Habitat and Wildlife Inventory: Guide to Coastal Zone Lands, Oswego County, New York

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Biological
Field Station
BULLETIN

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College of Arts and Science at
OSWEGO

Rice Creek Biological Field Station Bulletin

HABITAT AND WILDLIFE INVENTORY: GUIDE TO COASTAL ZONE LANDS, OSWEGO COUNTY, NEW YORK

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PREFACE

The study that is the basis for this report was funded under the National Science Foundation Student Originated Studies Program for $13,600, which provided stipends and expenses for eight of the persons conducting the study at the State University of New York College at Oswego. Support for a ninth person was provided by contributions of $500 each from the Onondaga Audubon Society (Syracuse, New York), and the Oswego County Environmental Management Council. The participants consisted of six undergraduates and three May, 1976 graduates of the State University College at Oswego, of which eight were biological science majors and one was a geography major. Facilities and office space were provided by the college at the Rice Creek Biological Field Station, as was the release time for the faculty advisor, Dr. George R. Maxwell II, for his consultation during the project.

The study was designed and conducted by the student participants to provide needed information on the habitats and wildlife found within the 36 square mile Oswego County Coastal Zone. The studies included works on vegetation, vertebrates and the mapping of the study areas by general habitat type. The main goal of the study was to provide basic information on the habitats of the Coastal Zone. Such information on terrestrial and aquatic areas was generally lacking and is vital to the overall picture of the area upon which future land use decisions should be based. This report makes available information to users, including government agencies, private organizations and private citizens. Among those groups who supported our application to NSF for funding are the St. Lawrence Eastern Ontario Commission, the Oswego County Environmental Management Council, the Oswego County Planners Office and the Onondaga Audubon Society. We hope that the information contained in this report will be of use to those mentioned above and to the community as a whole. We feel that the results will prove useful in indicating the relative values of areas of habitat.

In addition to the research component of the NSF-SOS Program, a second goal of this program is to provide training and practical field experience to the participants. We can definitely say that all participants benefited from this study in the furtherance of their respective professional educations.

While we feel that our work provides valuable basic information, it must be emphasized that further, more intensive studies are needed. This investigation only touches the surface of complex and intriguing areas such as Deer Creek Marsh. We hope that more work in these vital and interesting ecosystems will be pursued. For the present, however, we feel that the material in this report provides a reasonably informed overview of the habitat and wildlife of the Oswego County Coastal Zone.

We hope that this report will prove useful to a variety of persons, and aid in the preservation of important habitats. Such areas must be preserved and an overall pattern of intelligent land use must develop if the quality of life is to be maintained and enhanced. The capacity for the ecosphere of our planet to recover from thoughtless land abuse practices is great, but not infinite. It is the responsibility of every citizen to protect environmental quality for the enjoyment of future generations of residents and visitors to the Oswego County Coastal Zone. If this report can in some small way assure that the habitats of the Coastal Zone will be preserved for the future enjoyment by all citizens and maintained as a viable ecosystem, then we will be satisfied with our labors.

Copies of this report may be obtained by writing: Gerald A. Smith, Student Project Director, c/o G. R. Maxwell, Rice Creek Biological Field Station, State University College, Oswego, New York 13126.

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INTRODUCTION

Geography and Physiography

The habitat and wildlife inventory of the Coastal Zone of Oswego County included parts of the Towns of Oswego, Scriba, New Haven, Mexico, Richland, Sandy Creek and the City of Oswego. The area of the study generally conforms to the Coastal Zone defined by the St. Lawrence Eastern Ontario Commission, and encompasses 36.2 square miles in Oswego County. In the Town of Oswego the Coastal Zone is bordered on the west by the Oswego-Cayuga County Line, on the south by West Lake Road and U.S. Route 104, and by Lake Ontario on the north. In the Towns of Scriba and New Haven the area is bordered by County Route 1 on the south and Lake Ontario on the north. In the Town of Mexico the area is bordered by U.S. Route 104B on the south and Lake Ontario on the north. The area in the Town of Richland is bordered on the east by New York Route 3 and on the west by Lake Ontario. The area in the Town of Sandy Creek is bordered on the east by New York Route 3, on the west by Lake Ontario, and on the north by the Oswego-Jefferson County Line.

The topography of the Coastal Zone is most easily described as a series of undulating hills. The lake plain rises from a minimum of 250 feet above sea level in the numerous wetlands along the Lake Ontario shoreline, to a maximum of 308 feet above sea level at Derby Hill in the Town of Mexico. The south shore of Lake Ontario is basically underlain by Oswego sandstone and is considered part of the Erie-Ontario Plain. The eastern shore of Lake Ontario, in the Towns of Richland and Sandy Creek, is part of the fringe of the Tug Hill Plateau and is underlain by Utica shale.

The major shaping force of the Oswego County Coastal Zone topography has been the numerous glacial advances and retreats. The first advance had a smoothing effect while subsequent advances fit into the channels cut by the first. Upon retreat, the glaciers layed down till, which is unstratified, non-sorted mineral materials. This till is associated with the cobble and gravel beaches of the south shore of Lake Ontario and the sandy shore at the east end of the lake. The hilly character of the Oswego Coastal Zone is also of glacial origin. These hills were molded by the glaciers and are called drumlins. Drumlins are elongated, cigar-shaped hills, with their long axis oriented in a general north-south direction. These hills have steep side and nose slopes, the nose being at the north end and pointing in the direction of the glacial advance. The south end is often bumpy and more gently sloped. Truncated drumlins often form steep cliffs at the lake shore. Because of the disruption to drainage caused by drumlins, wetlands are often found in the low ground between them.

In addition to the Oswego and Salmon Rivers, approximately twenty streams drain directly into Lake Ontario. Most of the river courses are

cutting rather than depositing material and few have flood plains. Th sandy shore of the east end of the lake is a result of the prevailing westerly winds and lake currents that carry eroded mineral material to the end of the lake. The shoreline of Lake Ontario in Oswego County a of the Coastal Zone is approximately 35 miles in length.

The climate of Oswego County is classed as humid-continental broa representative of the northeastern United States. The climate is predo nantly governed by atmospheric flow from the northwest. Precipitation ranges from 29-40 inches and is fairly evenly distributed throughout t year. About 1/3 of the precipitation is received in the form of snow. an annual basis, the Oswego area receives about 70 clear, sunny days w one-half of these coming between June and October. Average annual fro dates occur from near the end of October to near the end of April. La Ontario modifies the climate of the Coastal Zone.

Socio-economic Considerations

The economic situation in Oswego County is at present at low ebb. hundred years ago Oswego was a shipping center of considerable importa but at present the port in the City of Oswego is functioning to a far degree. The port remains open year round, partially due to effluents from the Niagra-Mohawk steam generator at the west edge of the port's

The tax base of Oswego County is provided primarily by the Niagra Mohawk Power Corporation which supplies 53% of the county tax base. N Mohawk operates one steam generator and two nuclear power plants withi Coastal Zone. A third nuclear plant is presently under construction a Nine Mile Point Nuclear Complex. Other major industries in the Coasta Zone are the Hammermill Paper Campany and Alcan Aluminum. These indus plus construction, retail trade, and services make up the bulk of the ment. The State University of New York College at Oswego is also a la ployer of this area.

As stated above, Oswego County is presently in a depressed economi period. Unemployment in Oswego County reached 16% in July, 1975 and i presently around 13%. Growth of the manufacturing sector of the econo is unlikely due to the widespread locations of the employable work for The availability of space and high quality water from Lake Ontario mak growth in the power industry likely. A nuclear power plant site in th Town of New Haven is being considered by the New York State Gas and El tric Company and Long Island Lighting Company. The sand along Lake On io's eastern end provides the only mining resource of the Coastal Zone it does not produce any substantial employment opportunity. The agric sector of the economy is well established in Oswego County, but again is little chance for new growth in terms of employment. During the pa decade a salmonid fishing industry has begun to be developed and has b a major boost to the recreation/tourism sector of the economy. The La Ontario shoreline and the proximity to other recreational areas in New and Canada are major assets to this sector of the economy. Although a large portion of the land has been developed, the potential for more e sion is high. Labor sources for the recreation/tourism sector are rea

available. Recent events such as the high Mirex concentrations in lake game fish have placed a serious obstacle in the path of this expansion.

The dependent-worker ratio in Oswego County is above New York State average, while the participation of the available work force falls below state average. These two factors help to bring the local average income below state average. The generally depressed economy has helped reduce opposition to development of any kind, especially on environmental grounds.

The sources for much of the information present in the preceeding sections are: Technical Report: Physiography, Geology, and Soils, by St. Lawrence Eastern Ontario Commission, written by P.J. Coffey, J.E. Ferrel and A.L. Leaf, SUNY College of Environmental Science and Forestry, 1972; and The People of New York State Counties: Oswego, written by O.F. Larson, NYS College of Agriculture and Life Sciences, Cornell University, Ithaca, 1970.

Biology of the Oswego County Coastal Zone

The Coastal Zone lies in a transitional area between boreal forest and northeastern hardwood forest. The climate of the area has a significant effect upon the life forms found here. The proximity of Lake Ontario modifies the climate and aids the northward extension of the ranges of a number of species of southern affinities. The climax habitat is a deciduous forest with an extensive herbaceous ground cover. The biota of the area is characteristic of a transitional zone and exhibits a diverse species mix.

There are two basic ecosystems present in the Coastal Zone; wetlands and upland areas. The wetlands are a prominent and diverse constituent of the area. The uplands are mostly second growth in a variety of successional stages. The age since disturbance of upland habitats ranges from a maximum of 160 years to newly fallow agricultural land.

Species with southern affinities prevail among the region's mammals, reptiles and amphibians, with northern and mountain species appearing less commonly. The mammal fauna is typical of that found throughout the Northeastern United States, although many of the larger mammals have shifted their ranges so that they rarely occur in the area. The reptile and amphibian fauna is best described as depauperate, the major species being widely distributed. There is a large influx of migrating birds through the region as the Coastal Zone is part of the western section of the Atlantic Flyway. The area also supports a large and diverse assortment of breeding birds. The fish populations in the study zone are varied and numerous. Some of the lake species use the inland waters for spawning, and man supplements the area's fish population with periodic stocking.

SPECIFIC GROUP REPORTS

Cartography

The maps in this report were drafted from U.S.G.S. 7.5 minute topographical maps. The study area was divided into nine parts for mapping purposes. These nine parts are titled mapping units and are numbered from one to nine. Each mapping unit is comprised of two maps; a general habitat map and a specific point data map. The habitat maps have seven habitat classifications, the symbols showing the area extent of the particular habitats. The symbols do not portray any quantitative information. The point specific maps use capital letters to locate areas of importance and points of special interest.

Information for cartographic production was derived from two types of source material. Basic information; roads, waterways and civil boundaries; was taken from U.S.G.S. topographical maps. Habitat information was obtained from direct observation of particular areas and through the interpretation of aerial photographs. Some coastal features have changed since the production of the topographical maps so adjustments were made by using the aerial photographs. The photographs were taken in the spring of 1974, whereas the topographic maps were produced as long ago as 1954.

The base maps for habitat classification were drafted on tracing acetate with India ink and leroy pens. Once the base maps were prepared, the habitat classifications were defined and their area extent determined. The use of an Artograph variable projector facilitated the drafting of the habitat information onto the base maps. Symbolization was done with prepared stick-on media.

Table 1. Key to map units.

Map Unit 1

A Health Camp Swamp
B Health Camp Swamp, South
C West Bluffs Farmlands
D Camp Hollis Area
E Snake Swamp, Northwest
F Snake Swamp Woods
G Snake Swamp
H Sleepy Hollow Development
J Southeast Oswego Farmlands
K Lake Shore Road Shrublands
L Rice Creek Marsh
M Burt Point Area
N West Campus Shrublands
O S.U.C.O. Campus

Map Unit 2

A Oswego Harbor
B Breitbeck Park
C Oswego River Mouth
D Wright's Landing
E Fort Ontario Park
F Hammermill Shrublands
G Saint Paul's Area
H Wine Creek Area
J East Oswego Shrublands
K City Line Marsh

Map Unit 3

A Teal Marsh West
B Teal Marsh Central
C West Scriba Railroad Section
D Milea Beach Bird Strip Census
E Teal Marsh East
F Milea Beach Shrublands
G Alcan Plant Area
H King's Folly Area
J King's Folly Bird Strip Census
K Railroad Bird Strip Census
L Walker Woods
M Riker Beach Area
N Trailer Park Road Area
O Bay Shore Shrublands
P Lakeview Creek Fringe
Q Bible Camp
R West Power Plant Shrublands
S South Lakeview Road Farmlands
T Scriba Woods, West

Map Unit 4

A Power Plant Corridor
B Power Plant Complex
C Scriba Woods, East
D Sunset Bay Shrublands
E Old Railroad Bed
F West Nine Mile Bird Strip Census
G West Nine Mile Point Area
H Parkhurst Woods
J Richard Noyes Sanctuary
K Nine Mile Point Woods
L Shore Oaks Woods
M Shore Oaks Bird Strip Census

Map Unit 5

A Pleasant Point Area Woods
B West Catfish Farmlands
C Catfish Creek Woods
D Catfish Marsh
E North New Haven Farmlands
F Demster Woods
G Butterfly Swamp, West
H Butterfly Swamp, Central
J Butterfly Swamp, East
K Butterfly Wood Fringe
L Butterfly Central Bird Strip Cens

Table 1. Cont'd.

Map Unit 6

A Butterfly Swamp, East
B Mexico Point Swamp
C Mexico Farmlands
D Little Salmon Marsh
E Sage Creek Woods
F Sage Creek Marsh
G Rose's Farm
H Derby Hill Sanctuary
J Derby Hill Woods
K Sage Creek Marsh, East
L Ramona Beach Woods, South
M Ramona Beach Farmlands
N Ramona Beach Marsh
O Ramona Beach Woods, North
P Chedmardo Area

Map Unit 7

A Grindstone Marshes
B Pine Grove
C Salmon River Mouth Bar
D Deer Creek Marsh Woods, South
E Deer Creek Marsh
F Deer Creek Dunes
G Deer Creek Fringe

Map Unit 8

A Deer Creek Marsh
B Deer Creek Dunes North
C Kelley Road Wood Fringe
D Kelley Road Bird Strip Census
E West Sandy Pond Farmlands
F Rainbow Shores Woods
G South Pond Wetlands
H South Pond Sand Spit
J South Pond Fringe, East

Map Unit 9

A North Pond South Sand Spit
B North Pond, Inlet Area
C North Pond, North Sand Spit
D Seber Shores Area
E North Pond Marshes
F Blind Creek Cove Woods
G North Pond Farmlands
H Blind Creek Cove Woods North
J North Pond Fringe, East
K Elms Area
L Skinner Creek Area
M Greene Point Area

KEY

—·—·— Civil Boundaries

HABITAT CLASSIFICATIONS

WOODLANDS

RESIDENTIAL

WETLANDS

COMMERCIAL-INDUSTRIAL

SUCCESSIONAL LANDS

URBAN OPEN SPACE

FARMLANDS

MAP INDEX

Unit No.

