted structures and improvements, or for other appropriate law enforcement and general supervision of public use;

b) by the general public, subject to the basic guideline 4 set forth above, but only on:

-existing public roads;

-open jeep trails now designated by the Department of Environmental Conservation; and

-on rivers, lakes and ponds now or hereafter designated by the Department of Environmental Conservation as suitable for such motorized uses;

c) by snowmobiles on trails specifically designated by the Department of Environmental Conservation in accordance with the guidelines for such trails specified below.

3. The Department of Environmental Conservation may restrict under existing law the use of motor vehicles, motorized equipment and aircraft by the public or administrative personnel where in its judgement the character of the natural resources in a particular area or other factors make such restrictions desirable.

Roads, Jeep Trails and State Truck Trails

1. Continued use of existing roads, jeep trails and state truck trails by administrative personnel will be permitted, to the extent necessary, to reach, maintain and construct permitted structures and improvements.

2. Existing roads or jeep trails, now open to and used by the public for motor vehicle use may continue to be so used at the discretion of the Department of Environmental Conservation, provided such use is compatible with the wild forest character of an area.

3. No new roads or jeep trails will be constructed. No new state truck trails will be constructed unless such construction is absolutely essential to the protection or administration of an area and no alternatives exist and provided that there will be no material adverse effect on the wild forest character of the area.

Snowmobile Trails

Snowmobile trails should be designed and located in a manner which will not adversely affect adjoining private landowners or the wild forest environment and in particular:

-the mileage of snowmobile trails lost in the designation of wilderness, primitive and canoe areas may be replaced in wild forest areas with existing jeep trails or abandoned woods roads as the basis of such new snowmobile trail construction except in rare circumstances requiring the cutting of new trails;

-appropriate opportunities to improve the snowmobile trail system may be pursued where the impact on the wild forest environment will be minimized, such as (i) provision for snowmobile trails adjacent to but screened from certain public highways within the Park to facilitate snowmpbile access between communities where alternate routes are not available and topography permits; and (ii) the acquisition of portions of the Penn Central railroad right-of-way from the Park Boundary at Woodgate to Lake Placid which is recommended;

-deer wintering yards and other important wildlife and resource areas should be avoided by such trails.

Fire Towers

The educational and informational aspects of certain fire towers should be encouraged and wherever possible these fire towers should be retained regardless of their need from a fire control standpoint.

Tent Platforms

The current policy of the Department of Environmental Conservation with respect to the non-renewal and revocation of tent platform permits will be continued, and all such permits will be terminated and tent platforms removed by December 31, 1975.

Flora and Fauna

The same guidelines will apply as in wilderness areas, although exceptions may be made by the Department of Environmental Conservation in accordance with sound biological management practices, particularly where such practices will improve the wildlife resources.

Recreational Use and Over-Use

1. All types of recreational uses considered appropriate for wilderness areas are compatible with wild forest and, in addition, snowmobiling, motorboating and travel by jeep or other motor vehicles on a limited and regulated basis which will not materially increase existing motorized uses and will not adversely affect the essentially wild character of the land are permitted.

2. Certain wild forest areas offer better opportunities for a more extensive horse trail system than in wilderness, primitive or canoe areas and horse trails and associated facilities in these areas should be provided where appropriate.

3. Although the nature of most wild forest areas indicates that potential recreational over-use will not be as serious as in wilderness, primitive and canoe areas, care must nonetheless be taken to avoid over-use, and the basic wilderness guidelines in this respect apply also to wild forest lands. The relatively greater intensity of use allowed by the wild forest guidelines should not be interpreted as permitting or encouraging unlimited or unrestrained use of wild forest areas.

Designation of Wild Forest Areas

The application of the wild forest definition and criteria described above results in the initial designation under the master plan of about 1.2 million acres of wild forest land, comprising approximately 51 per cent of the forest preserve within the Adirondack Park. A wide variety of terrain and ecosystems is represented in these areas.

All wild forest areas are identified and their boundaries delineated on the map forming part of this master plan.

5. INTENSIVE USE

An intensive use area is an area where the state provides facilities for intensive forms of outdoor recreation by the public. An intensive use area is further defined to include campgrounds containing over 20 individual camping sites, developed beaches, launching sites for trailered boats, ski centers, visitor information centers, bobruns, parkways and memorial highways designed to accommodate significant numbers of visitors and their attendant facilities.

These areas provide for congregations and/or accommodations of visitors to the Park and often function as a base for day use of wild forest, wilderness, primitive and canoe areas.