1 Oswego Township

2 City of Oswego

3 Scriba Township, West

4 Scriba Township, East / New Haven Towns

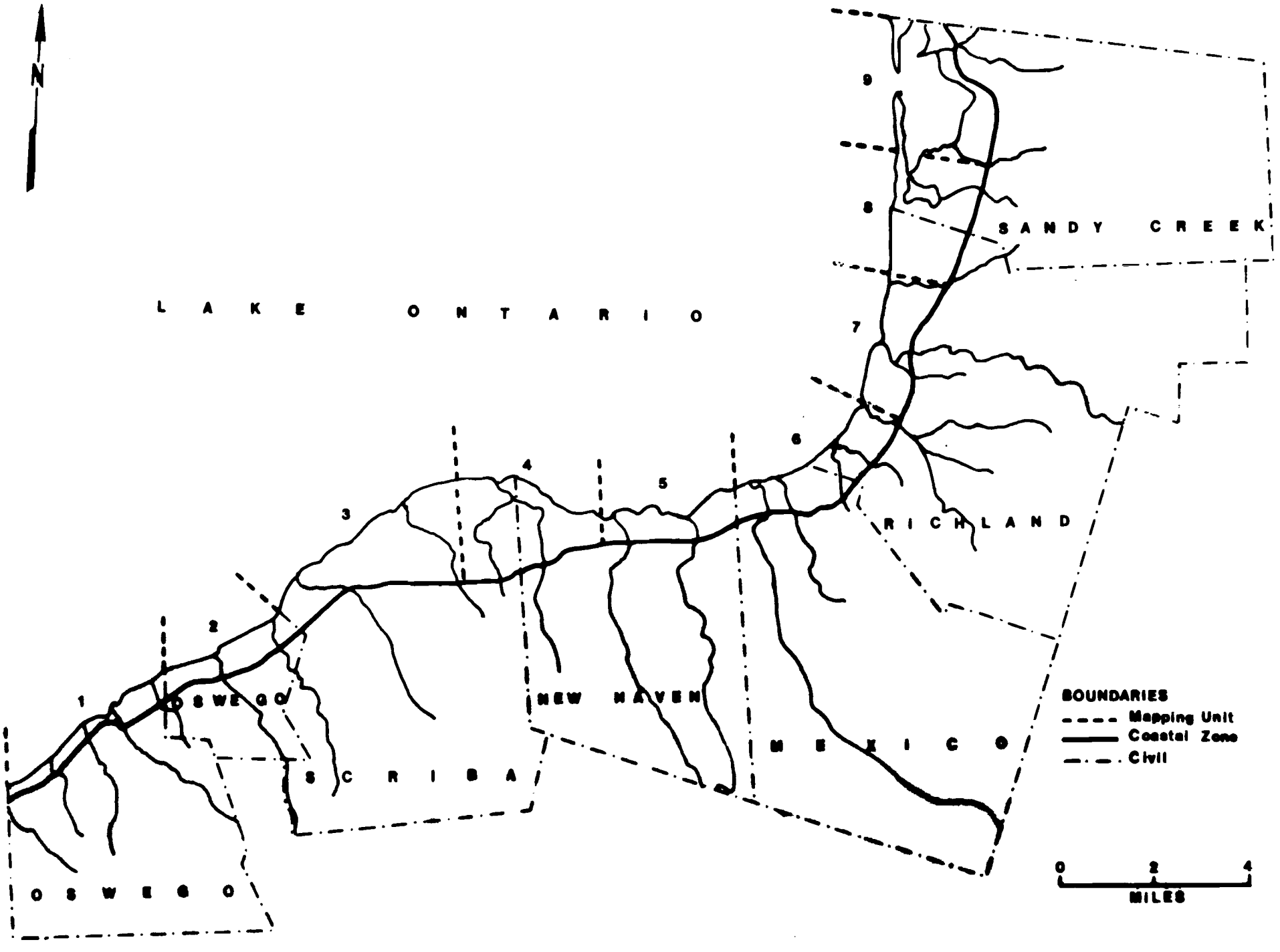
5 New Haven Township, East

6 Mexico Township / Richland Township, Soutl

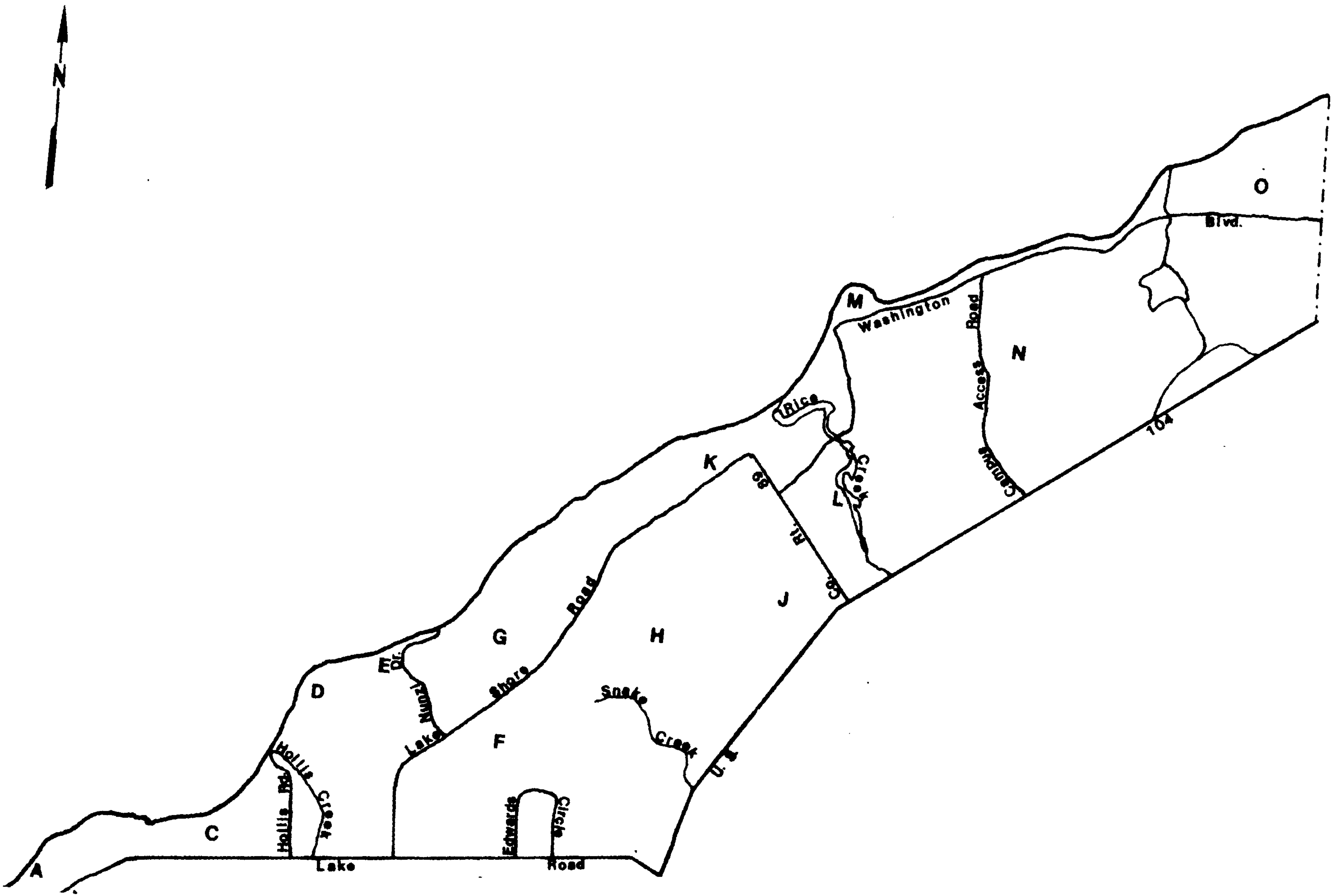
7 Richland Township, Central

8 Richland Township, North / Sandy Creek Towns

9 Sandy Creek Township, North



OSWEGO COUNTY COASTAL ZONE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M
Washington
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Campus
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Rice
Creek
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K
68
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Dr.
D
Nunzi
Lake
F
Snake
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Rd.
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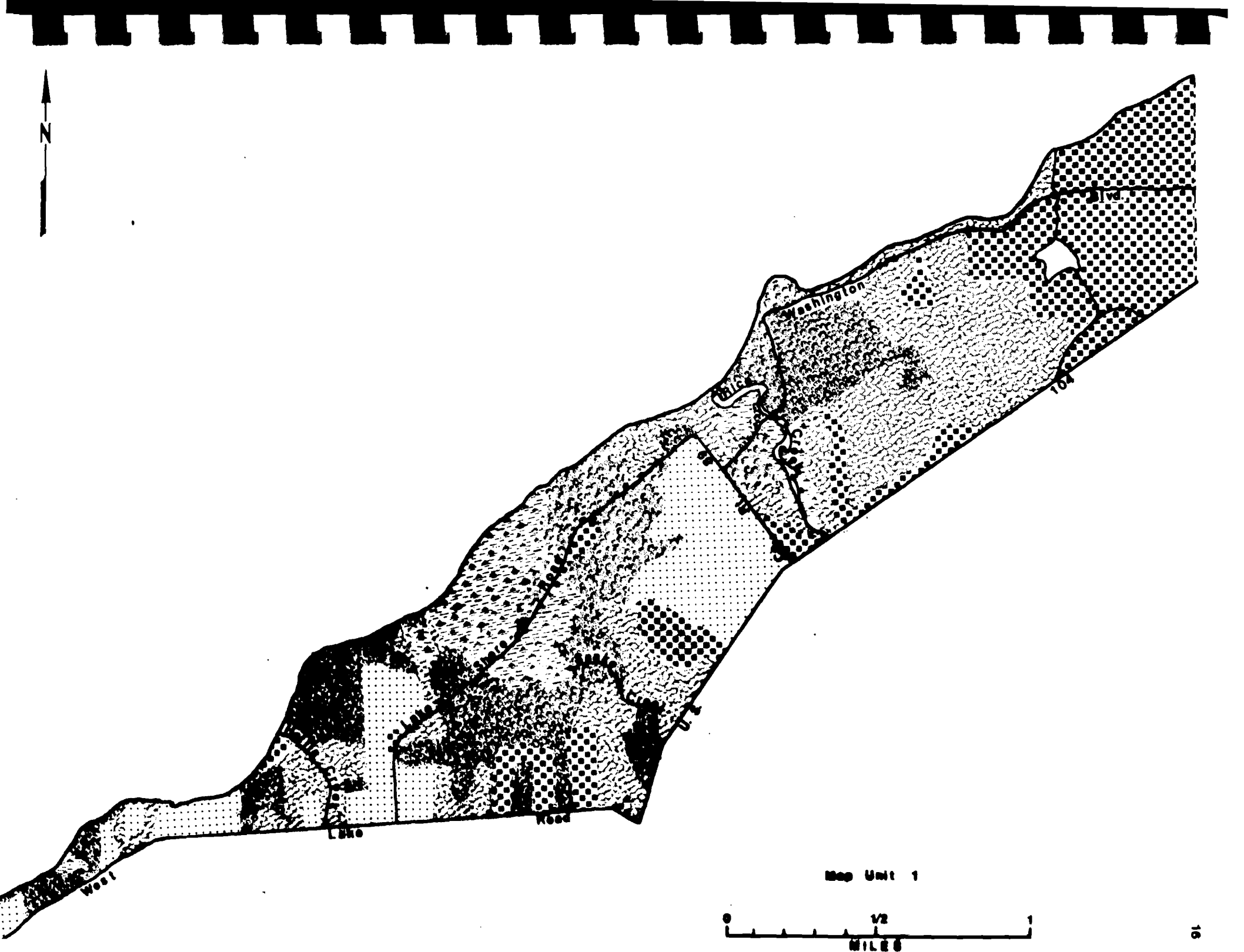
Map Unit 1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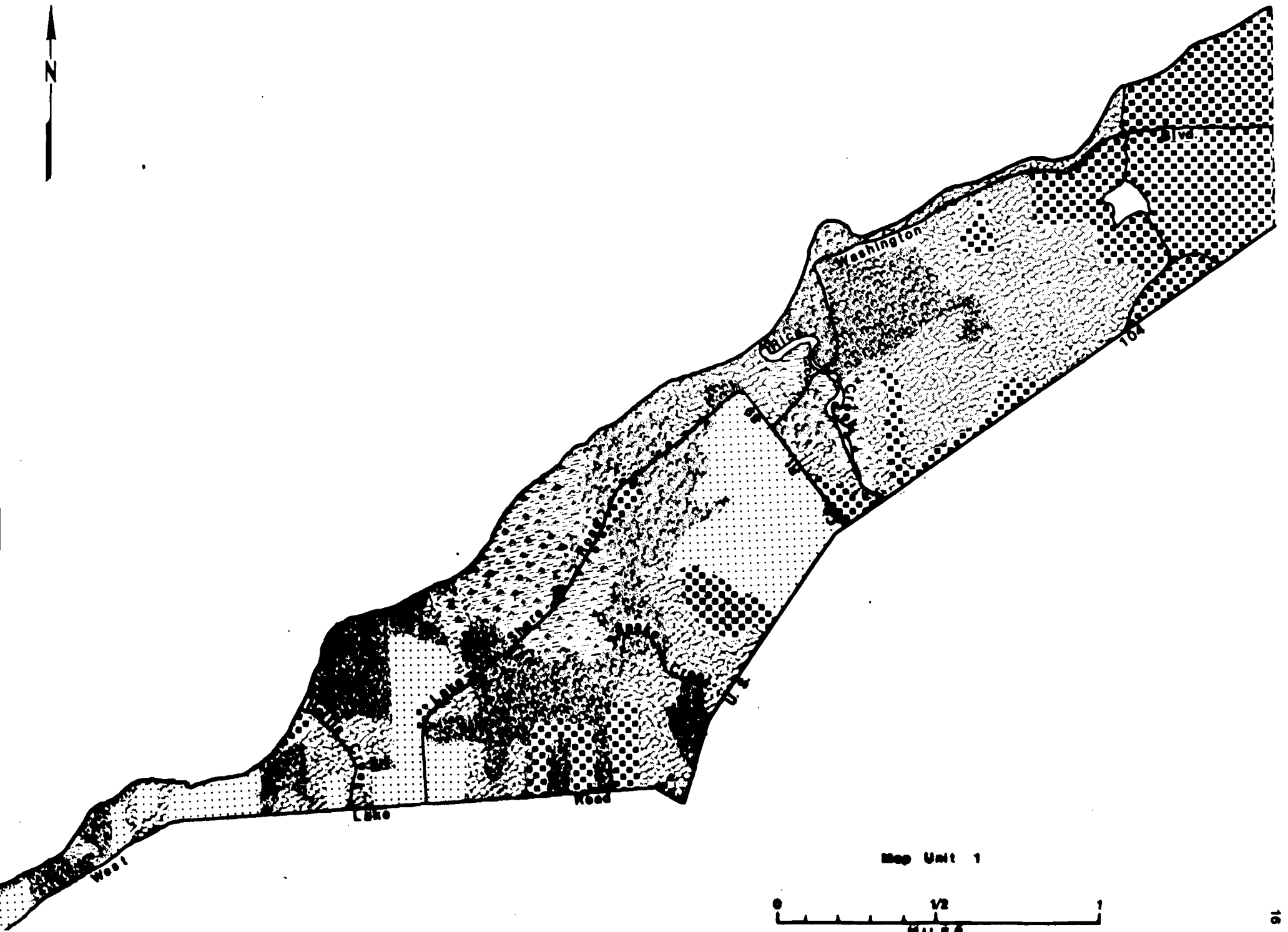
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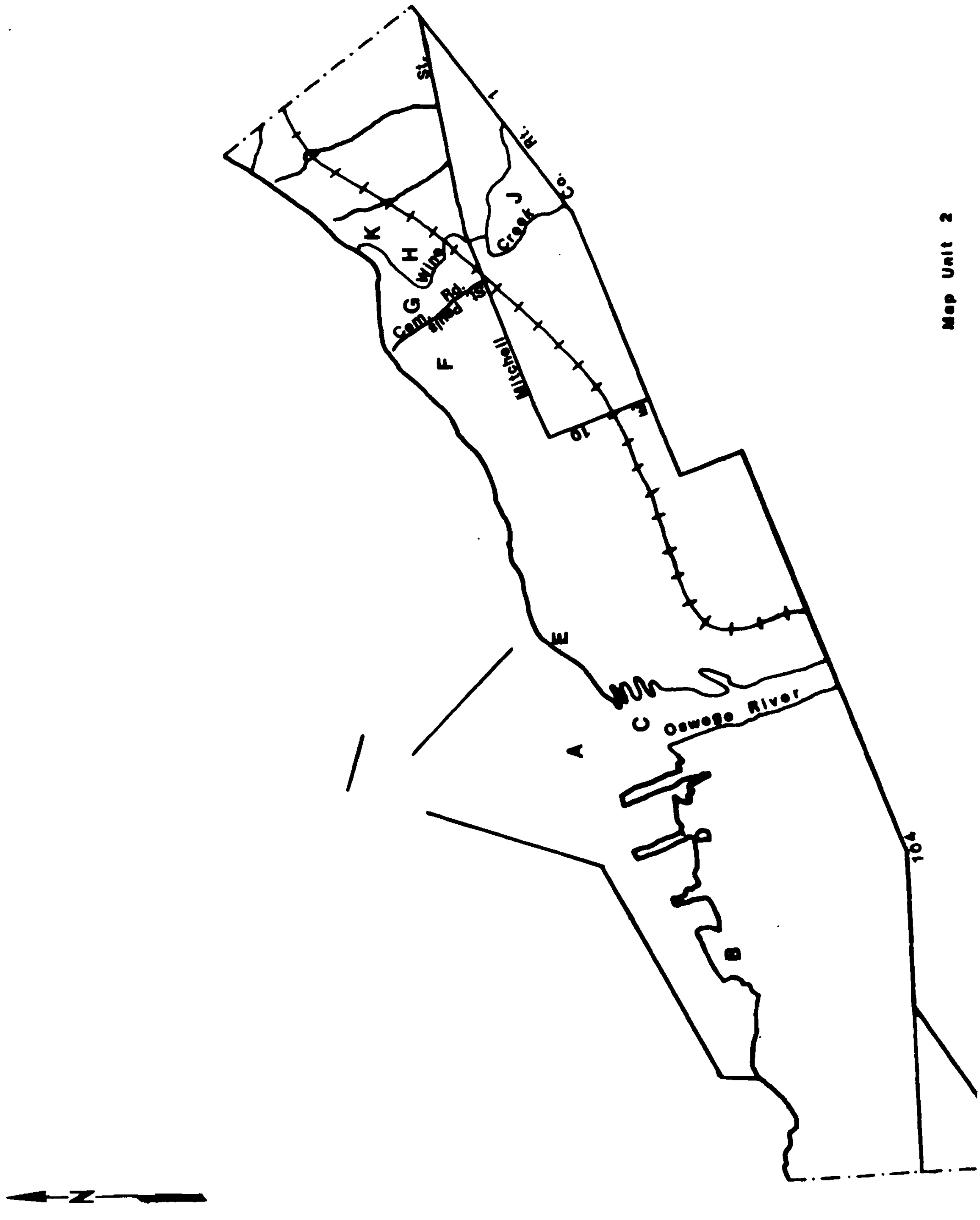
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J
K
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Cem.
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Co.
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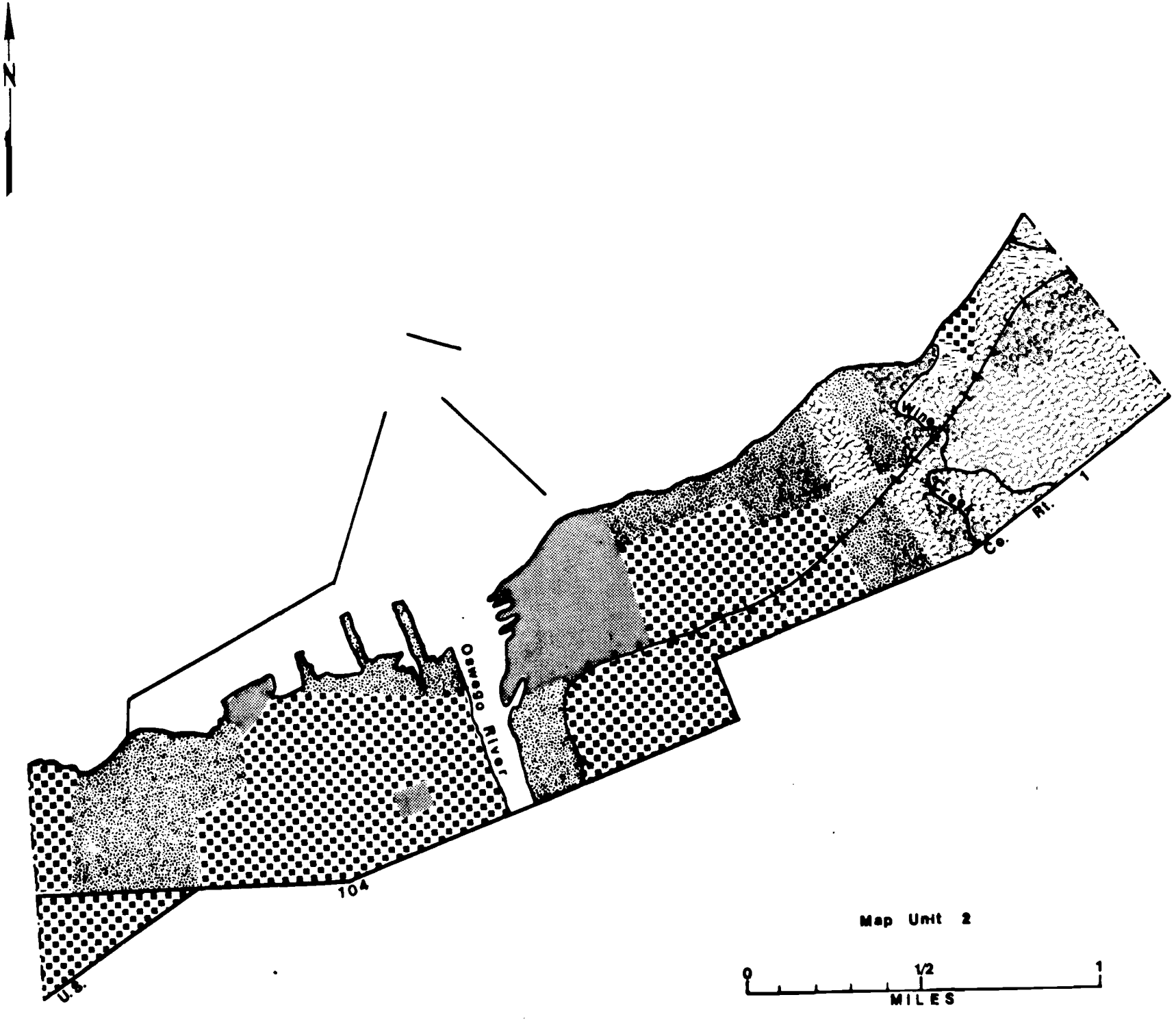
Map Unit 2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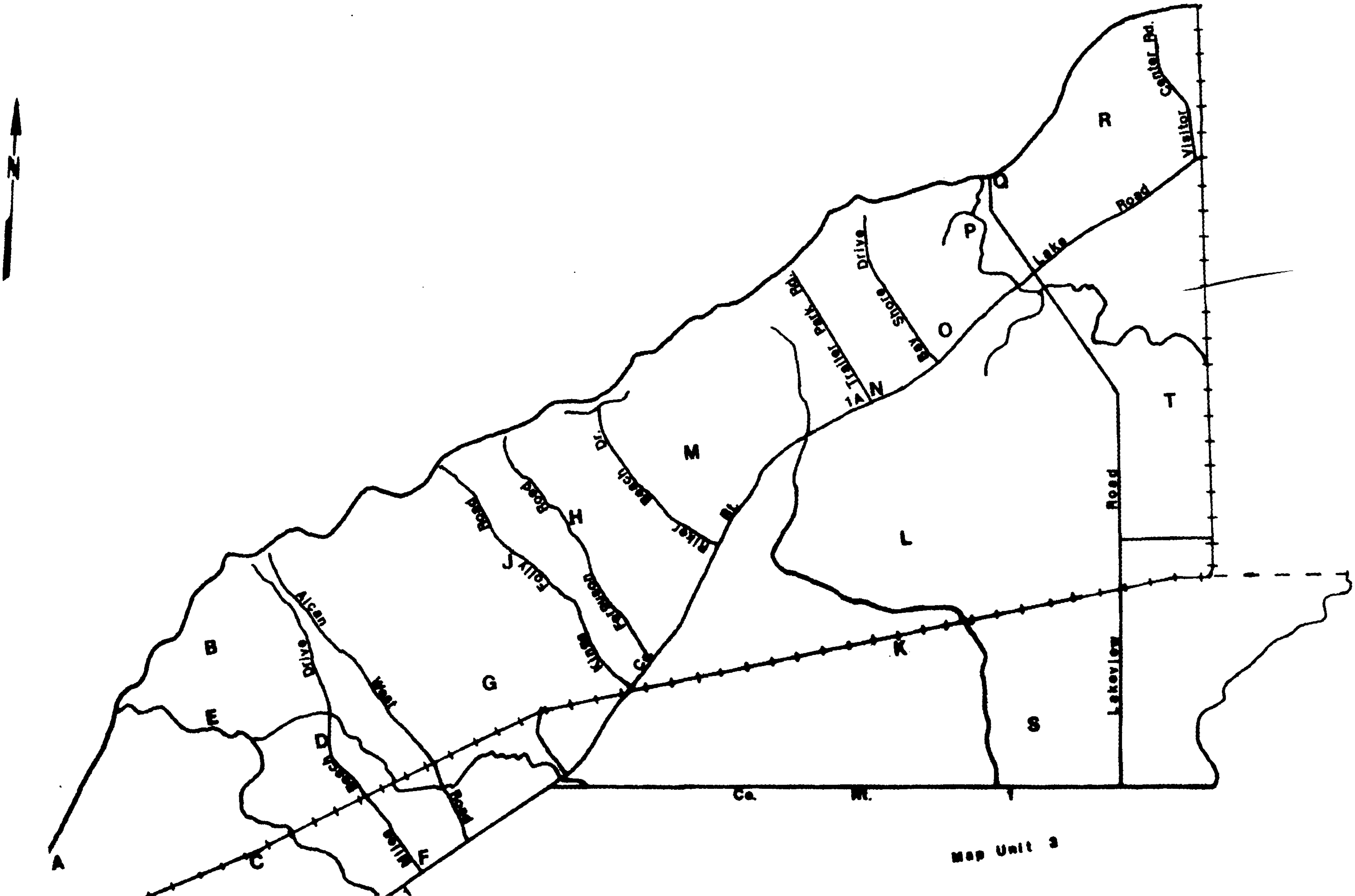
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Lake Road
Bay Shore Drive
Trailer Park Rd.
1A
Riker Beach Dr.
Rt.
Ferguson Road
Folly Road
Kings
Alcan West Road
Drive
Beach
Miles
Lakeview Road
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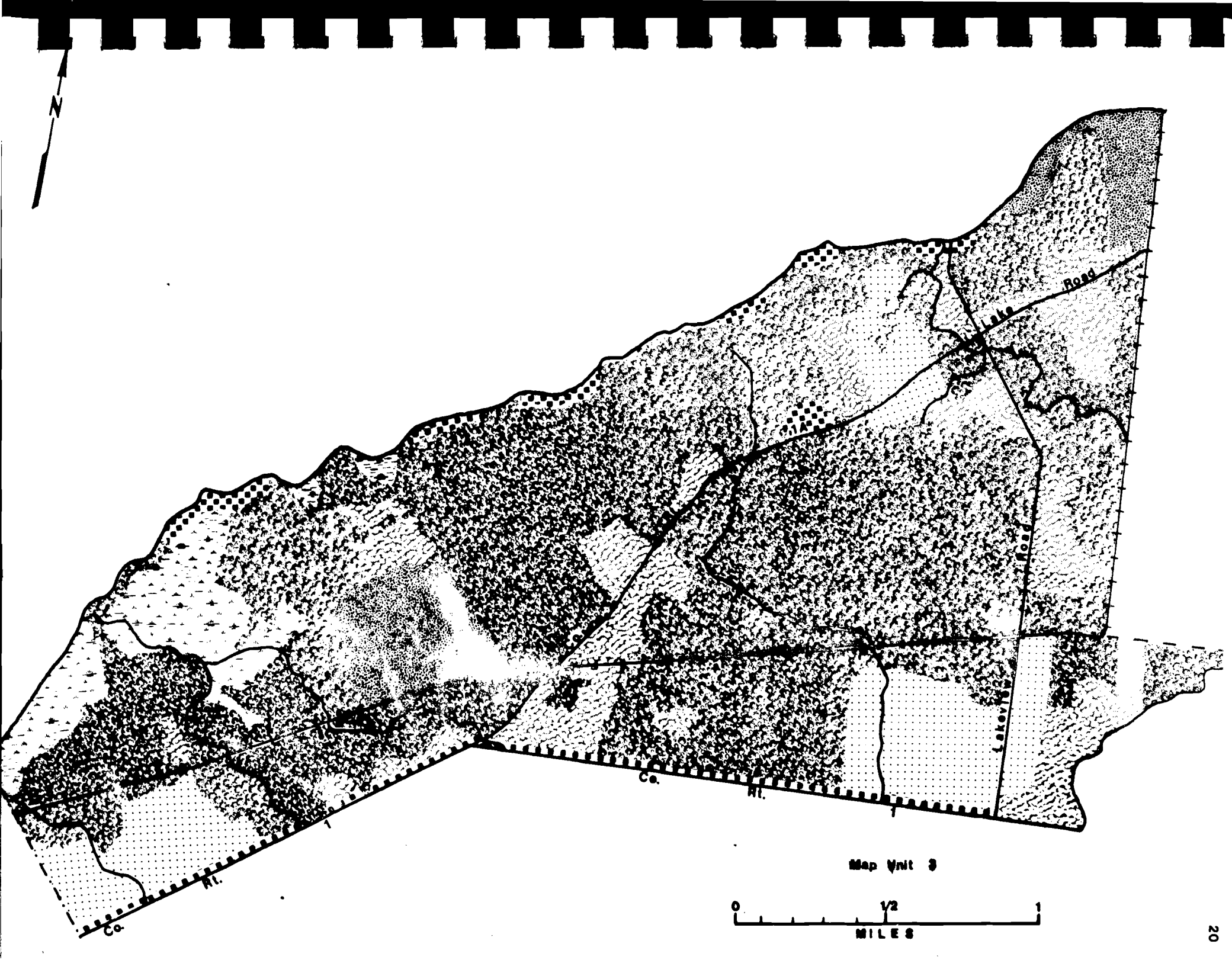
Map Unit 3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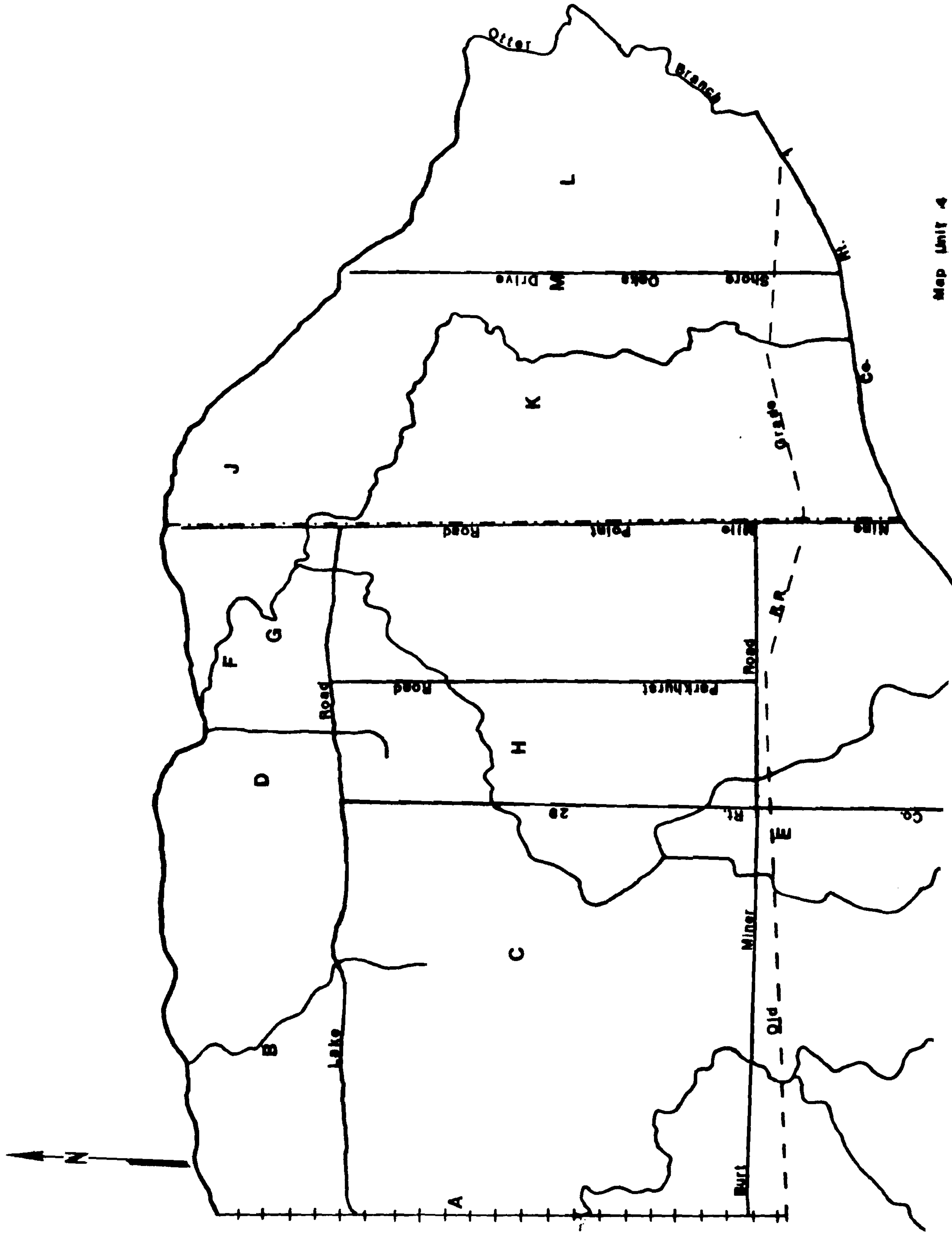
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Mile Point Road
Parkhurst Road
Lake Road
Miner Road
Burt
Old Grade R.R.
Co. Rt. 29
Co. Rt.
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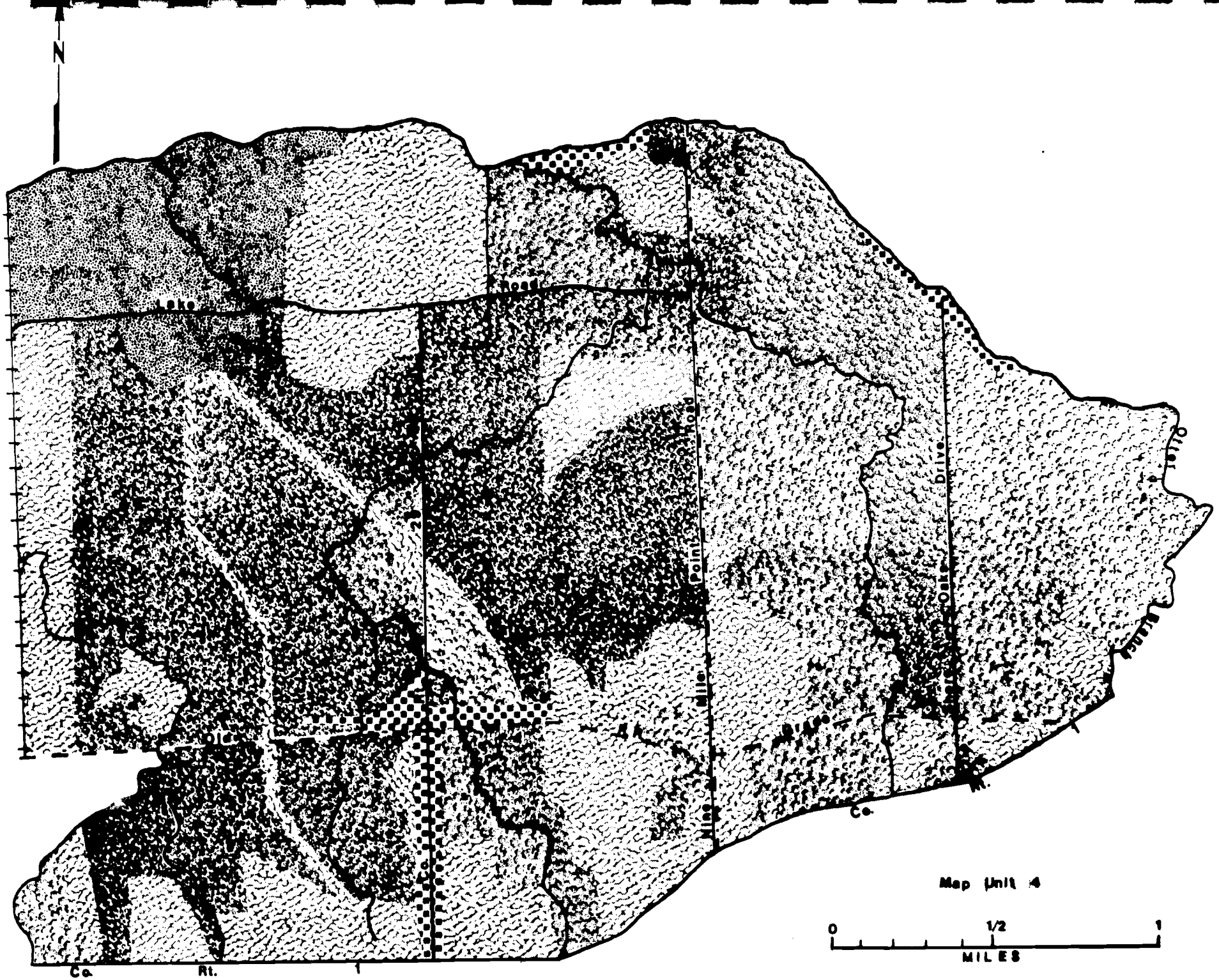
Map Unit 4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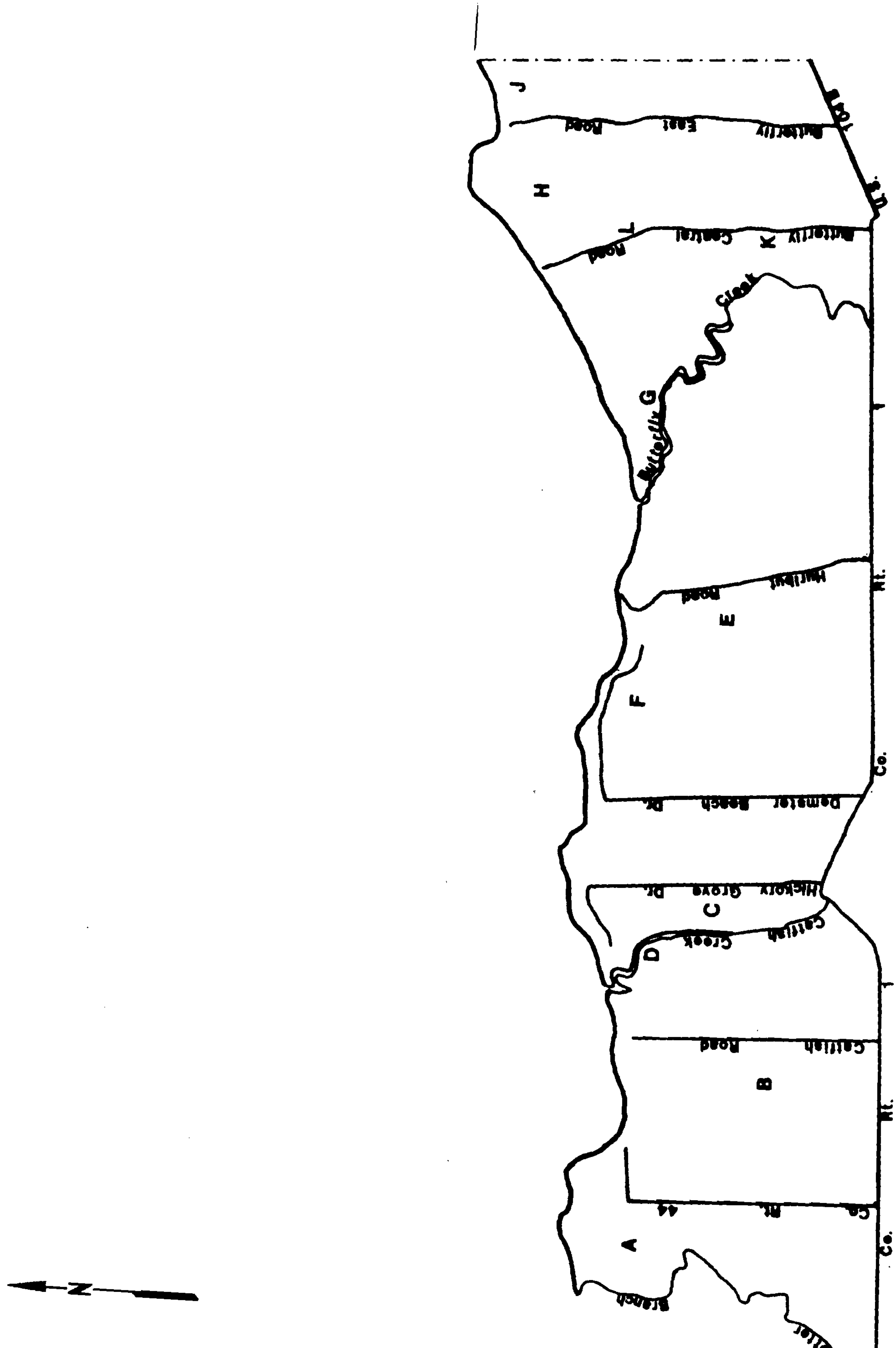
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L
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Catfish Creek
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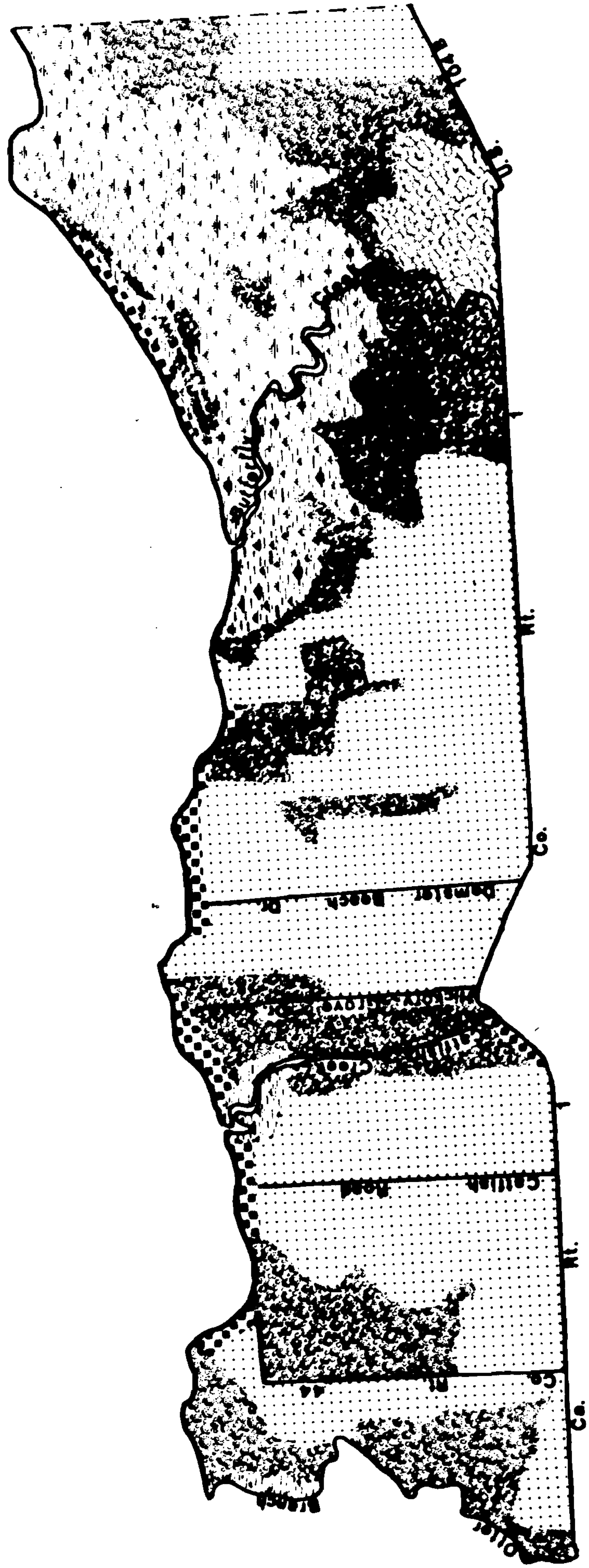
Co. Rt. 44
A
Branch



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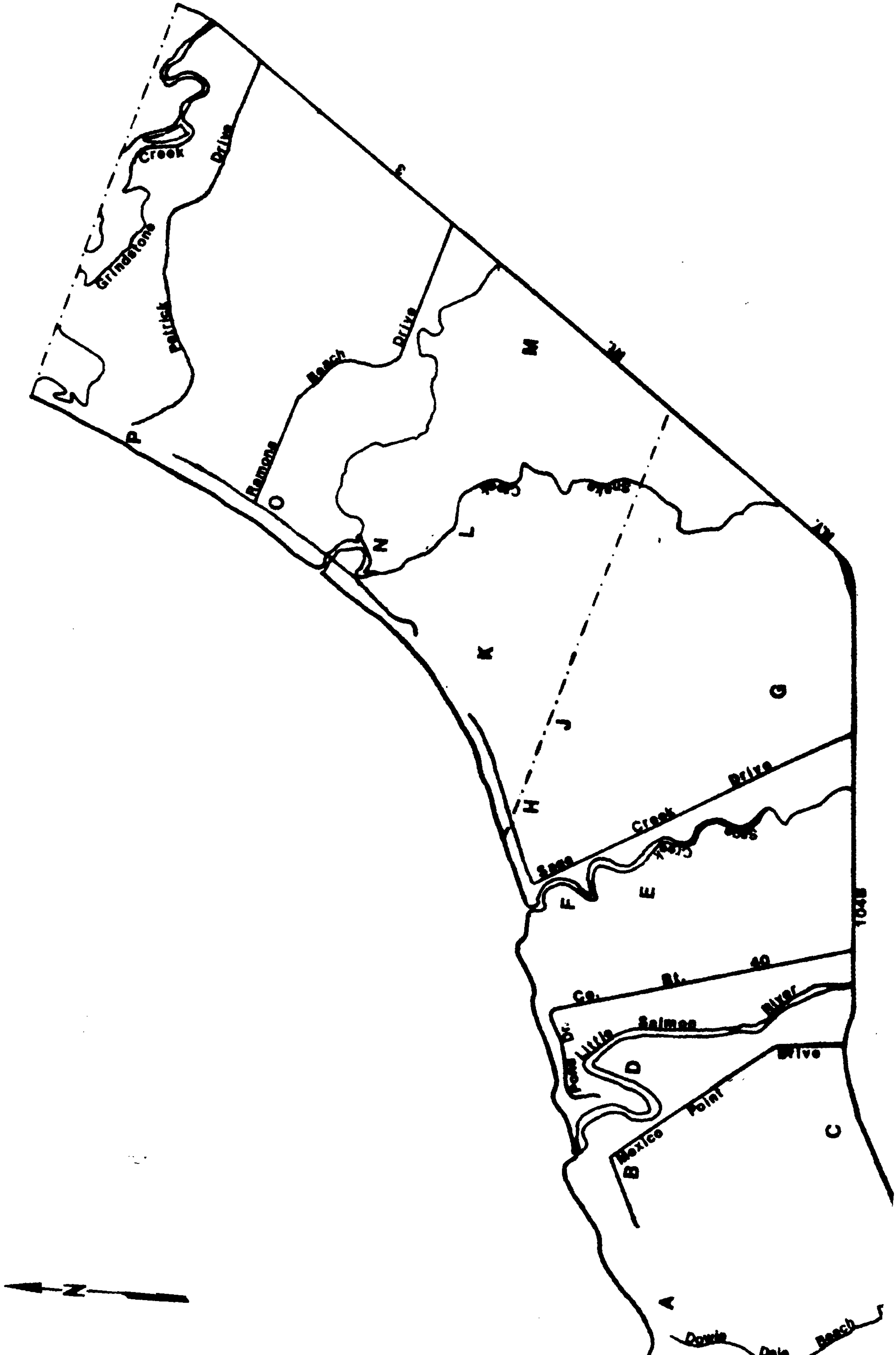

Grindstone
Creek
Drive
Patrick
Ramona
Beach
Drive
Snake
Creek
Snake
Creek
Drive
Little
Salmon
River
Co.
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40
Mexico
Point
Drive
1048
Dowie
Dale
Beach
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Grindstone Creek
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Sage Creek Drive
Little Salmon River
Map Unit 6
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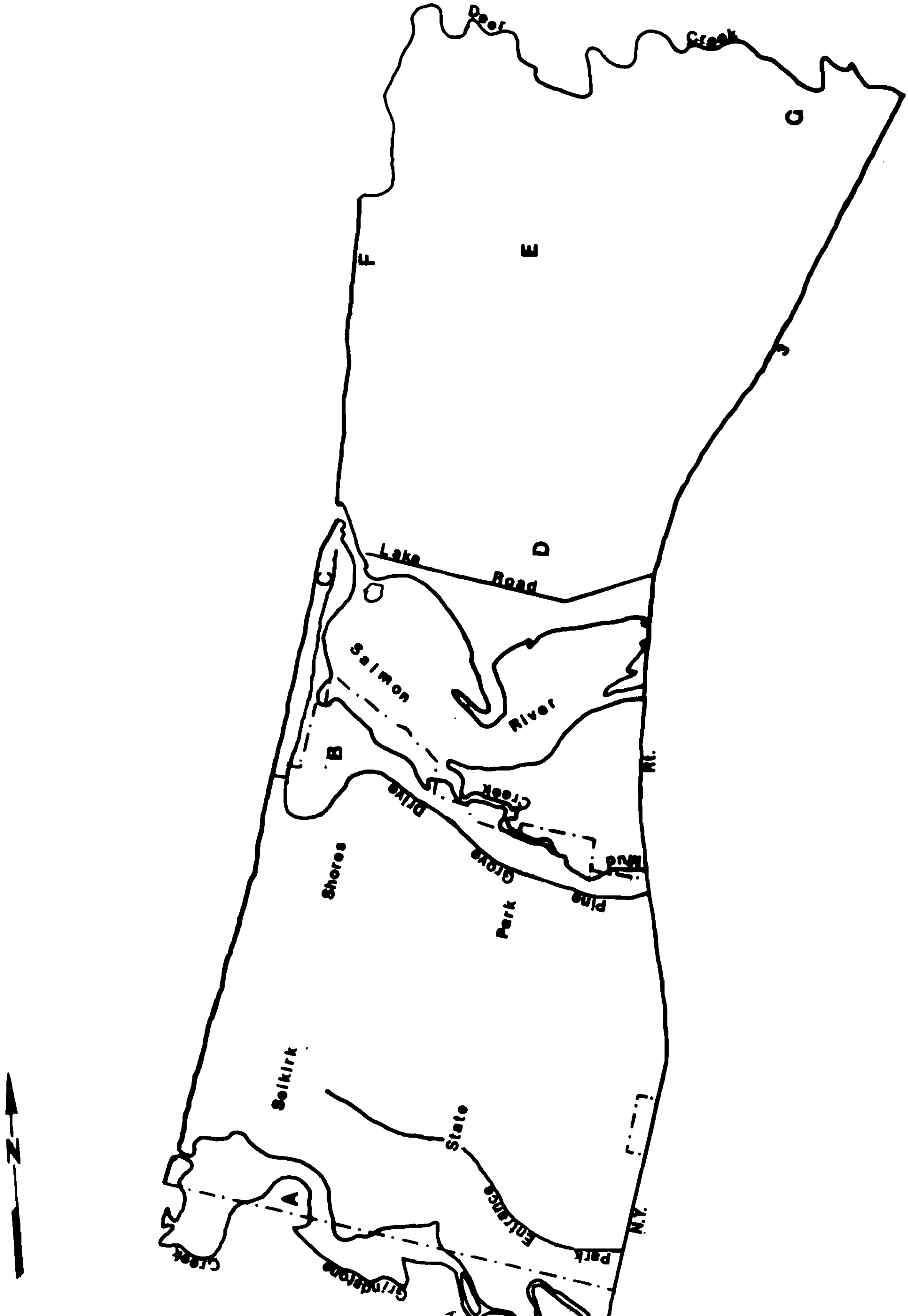
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D
Lake Road
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Salmon River
B
Creek
Pine Grove Drive
Selkirk Shores State Park
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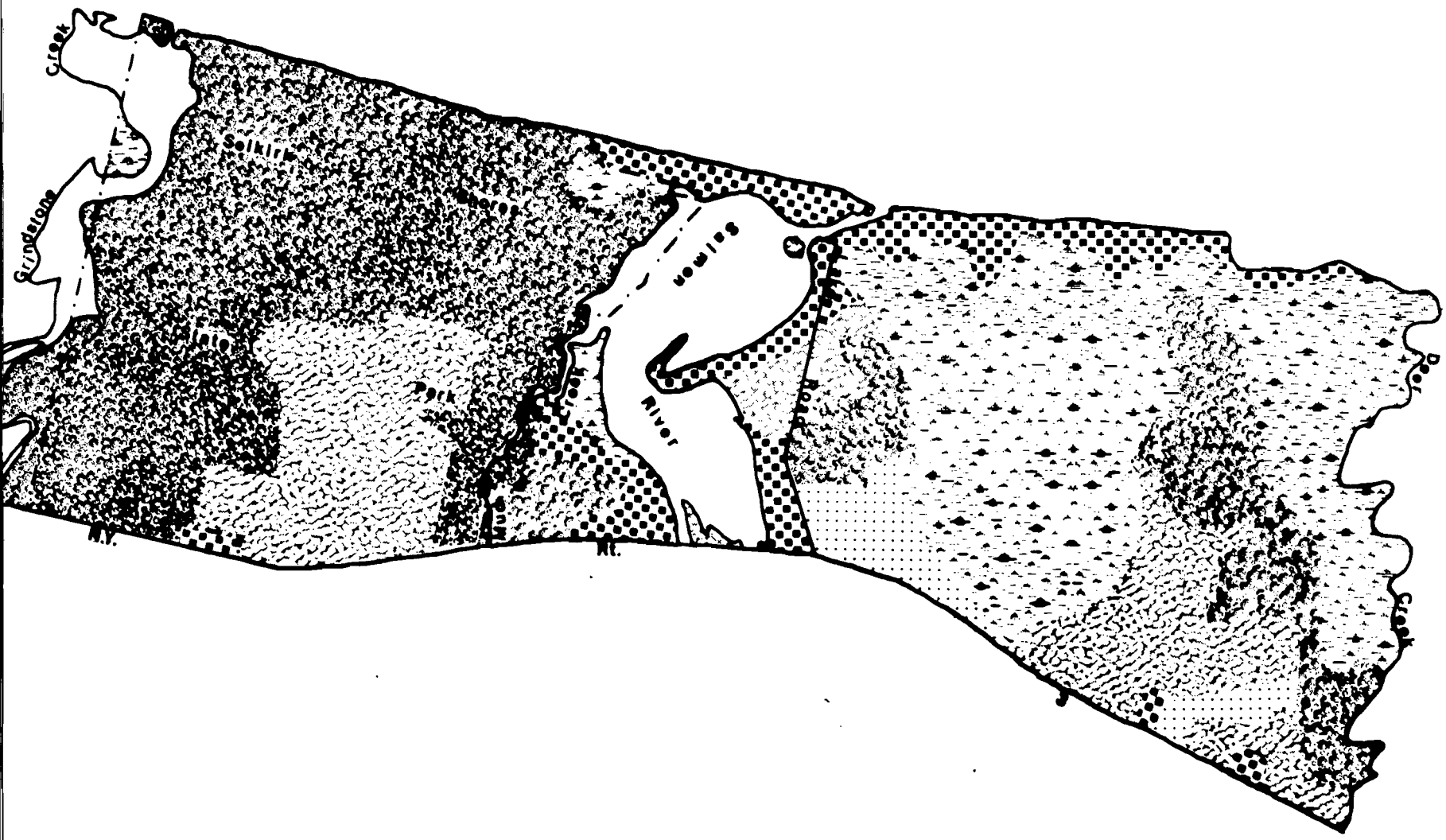
N.Y. Rt.
Grindstone Creek
A
N

Map Unit 7



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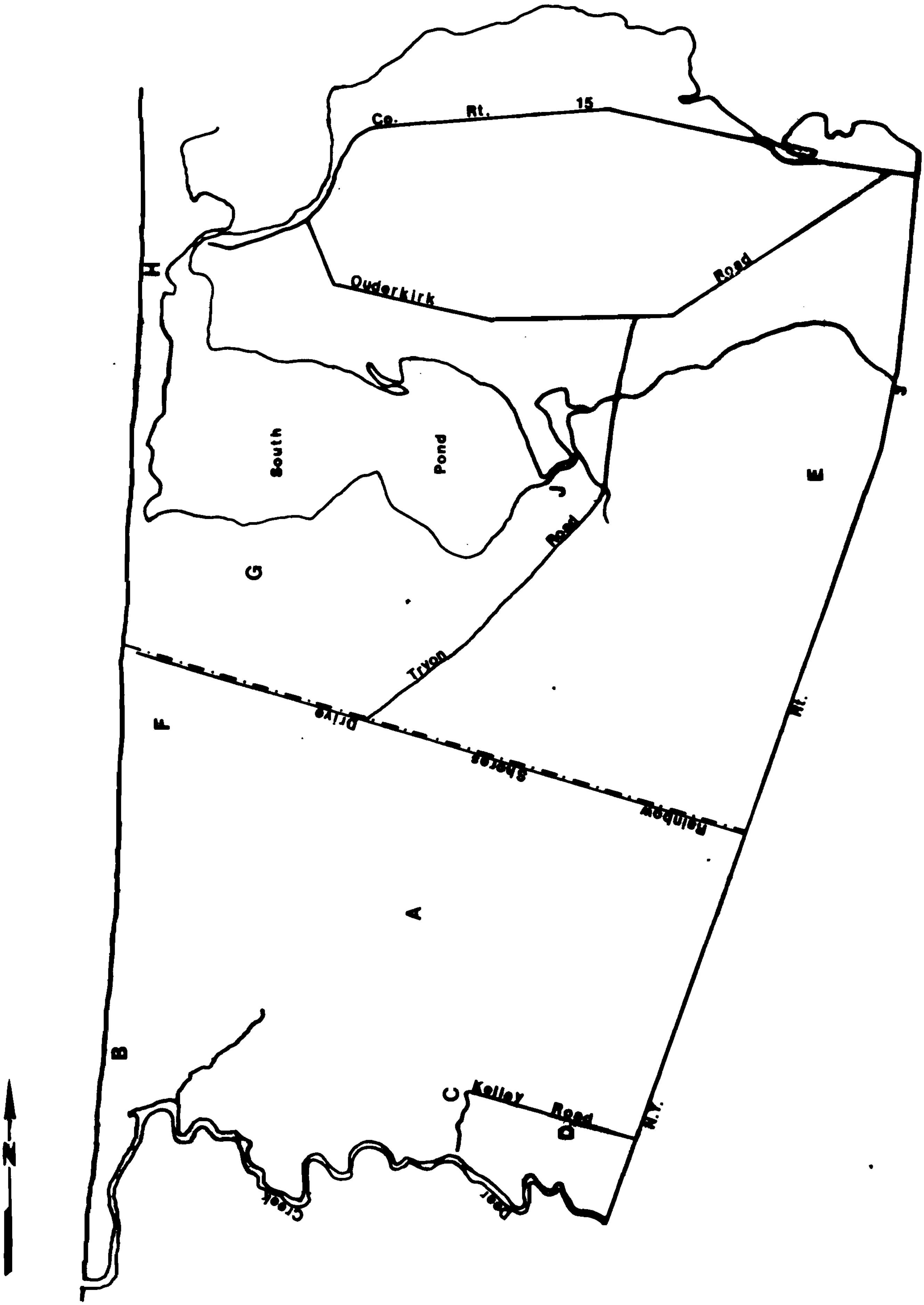
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South Pond
Tryon Road
Rainbow Shores Drive
N.Y. Rt. 3
Kelley Road
Deer Creek
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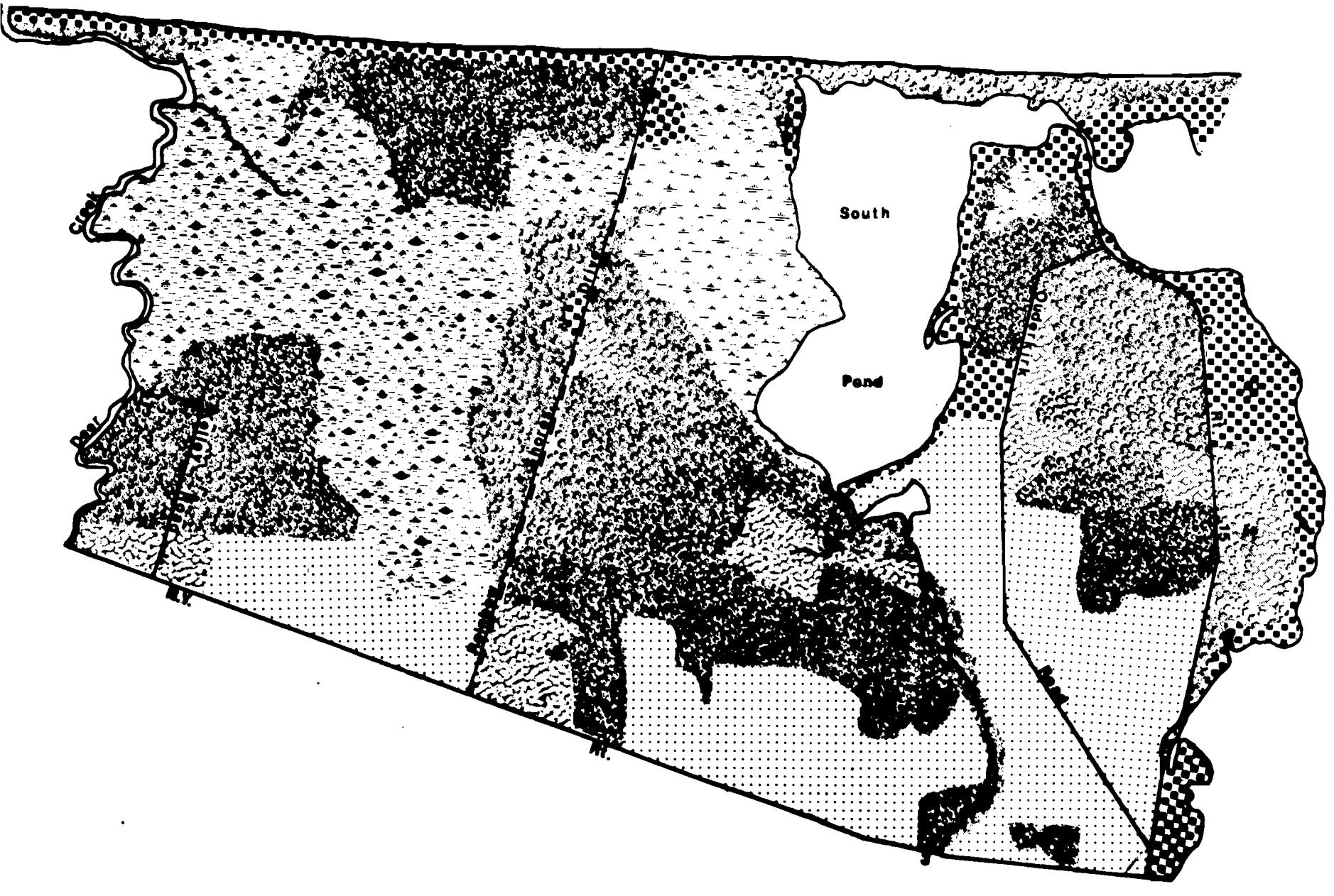
Map Unit 8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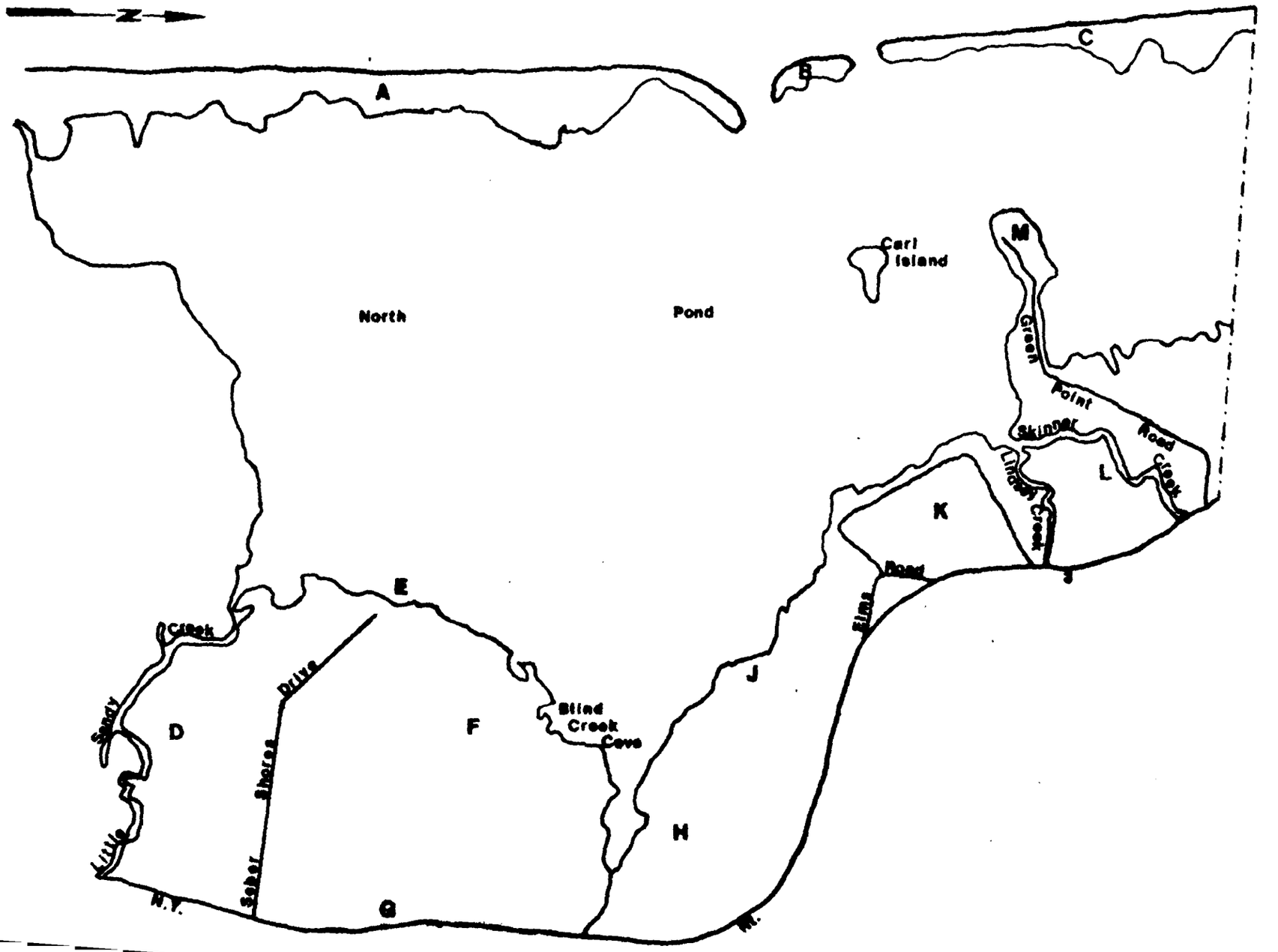
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A
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Pond
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Lindsay Creek
Road
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J
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Creek
Sandy
Drive
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Blind Creek Cove
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Little
Baker
N.Y.
G
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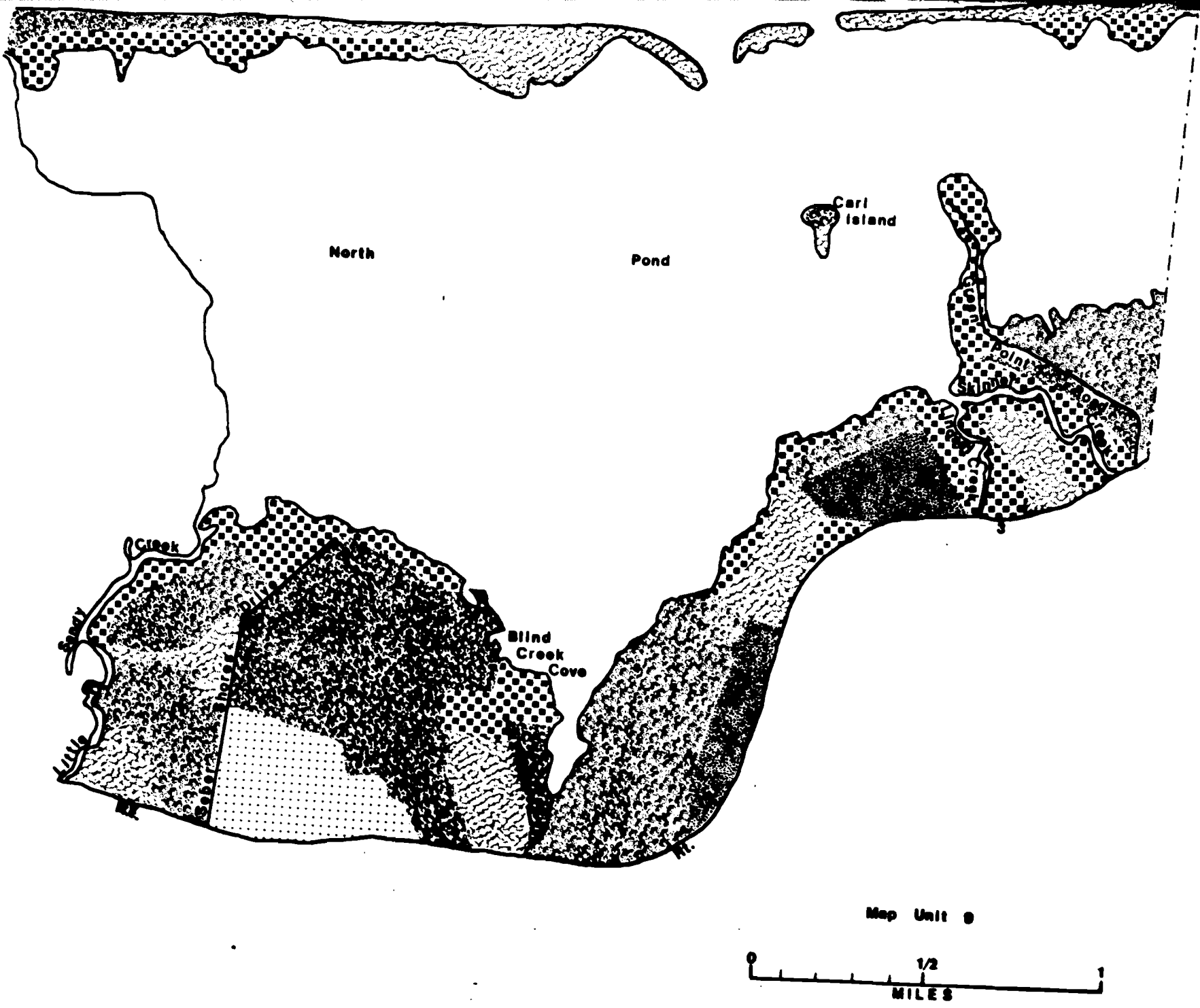
Map Unit 8


North
Pond
Carl
Island
Creek
Sandy
Blind
Creek
Cove
Map Unit
1/2
MILES

Vegetation

Introduction

The vegetation of Oswego County's Coastal Zone has and is going through changes reflective of the changing socio-economic scene in the county. The purpose of this study is to make available to local citizens, planning groups and government agencies a general view of the vegetation, or different types of plant communities, of this area. No attempt was made to inventory the flora, which encompasses all the plant species found in the Coastal Zone. Therefore, the major thrust of our study was to describe and locate the vegetative habitats that need to be looked at in future land use planning decisions. The value of a habitat is based upon many variables, especially its extent, presence of unique and/or endangered species or if it requires many years of succession to replace, as in mature forests and primary sand dunes.