Guidlines for Management and Use

Basic Guidelines

1. The primary management guideline for intensive use areas will be to provide the public opportunities for group camping, developed swimming and boating, downhill skiing, and similar outdoor recreational pursuits in a setting and on a scale that are in harmony with the relatively wild and undeveloped character of the Adirondack Park.

2. All intensive use facixititw should be located, designed and managed so as to blend with the Adirondack environment and to have the minimum adverse impact possible on surrounding state lands and nearby private holdings. Wherever possible such facilities should be adjacent to or serviceable from existing public road systems within the Park.

3. Priority should be given to the rehabilitation and modernization of existing intensive use areas before the construction of new facilities is considered.

4. Additions to the intensive use category should come either from new acquisitions or from the reclassification of appropriate wild forest areas, and only in exceptional circumstances from wilderness, primitive or canoe areas.

5. Since the concentrations of visitors at certain intensive use facilities often pose a threat of water pollution, the state should set an example for the private sector by installing modern sewage treatment systems with the objective of maintaining high water quality. Standards for the state should in no case be less than those for the private sector. Intensive use facilities should not be expanded beyond the capacity of their sewage treatment system.

Campgrounds

1. The older existing campgrounds will be redesigned, as the Department of Environmental Conservation budget permits, to reflect modern site planning principles that will better blend the facilities to the environment.

2. The informative campfire programs should be expanded.

3. Future campgrounds will be located so as to encourage public use on presently underutilized tracts of state land. They will not be situated where they will aggravate problems on lands already subjected to or threatened by over-use.

4. Future public campgrounds in the central Adirondacks will be of a rustic nature and be relatively small in size.

Boat Launching Sites

Launching sites for trailered boats should be provided only on large lakes regularly used by motorboats, and where private launching facilities open to the public are inadequate. Such sites should not be provided where the threat of overuse exists.

Ski Areas, Bobruns, Parkways

1. Existing ski centers at Gore and Whiteface should be modernized to the extent physical resources allow.

2. Every effort should be made to insure the permanent operation of the Van Hoevenberg bobsled run by the state or by another appropriate entity.

Visitor Information centers

1. Visitor information centers should be provided at major highway entrances to the Park and other appropriate locations.

2. These centers will be designed to provide visitors with interpretive information on the various natural resources and points of interest in the Park.

Recreational Use and Over-Use

Where the degree and intensity of permitted recreational uses are endangering the physical or biological resources of an area, appropriate administrative and regulatory measures will be taken to limit such use to the capability of the resource. Such administrative and regulatory measures may include, but need not be limited to:

-the prohibition of overnight camping within a specified distance of a designated intensive use area to avoid overflow camping on adjacent undeveloped state lands;

-the temporary closure of all or portions of a designated intensive use area to permit rehabilitative measures..

Section 575.1. General Rule

(a) No person shall engage in land use or development or subdivision that involves shoreline in the Adirondack Park, whether or not an Agency permit is also required, except in accordance with the shoreline restrictions.

(b) The shoreline building setback, vegetative cutting, and minimum lot width restrictions apply to lands in proximity to:

(1) lakes or ponds;

(2) rivers designated by Section 15-2715 of the Environmental Conservation Law for study for possible inclusion in the Wild, Scenic and Recreational Rivers System and listed in Appendix Q-5;

(3) all other rivers and all streams which are navigable by boat, including canoe.

(c) The shoreline setback requirement for on-site sewage disposal systems applies to all lakes, ponds, rivers and streams, including an intermittent stream with a defined bed and banks, regardless of navigability.

(d) Additional restrictions, set forth in Part 577 of these regulations, apply to the shorelines of wild, scenic and recreational rivers.

(e) The shoreline restrictions are set forth in tabular form below:

MINIMUM LOT WIDTHS AND BUILDING SETBACKS

Land Use Area	Minimum Lot Width	Minimum Building Setback
MODERATE INTENSITY USE	100 ft.	50 ft.
RURAL USE	150 ft.	75 ft.
RESOURCE MANAGEMENT	200 ft.	100 ft.

MINIMUM ON-SITE SEWAGE DISPOSAL SYSTEM SETBACKS

All Land Use Areas 100 ft.

MINIMUM VEGETATIVE CUTTING RESTRICTIONS

All Land Use Areas

(a) Not more than 30% of the trees 6 inches or more in diameter at breast height within 35 feet of the mean high water mark may be cut over any 10 year period.

(b) No cutting of any vegetation may take place within 6 feet of the mean high water mark, except that up to 30% of the shorefront may be cleared of vegetation on any individual lot.

(c) These standards do not prevent the removal of dead, dying, diseased or rotten trees or vegetation, or of other vegetation presenting safety or health hazards.