Methods

The study area consisted of all the coastal land in the county. Specific areas for study were randomly selected in a continuous tract from the Oswego Town line near Sterling, to the county line near Jefferson County on the North Pond sand spits. Plant sampling techniques were chosen to correspond with our purpose; a description of the different habitat associations, their locations and the species of plants associated with them. This was accomplished by thorough descriptive cruises and quantitative use of random pairs in the major wooded tracts. (See Cain,1971 for a detailed description of this vegetation survey method,) The areas randomly picked were visited by the team and mimeographed data sheets were used to record field notes. Information included on these sheets was random pair specifications, and forest cruising notes, noting canopy, understory, and ground cover height, percent cover and species composition. By synthesizing the data from the various stands sampled, a general pattern for the vegetation of the region was developed.

Results

The study has yielded a general species list for the area (see Table 2). Species order and nomenclature followed that used by Faust (1961) in the Checklist of the Vascular Plants of Onondaga County. Those species not native to North America, but naturalized in the area, are indicated on the checklist with an asterisk (*). Lack of time and manpower precluded the identification of the grasses and sedges.

For each of the large woodlands in which random pair data was collected, the density, frequency (distribution) and dominance (basal area) were calculated. The phenomena of coverage which is based on basal area, must be considered along with the frequency and density to get an accurate indication of the dominant species. The total of these values is called the importance value. Tables 3-10 summarize the calculation of the random pair data, tree species being listed in order according to importance value. Analysis of the data collected in the wooded tracts enabled the

identification of the dominants and subdominants in each specific woodland.

The study has revealed some unique vegetation in our area with regard to age, composition and nature of habitat.The following vegetation habitats were selected as the major plant associations. Further research, relating specific climate, soil and geology of the area, will bring out a more precise breakdown of these habitats. The major wooded lots are more or less described by criteria we feel are easily understood by the layman as well as the experienced planner.

The extent and distribution of the major habitat divisions within the Coastal Zone may be refered to in the habitat maps of the Cartography section. Areas of specific importance are discussed at length in the Specific Area Reports section.

Mature forest: Many trees present are over 22 inches in diameter at breast height (D.B.H.). There is a definite canopy and understory layer. The ground cover is usually sparse, and there may be much leaf litter. This category comprises the Beech-Maple-Hemlock climax of this area. Common associates of this complex are red maple, wild black cherry, basswood, with ironwood, witch hazel, shadbush, striped maple, and hophornbeam in the understory. Ground cover consists of sparsely covered areas because of the lack of sunlight and the presence of a thick duff layer on the forest floor. Species found here include the following: false solomon's seal, Christmas fern, white baneberry (doll's eyes), beechdrops, jack-in-the-pulpit, foam flower, wild leek,may apple and Herb Robert. This is not a complete listing. Refer to each area specifically for the description of that type of habitat.

Intermediate forest: The largest trees found here are up to, but usually not exceeding 22 inches D.B.H. The understory is more profuse, and ground cover is extensive due to more open areas. This forest type comprises most of the woods found in the study area due to the disturbed nature of much of the Coastal Zone. These areas are all second growth forests succeeding to mature forest. The tree species found here are also in the mature woods. The canopy consists of beech, sugar maple, white ash, wild black cherry, pignut hickory, and in some areas elm, poplar and paper birch. The understory consists of speckled alder, elm, shadbush, American chestnut, choke cherry, spicebush and hobblebush. The ground cover is profuse and includes partridgeberry, Canada mayflower, doll's eyes, wild ginger, wood fern, cinammon fern, enchanter's nightshade and solomon's seal.

Swamp forest: The soil in this forest type is water-logged and sometimes covered by one foot or more of water. The canopy species associated with such an environment include red maple, white ash, elm, and quaking aspen. Sycamore is also found in wet areas, particularly along streamsides. Speckled alder, willows, silver maple, blueberry, and elderberry are common understory companions. The herbaceous layer includes false hellebore, jewelweed, beggar's hick, swamp milkweed and spearmint. Royal fern, and sensitive fern also grow lushly here. Within the Coastal Zone, there are many such wet forests due lowground levels and/or high

lake water levels. These areas are also found in uneven logged areas, holes, and small woods depressions. The swamp forest has a mineral substrate and is annually flushed.

Old field: Various species of invading trees are present in the old field habitat, many over 9 feet in height. Shrubs form a dense understory, and the herbaceous layer is also heavily covered. This habitat classification encompasses successional areas that grade into intermediate forest, the shrublands of the county and old abandoned fields. Common species of trees invading this area are elm, red maple, white ash, poplars, pin cherry, white cedar and willows. The common shrubs found in an old field are red-osier dogwood, silky dogwood, staghorn sumac, arrowwood, speckled alder, craetagus, apple, pear and purple flowering raspberry. The numerous herbaceous species are detailed in the specific area reports.

New field: These fields consist of predominantly annual herbaceous plants, and if any, the invading shrubs are below 9 feet tall. Especially common herbs include goldenrods, queen anne's lace, field strawberry, field bindweed, orange hawkweed and New England aster.

Wetlands: This category includes all the wetlands types such as shoreline swamps, cattail marshes and deep water swamps. Most important are the types of emergent and submergent vegetation that comprise the wetland. Typical marshes have varying degrees of open water, with cattail fringes and intermediate forest borders. Species commonly found in the marsh wetlands of the Coastal Zone include giant bur-reed, spike rushes, cattail, arrowhead, arrow-arum, elodea, duckweed, smartweed, pickeralweed, swamp candles, swamp loosestrife, yellow and scented water lily, and bulrush. Sweet gale, along with buttonbush and blueberry will often form very dense stands of shrubs in swamp areas. These wetlands are discussed in each case as they apply to a specific area.

Dune complex: This habitat represents a unique, fragile ecosystem along Lake Ontario. The primary sand dunes are a community of specialized dune invader species such as beach grass and beach wormwood. Cottonwoods, quaking aspen and heart-leaved willow are the most common woody invaders. When established, these dunes are found to support a mature woods community comprised of black oak, wild black cherry, choke cherry, and basswood. The understory includes hobblebush, striped maple and maple-leafed viburnum. The ground cover is extensive and composed of doll's eyes, starry false solomon's seal, beach pea, sea rocket, moneywort, hellborine, and tall meadow rue. Species such as sea rocket, beach grass, beach wormweed, heart-leaved willow and beach pea are endemic to sand dunes, and unique in this part of central New York.

Urban, industrial and agricultural: These categories are self-explanatory. Agriculture includes pastures, croplands and orchards. Urban habitat includes areas of concentrated human settlement, most notable of which are the numerous camp colonies found along the Lake Ontario shoreline. These camp colonies are, to a great extent, seasonally occupied.

Specific Area Reports

Oswego Township

Health Camp Marsh: This marsh occupies 36 acres and straddles Health Camp Road, being separated from Lake Ontario by land. The main body of the marsh is 3/4 open water, with patches of open marsh consisting of arrowhead and arrow-arum and duckweed. The west edge of the marsh is bordered by agricultural lands, while the rest is surrounded by a wet intermediate woods. The canopy of this woods averages 35 feet in height, with sugar maple, white ash, and black locust the predominant tree species. Young yellow birch, and elm are also found here. Grape, witch hazel, and arrowood comprise the dense understory. The dominant herbaceous species present are hellborine, jewelweed, false nettle, jack-in-the-pulpit, and lady fern. Patches of cardinal flower were found in several very wet areas in these woods.

The north sector of Health Camp Marsh is surrounded by a more mature upland woods, and bordered on the northeast by a small cabin colony. Although this section of the marsh borders the lake, there is no surface outlet to Lake Ontario. The drier woods in this area are composed of white ash, cottonwood, yellow birch, basswood, and pin cherry. American beech and red oak are also found here. The marsh itself is densely filled with speckled alder and buttonbush reaching up to six feet in height. White ash, red maple, pin cherry, and silver maple are found along the edge and at points invading this section of the marsh. Swamp milkweed was a predominant herb here.

Snake Creek Swamp: This 131 acre wetland area is located 2½ miles west of the city of Oswego. A barrier beach separates the swamp from Lake Ontario and a wood fringe adds to the inaccessability of this area. The wood fringe is a deciduous woods composed predominantly of red maple, beech, basswood, red oak and black cherry, with a canopy averaging 45 feet. These species are also present in the understory along with serviceberry, american chestnut, and arrowood. In areas bordering the swamp, where the soil is poorly drained, red maple and silver maple predominate, and sensitive fern is a common ground cover species.

Lake Shore Road bisects the swamp, the north section being a shrubby swamp, consisting mostly of buttonbush and swamp loosestrife. There is open water throughout, with duckweed found on the surface of the water. On the south side of the road, the swamp is more densely filled, being invaded by tree species such as red maple, from the wood fringe surrounding the swamp.

Rice Creek Mouth and Burt Point: Where Rice Creek empties directly into Lake Ontario, it widens into a slow-moving stream, with marshy areas covering a good part of the mouth. Cattail and arrow-arum are found abundantly in these areas. The woodlands bordering the mouth are a well-developed deciduous woods, but the area is greatly disturbed. Well-traveled footpaths are found throughout Burt Point. The dense canopy is approximately 45 feet tall, with basswood, and red maple being

the predominant species. Beech, white ash, red oak and black cherry are also found less commonly here. The understory cover averages 35%, and consists of hophornbeam and striped maple. Young red maple and red oak are common in these woods. Near the creek edge, mature hemlocks were found, along with one of the few mature sycamores found on the study area. Some unusually large beech (D.B.H. = 21.5") and black oak (D.B.H. = 36.0") were also found here.

College Brushlands: The area just west of the State University College at Oswego, and extending to Rice Creek, is a good stretch of typical mixed successional land. The brushlands owned by the college are relatively undisturbed, except some areas that are periodically mowed. The majority of this large brushland area fits into the old field habitat classification. Typical shrubs such as staghorn sumac, red-osier dogwood, arrowood, silky dogwood, Craetagus sp., and willow grow quite densely here. Some patches of pure arrowood and dogwood reach ten feet in height towards the middle of the brushlands. A few white ash and red maple, averaging 40 feet tall, were found along the edge of the field, as was pin cherry, a typical successional species.

Scriba Township

Teal Marsh and Surrounding Areas: The Milea Beach Area comprises an area of high habitat diversity. Teal Marsh constitutes a large part of Milea Beach, but also found here are areas of deciduous woods, mixed woods, and swamp woods, ranging from young intermediate woods to areas that are relatively undisturbed and mature. Teal Marsh is estimated by the Central New York Coastal Zone Management Program (1975) to be 30% shrub swamps and 70% wooded swamps. Buttonbush is the dominant species found in the shrub swamps, where it grows so densely as to almost exclude all other species. The wooded swmaps found in the low areas throughout Milea Beach, are composed of red maple, silver maple and speckled alder. Other emergent vegetation includes royal fern, duckweed, cattail and arrow-arum.

The barrier beaches that border Teal Marsh are completely developed for recreational uses. Milea Beach Road, a dirt acess road to the beach, cuts through a fairly mature mixed woods, the dominant species being red maple, beech, sugar maple and hemlock, in decreasing order of importance (See Table 3). Hobblebush, maple-leafed viburnum and striped maple are common in the understory. Groundcover species here, such as doll's eyes, solomon's seal, painted trillium and foamflower are typical of rich woods. Also found in these woods was a showy lady's slipper, an orchid species protected by law.

The woods bordering the west edge of Teal Marsh are much less disturbed than the east side woods. This area is not as accessible, hence there is little human traffic. The canopy averages 65 feet tall, with many of the trees having a diameter greater than 20 inches. The dominant tree species here are red oak, sugar maple, beech and red maple, this woods being higher and drier than Milea Beach Central (See Table 4). The understory and groundcover are less dense as is usually found in more mature woods.

Scriba Northwest Woods: Scriba Northwest woods encompasses a large wooded area extending east from Alcan West Road to the trailer park road, and generally north of County Route 1. It is essentially upland woods of varying ages and comprises one of the largest wooded tracts in Scriba Town. The area bordering County Route 1 is successional; mostly old field habitat.

The western portion of the area consists of a 40-70 year old second growth forest. The area in the vicinity of King's Folley Road is the most mature; the canopy is approximately 50-65 feet tall and the cover is dense. The order of importance of the dominant tree species in the canopy is: sugar maple, white ash, beech, hemlock and red maple.(see Table 5). Wild black cherry, pignut hickory and yellow birch are less common here. Maple-leaf viburnum, hophornbeam, ironwood, and serviceberry form a somewhat dense unde story layer. The ground cover includes wood strawberry, partridgeberry, wh snakeroot and painted trillium. Poison ivy is particularly abundant here. In wet areas in these woods, dense patches of jewelweed and sensitive fern a common.

The eastern section of Scriba Northwest woods is similar in composition but younger, and dissected into smaller tracts by camp roads.

Walker Woods: This area consists of a mature woods surrounded by a young, wet intermediate forest. The intermediate forest contains red maple, sugar maple, beech, basswood, white ash, and quaking aspen. The ground cove is sparse and shows evidence of recent grazing. The mature woods has a canc cover of about 85% and reaches a height of 50 feet. American beech and suga maples with diameters over 23 inches are common. The woods also contain her lock, paper birch, wild black cherry and striped maple. Ground cover inclu partridgeberry, solomon's seal, New York fern, ground yew and Christmas fer

Scriba Woods: This area is located just west of County Route 29, betwe Lake Road and Burt Miner Road. The Power Authority of the State of New Yor owns the land here and the power corridor from the Fitzpatrick Nine Mile Po power plant passes through the area. A mature woods bordered by successiona fields comprise the vegetative habitats in this sector.

Along County Route 29 are old fields, including an abandoned orchard a hay fields. These fields contain many alder thickets, Craetagus species, a ple and pear trees. Beneath the transmission lines are young elm, and low shrubs of speckled alder, willow and staghorn sumac. The vegetation under the lines is controlled by herbicide spraying and periodic clearing. This power corridor bissects the mature woods.

The wooded area east of the power corridor is representative of a typi cal climax community in our area. The canopy cover is 80-90% and reaches to 75 feet in height. Dominant canopy species include American beech and sugar maple, many of which have diameters over 24 inches (see Table 6). There are also large hemlocks, red maples, white ash and yellow birch. The undestory cover is about 20% and 35 feet tall. Species present include hop hornbeam, striped maple, serviceberry and ironwood. Ground cover is sparse due to a thick layer of beech leaf litter and lack of light penetration. B cohosh, false solomon's seal, solomon's seal and wild sassparilla were a fe of the herbaceous species flowering at the time this area was cruised. The woods have little evidence of disruption. They are protected and stable, w

few dwellings, roads or footpaths.

West Nine Mile Point Woods: This area borders Lake Ontario and is just east of the Nine Mile Point Power Complex. It consists of two major habitat types; an intermediate forest, and open fields in various stages of succession. The woods are fairly undisturbed, except near the lake shore where a seasonal camp colony is found. The major tree species consist of black oak, sugar maple, paper birch, white ash and quaking aspen. The canopy cover is very dense and reaches a height of about 45 feet. The fields are in an early stage of succession with patches of shrubs consisting primarily of red osier dogwood and arrowwood.

New Haven Township

Mexico Bay West Woods: This area is one of the largest, continuous tracts of woodlands within the Coastal Zone, being bisected only by Shore Oaks Road. The Noyes Woods Sanctuary on the western edge of this tract is approximately 50 acres and is representative of the beech-maple-hemlock climax complex in the Coastal Zone. The sanctuary is on the east side of Nine Mile Point and is bordered by an old apple field and an abandoned white pine plantation. The forest is mature with a canopy cover of 95%, and consisting predominantly of sugar maple, hemlock, white ash, beech and red maple (see Table 7). Associate canopy species include red oak, wild black cherry and yellow birch. The understory is sparse in much of this section of Mexico Bay West woods, and contains striped maple, hobblebush, witch hazel, hophornbeam and ironwood. The ground cover is about 20-30%, with wintergreen, Canada mayflower, blue cohosh, doll's eyes, partridgeberry, wild ginger and trailing arbutus common in this layer.

Wooded areas east of Noyes Woods Sanctuary are very disturbed, being actively logged, and bordered by a seasonal camp colony. Logging roads and slashed areas are found throughout these woods. The area along Shore Oaks Road includes grazed, wet forests consisting of sugar maple, red maple, white ash and basswood. Drier upland sections contain mature sugar maple, beech, and hemlock, along with yellow birch, red oak and white ash. Common understory species include spicebush, ironwood, hophornbeam and witch hazel.. Trillium, lion's foot, ground pine, foam flower and partridgeberry comprise the ground cover.

The Pleasant Point Road area is an extension of the Shore Oaks intermediate forest, but with less disturbance. The area is bound on the south by County Route 1, on the west by Otter Creek and on the east by County Route 44. It is fringed by active agricultural land. Old orchards are found near County Route 44. The predominant species in the forest are beech, and sugar maple, along with basswood, wild black cherry and hemlock. There are developed areas near the lake shore, but these are few and represent the only human disturbance of this area.

Catfish Creek Area: This wooded area east of County Route 44 includes Catfish Creek swamp and the Hickory Grove Road woodlands. It is bordered on the south by County Route 1, on the west by County Route 44 and on the east by Hickory Grove Road. A large amount of the land along Hickory Grove Road is devoted to agricultural uses.

The creek inlet contains patches of cattail, arrow-arum, scented water lily, duckweed, Elodea, burreed, spike rush and pickeral-weed. The shoreline here is fringed with highbush blueberry, and silky willow, nannyberry and silky dogwood grow lushly. The lower creek fringe also contains alder thickets mixed with hophornbeam. A dense hemlock stand and a grove of shag bark hickory about 80 feet tall are found in the woods along the lower cree

The banks upstream are lined with blueberry, spicebush, elderberry, hobblebush, sensitive fern and jewelweed. This part of the creek is relatively undisturbed, and bordered on both sides by mature woods. The forest canopy consists of sugar maple, American beech, basswood, hamlock, red mapl and sycamore. The ground cover is dense and includes, besides those specie mentioned above, false hellebore, may apple, early meadow rue and deadly nightshade.

Especially notable in this area is the presence of two very old remnant trees; a sugar maple with a diameter of 71.2 inches and a red oak with a diameter of 65.2 inches. This sugar maple is among some of the largest tre of this species found in New York State.

Butterfly Swamp Area: This swamp is the second largest wetland within the Coastal Zone. The swamp and the area surrounding it contain a diversit of habitats, including active farmlands, successional fields, intermediate swamp woods and a unique hemlock dune complex.

Active farmlands and successional fields border County Route 1 and U.S Route 104B. Speckeled alder, arrowwood, red osier dogwood, silky dogwood, pear and apple trees are found within the successional fields. Near the swamp woods, alder thickets are found, along with staghorn sumac, white ash hophornbeam and witch hazel.

The canopy cover in the swamp is about 30% and consists of red maple, silver maple, and hemlock. In drier areas, poplar and white ash are found. The understory includes highbush blueberry, buttonbush, wild rose and sweet gale. The herbaceous layer contains royal fern, sensitive fern, scented water lily, water dock, and water horehound.

The hemlock covered dune complex is unique within the study area. Thi miniature ecosystem consists of several parallel dune"islands" situated 120 from the lake shore in the western part of Butterfly Swamp. These dunes ar dominated by very old hemlocks averaging 60 feet in height. Also found in the canopy are red maple and swamp white oak. This is one of the few areas in the Coastal Zone where tupelo was found; on the dune "islands" it reache a height of 70 feet. The sparse understory contains highbush blueberry, st maple and arrowood. The herbaceous layer is extensive and consists of grou yew, wintergreen, partridgeberry, pyrola and trillium.

Most of the dune "islands" are undisturbed, however, one of the dunes being clear-cut. The age of many of the hemlocks that were cut out was determined to be more than 125 years old. It conceivably could have taken more than 200 years of succession to produce these stable, mature dunes, ye it took only a few weeks to indiscriminantly clear-cut one half of one of t "islands".

Mexico Township

Derby Hill Area: This area has a variety of small habitat tracts including Sage Creek Marsh, active farmlands, successional fields and woodlands. The emergent vegetation of the marsh includes cattail, spike rush, giant bur-reed, scented water lily and Elodea. The active farmlands are surrounded by hedgerows containing staghorn sumac, Craetagus species, young red oak and apple trees. The woodlands in this area are wet, intermediate woods and contain species typically found in such a habitat.

Richland Township

Ramona Beach Area: This area is comprised of a marsh bordered on the lake side by a highly developed camp colony, and surrounded by woods of various ages. The most mature woods is on the north fringe of Ramona Beach Marsh.

The woods on the south edge of the marsh have a canopy 40-50 feet tall, with a covering of about 60%, and consisting of red oak, wild black cherry and red maple. Planted conifers in this area include blue spruce, balsam fir, and white pine. The more mature woods bordering Ramona Beach Road have a canopy cover of 75% and are about 65 feet in height. The predominant species in the canopy are red maple, red oak and hemlock. Also found here are a few mature sassafras, which possibly represents this species' northern range limit. The ground cover consists of New York fern, wintergreen, white adder's mouth, running pine, sensitive fern, Indian cucumber root and Canada mayflower. The most disturbed areas in these woods ~~is~~ along the south side of Ramona Beach Road, where intense logging and clearing are occurring.

Deer Creek Marsh Area: This marsh is the largest wetland in the Coastal Zone, encompassing more than 1300 acres. Cattail and buttonbush form dense areas of emergent vegetation, with only one quarter of the wetland being open marsh. There is a mature woods bordering the southeast and north sides and a young swamp woods surrounds the south edge of the marsh, forming a buffer zone around this fragile wetland.

Deer Creek Marsh is maintained because the sand dunes to the west act as a barrier between the marsh and Lake Ontario. The dunes are being dramatically altered by sand mining and recreational abuses such as trail bikes and road construction, which are destroying the stabilizing dune vegetation. If the process continues indefinitely, the dunes will begin to move inland, filling in Deer Creek Marsh in the process. At present, the dunes closest to the lake support such dune stabilizing species as beach grass, beach wormwood, starry false solomon's seal and poison ivy. Common woody species on these dunes include quaking aspen, cottonwood and heart-leaved willow. The dunes further inland support an established woods that includes black oak, red maple, hemlock and wild black cherry.

Between the eastern edge of Deer Creek Marsh and U.S. Route 3 is a mature, diverse woods that is leased by the Mad River Club. Canopy species include American beech, red maple, sugar maple and basswood. Also found here, although less commonly, are yellow birch, black walnut and paper birch. Ground cover consists of jewelweed, may apple, jack-in-the-pulpit and enchanter's

nightshade. Also part of the ground cover are wild leek, foam flower and sharp-lobed hepatica, species that are typical of rich woods.

Rainbow Shores woods forms the northern fringe of the marsh. This area is a fairly mature woodland, similar in composition to the Mad River Club woods. The woods in the vicinity of Rainbow Shores, however, are greatly disturbed as they are currently being developed for trailer campsites.

Sandy Creek Township

Rainbow Shores Loop Road Area: This are is located between Rainbow Shores Road and South Pond. It is bordered on the west by Lake Ontario and on the east by Tryon Road. The area contains summer and permanent residents, and active farmlands with grazed fields. The Loop Road connects Rainbow Shores Road with South Pond, about one quarter of a mile inland fro Lake Ontario. This loop road is built through a shrubswamp that is part of the South Pond wetlands, and effects the drainage in the area. Wooded area near the swamp, the swamp itself, and the dunes bordering South Pond were studied.

The vegetation in the swamp is dense and consists predominantly of buttonbush. Red maple forms a sparse canopy, about 20 feet in height. Man of these red maples are in poor condition or dying, possibly due to the poo drainage in the area or unusually high water levels. The emergent vegetati includes arrow-arum, calla lily, broad-leaved arrowhead, water plantain, ca tail, brackern fern, purple loosestrife, swamp horsetail and royal fern.

The canopy species of the secondary sand dunes bordering South Pond include red oak, red maple, wild black cherry, white pine and white ash. Ground cover is 70% and consists of wintergreen,false solomon's seal, honeysuckle, blue cohosh and doll's eyes.

A bog type habitat is found near the southeast end of South Pond. Spagnum moss, bog rosemary, leatherleaf, large cranberry and pitcher plant are found here. The area is surrounded by a dense fringe of buttonbush and speckled alder. The small woods that seperates South Pond from this part of the shrubswamp contains red oak, sugar maple, wintergreen, indian pipe, low bush and high bush blueberry, and spiked moss. Dr. Mildred Faust, professor emeritus at the University of Syracuse, found such bog indicators plants in this area over 35 years ago.

Blind Creek Cove Woods: The area on the north bank of Blind Creek is a wet intermediate woods, with a canopy height of about 45 feet and a canop cover of 85%. The dominant species in the canopy are, in order of importar are: red maple, hemlock, wild balck cherry, white ash and American beech. (Table 10.) Because much of the area is very wet, red maple is especially predominant. The understory cover varies from 15-85% and ranges from 10-2(feet in height. The dominant species are hophornbeam, chokecherry and mountain maple. The ground cover contains trillium, New York fern, wintergree beech drops, solomon's seal and starry moss. Patches of cardinal flowers can be found in several wet areas within this woods.

The area just south of Blind Creek consists of active farmlands near Route 3, and intermediate woods near North Pond. The canopy cover in this woods is about 90% and composed of American beech, hemlock, sugar maple, wild black cherry and paper birch. The understory cover is about 75%, the understory being about 15 feet tall.and including such species as hophornbeam, ironwood, serviceberry and witch hazel. The ground cover is almost 100% and consists of false solomon's seal, sensitive fern, Christmas fern, may apple and foam flower. Near the shore of North Pond, a dense hemlock stand is found, with bog indicator species of clintonia, goldthread, wintergreen, bog rosemary, sweet gale and spagnum moss present.

North Pond; South Sand Spits: The North Pond beach dune ecosystem is a dynamic area with regard to vegetation and geology. The dunes are approximately 90 feet high on the sheltered bay side near the southern end of the spit. Blow-outs and foot trails are common throughout this section of public beach. A number of summer homes are located on the pond side of these dunes. This secondary dune system supports a mature woods which is about 50 feet in height and consists of black oak, American beech, hemlock, wild black cherry and basswood. The understory cover is 30% and contains serviceberry, quaking aspen, striped maple and pin cherry. Included in the ground cover are helleborine, starry flase solomon's seal, deadly nightshade, summer grape and Canada mayflower.

The lake side, primary dunes have a sparse cover of cottonwood, quaking aspen and choke cherry. Little understory is present, black willow and pin cherry being the species found there. The ground cover contains beach grass, beach wormwood, poison ivy and summer grape. Towards the north end of this spit, the dunes level out and a change in the vegetation occurs. The few tree species here include big-toothed aspen, quaking aspen, cottonwood and heart-leaved willow. The ground cover is almost exclusively beach grass.

North Pond; North Sand Spits: The dunes of the north sand spit are about 70 feet in height and are vegetatively distinctive. The dune vegetation is divided into a lake side association and a pond side association, similar to that found on the south spit. Although the vegetation here is not as mature as that on the south spit, the composition is similar.

The canopy of the lake side association consists of red oak, cottonwood, white ash and sugar maple. The understory contains choke cherry and striped maple . Beach grass interspersed with poison ivy is found in the ground cover.

The pond side vegetation show the sheltering benefits of the dune. Here the vegetation is lush, with a canopy cover of 80%. This layer is predominantly sugar maple, American beech, hemlock, basswood and white ash. The understory cover is about 60% and contains serviceberry, striped maple and maple-leaf viburnum. The ground cover is dense throughout much of the forested area. The major species are starry false solomon's seal, helleborine and beech and maple seedlings.

The dune complex of both the north and south sand spits is extremely vulnerable. At the present time, the majority of the dunes are stabilized, but housing and intense recreational use are destroying vital primary dune

vegetation. This destabilization of the dunes has already caused large scale shifting of parts of the south spit dunes.

Carl Island: This island is located in North Pond, just south of the Greene Point area. Access is by boat only. Carl Island is a small island just 10 feet above the pond level and is therefore subject to periodic flooding.

Trees 40 feet in height and forming a canopy cover of 40% are found on a small rise on the western part of the island. Species found here include black willow, red maple, white ash, wild black cherry and staghorn sumac. Choke cherry, staghorn sumac and speckled alder form dense stands on parts of the island. In wet areas, the ground cover contains cattail, jewelweed, spike rush and curled dock. In the drier areas, may apple, indian poke, evening primrose, dwarf St. Johnswort and deadly nightshade are common. Emergent vegetation includes cattail, spike rush, giant rush and arrow-arum.

Table 2. A checklist of the vascular plants found during the summer of 1976 in the Coastal Zone, Oswego County, NY. Alien species are denoted with an asterick (*).

LYCOPODIACEAE Mx.
Lycopodium L.
L. clavatum L. - Running clubmoss
L. obscurum L. - Ground pine
L. tristachyum L. - Ground cedar

SELAGINELLACEAE Underw.
Selaginella Beauv.
S. apoda (L.) Spring - Creeping spikemoss

EQUISETACEAE Mx.
Equisetum L.
E. arvense L. - Common horsetail
E. fluviatile L. - Swamp horsetail
E. hyemale L. - Scouring rush
E. sylvaticum L. - Wood horsetail

OSMUNDACEAE R. Br.
Osmunda L.
O. cinnamomea L. - Cinnamon fern
O. regalis L. - Royal fern

POLYPODIACEAE R. Br.
Adiantum L.
A. pedatum L. - Maidenhair
Athyrium Roth
A. filix-foemina (L.) Roth - Lady fern
Onoclea L.
O. sensibilis L. - Sensitive fern
Polystichum Roth
P. acrostichoides (Mx.) Schott - Christmas fern
Thelypteris Schmidel
T. noveboracensis (L.) Nieuwl. - New York fern

TAXACEAE Lindl.
Taxus L.
T. baccata L. - Ground hemlock

PINACEAE Lindl.
Abies (L.) Mill.
A. balsamea (L.) Mill. - Balsam fir
Larix Mill.
L. laricina (DuRoi) K. Koch - Tamarack
Picea A. Dietr.
P. mariana (Mill.) BSP. - Black spruce
Pinus L.
P. strobus L. - White pine
Tsuga (Endl.) Carr.
T. canadensis (L.) Carr. - Canada hemlock
Juniperus L.
J. communis L. - Common juniper
Thuja L.
T. occidentalis L. - White cedar

Table 2. Cont'd

TYPHACEAE J. St. Hil.
Typha L.
T. angustifolia L. - Narrow-leaved cattail
T. latifolia L. - Broad-leaved cattail

SPARGANIACEAE Agardh
Sparganium L.
S. eurycarpum Engelm. - Giant bur-reed

ALISMATACEAE DC.
Alisma L.
A. plantago-aquatica L. - Common water-plantain
Sagittaria L.
S. cuneata Sheldon - Arum-leaved arrowhead
S. latifolia Willd. - Broad-leaved arrowhead

HYDROCHARITACEAE Lindley corr. Aschers.
Elodea Mx.
E. canadensis Mx. - Common waterweed

GRAMINEAE Juss.
Ammophila Host.
A. arenoria - Beach grass

ARACEAE Necker
Arisaema Mart.
A. triphyllum (L.) Schoot - Jack-in-the-pulpit
Calla L.
C. palustris L. - Wild calla
Peltandra Raf.
P. virginica (L.) Kunth - Arrow-arum

LEMNACEAE Dumort.
Lemna L.
L. minor L. - Common duckweed

PONTEDERIACEAE Dumort.
Pontederia L.
P. cordata L. - Pickerel-weed

LILIACEAE Zinn.
Allium L.
A. tricoccum Ait. - Wild leek
Clintonia Raf.
C. borealis (Ait.) Raf. - Yellow clintonia
Convallaria L.
C. majalis L. - Lily-of-the-valley
Hemerocallis L.
H. fulva (L.) L. - Day lily
Lilium L.
L. canadense L. - Canada lily
Medeola L.
M. virginiana L. - Indian cucumber root

Polygonatum Mill.
P. biflorum (Walt.) Ell. - Solomon's seal
Smilacina Desf.
S. racemosa (L.) Desf. - False solomon's seal
S. stellata (L.) Desf. - Star flowered solomon's seal
Smilax L.
S. rotundifolia L. - Common greenbrier
Trillium L.
T. erectum L. - Red trillium
T. grandiflorum (Mx.) Salisb. - White trillium
T. undulatum Willd. - Painted trillium
Veratrum L.
V. viride Ait. - False hellebore

IRIDACEAE Lindl.
Iris L.
*I. pseudacorus L. - Yellow iris
I. versicolor L. - Large blue flag

ORCHIDACEAE Lindl.
Cypripedium L.
C. reginae Walt. - Showy ladyslipper
Epipactis Sw.
*E. helleborine (L.) Crantz - Weed orchid
Habenaria Willd.
H. clavellata (Mx.) Spreng. - Green woodland orchid
Malaxis Sw.
M. monophylla (L.) Sw. - White adder's mouth
Spiranthes Rich.
S. cernua (L.) L.C. Richard - Nodding ladies' tresses

SALICACEAE Lindl.
Populus
P. deltoides Marsh. - Cottonwood
P. grandidentata Mx. - Large-toothed aspen
P. tremuloides Mx. - Trembling aspen
Salix L.
*S. alba L. - White willow
S. discolor Muhl. - Pussy willow
S. nigra Marsh.- Black willow
*S. purpurea L. - Basket willow
S. rigida Muhl. - Cordate or Heart-leafed willow
S. sericea Marsh. - Silky willow
S. syriticola - Heart-leaved willow

MYRICACEAE Dumort.
Myrica L.
M. gale L. - Sweet gale

JUGLANDACEAE Lindl.
Carya Nutt.
C. glabra (Mill.) Sweet. - Pignut
C. ovata (Mill.) K. Koch - Shagbark hickory
Juglans L.
J. nigra L. - Black walnut

Table 2. Cont'd

BETULACEAE Agardh.
Alnus Mill.
A. incana (L.) Moench. - Speckled alder
Betula L.
B. alegheniensis Britton - Yellow birch
B. papyrifera Marsh. - Paper birch
Carpinus L.
C. caroliniana Walt. - American hornbeamr or Ironwood
Corylus L.
C. cornuta Marsh. - Beaked hazelnut
Ostrya Mirbel.
O. virginiana (Mill.) K. Koch - Eastern hophornbeam

FAGACEAE Drude
Castanea Mill.
C. dentata (Marsh.) Borkh. - American chestnut
Fagus L.
F. grandifolia Ehrh. - American beech
Quercus L.
Q. bicolor Willd. - Swamp white oak
Q. rubra L. - Red oak
Q. velutina Lam. - Black oak

ULMACEAE Mirbel
Ulmus L.
U. americana L. - American elm
U. rubra Muhl. - Slippery elm

URTICACEAE Reichenb.
Boehmeria Jacq.
B. cylindrica (L.) Sw. - False nettle
Urtica L.
*U. dioica L. - Stinging nettle

ARISTOLOCHIACEAE Blume
Asarum L.
A. canadense L. - Wild ginger

POLYGONACEAE Desv.
Polygonum L.
*P. caespitosum Blume - Smartweed
P. coccineum Muhl. - Swamp smartweed
P. hydropiper L. - Common smartweed
Rumex L.
*R. acetosella L. - Sheep sorrel
*R. crispus L. - Curly dock
*R. obtusifolius L. - Broad-leaved dock

CHENOPODIACEAE Dumort.
Chenopodium L.
*C. album L. - Lamb's quarters

PHYTOLACCACEAE Lindl.
Phytolacca L.
P. americana L. - Pokeweed

PORTULACACEAE Reichenb.
Claytonia L.
C. virginica L. - Narrow-leaved spring beauty

CARYOPHYLLACEAE Reichenb.
Arenaria L.
A. lateriflora L. - Sandwort
Dianthus L.
*D. armeria L. - Deptford pink
Silene L.
*S. cucubalus Wibel - Bladder campion
Stellaria L.
*S. graminea L. - Common stitchwort

NYMPHAEACEAE DC.
Nympheae L.
N. odorata Ait. - Sweet scented water lily

RANUNCULACEAE Gerard
Actaea L.
A. alba (L.) Mill. - Doll's eyes
A. rubra (Ait.) Willd.- Red baneberry
Aquilegia L.
A. canadensis L. - Wild columbine
Coptis Salisb.
C. trifolia (L.) Salisb. - Gold thread
Hepatica Mill.
H. acutiloba DC. - Sharp-lobed hepatica
Ranunculus L.
*R. acris L. - Tall field buttercup
R. pensylvanicus L. - Bristly crowfoot
R. sceleratus L. - Cursed crowfoot or Celery-leaved buttercup
Thalictrum L.
T. dioicum L. - Early meadow rue
T. polygamum Muhl. - Tall meadow rue

BERBERIDACEAE Desv.
Caulophyllum Mx.
C. thalictroides (L.) Mx. - Blue cohosh
Podophyllum L.
P. peltatum L. - May apple

LAURACEAE Lindl.
Lindera Thunb.
L. benzoin (L.) Blume - Spice bush
Sassafras Nees
S. albidum (Nutt.) Nees - Sassafras

CRUCIFERAE B. Juss.
Hesperis L.
*H. matronalis L. - Dame's rocket
Lepidium L.
*L. campestre (L.) R. Br. - Downy peppergrass

Table 2. Cont'd.

Cakile Mill.
C. edentulata (Bigel.) Hook - Sea rocket
Var. lacustris
Rorippa Scop.
R. islandica (Oeder) Borbás - Marsh yellow cress

SARRACENIACEAE La. Pyl.
Sarracenia L.
S. purpurea L. - Pitcher plant

SAXIFRAGACEAE Desv.
Tiarella L.
T. cordifolia L. - Foam flower

HAMAMELIDACEAE Lindl.
Hamamelis L.
H. virginiana L. - Witch hazel

PLATANACEAE Lindl.
Platanus L.
P. occidentalis L. - American sycamore

ROSACEAE B. Juss.
Amelanchier Medic.
A. arborea (Mx. f.) Fern. - Shadbush
Fragaria L.
*F. vesca L. - Wood strawberry
F. virginiana Duch. - Field strawberry
Potentilla L.
P. anserina L. - Silverweed
Prunus L.
*P. avium L. - Mazzard
P. pensylvanica L. f. - Pin cherry
P. virginiana L. - Common chokecherry
P. serotina Ehrh. - Black cherry
Pyrus L.
*P. aucuparia (L.) Ehrh. - European mountain-ash
*P. communis L. - Pear
*P. malus L. - Apple
Rosa L.
R. carolina L. - Pasture rose
R. palustris Marsh. - Swamp rose
Rubus L.
R. flagellaris Willd. - Dewberry
R. odoratus L. - Purple-flowering raspberry

FABACEAE Reichenb.
Desmodium Desv.
D. glutinosum (Muhl.) Wood. - Tick trefoil
Lathyrus L.
L. maritimus (L.) Bigel - Beach pea
Lotus L.
*L. corniculatus L. - Birdsfoot trefoil

Robinia L.
*R. pseudo-acacia L. - Black locust
Vicia L.
*V. cracca L. - Tufted vetch or Cow vetch

OXALIDACEAE Lindl.
Oxalis L.
O. montana Raf. - Pink wood sorrel

GERANIACEAE J. St. Hil.
Geranium L.
G. robertianum L. - Herb Robert

POLYGALACEAE Desv.
Polygala L.
P. sanguinea L. - Field milkwort

ANACARDIACEAE Lindl.
Rhus L.
R. toxicodendron L. - Poison ivy
R. typhina Torner - Staghorn sumac

CELASTRACEAE Lindl.
Celastrus L.
C. scandens L. - Bittersweet

ACERACEAE J. St. Hil.
Acer L.
A. nigrum Mx. - Sugar maple
A. pensylvanicum L. - Striped maple
A. rubrum L. - Red maple
A. saccharinum L. - Silver maple
A. spicatum Lam. - Mountain maple

HIPPOCASTANACEAE T. and G.
Aesculus L.
*A. Hippocastanum L. - Horse chestnut

VITACEAE Lindl.
Parthenocissus Planch.
P. quinquefolia (L.) Planch. - Virginia creeper
Vitis L.
V. labrusca L. - Fox grape
V. aestivalis Mx. - Summer grape

TILIACEAE Gerard
Tilia L.
T. americana L. - American basswood

MALVACEAE Neck.
Hibiscus L.
H. moscheutos L. - Rose mallow
Malva L.
*M. moschata L. - Musk mallow

Table 2. Cont'd.

HYPERICACEAE Lindl.
Hypericum L.
*H. perforatum L. - Common St. John's-wort

VIOLACEAE DC.
Viola L.
V. incognita Brain. - White violet
V. selkirkii Pursh. - Great-spurred violet

LYTHRACEAE Lindl.
Lythrum L.
*L. salicaria L. - Purple loosestrife

ONAGRACEAE Dumort
Circaea L.
C. quadrisculcata (Maxim.) Franch. and Sav. - Enchanter's nightshade
Epilobium L.
*E. hirsutum L. - Great hairy willowherb
Oenothera L.
O. biennis L. - Evening primrose

UMBELLIFERAE B. Juss.
Daucus L.
*D. carota L. - Wild carrot

CORNACEAE Link.
Cornus L.
C. alba L. - Red-osier dogwood
C. alternifolia L. f. - Alternate-leaf dogwood
C. amomum Mill. - Silky dogwood
Nyssa L.
N. sylvatica Marsh - Sour-gum, tupelo

ERICACEAE DC.
Andromeda L.
A. polifolia L. - Bog rosemary
Chamaedaphne Moench.
C. calyculata (L.) Moench. - Leatherleaf
Epigaea L.
E. repens L. - Trailing arbutus
Gaultheria Kalm
G. procumbens L. - Aromatic wintergreen
Pyrola L.
P. elliptica Nutt. - Shinleaf
P. rotundifolia L. - Round-leaved shinleaf
Vaccinium L.
V. corymbosum L. - High-bush blueberry
V. macrocarpon Ait. - Large cranberry

PRIMULACEAE Vent.
Lysimachia L.
L. ciliata L. - Fringed loosestrife
*L. nummularia L. - Moneywort
L. terrestris (L.) BSP. - Swamp candles

Table 2. Cont'd.

OLEACEAE Lindl.
Fraxinus L.
F. americana L. - White ash
F. pennsylvanica Marsh - Red ash

GENTIANACEAE Desv.
Gentiana L.
G. crinita Froel. - Fringed gentian

APOCYNACEAE Desv.
Apocynum L.
A. sibiricum Jacq. - Clasping-leaved dogbane

ASCLEPIADACEAE Lindl.
Asclepias L.
A. incarnata L. - Swamp milkweed
A. syriaca L. - Common milkweed

CONVOLVULACEAE L.
Convolvulus L.
C. arvensis L. - Field bindweed
Cuscuta L.
C. gronovii Willd. - Dodder
Ipomoea L.
I. purpurea (L.) Roth. - Morning glory

POLEMONIACEAE DC.
Phlox L.
P. divaricata L. - Blue phlox

HYDROPHYLLACEAE Lindl.
Hydrophyllum L.
H. virginianum L. - Virginia waterleaf

BORAGINACEAE Lindl.
Echium L.
*E. vulgare L. - Blueweed or Viper's bugloss

VERBENACEAE J. St. Hil.
Verbena L.
V. hastata L. - Blue vervain

LABIATAE Juss.
Glecoma L.
*G. hederacea L. - Gill-over-the-ground
Hedeoma Pers.
H. pulegioides (L.) Pers. - American pennyroyal
Leonurus L.
*L. cardiaca L. - Motherwort
Lycopus L.
L. americanus Muhl. - Cut-leaved water-horehound
Mentha L.
M. arvensis L. - Field mint
*M. spicata L. - Spearmint

Table 2. Cont'd.

Prunella L.
*P. vulgaris L. - Heal-all

SOLANACEAE Zinn.
Solanum L.
S. carolinense L. - Horse nettle
*S. dulcamara L. - Deadly nightshade

SCROPHULARIACEAE Lindl.
Chelone L.
C. glabra L. - Turtlehead
Linaria Mill.
*L. vulgaris Hill - Butter-and-eggs
Melampyrum L.
M. lineare Desr. - Cow wheat
Verbascum L.
*V. blattaris L. - Moth mullein
*V. thapsus L. - Common mullein

OROBANCHACEAE Lindl.
Epifagus Nutt.
E. virginiana (L.) Bart. - Beechdrops

LENTIBULARIACEAE Dumort.
Utricularia L.
U. vulgaris L. - Great bladderwort

PLANTAGINACEAE Lindl.
Plantago L.
*P. major L. - Common plantain

RUBIACEAE B. Juss.
Cephalanthus L.
C. occidentalis L. - Buttonbush
Galium L.
G. asprellum Mx. - Rough bedstraw
Mitchella L.
M. repens L. - Partridge berry

CAPRIFOLIACEAE Vent.
Diervilla Mill.
D. lonicera Mill. - Bush honeysuckle
Lonicera L.
L. canadensis Marsh. - Fly honeysuckle
*L. morrowi Gray - Morrow's honeysuckle
Sambucus L.
S. canadensis L. - Elderberry
S. racemosa L. - Red-berried elder
Viburnum L.
V. acerifolium L. - Maple-leaved viburnum
V. alnifolium Marsh. - Hobblebush
V. lentago L. - Nannyberry
V. recognitum Fern. - Arrow-wood

Table 2. Cont'd.

CUCURBITACEAE L.
Echinocystis T. and G.
E. labata (Mx.) T. and G. - Wild cucumber

LOBELIACEAE Dumort.
Lobelia L.
L. cardinalis L. - Cardinal flower.

COMPOSITAE Adans.
Achillea L.
*A. millefolium L. - Common yarrow
Ambrosia L.
A. artemisiifolia L. - Common ragweed
Anaphalis DC.
A. margaritacea (L.) C.B. Clarke - Pearly everlasting
Arctium L.
*A. minus (Hill) Bernh. - Common burdock
Artemisia L.
*A. stelleriana Bess. - Beach wormwood
Aster L.
A. macrophyllus L. - Large-leaved aster
A. novae-angliae L. - New England aster
Bidens L.
B. frondosa L. - Beggar's ticks
Chrysanthemum L.
*C. leucanthemum L. - White daisy
Cichorium L.
*C. intybus L. - Chicory
Cirsium Mill.
*C. vulgare (Savi) Ten. - Bull thistle
Coreopsis L.
C. lanceolata - Lance-leaved tickseed
Eupatorium L.
E. maculatum L. - Joe-Pye weed
E. perfoliatum L. - Boneset
E. rugosum Houtt. - White snakeroot
Hieracium L.
*H. aurantiacum L. - Devil's paint-brush
Lactuca L.
*L. serriola L. - Prickly lettuce
Prenanthes L.
P. alba L. - Lion's foot
Rudbeckia L.
R. hirta L. - Black-eyed susan
Solidago L.
S. caesia L. - Woodland goldenrod
S. canadensis L. - Canadian goldenrod
Sonchus L.
*S. oleraceus L. - Common sow-thistle
Tanacetum L.
*T. vulgare L. - Tansy

Table 3. Evaluation of random pair data collected during the summer of 1976, at Milea Beach East, Oswego County Coastal Zone.

Species	Frequency	Density	Dominance	Importance Value
Red Maple	0.210	0.215	0.266	0.691
American Beech	0.180	0.190	0.312	0.681
Sugar Maple	0.180	0.175	0.137	0.492
Hemlock	0.120	0.130	0.118	0.368
White Ash	0.102	0.100	0.086	0.288
Red Oak	0.066	0.060	0.019	0.145
Yellow Birch	0.048	0.050	0.035	0.133
Pin Cherry	0.036	0.030	0.005	0.071
Wild Black Cherry	0.012	0.010	0.004	0.026
American Chestnut	0.006	0.005	0.013	0.024
Hophornbeam	0.012	0.010	0.002	0.024
Basswood	0.012	0.010	0.001	0.023
Crataegus	0.006	0.005	0.000	0.011
Striped Maple	0.006	0.005	0.000	0.011
Speckled Alder	0.006	0.005	0.000	0.011
	1.000	1.000	1.000	3.000

Total Distance = 1605.9 ft.

Mean Distance = 12.8 ft.

Trees/Acre = 412.4

Mean Basal Area/Tree = 72.5 sq. in.

Mean D.B.H./Tree = 9.6 in.

Basal Area/Acre = 29917.5 sq. in.

Table 4. Evaluation of random pair data collected during the summer of 1976, at Milea Beach Central, Oswego County Coastal Zone.

Species	Frequency	Density	Dominance	Importance Value
Red Oak	0.221	0.237	0.242	0.701
Sugar Maple	0.202	0.227	0.124	0.554
American Beech	0.117	0.121	0.284	0.522
Red Maple	0.123	0.116	0.181	0.420
White Ash	0.123	0.116	0.042	0.281
Wild Black Cherry	0.061	0.056	0.061	0.178
Yellow Birch	0.067	0.056	0.019	0.142
Hemlock	0.025	0.020	0.032	0.077
Hophornbeam	0.031	0.025	0.008	0.064
Cottonwood	0.012	0.010	0.005	0.027
Striped Maple	0.012	0.010	0.001	0.023
Quaking Aspen	0.006	0.005	0.001	0.012
	1.000	1.000	1.000	3.000

Total Distance = 1227.5 ft.

Mean Distance = 9.9 ft.

Trees/Acre = 691.7

Mean Basal Area/Tree = 65.2 sq. in.

Mean D.B.H./Tree = 9.1 in.

Basal Area/Acre = 45077.6 sq. in.

Table 5. Evaluation of random pair data collected during the summer of 1976, at King's Folly Road (Scriba Northwest Woods), Oswego County Coastal Zone.

Species	Frequency	Density	Dominance	Importance Value
Sugar Maple	0.229	0.242	0.248	0.720
White Ash	0.170	0.173	0.165	0.508
American Beech	0.142	0.156	0.178	0.477
Hemlock	0.108	0.105	0.184	0.396
Red Maple	0.065	0.066	0.049	0.180
Wild Black Cherry	0.050	0.041	0.044	0.135
Yellow Birch	0.053	0.046	0.034	0.132
Hophornbeam	0.046	0.046	0.029	0.121
Basswood	0.019	0.018	0.018	0.055
Elm	0.015	0.013	0.014	0.042
Striped Maple	0.019	0.015	0.002	0.036
Pin Cherry	0.015	0.015	0.003	0.034
Pignut Hickory	0.012	0.010	0.003	0.025
Quaking Aspen	0.006	0.005	0.013	0.024
Red Oak	0.006	0.005	0.008	0.019
Ironwood	0.009	0.008	0.001	0.018
Serviceberry	0.006	0.008	0.002	0.016
Staghorn Sumac	0.006	0.008	0.001	0.015
Crataegus	0.003	0.005	0.001	0.009
Apple	0.003	0.003	0.001	0.007
Arrowood	0.003	0.003	0.001	0.006
Silky Dogwood	0.003	0.003	0.000	0.006
Elderberry	0.003	0.003	0.000	0.006
Shagbark Hickory	0.003	0.003	0.001	0.006
Spicebush	0.003	0.003	0.000	0.006
	1.000	1.000	1.000	3.000

Total Distance = 2526.3 ft.

Mean Distance = 10.3 ft.

Trees/Acre = 640.1

Mean Basal Area/Tree = 53.8 sq. in.

Mean D.B.H./Tree = 8.3 in.

Basal Area/Acre = 34416.6 sq. in.

Table 6. Evaluation of random pair data collected during the summer of 1976, at Scriba Woods East, Oswego County Coastal Zone.

Species	Frequency	Density	Dominance	Importance Value
American Beech	0.246	0.262	0.385	0.893
Hemlock	0.174	0.188	0.164	0.526
Sugar Maple	0.168	0.163	0.141	0.472
Red Maple	0.114	0.109	0.137	0.360
White Ash	0.078	0.069	0.060	0.207
Paper Birch	0.054	0.050	0.047	0.151
Yellow Birch	0.054	0.054	0.036	0.144
Hophornbeam	0.060	0.054	0.018	0.133
Wild Black Cherry	0.018	0.015	0.006	0.039
Striped Maple	0.018	0.020	0.001	0.039
Quaking Aspen	0.006	0.005	0.004	0.015
Basswood	0.006	0.005	0.000	0.011
Pin Cherry	0.006	0.005	0.000	0.011
	1.000	1.000	1.000	3.000

Total Distance = 1253.7 ft.

Mean Distance = 9.9 ft.

Trees/Acre = 690.2

Mean Basal Area/Tree = 87.8 sq. in.

Mean D.B.H./Tree = 10.8 in.

Basal Area/Acre = 60634.9 sq. in.

Table 7. Evaluation of random pair data collected during the summer of 1976, at Mexico Bay West, Oswego County Coastal Zone.

Species	Frequency	Density	Dominance	Importance Value
Sugar Maple	0.264	0.283	0.284	0.831
Hemlock	0.111	0.115	0.183	0.410
White Ash	0.129	0.122	0.114	0.365
American Beech	0.111	0.108	0.099	0.318
Red Maple	0.085	0.080	0.062	0.228
White Pine	0.031	0.038	0.083	0.152
Hophornbeam	0.061	0.064	0.016	0.141
Red Oak	0.041	0.038	0.059	0.138
Wild Black Cherry	0.031	0.027	0.035	0.093
Basswood	0.028	0.026	0.007	0.061
Yellow Birch	0.026	0.024	0.010	0.060
Paper Birch	0.013	0.011	0.014	0.038
Quaking Aspen	0.011	0.013	0.013	0.036
Witch Hazel	0.011	0.009	0.001	0.021
Cottonwood	0.007	0.007	0.004	0.018
Ironwood	0.009	0.007	0.002	0.018
Apple	0.007	0.005	0.002	0.014
Striped Maple	0.007	0.007	0.000	0.014
Red Pine	0.002	0.002	0.010	0.014
Pin Cherry	0.004	0.004	0.000	0.008
White Oak	0.002	0.002	0.002	0.006
Speckled Alder	0.002	0.002	0.000	0.004
Serviceberry	0.002	0.002	0.000	0.004
Elm	0.002	0.002	0.000	0.004
American Chestnut	0.002	0.002	0.000	0.004
	1.000	1.000	1.000	3.000

Total Distance = 3452.5 ft.

Mean Distance = 10.1 ft.

Trees/Acre = 669.8

Mean Basal Area/Tree = 61.9 sq.in.

Mean D.B.H./Tree = 8.9 in.

Basal Area/Acre = 41489.6 sq. in.

Table 8. Evaluation of random pair data collected during the summer of 1976, at Butterfly Swamp dunes, Oswego County Coastal Zone.

Species	Frequency	Density	Dominance	Importance Value
Hemlock	0.684	0.786	0.782	2.252
Yellow Birch	0.105	0.071	0.031	0.208
Tupelo	0.053	0.036	0.112	0.200
Striped Maple	0.053	0.036	0.036	0.124
Red Oak	0.026	0.018	0.026	0.070
Paper Birch	0.026	0.018	0.008	0.052
Red Maple	0.026	0.018	0.002	0.047
Sugar Maple	0.026	0.018	0.003	0.047
	1.000	1.000	1.000	1.000

Total Distance = 305.6 ft.

Mean Distance = 8.7 ft.

Trees/Acre = 892.8

Mean Basal Area/Tree = 100.2 sq. in.

Mean D.B.H./Tree = 11.3 in.

Basal Area/Acre = 89434.0 sq. in.

Table 9. Evaluation of random pair data collected during the summer of 1976, at Ramona Beach woods, Oswego County Coastal Zone.

Species	Frequency	Density	Dominance	Importance Value
Red Maple	0.291	0.307	0.371	0.969
Hemlock	0.291	0.295	0.261	0.848
Yellow Birch	0.139	0.136	0.151	0.427
Wild Black Cherry	0.089	0.080	0.074	0.242
White Ash	0.051	0.045	0.047	0.143
American Beech	0.013	0.011	0.035	0.059
Arrowwood	0.013	0.011	0.033	0.057
Red Oak	0.025	0.023	0.005	0.053
Witch Hazel	0.025	0.023	0.001	0.049
Sugar Maple	0.013	0.023	0.005	0.041
Sassafras	0.013	0.011	0.015	0.039
Ironwood	0.013	0.011	0.001	0.025
American Chestnut	0.013	0.011	0.000	0.024
Speckled Alder	0.013	0.011	0.000	0.024
	1.000	1.000	1.000	3.000

Total Distance = 498.7 ft.