MINIMUM FRONTAGES FOR DEEDED OR CONTRACTUAL ACCESS TO WATER BODIES

(by lots, parcels or sites or multiple family dwelling units not having separate and distinct shoreline ownership)

All Land Use Areas

(a) Where 5-20 lots or units are involved, at least 100 feet.

(b) Where 21-100 lots or units are involved, the frontage required by (a), and at least 3 feet for each lot or unit exceeding 20.

(c) Where 101-150 lots or units are involved, the frontage required by (a), (b), and at least 2 feet for each lot or unit exceeding 100.

(d) Where more than 150 lots or units are involved, the frontage required by (a), (b) and (c), and at least one foot for each lot or unit exceeding 150.

Section 575.2 Measuring distances.

(a) All distances specified in the shoreline restrictions are measured horizontally. Shoreline lot widths are measured along the shoreline as it winds and turns at mean high water.

(b) Building setback restrictions are measured along the shortest line between any point of the structure and any point on the mean high water mark.

(c) Sewage disposal system setbacks are measured along the shortest line between any point of the seepage pit, drainage field or other leaching facility and any point on the mean high water mark.

(d) In the case of the Great Sacandaga Lake, "mean high water mark" shall mean the spillway elevation contour of 771 feet above mean sea level.

Section 575.3. Variances of less than two feet. The Agency will not require that a landowner in need of a shoreline building setback, on-site sewage disposal system setback, or minimum lot width variance of two feet or less submit an application for such variance, provided that the town or village involved is consulted and does not object to the proposed action.

Section 575.4. Structures to which applied. (a) The shoreline building setback restrictions apply to all principal buildings and to all accessory structures exceeding 100 square feet in size, including garages, sheds, porches, decks, barns, gazebos, guest cottages, tennis courts and permanent swimming pools, but not including boathouses or docks.

(b) Porches, decks and other structures physically attached to single family dwellings or to other structures subject to the building setback restrictions shall be considered to be a part of the structure for purposes of applying the setback restriction.

(c) "Boathouse" means a structure with direct access to a navigable body of water used primarily for the storage of boats and not for human habitation.

(d) Decks or patios which are not physically attached to another structure are subject to the building setback restrictions if exceeding 100 square feet, unless flush with natural ground level without raised elements such as railings or walls.

Section 575.5. Replacement and expansion of existing structures. (a) Any existing structure lawfully in non-conformance with the building setback restrictions, or any such structure which was existing on August 1, 1973 and was thereafter removed or destroyed by fire, wreckage or other cause, may be replaced in kind on the same foundation or location or in the same immediate vicinity provided the previously-existing setback non-conformance is not increased. A mobile home may be replaced by a single family dwelling, and a single family dwelling may be replaced by a mobile home.

(b) Expansions of existing structures in proximity to lakes, ponds, rivers or navigable streams shall be subject to the shoreline building setback restrictions according to the following rules:

(1) Expansions of existing structures which are in compliance with the building setback restrictions may not result in violations of such restrictions.

(2) An existing single family dwelling or mobile home which is lawfully in non-compliance with the building setback restrictions may be expanded to the rear or laterally as long as such expansion does not bring the structure any closer to the mean high water mark. An existing structure other than a single family dwelling or mobile home may be expanded to the rear, but may not be expanded laterally within the applicable setback distance to a greater extent than 25% of the average width of the structure existing within the setback distance as of May 22, 1973.

Expansions of existing structures may also be subject to Agency permit jurisdiction, according to the rules set forth in Section 573.5 of these regulations.

Section 575.6. Application of lot width restrictions. (a) Except as provided in subdivision (c) of this section, the shoreline lot width restrictions apply to any lot, parcel or site which adjoins or includes a shoreline, or is located in whole or in part within the applicable building setback distance.

(b) The shoreline lot width restrictions apply to single family residences on lots created by a subdivision by gift, devise, or inheritance and on lots in preexisting subdivisions which have not received New York State Department of Health approval.

(c) The shoreline lot width restrictions shall not apply to subdivisions which do not involve the construction of any new single family residence or other new principal building, such as a subdivision solely involving existing buildings, or a subdivision of land for a boundary adjustment.

Section 575.7. Application of sewage system setback restrictions.

(a) Any seepage pit, drainage field or other leaching facility receiving any form of household effluent, regardless of whether it receives toilet wastes, is subject to the sewage disposal system setback restrictions.

(b) Any outhouse privy or other pit privy which is not a self-contained system is subject to the sewage disposal system setback restrictions.

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