Mean Distance = 9.1 ft.

Trees/Acre = 827.8

Mean Basal Area/Tree = 85.4 aq. in.

Mean D.B.H./Tree = 10.4 in.

Basal Area/Acre = 70710.7 sq. in.

Table 10. Evaluation of random pair data collected during the summer of 1976, at North Blind Creek Cove woods, Oswego County Coastal Zone.

Species	Frequency	Density	Dominance	Importance Value
Red Maple	0.381	0.460	0.300	1.141
Hemlock	0.214	0.200	0.323	0.737
Wild Black Cherry	0.238	0.200	0.156	0.594
American Beech	0.048	0.040	0.093	0.181
White Ash	0.024	0.020	0.093	0.137
Paper Birch	0.048	0.040	0.005	0.093
Red Oak	0.024	0.020	0.024	0.068
Yellow Birch	0.024	0.020	0.006	0.050
	1.000	1.000	1.000	3.000

Total Distance = 261.7 ft.

Mean Distance = 8.4 ft.

Trees/Acre = 970.5

Mean Basal Area/Tree = 99.8 sq. in.

Mean D.B.H./Tree = 11.3 in.

Basal Area/Acre = 96848.6 sq. in.

Mammals

Introduction

In our summer's work, we tried to assess the present status of the mammals of Oswego County Coastal Zone with regard to species occurrence, diversity and distribution. Active field work was supplemented with information from local residents and library research.

Mammalian faunal history: an introduction to Oswego's mammalian fauna.

Present Fauna: The majority of the mammalian species that occur in Oswego County coastal zone are wide-ranging species with no special regional affinity. The remainder are primarily northern species approaching the southern limits of their range in the area or northeastern species reaching the western limits of their range in the area. A few are southern species approaching their northern limits. The coastal zone is basically a transition area in mammal distributions especially with regard to the northern and southern species.

The smaller mammals are much more abundant than the larger mammals as would be expected. The numbers and distributions of both are restricted by geographical barriers such as Lake Ontario and by ecological barriers such as habitat type and various environmental conditions. Frequently, man too has a direct influence on these distributions as is discussed in the following section.

Past Fauna: The fauna in any region is always changing. The key factor in this process is that the ecosystem remains stable and balanced. The effect man has on this process is to speed up and even direct the rate of change, with the end result of instability and eventual degradation of ecosystem. By opening up areas through cutting of forests, draining swamps or decreasing the overall size of areas, the original habitat is modified or destroyed and a new one created. The effect is to cause the animals adapted to the old habitat to leave. Other animals may extend their range to occupy the new habitat, but overall species diversity may decrease.

With the clearing of land for agricultural and urban development, the Virginia Opossum, Prairie Deermouse and Eastern Cottontail have all extended their ranges with this area. Conversely, with the additional pressures of hunting and trapping, larger mammals such as the Black Bear, bobcat, mountain lion, fisher, marten, wolf, coyote and river otter have all decreased the southern limits of their ranges and are rarely found in the area or do not occur at all.

There are some species of mammals while not endangered in an overall sense, are affected in certain specific localities. The Whitetail Deer populations have shifted out of many areas where they were once abundant due to pressures of increasing urban and recreational development. It is the larger mammals that are first affected as areas become disturbed.

Many of the small mammals, limited by the presence of moist conditions and dense cover, have become less abundant as wet woods and fields are drained by man.

Possible Future Fauna: If habitat disturbance continues to result from man's activities, it can be expected that the populations in the disturbed habitats will continue to decrease as the inhabitants migrate out in search of appropriate habitats. While some of these may not be important game species, they support other species which are, either on a direct or indirect basis. Many small mammals serve an important function in seed dispersal of trees and vegetation which support other mammals. In addition, they are an important control of insects and fungi which may be harmful to both plant and animal life. As species leave an area, the populations of some remaining species may go unchecked possibly causing economic problems for man.

Methods and Materials

We attempted to gather as much first-hand information as possible on the mammals that occur in the area but since many mammals are secretive and elusive it was not possible to do so for all of them. We supplemented the information obtained in our field work with that obtained through library research and through talking with local people familiar with the fauna found in the area.

Our field work supplied us with information on many of the smaller mammals, rabbits, weasels, raccoons, opossum and deer. Most of our information on bats and moles comes from library research while much of the information on the furbearers comes from local trappers.

Our field work methods included trapping, observation of road kills and sightings of mammals and signs of their occurrence in an area. When an animal was trapped or observed, we recorded what it was, where it was and the habitat type in which it was found. The smaller mammals trapped were toe-clipped in order to get information through recapture data on populations sizes. From the data we collected it is possible to say something about the relative abundance of an animal, where it is found and the habitats with which it is associated.

Sherman traps, snap traps and pit traps were used to capture the smaller mammals. The Sherman traps were set by selecting a straight line (or lines) through an area chosen at random within each study site. Traps were placed about every fifteen paces. The number of traps and lines varied from one area to another. Rolled oats were used for bait. Snap traps were set out in the same fashion as the Sherman traps except that they were usually set along a waterway and peanut butter was used for bait. Pit traps consisted of a large can sunk into the ground with its top rim just below the plane of the surface. They were set, when time allowed, in spots that appeared likely to have moles or shrews in the vicinity.

Havahart traps were used in an attempt to capture the larger mammals but we found we could gather more information on them through observation.

The use of mist nets to capture bats met with little success as it appeared that the bats were able to detect the net and avoid flying into it.

Results

As a result of our field work, we were able to determine what species do occur within the Oswego County Coastal Zone and their relative abundance and distribution. Notes taken on the habitat in which mammals were captured, supplemented with library research, allowed us to obtain a correlation of species with the major habitats as well as more detailed accounts of each species. These findings are presented in this section along with notes on the special aspects of each species.

The species found in each trapping locality are noted in Table 11. The mammals which may be found in each of the major habitat divisions are listed in Table12. In some instances, a species actual occurence within a particular habitat division depends upon the existence of certain environmental conditions. For details, refer to the Natural History section which describes each species.

Natural History Section: Detailed accounts of individual species are presented in this section. The relative abundance, distribution and specific habitat requirements are described as well as any special aspects.

MOLES

Hairytail Mole *Parascalops breweri* (Bachman)

Only one hairytail mole was captured within the study area and that was in the vicinity of Deer Creek Marsh. The low number of captures is most likely reflective of the burrowing habits of the mole which decreases the chances of it being captured by surface traps. The hairytail mole normally occurs in well drained, light soil in wooded areas and shrub lands. In the Tug Hill region, it was found in stands of maple, beech and yellow birch (Connor,1966). Stands of this type of woods occur throughout the study area but many of these areas are not well drained making it unsuitable for the hairytail mole. It is probably found throughout the study area but in smaller numbers than the starnose mole which is found in wet areas.

Starnose Mole *Condylura cristata cristata* (Linnaeus)

Three specimens were captured during the study, one near Ramona Beach Marsh and two along a small stream near Snake Creek Swamp. Although it was only captured at two sites, it is probably common in suitable habitats throughout the area. The starnose mole is partially aquatic and is found in moist environments including marshy areas, damp woods and meadows, and brushy swamps. Connors (1966) reported it as being common in the Tug Hill area in the above mentioned habitats and practically absent in dry wooded areas where the hairytail mole could be expected to be found.

SHREWS

Masked Shrew *Sorex cinereus cinereus* Kerr

Only a few masked shrews were captured in the study area but this could be due to their small size which makes trapping them difficult. They were captured throughout the study area in all the major land habitat types. They were found most often in deciduous woods of the beech-maple type and also marshy, hemlock habitats. The Teal Marsh area provided the greatest number of captures, three, for any individual trapping area. The area trapped was about an acre in size and hemlock bordering a marsh was the habitat type.

Smoky Shrew *Sorex fumeus fumeus* Miller

The smoky shrew was not captured within the study area but it is possible that a few do exist as Connor (1960) did catch them on the Tug Hill plateau. He found them to be most abundant along stream banks in woods. Since we did considerable trapping along streams within the study area, it is possible that the smoky shrew is confined to the higher elevations locally. Hamilton (1943) states that the smoky shrew undergoes drastic population fluctuations and tends to be clumped only in certain areas. These factors may also be why we did not capture any of these shrews.

Northern Water Shrew *Sorex palustris albibarbis* (Cope)

No specimens of northern water shrews were captured within the study area, but it is possible that they do occur as they are found in parts of Oswego County at higher elevations (Connor,1966). The shrew is found along waterways, primarily at the higher elevations within New York State such as the Adirondacks, Tug Hill Plateau and the Catskills. We did considerable trapping along streams within the study area so that if the water shrew does exist in the area, it does so in small numbers. The most likely location for their existence would be the northeastern corner of the study area near North Pond.

Thompson's Pygmy Shrew *Microsorex thompsoni*

The pygmy shrew is the smallest mammal found in New York. It is so small that it is rarely captured and can go undetected in an area for a long time. We did not capture any pygmy shrews, but it is possible that they exist in the area. They have been captured in nearby Lewis and Onondaga Counties where they have been taken in open situations along the edge of woods (Connor,1960). It is likely that more extensive trapping with pit traps would have provided captures of the pygmy shrew within the study area.

Least Shrew *Cryptotis parva parva* (Say)

Although we did not capture any least shrews during our trapping, a specimen was captured by D. D. Stone in 1898 in the Town of Scriba (NYSM: Speciman No. 6189). Connor (1966) made no captures of the least shrew on the Tug Hill Plateau. Hall and Kelson (1959) do not include Oswego County within the range of this species. It is likely, therefore, that if the least shrew still does occur in Oswego County, it does so in small numbers. In areas where the least shrew is found, it occurs most often in low, damp meadows (Hamilton,1943), a habitat that is common throughout the study area.

Shorttail Shrew *Blarina brevicauda talpoides* (Gapper)

The shorttail shrew was captured more frequently within the study area than any other mammal except the white-footed mouse. In Scriba Woods, where extensive trapping was done, slightly more than one individual per acre was captured. In a field next to Snake Creek Swamp, seven shorttail shrews were captured in fifteen traps set for one night. It was found practically in every land habitat type except dry young fields. Mature woods and successional fields appear to be their common habitat.

BATS

Difficulty was encountered in determining the bats inhabiting the study area. They avoided the mist nets set up to capture them and as a result, much of the information concerning the bats has been obtained from library research. Information regarding the roosting and foraging requirements of each species is located in Table 13. Frequently, foraging sites are in different habitats than the roosting sites, yet, they are equally important. Disturbance of either site would result in a migration of species out of the area.

Silver-haired Bat *Lasionycteris noctivagans* (Le Conte)

The silver-haired bat, while captured only once during the summer, is one of the more common bats in the area. This bat was caught over a small pond in a gravel pit in Butterfly Swamp, Scriba township. Another was captured on the campus of the State University of New York, College at Oswego, Oswego, New York (December,1976). In all probability, the silver-haired bat occurs throughout most of the study area.

Keen's Myotis *Myotis keenii keenii* (Merriam)

Keen's Myotis was not collected throughout the duration of the study but probably occurs to a small extent in the area. It has been captured in Jefferson County, just outside Watertown, New York about sixty miles distant from the city of Oswego. Keen's Myotis usually fly late at

night (Hall and Kelson,1959) which contributes to the difficulty in assessing the abundance and local distribution of this species.

Small-footed Myotis *Myotis leibii* (previously known as *Myotis subulatus*)

The small-footed myotis was not collected in the study area, although it lies within the range of the species. This bat, the smallest in eastern United States, is a solitary species and appears fairly early in the evening to forage. It has been found in a cave located about one mile outside Watertown, New York in Jefferson County (approximately sixty miles from Oswego).

Eastern Pipistrelle *Pipistrellus subflavus obscurus* Miller

As with many of the other bats, this species was not collected during the summer's work. It, too, is one of the smallest eastern bats and can occur in the area although it is approaching the northern limits of its range.

Red Bat *Lasiurus borealis borealis* (Muller)

This beautifully colored bat was not taken in the study area although it is known to inhabit this region having been collected in Oswego County during the fall of 1974 (State University of New York-Oswego Vertebrate Collections). They are a member of the tree bat group and typically migrate south in the fall. Red Bats are quite restricted in its foraging habits, covering one small area over and over. They would be one of the first bats to be affected if their foraging sites were disturbed.

Little Brown Myotis *Myotis lucifugous* (LeConte)

The little brown myotis was not collected during the study but probable sightings were made at dusk as the bats came out to hunt insects over ponds and swamps. They are one of the most numerous bats in the area and have been collected in the Watertown Cave previously described. Populations consume literally tons of insects annually and hibernate locally.

Big Brown Bat *Eptesicus fuscus fuscus* (Palisot de Beauvois)

This bat was not taken during the study period however it is one of the most common and most widely distributed bats in the Great Lakes region (Burt,1969). The Big Brown Bat is found locally, frequently roosting in houses and has been collected from the Watertown cave.

Hoary Bat Lasiurus cinereus cinereus (Palisot de Beauvois)

The largest and most striking of the eastern bats, the hoary bat was not seen in the study area. Similar to the red bat, in that it too is a tree bat and migratory, the hoary bat probably occurs in the area although the extent of its occurrence is questionable. Paul Connor (1966) found the hoary bat to be fairly common in areas through central and northern New York. William H. Burt (1957) felt that the hoary bat was relatively scarce throughout the Great Lakes region. Both Burt and Connor mentioned the difficulties in detecting the bat because of its late evening emergence when it is nearly dark. In actuality, the occurrence of the hoary bat in this area is probably somewhat between the two views and an accurate determination is hindered by its semi-nocturnal habits.

Indiana or Social Myotis Myotis sodalis Miller and G. M. Allen

In addition to the other bats, this bat was not captured during the study period. It inhabits caves as far as is known and frequently hibernates with the little brown bat (Myotis lucifugous). The habits of the Indiana Myotis are poorly known. It is known to occur in a cave outside Watertown, New York (approximately sixty miles north).

CARNIVORES

Shorttail Weasel Mustela erminea cicognanii Bonaparte

One capture was made throughout the summer of the shorttail or ermine weasel at Kelly Drive in Richland Township. They do not seem to be as abundant as the longtail weasel (Mustela frenata). The weasel was captured in a damp hayfield surrounded by woods. They normally inhabit brushy or wooded areas especially near water (Burt,1964) but may range out into open country when foraging. They, along with the related longtail weasel, are one of the main controls of mouse populations (Burt,1969).

Longtail Weasel Mustela frenata novaboracensis (Emmons)

The longtail weasel was fairly numerous within the study area. Eight longtail weasels were noted in all, six through capture, one through observation of tracks and one roadkill. They were found throughout the coastal study strip and occurred in nearly every habitat from new field to mature woods. They seemed to occur most frequently under conditions of dense cover near water. This agrees with the findings of Burt (1964).

Mink Mustela vison

No mink were captured in the coastal area although a local trapper reports them to be common throughout especially along creeks. They are

excellent swimmers as well as being adept on land but have a close association with water as a habitat requirement.

A high population of about 12 mink per mile was reported along Black Creek, located just south of the Coastal Zone. Connor (1966) stated mink were common on the Tug Hill Plateau which is about 15 miles east of the study area.

Red Fox *Vulpes vulpes*

The red fox was noted twice throughout the summer; one live observation at Kelly Drive in Richland Township and the location of a den that had been active the previous year was reported in Butterfly Swamp by a land-owner. A local trapper reports red fox as well as gray to be numerous in the area. Based on Connor's study (1966), red fox were common in the Tug Hill Plateau region, about 15 miles east of the study area. They were most numerous about the old fields and shrubby habitats along the fringe of deeper woods. This agrees with the habitats noted for the red fox during our summer's study.

Gray Fox *Urocyon cinereoargenteus* (Schreber)

No gray fox were observed in the study area, but according to a local trapper, they are abundant and become more numerous as one proceeds westward. Once rare, their populations have become more numerous in recent decades (Connor,1966). Although the gray fox has extended its range northward it seems to be better suited to the lowlands (Connor,1966). Gray fox have been collected within the county (State University of New York-Oswego Vertebrate Collections) and occupies forests and open brushlands (Burt,1969).

Bobcat *Lynx rufus rufus* (Schreber)

Bobcats were not seen within the study area throughout the summer. A local trapper spoke of them as being rare but that some might be found in swamp areas. There have been three sightings of bobcat within recent years: one had reportedly been seen in Butterfly Swamp in 1974, one had been sighted in Sterling, New York in 1975 and a female with four cubs was seen crossing Route 481 in spring 1975. They were common on the Tug Hill Plateau according to Connor (1966). Bobcats inhabit shrub lands, swamp and broken country (Hall and Kelson,1959).

Coyote *Canis latrans* Say

Coyotes, although not observed this summer in the study area, are known to occur within this county. According to a local trapper, coyotes are becoming more numerous over the last few years, especially near the Towns of Mexico and Texas, both of which lie within the Coastal Zone study area.

Coyotes inhabit open or semi-open country such as shrublands.

River Otter Lutra canadensis canadensis (Schreber)

River otters are rare in the Oswego County and were not seen within the Coastal Zone during the summer. According to a local trapper, some had been seen in Volney Township along Mud Creek.

River otters are found along lakes and streams and are excellent swimmers, although they occasionally travel cross country (Burt,1969).

SQUIRRELS AND RELATIVES

Red Squirrel Tamiasciurus hudsonicus loquax (Bangs)

Six red squirrels were observed throughout the summer. They are not scarce but they are not as common as the eastern gray squirrel. The red squirrel is a northern species approaching the southern limits of its range in the area and is most closely associated with the beech-maple-hemlock tree composition of mature woods.

Eastern Gray Squirrel Sciurus carolinensis matacembei (H. H. Bailey)

A total of ten eastern gray squirrels were observed throughout the summer. According to local hunters, however, they are numerous in the area. They were most abundant in fairly mature woods of beech maple and hemlock near marshy situations.

Eastern Chipmunk Tamias striatus lysteri (Richardson)

The eastern chipmunk was one of the most numerous species captured during the entire summer. We captured 126 chipmunks, however, some of these are recaptures. Chipmunks are hard to handle and as a result, the mark-recapture method of tagging was not used. An exact number of chipmunks cannot be ascertained. The eastern chipmunk occurred in a wide variety of habitats including mature woods, intermediate woods, deciduous wooded swamps, and to a lesser extent, shrublands. They were most abundant in the intermediate woods and deciduous wooded swamps.

Southern Flying Squirrel Glaucomys volans volans (Linnaeus)

Two southern flying squirrels were caught during the summer from Scriba Woods. The low number of captures may be more a reflection of the habits of the squirrel itself than of a low population. Flying squirrels are nocturnal, extremely shy and secretive and may avoid traps. The squirrels that were taken were caught on the ground. Because it is seldom observed, the actual abundancy and distribution of the southern flying squirrel is hard to assess. It is however, associated with mature, densely forested areas never far from water (Paradiso,1969).

Northern Flying Squirrel *Glaucomys sabrinus macrotis* (Mearns)

The northern flying squirrel was not taken this summer. It is a more northern species that is beginning to reach the southern limits of its range in the area and hence is probably less common than the southern flying squirrel. Little is known of the habits of the northern flying squirrel but it is probably quite similar in its habitat requirements to the southern flying squirrel (Paradiso,1969).

MICE, VOLES AND RATS

Woodland Deer Mouse *Peromyscus maniculatus gracilis* (Le Conte)

We did not make any definite captures of the woodland deer mouse. As with the prairie deer mouse, it is hard to distinguish from the white-footed mouse. It does occur in Oswego County in the Tug Hill Plateau region (Connor,1966) which is about fifteen miles east of the study area. The white-footed mouse is rare on the Tug Hill Plateau and common in the study area, so it is possible that the forest deer mouse selects a habitat found on the Plateau but not in the study area.

Prairie Deer Mouse *Peromyscus maniculatus bairdii* (Hoy and Kennicott)

The prairie deer mouse is one of two forms of the deer mouse (*Peromyscus maniculatus*), found in Oswego County. It has been reported from the North Pond area within the study area in 1960 (Whitaker and Goodwin,1960). We did some trapping near North Pond in habitats normally inhabited by the prairie deer mouse but no captures were made of mice which could be positively identified as prairie deer mice. It is possible that some were captured but were identified as white-footed mice as the two are difficult to distinguish. Where found, the prairie deer mouse inhabits the early successional stages (Burt,1957).

White-footed Mouse *Peromyscus leucopus noveboracensis* (Fischer)

The white-footed mouse was captured more often than any other mammal during the study. It is found in almost every type of land habitat that occurs within the study area. An abandoned apple orchard near Snake Creek yielded a capture of seventeen white-footed mice in about a one acre trapping plot. Thirteen individuals were captured in a one-half acre plot in an intermediate woods near Snake Creek Swamp while nine individuals per acre was found in a mature section of Scriba Woods. The white-footed mouse was captured most often in intermediate woods and in decreasing numbers in mature woods, alder thickets, shrublands and fields.

Woodland Jumping Mouse *Napaeozapus insignis insignis* (Miller)

Ten woodland jumping mice were captured this summer in the study zone. There seemed to be a definite selection for heavy herbaceous

cover along streams with little surrounding canopy. This agrees with the findings of Burt (1964). They also occurred to a lesser extent in wet, grassy fields and hemlock-oak marshes.

Meadow Jumping Mouse Zapus hudsonius

Twenty-two meadow jumping mice were captured within the coastal zone of Oswego County. There did not seem to be any selection for a particular habitat among the meadow jumping mouse except that it be near water and adequate cover. It appeared in oak-hemlock forests, beech-maple-hemlock forests and dense, wet grass fields. Burt (1964) also found the meadow jumping mice to be unrestricted in various land habitats. Meadow jumping mice were distributed throughout the study area appearing where the required habitats occurred.

Boreal Red-backed Vole Clethrionony gapperi gapperi (Vigors)

Although the boreal red-backed vole was not found to be widespread in the study area, where they were found they were numerous. They were captured only in the northeastern corner of the study area near Deer Creek Marsh and North Pond. Near Blind Creek Cove, a population of about twelve voles per acre was found using the mark and recapture method. They were found in the damper areas of the site while the white-footed mouse was found in the drier areas. Near Rainbow Shores Road, the boreal red-backed vole and white-footed mouse were found in the same habitat of a slightly damp, mixed woods. The voles were captured most often in damp areas of hemlock-yellow birch woodlands with plenty of ground cover.

Meadow Vole Microtus pennsylvanicus pennsylvanicus (Ord)

The meadow vole was captured in many of the fields found in the study area. It was found frequently in damp meadows with good ground cover and less often in drier fields. Some fields yielded no captures of voles while other fields of the same type did produce captures for no apparent reason. Extensive trapping in an abandoned apple orchard near Snake Creek produced a capture of twenty-seven individuals in about a one acre trapping plot.

Pine Vole Pitymys pinetorum scalopsoides (Audubon and Bachman)

We did not capture any pine voles but it is possible that they do occur in the area as Connor (1966) captured some in Lewis County on the Tug Hill Plateau. Typically they are found in mature deciduous and mixed woods (Burt,1957). The pine vole can also be found in apple orchards where they can do some damage to the trees by girdling them, especially during the winter months (Hamilton,1943).

House Mouse and Norway Rat *Mus musculus domesticus* Rutty
Rattus norvegicus norvegicus (Berkenhout)

We did not catch any of these pests during our trapping as we did not do any trapping near human habitation where the house mouse and Norway rat are most often found. They are common in the area as local homeowners and farmers well know. They often become a considerable nuisance and do considerable damage by chewing and stealing food.

MISCELLANEOUS

Eastern Cottontail *Sylvilagus floridanos mearsii* (J. A. Allen)

The cottontail is widespread and abundant throughout the area. Signs of their presence were often found along hedgerows and in new and old fields. Some indications of their presence were found in wooded areas but not as often as in field habitats.

Striped Skunk *Mephitis mephitis nigra* (Peale and Palisot de Beauvois)

Striped skunks were found only a few times throughout the study as roadkills. A local trapper reported skunk populations to be spotty within the area. Burt (1964) described their habitat requirements to be brushy or sparsely wooded areas along streams.

Porcupine *Erethizon dorsatum dorsatum* (Linnaeus)

According to local trappers, porcupines can be found near many of the swamps and marshes found along the shoreline of the lake. Teal Marsh and Riker Beach reportedly have unusually high populations of these animals. A porcupine nest was observed in the vicinity of Ramona Beach Swamp. They are found most often in large areas of woods that lie close to wetlands.

Muskrat *Ondatra zibethicus zibethicus* (Linnaeus)

Muskrats are abundant throughout the study area. Their burrows or houses were observed on most of the larger stream creeks, rivers and ponds that are found in the area. They are particularly abundant in Butterfly Swamp and Deer Creek Marsh. According to a local trapper, their numbers have been decreasing lately due to trapping and in particular to increased predation by mink which have been increasing in the last few years. They were observed most often in swamps and marshes and less frequently along streams and creeks.

Virginia Opossum *Didelphis marsupialis virginiana* Kerr

Opossums, our only native marsupial, were common throughout the study area, as was reflected by the frequency of roadkills and reports of local

trappers. Unknown in this area not many years ago, the opossum has extended its range with the clearing of areas for farmland and urban areas (Burt,1969). Its northern limit is now within the Tug Hill Plateau region of upper New York (Connor,1966). Opossums are most abundant in lowlands, especially farmlands and shrublands near water, which cover a large portion of the study area.

Woodchuck *Marmota monax rufescens* Howell

Woodchucks were common throughout the study area. Their numbers are kept in check by farmers who dislike the woodchucks burrows. They were most often seen in open fields and along hedgerows but a few were seen within woods a hundred feet or so from any clearing.

Beaver *Castor canadensis* Kuhl

Beavers are found throughout the study area in good numbers. The Conservation Department receives more complaints about beavers from Oswego County than from any other county. According to local trappers, the number and location of beavers in the area change from year to year as a result of trapping. Some areas that have particularly high populations of beaver include Deer Creek Marsh, Ramona Beach Swamp and Butterfly Swamp.

Whitetail Deer *Odocoileus virginianus borealis*

Whitetail deer were observed throughout the study area. Their tracks were often found in the soft soil along streams and swamps. They appeared to be particularly abundant in the Deer Creek Marsh area where, one morning, a group of seven deer were spotted feeding in a field. According to local hunters, the number of deer present this year is greater than in years past. This could be due to the relative mildness of the past few winters or perhaps due to a lack of extensive hunting the last several years. The effect of an increasing number of coyotes in the area on the deer population could be an interesting one in the future. However, at present, man and domestic dogs are the only enemies the deer have locally.

Raccoon *Procyon lotor lotor* (Linnaeus)

Raccoon was captured only once during the study in Butterfly Swamp. Raccoon tracks were sighted many times ranging throughout the extent of the study area. It appears that raccoons are numerous and their habitats are located in wooded or shrubby areas close to water.

Conclusions

The mammal fauna found in the Coastal Zone is typical of the fauna found in the Northeastern United States. Most of the species found in

the Coastal Zone are distributed throughout the study area. The red-backed vole appears to be the only exception as it is restricted to the northeastern corner of the study area.

The predominant habitat associations are described for each species although many of the species are found to a lesser degree in additional habitats.

Species that are uncommon in Oswego County include the bobcat and river otter. Although we have no record of either species presently existing within the Coastal Zone, they can be found in areas close to the study area. If measures are taken to protect these species, they probably could become reestablished within the Coastal Zone as adequate habitats for both species exist here. Deer Creek Marsh and Butterfly Swamp are two areas in particular that could be suitable habitat for both species.

Our field work and the results that are presented provide a base for further research. Further research may add a few species to our species list and also may be able to strengthen correlations between a species and a particular habitat.

Table 11. Localities within Oswego County Coastal Zone in which species were found, Summer 1976.

	West Bluff Farmlands	Snake Swamp Woods	Snake Swamp	Snake Swamp Fields	West Campus Shrublands	Teal Marsh, East	King's Folly Area	Scriba Woods	Noyes Sanctuary	Shore Oaks Woods	Pleasant Pt. Woods	Catfish Creek Woods	Butterfly Swamp, Central	Butterfly Swamp, East	Butterfly Wood Fringe	Sage Creek Woods	Derby Hill Woods
MOLES																	
Hairytail Mole				X													
Starnose Mole				X													
SHREWS																	
Masked Shrew		X		X	X	X	X	X	X	X		X	X	X	X		X
Shorttail Shrew														X			
BATS																	
Silver-haired Bat						X											
Little Brown Bat																	
CARNIVORES																	
Shorttail Weasel					X			X				X					
Longtail Weasel		X		X											X		
Red Fox														X			
SQUIRRELS AND RELATIVES							X	X	X				X				
Red Squirrel							X	X	X	X	X						
E. Gray Squirrel						X	X	X	X	X	X	X	X	X	X	X	X
E. Chipmunk								X									
S. Flying Squirrel																	
MICE, VOLES, RATS	X	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X
White-footed Mouse							X	X	X	X			X				
Woodland Jumping Mouse					X	X					X			X		X	
Meadow Jumping Mouse				X										X			
Meadow Vole																	
Boreal Redback Vole																	
Miscellaneous							X			X	X			X			
E. Cottontail										X							
Striped Skunk																	
Porcupine														X			
Muskrat				X			X										
Virginia Opossum									X								
Woodchuck				X													
Beaver			X				X		X	X	X			X	X		
Whitetail Deer									X	X	X			X			
Raccoon																	

Table 11. cont'd.

	Ramona Beach Road	Patrick Drive Fields	Deer Creek Dunes	Deer Creek Fringe	Deer Creek Marsh	Kelley Road Wood Fringe	Kelley Road Fields	Rainbow Shores Woods	South Ponds Wetlands	Rainbow Shores Woods, East	Ouderkirk Road, West Field	Co. Rt. 15 Woods, West	North Pond - South Sand Spit	Seber Shores Area	Blind Creek Cove Woods	Carl Island
MOLES																
Hairytail Mole																
Starnose Mole																
SHREWS																
Masked Shrew	X			X												
Shorttail Shrew	X	X	X	X	X	X			X	X	X			X		
BATS																
Silver-haired Bat																
Little Brown Bat																
CARNIVORES																
Shorttail Weasel							X									
Longtail Weasel				X							X			X		
Red Fox							X									
SQUIRRELS AND RELATIVES																
Red Squirrel														X		
E. Gray Squirrel			X													
E. Chipmunk	X		X			X		X	X	X				X	X	
S. Flying Squirrel																
MOLES, VOLES, RATS																
White-footed Mouse	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X
Woodland Jumping Mouse															X	
Meadow Jumping Mouse		X	X										X		X	
Meadow Vole		X					X		X		X					X
Boreal Redback Vole						X		X	X	X					X	
Miscellaneous																
E. Cottontail		X														
Striped Skunk																
Porcupine																
Muskrat																
Virginia Opossum																
Woodchuck																
Beaver	X															
Whitetail Deer		X		X		X										
Raccoon		X														

Table 12. Mammalian associations with the major habitats in Oswego County Coastal Zone, New York, Summer 1976.

Species	Major Habitat Divisions				
	Mature Woods	Intermediate Woods	Shrub-lands	New Field	Aquatic (Wetlands)
MOLES					
Hairytail Mole*	X	X	X	X	
Starnose Mole *	X	X	X	X	X
SHREWS					
Masked Shrew*	X	X	X	X	
Smoky Shrew	X				
N. Water Shrew	X				
Thompson's Pygmy Shrew	X	X	X	X	
Least Shrew				X	
Shorttail Shrew*	X	X	X	X	
BATS					
Silver-haired Bat*	X	X			X
Keen's Myotis	X	X			X
Small-footed Myotis	X	X			
E. Pipistrelle	X	X			X
Red Bat	X	X			X
Little Brown Myotis*	X	X			X
Big Brown Bat	X	X			
Hoary Bat	X	X			
Indiana Myotis	X	X			
CARNIVORES					
Shorttail Weasel*	X	X	X	X	
Longtail Weasel*	X	X	X	X	
Mink	X	X	X	X	X
Red Fox*		X	X	X	
Gray Fox	X	X	X		
Bobcat	X	X	X		X
Coyote	X		X		
River Otter					X
SQUIRRELS AND RELATIVES					
Red Squirrel*	X	X			
E. Gray Squirrel *	X	X			
E. Chipmunk*	X	X	X		
S. Flying Squirrel	X	X			
N. Flying Squirrel	X	X			

*designates species that were captured or observed during our field work.

Table 12. continued

Species	Major Habitat Divisions: Mature Woods	Intermediate Woods	Shrub-lands	New Field	Aquatic (Wetlands)
MICE, VOLES AND RATS					
Woodland Deermouse	X	X			
Prairie Deermouse			X	X	
White-footed Mouse*	X	X	X	X	
Woodland Jumping Mouse*	X	X	X		
Meadow Jumping Mouse*	X	X	X	X	
Meadow Vole*			X	X	
Boreal Redback Vole*	X	X			
Pine Vole	X	X		X	
House Mouse and Norway Rat	associated with human habitats				
MISCELLANEOUS					
E. Cottontail*	X	X	X		
Striped Skunk*	X	X	X	X	
Porcupine*	X	X			
Muskrat*					X
Virginia Opossum*	X	X		X	
Woodchuck*			X	X	
Beaver*					X
Whitetail Deer*	X	X	X		
Raccoon*	X	X	X		

*designates species that were captured or observed during our field work.

Table 13. Roosting (R) and foraging (F) sites for the bat fauna of Oswego County Coastal Zone, New York; Summer 1976

Scientific Name	Common Name	Mature Woods	Intermediate Woods	Shrublands	New Field	Aquatic (Wetlands)	Man-made Structures	Caves
Lasionycteris noctivagans	Silver-haired Bat	R,F	R,F			F	R	R
Myotis keenii	Keen's Myotis	R,F	R,F			F	R	R
Myotis leibii	Small-footed Myotis	R,F	R,F	F			R	R
Pipistrellus subflavus	Eastern Pipistrelle	R,F	R,F			F	R	R
Lasiurus borealis	Red Bat	R,F	R,F	R		F		
Myotis lucifugous	Little Brown Myotis	R,F	R,F			F	R	R
Eptesicus fuscus	Big Brown Bat	R,F	R,F				R	R
Lasiurus cinereus	Hoary Bat	R,F	R,F	R				
Myotis sodalis	Indiana Myotis	foraging habits and most roosting sites are unknown for this species					R	R

Birds

Introduction

The Oswego County Coastal Zone is among the more important areas for birds within New York State. During all seasons of the year large numbers of birds utilize the area. In the winter large numbers of waterfowl and waterbirds congregate in coastal areas which also support considerable concentrations of hawks and other species.

The Coastal Zone also lies along one of the major migration flyways in Eastern North America. Derby Hill is becoming famous as a place where one may see concentrations of migrants such as hawks, waterbirds and blackbirds equaled at very few locations in North America. A combination of factors make the nearshore areas of Oswego County extremely valuable to the birds of the continent as a whole.

It is not the purpose of this report, however, to treat all aspects of the birds of the Coastal Zone. The information presented is restricted to the data collected during the study period of 31 May to 22 August, 1976. Additional data from a variety of sources including the author's ten years of field experience in the area may be found in "Birds of Oswego County", presently in preparation and hopefully available sometime in 1977 or early 1978. Information regarding the date of publication may be obtained from the author of this section.

It is hoped that these data will provide significant insight into the general status of breeding birds in the area and give a clear idea of what habitats are of particular importance from the standpoint of breeding birds. It is also hoped that these data can be used in conjunction with results of other sections and provide an indication of what are the most valuable areas within the Coastal Zone. The results of these assessments may be found in the Conclusions, Evaluations and Recommendations sections of this report.

Methods

This discussion includes the major studies undertaken in this project and found in the following tables in the bird section report.

Checklist for the birds of the Oswego County Coastal Zone: A cumulative list of those species known to have occurred within the Coastal Zone in the last 26 years, and the usual seasons of occurrence is found in Table 14. These data come from three sources: 1) records published by the Federation of New York State Bird Club in The Kingbird, for that period; 2) the author's personal observations during the last ten years; and 3) the summer's study. The nomenclature for each species is based upon the American Ornithologist's Union Checklist (5th Edition) through the 33rd supplement Auk 93: Oct. 1976.

The seasonal status of each species is defined as follows: resident- a species occurring in the area all year with most individuals being non-

migrating; breeder - a species breeding in the area; winterer - a species regularly spending at least part of the winter season (12/15-3/10) in the area; migrant - a species that migrates through the area in spring and/or fall; vagrant - a species of irregular occurrence in the area; summering non-breeder - a species spending at least part of the summer period (6/1-8/15) in the area but not breeding.

Habitat associations of major breeding species, and species of regular occurrence during the non-breeding season: The primary habitats used by breeding bird species during their nesting period are found in Table 15 and those habitats utilized by species during the non-breeding are in Table 16 The following habitats used in Tables 15 and 16 are described below.

Lake Ontario Littoral Zone and Shore: The immediate shoreline area along the lake, including shore materials and overhanging cliffs of rocks and other materials.

Marshes: To include areas dominated by open water with cattail and grass marshes (see vegetation section).

Other Wetlands: All other non-marsh wetlands including shrub swamps and young wooded swamps.

Swamp Woodlands: Wooded areas with at least large pockets of standing water and very wet soil.

Other Woodlands: All other wooded areas.

Shrublands: See vegetation section.

Active Farmlands and Associated Areas: Areas of active agriculture including orchards, grazing areas and pine plantations.

Residential and Developed Areas: Includes urban and suburban areas.

Red and blue lists: These lists provide my interpretation of those species which should be closely watched in the immediate future. (See Table 17) The red list consists of those species which have been expirated or are in immediate danger of expiration from the area, and a local endangered species list. The blue list, patterned after the National Audubon Society's Continental Blue List, consists of species that are declining and/or very uncommon. The placement of a species on either list is valid only pertaining to the seasonal modifiers listed next to it. For example, the White-throated Sparrow is blue-listed as a breeder but is a very common migrant through the area.

Population estimates for selected wetland species: *The population of species is closely tied to wetland habitats along the Coastal Zone are described in Table 18 These figures were obtained by frequent observations including transects through each area. For breeding species the number of breeding pairs is given; for non-breeders the average number of individuals using the area is provided.*

Roadside surveys: These censuses are patterned after the roadside censuses conducted by cooperators using methods provided by the U.S. Fish and Wildlife Service (Anon.,1975). (See Table 19). The following modifications were made in these methods to adapt to this study's conditions: 1) routes were designed to remain within the Coastal Zone; 2) each stop was 0.25 miles apart instead of 0.5 miles apart; 3) observations were for a period of five minutes instead of three at each stop; 4) each route was 6 miles in length.

The three routes were chosen on secondary roads so observations could be taken without excessive traffic causing disruptions. A brief summary of the route of each census is provided below.

Oswego Town Census: Start at State University College in front of Oswego President's house. Proceed west along Campus Shore Road to where it joins Washington Boulevard. Turn right onto Lakeshore Road , then right on West Lake Road to the census end near the mouth of Eight Mile Creek.

Scriba East Census: Start on Lakeview Road just south of the intersection with County Route 1A. Proceed south on Lakeview Road to Burt Miner Road. Turn left (east), proceed to Parkhurst Road and turn left (north) and proceed to Lake Road. Turn right (east) and proceed to Nine Mile Point Road, then turn right (south) and proceed to Burt Miner Road. Turn right (west) and proceed to the census end located at the first stream crossing.

New Haven Census: Start at Samson's Grocery on County Route 1, just east of the intersection of Nine Mile Point Road. Proceed east on County Route 1 to the intersection of Route 104B and turn left (east) on Route 104B, then proceed to the end at the border of the Hamlet of Texas.

The average number of individuals present at each stop is the figure provided for that stop in the table.

Breeding bird strip censuses: These censuses were performed using the methods devised by the National Audubon Society (VanVelzen,1972). The data provided in Table 20 includes singing males present on site, individuals per hour of observation in each area and calculation of the number of territorial males per 100 acres of habitat. The strips used in these studies were 330 feet wide with varying lengths. Location data for each census is briefly described below.

Milea Beach: Start at the intersection of Milea Beach Road and the railroad tracks. Proceed north along the road 0.8 miles, to the end of the census at the lake shore. 29.5 acres; 11.9 hectares

Alcan East: Start at the lake shore along Alcan East Road, proceed south 0.8 miles to census end. 29.5 acres; 11.9 hectares

Railroad Track: Start at the intersection of Lake Road and the railroad tracks, proceed east 1.4 miles to end of census. 51.6 acres; 20.9 hectares

King's Folly: Start at the intersection of King's Road and County Route 1A, then proceed north to the lake shore. 40.5 acres; 16.4 hectares

West Nine Mile Point: Start at the intersection of Lake Road and West Nine Mile Point Road, proceed north, then east along the road to census end at the intersection with Nine Mile Point Road. 29.5 acres; 11.9 hectares

Shore Oaks: Start at the intersection of Shore Oaks Road and the lake shore, proceed south along Shore Oaks Road 1.1 miles to the census end. 40.5 acres; 16.4 hectares

Butterfly Central: Start at the intersection of County Route 1 and Butterfly Central (private) Road and proceed north to near the lake shore at swamp area. 36.9 acres; 15.0 hectares

Ramona Beach: Start at the first large wood edge, west of Route 3 along Ramona Beach Road, proceed west, then south along the road to the census end at the end of the road. 36.9 acres; 15.0 hectares

Kelley Road: Start at the intersection with the first wood edge along Kelley Road, west of Route 3. Proceed west to the edge of Deer Creek Marsh. 25.8 acres; 10.4 hectares

The data derived from these censuses are useful in providing present population levels for the species in these habitats. In addition, they provide relative abundance of the various species present.

Transect studies: These studies as presented in Table 21, were conducted by methods similar to those used for the strip censuses except that they are less intensive, each area usually being visited 2-3 times. Also, the time of day for each census was greatly varied. Due to these factors, the data is somewhat less definitive than the more intensive studies and should be so interpreted. It is likely that, in general, fewer birds were noted in each area than were actually present. The data provides a good estimate of relative abundance. Each of the transects was approximately 0.5 miles long and 330 feet wide or a total of 20 acres. These data are presented in whole individuals per observation hour with any fractions rounded off to the nearest whole number. The starting point and direction of travel for each transect is given below.

Snake Swamp Fringe: Start at the intersection of Lakeshore Road and Sleepy Hollow Road. Proceed south along the road then southwest along swamp fringe.

Burt Point Area: Start at Burt Point and proceed west toward Rice Creek Mouth.

East Oswego Shrublands: Start at the intersection of St. Paul Street and Mitchell Street.Proceed south along St. Paul Street.

Smith's Beach Area: Start at the intersection of Smith's Beach Road and Mitchell Street. Proceed north along Smith's Beach Road.

Milea Beach Camp Colony: Start at the northwest end of Milea Beach Road and proceed east along the road.

West Teal Marsh: Start at the north end of JoLo Shores Road and proceed south along that road.

Trailer Park Area: Start at the north side of Scriba Trailer Park off County Route 1A. Proceed north along the trailer park road.

Riker Beach Woods: Start about 0.1 miles south of the north end of Riker Beach Road and proceed east.

Bayshore Beach Shrublands: Start at the houses 0.2 miles south of the north end of Bayshore Grove Road and proceed west.

Scriba Woods: Start at County Route 29 intersection with the power line corridor and proceed west-northwest.

Parkhurst Woods: Start at the intersection of Lake Road and Parkhurst Road and proceed southwest.

Lycoming Area: Start at the old railroad bed in the Village of Lycoming and proceed east along the old railroad bed.

Bible Camp Area: Start at the north end of Lakeview Road and proceed west-southwest.

West Power Complex Shrublands: Start about 0.1 miles south of the north end of Niagra-Mohawk Visitor Center Road and proceed west.

North Nine Mile Point Area: Start at the north end of Nine Mile Point Road and proceed south along the road.

Railroad East: Start at the intersection of Nine Mile Point Road and the old railroad bed and proceed east along the old railroad bed.

Noyes Woods Sanctuary: Start just south of the north end of Nine Mile Point Road and proceed east along Mr. Noyes' "Woods" Road.

Pleasant Point Area: Start at the northeast end of County Route 44 and proceed west-northwest, then south.

Catfish Woods: Start at "Fisher Drive" intersection with Hickory Grove Road and proceed west-northwest.

Mexico Point East: Start at the northwest end of Pond Drive and proceed east-southeast along the Little Salmon River.

Derby Hill Area: Start at the bluff atop Derby Hill and proceed southeast.

Chedmardo Area: Start at the west end of Patrick Drive and proceed southeast.

South Deer Creek Fringe: Start at Brennan's Beach Area and proceed southeast along the beach road.

Rainbow Shores Woods: Start at the west end of the pavement on Rainbow Shores Road and proceed southeast, then south.

East Rainbow Shores: Start at the intersection of Rainbow Shores Road and Tryon Road and proceed east along Rainbow Shores Road.

South Blind Creek Cove Woods: Start 0.1 miles east of the west end of Blind Creek Cove Road and proceed south.

South Pond Wetlands: Start at the intersection of Rainbow Shores Road and private drive 0.3 miles east of the west end of Rainbow Shores Road and proceed northeast.

South Spit, North Pond: Start at the north end of the south spit and proceed south.

Greene Point Area: Start at the intersection of Greene Point Road and Route 3 and proceed west.

Elms Area: Start at the intersection of Elms Road and Route 3 and proceed west.

North Blind Creek Cove Woods: Start at the intersection of Blind Creek Cove Road and Route 3 and proceed northwest.

Carl Island: Not surveyed as a transect as the island was too small.

Hooded Warbler distribution: The distribution of Hooded Warblers within the area is presented in Figure 1. The numbers indicate adult males present.

Bird of prey locations: The general locations where bird of prey were located are noted in Table 22. In addition, the state of actual or suspected nesting activity is provided.

Table 14. Species and occurrence checklist for the birds of the Oswego County Coastal Zone.

Key

R- resident M- migrant
B- breeder V- vagrant
W- winterer S- summering non-breeder

Species	Common Name	Seasonal Status				
Gavia immer	Common Loon		W	M		
Gavia stellata	Red-throated Loon			M		
Podiceps grisegena	Red-necked Grebe			M		
Podiceps auritus	Horned Grebe		W	M		
Podilymbus podiceps	Pied-billed Grebe	B	W	M		
Fulmarus glacialis	Northern Fulmar				V	
Pelecanus occidentalis	Brown Pelican				V	
Phalacrocorax carbo	Great Comorant				V	
Phalacrocorax auritus	Double-crested Comorant		W	M		S
Ardea herodias	Great Blue Heron			M		S
Butorides striatus	Green Heron	B		M		
Florida caerulea	Little Blue Heron				V	
Bubulcus ibis	Cattle Egret			M		
Casmerodius albus	Great Egret			M		S
Egretta thula	Snowy Egret				V	
Hydramassa tricolor	Louisiana Heron				V	
Nycticorax nycticorax	Black-crowned Night Heron			M		S
Ixobrycus exilis	Least Bittern	B		M		
Botaurus lentiginosus	American Bittern	B		M		
Plegadis falcinellus	Glossy Ibis				V	
Cygnus olor	Mute Swan				V	
Olor columbianus	Whistling Swan			M		
Branta canadensis	Canada Goose	B	W	M		
Branta bernicla	Brant			M		
Chen caerulescens	Snow Goose			M		
Anas platyrhynchos	Mallard	B	W	M		
Anas rubripes	Black Duck	B	W	M		
Anas strepera	Gadwall		W	M		
Anas acuta	Pintail		W	M		
Anas crecca	Green-winged Teal			M		
Anas discors	Blue-winged Teal	B		M		
Anas americana	American Wigeon			M		
Anas clypeata	Northern Shoveler			M		
Aix sponsa	Wood Duck	B		M		
Aythya americana	Redhead		W	M		
Aythya collaris	Ring-necked Duck			M		
Aythya valisineria	Canvasback		W	M		
Aythya marila	Greater Scaup		W	M		
Aythya affinis	Lesser Scaup		W	M		
Aythya fuligula	Tufted Duck				V	
Bucephala clangula	Common Grackle		W	M		
Bucephala islandica	Barrow's Goldeneye		W	M		
Bucephala albeola	Bufflehead		W	M		

Table 14 Cont'd.

Species	Common Name	Seasonal Status				
Clangula hyemalis	Oldsquaw		W	M		
Histrionicus histrionicus	Harlequin Duck				V	
Somateria mollissima	Common Eider				V	
Somateria spectabilis	King Eider		W			
Melanitta deglandi	White-winged Scoter		W	M		
Melanitta perspicillata	Surf Scoter		W	M		
Melanitta nigra	Black Scoter		W	M		
Oxyura jamaicensis	Ruddy Duck		W	M		
Lophodytes cucullatus	Hooded Merganser		W	M		
Mergus merganser	Common Merganser		W	M		
Mergus serrator	Red-breasted Merganser		W	M		
Cathartes aura	Turkey Vulture	B		M		
Coragyps atratus	Black Vulture				V	
Elanoides forficatus	Swallow-tailed Kite				V	
Accipiter gentilis	Goshawk		W	M		
Accipiter striatus	Sharp-shinned Hawk	B	W	M		
Accipiter cooperii	Cooper's Hawk	B	W	M		
Buteo jamaicensis	Red-tailed Hawk	B	W	M		
Buteo lineatus	Red-shouldered Hawk			M		
Buteo platypterus	Broad-winged Hawk	B		M		
Buteo swainsoni	Swainson's Hawk				V	
Buteo lagopus	Rough-legged Hawk		W	M		
Aquila chrysaetos	Golden Eagle			M		
Haliaeetus leucocephalus	Bald Eagle		W	M		S
Circus cyaneus	Marsh Hawk	B		M		
Pandion haliaetus	Osprey			M		S
Falco rusticolus	Gyrfalcon				V	
Falco peregrinus	Peregrine Falcon			M		
Falco columbarius	Merlin			M		
Falco sparverius	American Kestrel		B	W	M	
Bonasa umbellus	Ruffed Grouse	R				
Phasianus colchicus	Ring-necked Pheasant	R				
Grus canadensis	Sandhill Crane				V	
Rallus limicola	Virginia Rail		B		M	
Porzana carolina	Sora		B		M	
Gallinula chloropus	Common Gallinule		B		M	
Fulica americana	American Coot			W	M	
Charadrius semipalmatus	Semipalmated Plover				M	
Charadrius melodus	Piping Plover				M	
Charadrius vociferus	Killdeer		B		M	
Pluvialis dominica	American Golden Plover				M	
Pluvialis squatarola	Black-bellied Plover				M	
Arenaria interpres	Ruddy Turnstone				M	
Philohela minor	American Woodcock		B		M	
Capella gallinago	Common Snipe		B		M	
Numenius phaeopus	Whimberal				M	
Bartramia longicauda	Upland Sandpiper		B		M	
Actitis macularia	Spotted Sandpiper		B		M	
Tringa solitaria	Solitary Sandpiper				M	
Tringa melanoleuca	Greater Yellowlegs				M	

Table 14 Cont'd.

Species	Common Name	Seasonal Status				
Tringa flavipes	Lesser Yellowlegs			M		
Catoptrophorus semipalmatus	Willet				V	
Caladris canutus	Red Knot			M		
Caladris maritima	Purple Sandpiper			M		
Caladris melanotos	Pectoral Sandpiper			M		
Caladris fuscicollis	White-rumped Sandpiper			M		
Caladris bairdii	Baird's Sandpiper			M		
Caladris minutilla	Least Sandpiper			M		
Caladris alpina	Dunlin			M		
Caladris pusilla	Semipalmated Sandpiper			M		
Caladris mauri	Western Sandpiper			M		
Caladris alba	Sanderling			M		
Limnodromus griseus	Short-billed Dowitcher			M		
Limnodromus scolopaceus	Long-billed Dowitcher			M		
Micropalama himantopus	Stilt Sandpiper			M		
Tryngites subruficollis	Buff-breasted Sandpiper			M		
Limosa fedoa	Marbled Godwit				V	
Limosa haemastica	Hudsonian Godwit			M		
Phalaropus fulicarius	Red Phalarope			M		
Steganopus tricolor	Wilson's Phalarope			M		
Lobipes lobatus	Northern Phalarope			M		
Stercorarius pomarinus	Pomarine Jaeger			M		
Stercorarius parasiticus	Parasitic Jaeger			M		
Stercorarius longicaudus	Long-tailed Jaeger				V	
Larus hyperboreus	Glaucous Gull		W	M		
Larus glaucoides	Iceland Gull		W	M		
Larus marinus	Great Black-backed Gull		W	M		S
Larus argentatus	Herring Gull		W	M		S
Larus thayeri	Thayer's Gull		W			
Larus delawarensis	Ring-billed Gull		W	M		S
Larus ridibundus	Balck-headed Gull				V	
Larus atricilla	Laughing Gull				V	
Larus pipixcan	Franklin's Gull			M		S
Larus philadelphia	Bonapartes Gull			M		S
Larus minutus	Little Gull			M		
Rissa tridactyla	Black-legged Kittiwake			M		
Sterna forsteri	Forster's Tern			M		
Sterna hirundo	Common Tern		B	M		
Sterna caspia	Caspian Tern			M		S
Chlidonias niger	Black Tern		B	M		
Columba livia	Rock Dove	R				
Zenaida macroura	Mourning Dove		B	W	M	
Coccyzus americanus	Yellow-billed Cuckoo		B		M	
Coccyzus erythropthalmus	Black-billed Cuckoo		B		M	
Otus asio	Screech Owl	R				
Bubo virginianus	Great Horned Owl	R				
Nyctea scandiaca	Snowy Owl			W	M	
Strix varia	Barred Owl		B	W	M	
Asio otus	Long-eared Owl			W	M	S
Asio flammeus	Short-eared Owl				M	

Table 14 Cont'd.

Species	Common Name	Seasonal Status				
Aegolius funereus	Boreal Owl				V	
Aegolius acadicus	Saw-Whet Owl		W	M		
Caprimulgus vociferus	Whip-poor-will			M		
Chordeiles minor	Common Nighthawk	B		M		
Chaetura pelagica	Chimney Swift	B		M		
Archilochus colubris	Ruby-throated Hummingbird	B		M		
Megaceryle alcyon	Belted Kingfisher	B	W	M		
Colaptes auratus	Common Flicker	B		M		
Dryocopus pileatus	Pileated Woodpecker	R				
Melanerpes carolinus	Red-bellied Woodpecker	R				
Melanerpes erythrocephalus	Red-headed Woodpecker	B		M		
Sphyrapicus varius	Yellow-bellied Sapsucker			M		
Picoides villosus	Hairy Woodpecker	B	W	M		
Picoides pubescens	Downy Woodpecker	B	W	M		
Picoides arcticus	Black-backed Three-toed Woodpecker				V	
Tyrannus tyrannus	Eastern Kingbird	B		M		
Myiarchus crinitus	Great Crested Flycatcher	B		M		
Sayornis phoebe	Eastern Phoebe	B		M		
Empidonax flaviventris	Yellow-bellied Flycatcher			M		
Empidonax virescens	Acadian Flycatcher				V	
Empidonax traillii	Willow Flycatcher	B		M		
Empidonax alnorum	Alder Flycatcher	B		M		
Empidonax minimus	Least Flycatcher	B		M		
Contopus virens	Eastern Wood Pewee	B		M		
Nuttallornis borealis	Olive-sided Flycatcher			M		
Eremophila alpestris	Horned Lark	B	W	M		
Iridoprocne bicolor	Tree Swallow	B		M		
Riparia riparia	Bank Swallow	B		M		
Stelgidopteryx ruficollis	Rough-winged Swallow	B		M		
Hirundo rustica	Barn Swallow	B		M		
Petrochelidon pyrrhonota	Cliff Swallow			M		
Progne subis	Purple Martin	B		M		
Cyanocitta cristata	Blue Jay	B	W	M		
Corvus corax	Common Raven				V	
Corvus brachyrhynchos	Common Crow	B	W	M		
Parus atricapillus	Black-capped Chickadee	B	W	M		
Parus hudsonicus	Boreal Chickadee		W	M		
Parus bicolor	Tufted Titmouse	B	W	M		
Sitta carolinensis	White-breasted Nuthatch	B	W	M		
Sitta canadensis	Red-breasted Nuthatch	B	W	M		
Certhia familiaris	Brown Creeper	B	W	M		
Troglodytes aedon	House Wren	B		M		
Troglodytes troglodytes	Winter Wren	B		M		
Thryothorus ludovicianus	Carolina Wren	B	W	M		
Cistothorus palustris	Long-billed Marsh Wren	B		M		
Mimus polyglottus	Mockingbird			M		S
Dumetella carolinensis	Gray Catbird	B		M		
Toxostoma rufum	Brown Thrasher	B		M		
Turdus migratorius	American Robin	B	W	M		

Table 14 Cont'd.

Species	Common Name	Seasonal Status				
Hylocichla mustelina	Wood Thrush		B		M	
Catharus guttatus	Hermit Thrush				M	
Catharus ustulatus	Swainson's Thrush				M	
Catharus minimus	Gray-cheeked Thrush				M	
Catharus fuscescens	Veery		B		M	
Sialia sialis	Eastern Bluebird		B		M	
Polioptila caerulea	Blue-gray Gnatcatcher		B		M	
Regulus satrapa	Golden-crowned Kinglet		B	W	M	
Regulus calendula	Ruby-crowned Kinglet				M	
Anthus spinoletta	Water Pipit				M	
Bombycilla garrulus	Bohemian Waxwing			W	M	
Bombycilla cedrorum	Cedar Waxwing		B	W	M	
Lanius excubitor	Northern Shrike			W	M	
Lanius ludovicianus	Loggerhead Shrike				M	S
Sturnus vulgaris	Starling	R			M	
Vireo flavifrons	Yellow-throated Vireo		B		M	
Vireo solitarius	Solitary Vireo				M	
Vireo olivaceus	Red-eyed Vireo		B		M	
Vireo philadelphicus	Philadelphia Vireo				M	
Vireo gilvus	Warbling Vireo		B		M	
Mniotillta varia	Black-and-white Warbler		B		M	
Protonotaria citrea	Prothonotary Warbler					V
Helmitheros vermivorus	Worm-eating Warbler					V
Vermivora chrysoptera	Golden-winged Warbler		B		M	
Vermivora pinus	Blue-winged Warbler		B		M	
Vermivora peregrina	Tennessee Warbler				M	
Vermivora celata	Orange-crowned Warbler				M	
Vermivora ruficapilla	Nashville Warbler				M	
Parula americana	Northern Parula				M	
Dendroica petechia	Yellow Warbler		B		M	
Dendroica magnolia	Magnolia Warbler				M	
Dendroica tigrina	Cape May Warbler				M	
Dendroica caerulescens	Black-throated Blue Warbler				M	
Dendroica coronata	Yellow-rumped Warbler			W	M	
Dendroica virens	Black-throated Green Warbler		B		M	
Dendroica cerulea	Cerulean Warbler		B		M	
Dendroica fusca	Blackburnian Warbler		B		M	
Dendroica dominica	Yellow-throated Warbler					V
Dendroica pensylvanica	Chestnut-sided Warbler		B		M	
Dendroica castanea	Bay-breasted Warbler				M	
Dendroica striata	Blackpoll Warbler				M	
Dendroica pinus	Pine Warbler		B		M	
Dendroica discolor	Prarie Warbler					V
Dendroica palmarum	Palm Warbler				M	
Seiurus aurocapillus	Ovenbird		B		M	
Seiurus noveboracensis	Northern Waterthrush		B		M	
Seiurus motacilla	Louisiana Waterthrush					V
Oporonis agilis	Connecticut Warbler				M	
Oporonis philadelphia	Mourning Warbler		B		M	
Geothlypis trichas	Common Yellowthroat		B		M	
Wilsonia citrina	Hooded Warbler		B		M	

Table 14 Cont'd.

Species	Common Name	Seasonal Status			
Wilsonia pusilla	Wilson's Warbler			M	
Wilsonia canadensis	Canada Warbler	B		M	
Septophaga ruticilla	American Redstart	B		M	
Passer domesticus	House Sparrow	R			
Dolichonyx oryzivorus	Bobolink	B		M	
Sturnella magna	Eastern Meadowlark	B	W	M	
Sturnella neglecta	Western Meadowlark	B			V
Agelaius phaeniceus	Red-winged Blackbird	B	W	M	
Icterus spurius	Orchard Oriole				V
Icterus galbula	Northern Oriole	B		M	
Euphagus carolinus	Rusty Blackbird			M	
Quiscalus quiscula	Common Grackle	B	W	M	
Molothrus ater	Brown-headed Cowbird	B	W	M	
Piranga olivacea	Scarlet Tanager	B		M	
Cardinalis cardinalis	Cardinal	R			
Pheucticus ludovicianus	Rose-breasted Grosbeak	B		M	
Passerina cyanea	Indigo Bunting	B		M	
Spiza americana	Dickcissel				V
Hesperiphona vespertina	Evening Grosbeak		W	M	
Carpodacus purpureus	Purple Finch	B	W	M	
Carpodacus mexicanus	House Finch				V
Pinicola enucleator	Pine Grosbeak		W	M	
Carduelis hornemannii	Hoary Redpoll				V
Carduelis flammea	Common Redpoll		W	M	
Carduelis pinus	Pine Siskin		W	M	
Carduelis tristis	American Goldfinch	B	W	M	
Loxia curvirostra	Red Crossbill		W	M	
Loxia leucoptera	White-winged Crossbill		W	M	
Pipilo erythrophthalmus	Rufous-sided Towhee	B		M	
Passerculus sandwichensis	Savannah Sparrow	B		M	
Ammodramus savannarum	Grasshopper Sparrow	B		M	
Ammodramus henslowii	Henslow's Sparrow	B		M	
Ammospiza caudacuta	Sharp-tailed Sparrow				V
Pooecetesgramineus	Vesper Sparrow	B		M	
Junco hyemalis	Dark-eyed Junco	B	W	M	
Spizella arborea	Tree Sparrow		W	M	
Spizella passerina	Chipping Sparrow	B		M	
Spizella pallida	Clay-colored Sparrow				V
Spizella pusilla	Field Sparrow	B		M	
Zonotrichia querula	Harris's Sparrow			M	
Zonotrichia leucophrys	White-crowned Sparrow			M	
Zonotrichia albicollis	White-throated Sparrow	B	W	M	
Passerella iliaca	Fox Sparrow			M	
Melospiza lincolnii	Lincoln's Sparrow			M	
Melospiza georgiana	Swamp Sparrow	B		M	
Melospiza melodia	Song Sparrow	B	W	M	
Calcarius lapponicus	Lapland Longspur		W	M	
Plectrophenax nivalis	Snow Bunting				

1- Nomenclature source: A.O.U. Checklist- 5th Edition, and supplements thru the 32nd supplement.

Table 15. Generalized habitat associations of major breeding species.

Lake Ontario Littoral and Shore

Killdeer	Belted Kingfisher	Rough-winged Swallow
Spotted Sandpiper	Bank Swallow	Barn Swallow

Marshes

Pied-billed Grebe	Blue-winged Teal	Black Tern
Least Bittern	Marsh Hawk	Long-billed Marsh Wren
American Bittern	Virginia Rail	Common Yellow-throat
Canada Goose	Sora	Red-winged Blackbird
Mallard	Common Gallinule	Swamp Sparrow
Black Duck	Common Snipe	

Other Wetlands

Pied-billed Grebe	Blue-winged Teal	American Woodcock
Green Heron	Wood Duck	Common Snipe
American Bittern	Turkey Vulture	Belted Kingfisher
Canada Goose	Marsh Hawk	Alder Flycatcher
Mallard	Virginia Rail	Red-winged Blackbird
Black Duck	Common Gallinule	Swamp Sparrow

Swamp Woodlands and Very Wet Woods

Wood Duck	Barred Owl	Northern Waterthrush
Screech Owl		

Other Woodlands

Sharp-shinned Hawk[1]	Least Flycatcher	Red-eyed Vireo
Cooper's Hawk	Eastern Wood Peewee	Black-and-white Warbler
Red-tailed Hawk	Blue Jay	Black-throated Green Warbler[1]
Broad-winged Hawk	Black-capped Chickadee	Cerulean Warbler
Ruffed Grouse	White-breasted Nuthatch	Blackburnian Warbler[2]
Screech Owl	Red-breasted Nuthatch[1]	Pine Warbler
Great Horned Owl	Brown Creeper	Ovenbird
Ruby-throated Hummingbird	Winter Wren[1]	Hooded Warbler
Pileated Woodpecker	Wood Thrush	Canada Warbler
Red-bellied Woodpecker	Veery	American Redstart
Red-headed Woodpecker	Blue-gray Gnatcatcher	Northern Oriole
Hairy Woodpecker	Golden-crowned Kinglet[2]	Scarlet Tanager
Downy Woodpecker	Yellow-throated Vireo	Rose-breasted Grosbeak
Great Crested Flycatcher		

1- indicates presence only in mixed areas with hemlock and/or other conifers present
2- indicates presence only in mixed areas with pine present

Table 15 Cont'd.

Shrublands

Red-tailed Hawk	Willow Flycatcher	Chestnut-sided Warbler
American Kestrel	Blue Jay	Common Yellowthroat
Ring-necked Pheasant	House Wren	Cardinal
American Woodcock	Gray Catbird	Indigo Bunting
Mourning Dove	Brown Thrasher	Rufous-sided Towhee
Yellow-billed Cuckoo	American Robin	Dark-eyed Junco
Black-billed Cuckoo	Cedar Waxwing	Chipping Sparrow
Ruby-throated Hummingbird	Golden-winged Warbler	White-throated Sparrow
Common Flicker	Blue-winged Warbler	Song Sparrow
Downy Woodpecker	Yellow Warbler	

Active Farmlands and Associated Areas

Red-tailed Hawk	Barn Swallow	Eastern Meadowlark
American Kestrel	Purple Martin[3]	Red-winged Blackbird
Ring-necked Pheasant	Common Crow	Common Grackle
Killdeer	House Wren	Brown-headed Cowbird
Upland Sandpiper	American Robin	American Goldfinch
Mourning Dove	Eastern Bluebird	Savannah Sparrow
Common Flicker	Starling	Grasshopper Sparrow
Eastern Kingbird	Warbling Vireo	Henslow's Sparrow
Eastern Phoebe	Yellow Warbler	Vesper Sparrow
Horned Lark	Common Yellowthroat	Chipping Sparrow
Tree Swallow	House Sparrow	Field Sparrow

Residential and Developed Areas

Rock Dove	Eastern Phoebe	House Sparrow
Common Nighthawk	American Robin	Red-winged Blackbird
Chimney Swift	Starling	Common Grackle

3- breeds only adjacent to water

Table 16. Generalized habitat associations for species of regular occurrence during non-breeding seasons.

Species	Lake Ontario Shore	Wet-lands	Wood-lands	Shrub-lands	Farm-lands	Developed Areas
Common Loon	X					
Red-throated Loon	X					
Red-necked Grebe	X					
Horned Grebe	X					
Pied-billed Grebe	X	X				
Double-crested Comorant	X					
Great Blue Heron	X	X				
Green Heron	X	X				
Cattle Egret	X	X			X	
Great Egret		X				
Black-crowned Night Heron	X	X				
Least Bittern		X				
American Bittern		X				
Whistling Swan	X	X				
Canada Goose	X	X			X	
Brant	X					
Snow Goose	X	X				
Mallard	X	X				
Black Duck	X	X				
Gadwall	X	X				
Pintail	X	X				
Green-winged Teal	X	X				
Blue-winged Teal	X	X				
American Wigeon	X	X				
Northern Shoveler	X	X				
Wood Duck	X	X				
Redhead	X	X				
Ring-necked Duck	X	X				
Canvasback	X	X				
Greater Scaup	X					
Lesser Scaup	X					
Common Goldeneye	X					
Barrow's Goldeneye	X					
Bufflehead	X					
Oldsquaw	X					
King Eider	X					
White-winged Scoter	X					
Surf Scoter	X					
Black Scoter	X					
Ruddy Scoter	X	X				
Hooded Merganser	X	X				
Common Merganser	X	X				
Red-breasted Merganser	X					
Turkey Vulture		X		X	X	

Table 16 Cont'd.

Species	Lake Ontario Shore	Wet-lands	Wood-lands	Shrub-lands	Farm-lands	Developed Areas
Goshawk			X	X	X	
Sharp-shinned Hawk			X	X	X	
Cooper's Hawk			X	X	X	
Red-tailed Hawk			X	X	X	X
Red-shouldered Hawk		X	X			
Broad-winged Hawk		X	X		X	
Rough-legged Hawk	X			X	X	
Golden Eagle	X			X	X	
Bald Eagle	X	X				
Marsh Hawk		X		X	X	
Osprey	X	X				
Peregrine Falcon	X	X				
Merlin	X	X				
American Kestrel	X	X		X	X	X
Ruffed Grouse			X	X		
Ring-necked Pheasant				X	X	
Virginia Rail		X				
Sora		X				
Common Gallinule		X				
American Coot	X	X				
Semipalmated Plover	X					
Piping Plover	X					
Killdeer	X	X			X	X
American Golden Plover	X	X			X	
Black-bellied Plover	X	X			X	
Ruddy Turnstone	X					
American Woodcock		X		X		
Common Snipe		X		X		
Whimberal	X					
Upland Sandpiper	X				X	
Spotted Sandpiper	X	X				
Solitary Sandpiper	X	X				
Greater Yellowlegs	X	X				
Lesser Yellowlegs	X	X				
Redknot	X					
Purple Sandpiper	X					
Pectoral Sandpiper	X	X				
White-rumped Sandpiper	X					
Baird's Sandpiper	X					
Least Sandpiper	X	X				
Dunlin	X					
Semi-palmated Sandpiper	X					
Western Sandpiper	X					
Sanderling	X					
Short-billed Dowitcher	X	X				

Table 16 Cont'd.

Species	Lake Ontario Shore	Wet-lands	Wood-lands	Shrub-lands	Farm-lands	Developed Areas
Stilt Sandpiper	X					
Buff-breasted Sandpiper	X					
Hudsonian Godwit	X					
Red Phalarope	X					
Wilson's Phalarope	X	X				
Northern Phalarope	X	X				
Pomarine Jaeger	X					
Parasitic Jaeger	X					
Glaucous Gull	X					X
Iceland Gull	X					X
Great Black-backed Gull	X					X
Herring Gull	X				X	X
Ring-billed Gull	X				X	X
Franklin's Gull	X					
Bonaparte's Gull	X					
Little Gull	X					
Black-legged Kittiwake	X					
Forster's Tern	X					
Common Tern	X	X				
Caspian Tern	X	X				
Black Tern	X	X				
Rock Dove	X			X	X	X
Mourning Dove				X	X	X
Yellow-billed Cuckoo				X		
Black-billed Cuckoo				X		
Screech Owl		X	X			
Great Horned Owl		X	X	X		
Snowy Owl	X				X	
Barred Owl		X	X			
Long-eared Owl			X		X[1]	
Short-eared Owl		X		X	X	
Saw-Whet Owl			X		X	
Whip-poor-will		X	X	X		
Common Nighthawk		X				X
Chimney Swift	X	X			X	X
Ruby-throated Hummingbird		X	X	X	X	
Belted Kingfisher	X	X				
Common Flicker	X	X	X	X	X	X
Pileated Woodpecker			X			
Red-bellied Woodpecker		X	X			X
Red-headed Woodpecker			X	X	X	
Yellow-bellied Sapsucker		X	X	X		
Hairy Woodpecker		X	X	X		

1- Pine plantations

Table 16 Cont'd.

Species	Lake Ontario Shore	Wet-lands	Wood-lands	Shrub-lands	Farm-lands	Developed Areas
Downy Woodpecker		X	X	X	X	X
Eastern Kingbird	X	X		X	X	
Great Crested Flycatcher			X	X		
Eastern Phoebe			X	X	X	X
Yellow-bellied Flycatcher			X	X		
Traill's (type) Flycatcher[2]		X	X	X		
Least Flycatcher		X	X	X		
Eastern Wood Pewee			X	X		
Olive-sided Flycatcher			X	X		
Horned Lark	X				X	X
Tree Swallow	X	X		X	X	X
Bank Swallow	X	X		X	X	X
Rough-winged Swallow	X	X			X	X
Barn Swallow	X	X		X	X	X
Cliff Swallow	X	X			X	
Purple Martin	X	X			X	X
Blue Jay	X	X	X	X	X	X
Common Crow			X	X	X	X
Black-capped Chickadee			X	X	X	X
Boreal Chickadee			X	X		
Tufted Titmouse			X	X	X	X
White-breasted Nuthatch		X	X	X	X	X
Red-breasted Nuthatch		X	X	X		
Brown Creeper		X	X	X		
House Wren		X	X	X	X	X
Winter Wren		X	X	X		
Carolina Wren			X	X	X	X
Long-billed Marsh Wren		X				
Short-billed Marsh Wren					X	
Mockingbird				X	X	X
Gray Catbird		X		X	X	
Brown Thrasher		X		X	X	
American Robin		X	X	X	X	X
Wood Thrush			X	X		
Hermit Thrush			X	X		
Swainson's Thrush			X	X		
Gray-cheeked Thrush			X	X		
Veery	X		X	X		
Eastern Bluebird				X	X	
Blue-gray Gnatcatcher			X	X		
Golden-crowned Kinglet			X	X		
Ruby-crowned Kinglet			X	X		
Water Pipit	X				X	

2- Includes Willow and Alder Flycatcher.

Table 16 Cont'd.

Species	Lake Ontario Shore	Wet-lands	Wood-lands	Shrub-lands	Farm-lands	Developed Areas
Cedar Waxwing				X	X	X
Northern Shrike	X	X		X	X	X
Loggerhead Shrike		X		X	X	
Starling	X	X	X	X	X	X
Yellow-throated Vireo			X	X		
Solitary Vireo			X	X		
Red-eyed Vireo			X	X		
Philadelphia Vireo			X	X		
Warbling Vireo			X	X		
Black-and-white Warbler			X	X		
Golden-winged Warbler				X		
Blue-winged Warbler				X		
Tennessee Warbler			X	X		
Orange-crowned Warbler			X	X		
Nashville Warbler			X	X		
Northern Parula			X	X		
Yellow Warbler			X	X	X	
Magnolia Warbler			X	X		
Cape May Warbler			X	X		
Black-throated Blue Warbler			X	X		
Yellow-rumped Warbler			X	X		
Black-throated Green Warbler			X	X		
Cerulean Warbler			X	X		
Blackburnian Warbler			X	X		
Chestnut-sided Warbler			X	X		
Bay-breasted Warbler			X	X		
Blackpoll Warbler			X	X		
Pine Warbler			X	X		
Palm Warbler			X	X		
Ovenbird		X	X	X		
Northern Waterthrush		X	X	X		
Connecticut Warbler			X	X		
Mourning Warbler			X	X		
Common Yellowthroat		X	X	X	X	
Hooded Warbler			X	X		
Wilson's Warbler			X	X		
Canada Warbler			X	X		
American Redstart			X	X		
House Sparrow					X	X
Bobolink				X	X	
Eastern Meadowlark					X	
Red-winged Blackbird	X	X		X	X	X
Northern Oriole			X	X	X	
Rusty Blackbird		X	X	X		
Common Grackle		X	X	X	X	X

Table 16 Cont'd.

Species	Lake Ontario Shore	Wet-lands	Wood-lands	Shrub-lands	Farm-lands	Developed Areas
Brown-headed Cowbird		X	X	X	X	X
Scarlet Tanager			X	X		
Cardinal			X	X	X	X
Rose-breasted Grosbeak			X	X		
Indigo Bunting				X	X	
Evening Grosbeak			X	X	X	X
Purple Finch			X	X		X
Pine Grosbeak			X	X		
Common Redpoll				X	X	
Pine Siskin			X	X		
American Goldfinch				X	X	X
Red Crossbill			X	X		
White-winged Crossbill			X	X		
Rufous-sided Towhee				X	X	
Savannah Sparrow					X	
Grasshopper Sparrow					X	
Henslow's Sparrow					X	
Vesper Sparrow					X	
Dark-eyed Junco			X	X	X	
Tree Sparrow				X	X	
Chipping Sparrow				X	X	
Field Sparrow				X	X	
White-crowned Sparrow			X	X		
White-throated Sparrow			X	X		
Fox Sparrow			X	X		
Lincoln's Sparrow			X	X		
Swamp Sparrow		X		X		
Song Sparrow		X	X	X	X	X
Lapland Longspur					X	
Snow Bunting	X				X	

Table 17. Red and blue lists for the area.

Definitions

Red list- consists of species expirated or in immediate danger of expiration from the area with regard to the seasons listed.

Blue list- consists of species that are declining and/or very uncommon in the area with regard to the seasons listed. Such species should be closely watched to determine their status in the future.

Key

B- breeder W- winterer M- migrant

Red List

Black-crowned Night Heron- B, M
Sharp-shinned Hawk- B, W
Cooper's Hawk- B, W
Red-shouldered Hawk- B
Bald Eagle- B, W, M
Marsh Hawk- B
Peregrine Falcon- M
Merlin- M
Piping Plover- B, M
Upland Sandpiper- B
Common Tern- B
Eastern Bluebird- B
Loggerhead Shrike- B, M
Pine Warbler- B

Blue List

Common Loon- M
Red-throated Loon- M
Red-necked Grebe- M
Horned Grebe- W
Pied-billed Grebe- B
Double-crested Comorant- M
Least Bittern- B
American Bittern- B, M
Snow Goose- M
Black Duck- B, W, M
Wood Duck- B, M
Redhead- W, M
Ring-necked Duck- M
Canvasback- W, M
King Eider- W
Ruddy Duck- M
Common Merganser- W, M
Turkey Vulture- B
Goshawk- B
Cooper's Hawk- M
Red-shouldered Hawk- M
Golden Eagle- M
Osprey- M
Virginia Rail- B
Sora- B
Whimberal- M
Purple Sandpiper- M
Baird's Sandpiper- B, M
Black Tern- B, M
Yellow-billed Cuckoo- B
Screech Owl- B
Long-eared Owl- all seasons
Short-eared Owl- all seasons
Whip-poor-will- B, M
Ruby-throated Hummingbird- B
Red-headed Woodpecker- B
Alder Flycatcher- B
Rough-winged Swallow- B

Table 17 Cont'd.

Blue List

Tufted Titmouse- B, W
Red-breasted Nuthatch- B
Winter Wren- B
Long-billed Marsh Wren- B
Short-billed Marsh Wren- B
Mockingbird- all seasons
Golden-crowned Kinglet- B
Blue-gray Gnatcatcher- B
Yellow-throated Vireo- B
Black-and-white Warbler- B
Golden-winged Warbler- B
Cerulean Warbler- B
Black-throated Green Warbler- B
Blackburnian Warbler- B
Hooded Warbler- B
Grasshopper Sparrow- B
Henslow's Sparrow- B
Vesper Sparrow- B
Dark-eyed Junco- B
White-throated Sparrow- B

Table 18. Population estimates of breeding bird pairs in selected wetlands in the Oswego County, New York Lake Ontario Coastal Zone, during the summer of 1976. Figures are in breeding pairs unless "a" so marked.

Species	Health Camp Marsh	Snake Swamp	Rice Creek Marsh	City-line Marsh	Teal Marsh	Catfish Creek Marsh	Butter-fly Swamp	Mexico Point Marsh	Little Salmon Marsh
Pied-billed Grebe	0	1	0	0	1	0	1-2	0	0
Great Blue Heron	2[a]	5[a]	2[a]	1[a]	4[a]	1[a]	6-10[a]	1[a]	2[a]
Green Heron	2	6-9	1-2	1	10-12	1	12-14	1	1
Black-crowned Night Heron	0	1[a]	0	0	0	0	1[a]	0	0
Least Bittern	0	2	0	0	1	0	2-3	0	0
American Bittern	0	1-2	1	1	1	0	2	1	0
Canada Goose	1+6yng.	2	1+7yng.	1	3	0	1+3yng.	0	0
Mallard	3	5-7	1	1	9-12	1	20-25	2	1
Black Duck	0	1	0	0	1	0	2-3	0	0
Blue-winged Teal	1	3-4	0	1	4	0	8-11	0	0
Wood Duck	1	3	0	1	2-3	1	3-4	0	0
Turkey Vulture	0	0	0	0	0	0	1	0	0
Marsh Hawk	0	0	0	0	0	0	0	0	0
Virginia Rail	0	2	0	1	1	0	3-4	0	0
Sora	0	1	0	0	1-2	0	2-3	0	0
Common Gallinule	1	8-10	1	1	2-5	0	5-6	0	0
Black Tern	0	0	0	0	0	0	0	0	0
Barred Owl	1	0	0	0	0	0	1	0	0
Belted Kingfisher	2	3	1	1	3-4	1	3	1	1-2
Long-billed Marsh Wren	1	4-7	0	1	3	0	3-4	0	1
Swamp Sparrow	2	10-15	1	2	8-12	1	8-10	2	1

a - average number of individuals present

Table 18 Cont'd.

Species	Sage Creek Marsh	Sage Creek East	Ramona Beach Marsh	Grndstn. Creek Marsh	Salmon River Marsh	Deer Creek Marsh	South Pond Marsh	North Pond Marsh
Pied-billed Grebe	0	0	2	1	1-2	5	0	0
Great Blue Heron	1[a]	1[a]	3-4[a]	2[a]	6-8[a]	12-20[a]	4[a]	2[a]
Green Heron	1	3	3	1-2	2-5	20+	2-3	1-2
Black-crowned Night Heron	0	0	0	0	1[a]	1[a]	0	1[a]
Least Bittern	0	0	2	0	0	4-5	0	1
American Bittern	1	0	2	0	2	4-5	1	1-2
Canada Goose	0	0	0	0	0	1	0	0
Mallard	1	1	6	3-5	4-5	30+	3-5	2-6
Black Duck	0	0	1	2-3	1	3-5	2-4	0
Blue-winged Teal	2	2	4	3-4	2-3	20-25	2	2-4
Wood Duck	1	1	2	2	1	4	1	1
Turkey Vulture	0	0	0	0	0	1[b]	0	0
Marsh Hawk	0	0	1[a]	0	0	1-2[c]	1	0
Virginia Rail	0	0	1-2	2	1	4-6	1	1-2
Sora	0	0	1	1	0	3-4	0	1
Common Gallinule	0	0	4	2-3	1	10-15	1-2	3-4
Black Tern	0	0	4	0	1	9	0	0
Barred Owl	0	0	0	0	0	1	0	0
Belted Kingfisher	1-2	2	1-2	2-3	3	5-7	1-2	2-3
Long-billed Marsh Wren	0	0	2	7-8	2-3	250[d]	4-5	4-6
Swamp Sparrow	1	2	3-4	4-5	2-3	120[d]	5-7	7-9

a- average number of individuals present
b- probable nest site
c- no nest
d- approximate, very difficult to census

Table 19. Roadside bird census in Oswego, Scriba and New Haven Towns, Oswego County, New York during the breeding season, 1976. Each census is 6 miles long with 0.25 miles between stops. Data represents number of individuals per stop.

Key

OSW- Oswego Township Survey SCE- Scriba East Survey NH- New Haven Survey

Species		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	Total Ind.	Stops Present
Green Heron	OSW									2			1	1	3								2			1	10	6
	SCE				1							1															2	2
	NH							1									2		1								4	3
Mallard	OSW																			1	1						2	2
	NH																						2				2	1
Blue-winged Teal	OSW														1												1	1
Ring-necked Pheasant	NH									1																	1	1
Killdeer	OSW	1			1											2								1			5	4
	SCE														1		1										1	1
	NH	2	1							1			1								3						8	5
Rock Dove	NH	5	4			2																					11	3
Mourning Dove	OSW												1				1	7	1		1						11	5
	SCE					1													1	1							3	3
	NH					1		1					1														3	3
Black-billed Cuckoo	NH				1																						1	1
Chimney Swift	OSW	1											1	1										1			4	4
Ruby-throated Hummingbird	SCE				1				2															1			4	3
Belted Kingfisher	OSW				1				1																		2	2
	NH						1																				1	1
Common Flicker	OSW					1			1				1				1			1	1						6	6
	SCE		1				1							1			1										4	4
	NH	1				1								1	1			2				1					7	6
Pileated Woodpecker	OSW							1																			1	1
Hairy Woodpecker	SCE									1																	1	1
Downy Woodpecker	OSW									1						1											2	2
	SCE																	1									1	1
	NH					1					1		1						1								4	4
Eastern Kingbird	OSW																		1		1						2	2
	SCE		1				1		1					1		2											6	5
	NH	1									1	1								1			1				5	5
Great Crested Flycatcher	SCE		1								1		1	1	1	1	1	2	1					1		1	12	11
	NH								1									1		1							3	3
Eastern Phoebe	SCE											1								1							2	2
	NH					1							1							1							3	3

Table 19 Cont'd.

Species		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	Total Ind.	Stops Present
Willow Flycatcher	OSW											1								1							2	2
	SCE							1			1	1												1		1	5	5
	NH	1			1	1				1		1		1	1			2			1		1				11	10
Least Flycatcher	OSW								1			1															2	2
	SCE	1																					1				2	2
	NH				1		2				1	1															6	5
Eastern Wood Pewee	OSW							1						1						1	1	1					5	5
	SCE	1								1		1					1	2	2			1	1				10	8
	NH						2			1			1							2							6	4
Tree Swallow	OSW	1								1													1				3	3
	NH		1	2										1													4	3
Bank Swallow	NH																4										4	4
Barn Swallow	OSW					1						2		2									2				7	4
	SCE			1			1	2	4	2	4		1	1		2				2	4	2	1	2		2	31	15
	NH		2				2			2	2			1	4	2	2						4	2			23	10
Purple Martin	OSW																						1				1	1
	NH			1																							1	1
Blue Jay	OSW						3																				3	1
	SCE	3	1				1	1	1	2		1	1				1										12	9
	NH				1																						1	1
Common Crow	OSW															1	1	2	1								5	4
	SCE	3	1				1							1		1		1				2	1				11	8
	NH	1	1	1		1	1	1	1	1					2		4								1	1	15	11
Black-capped Chickadee	SCE				1																		1				2	2
White-breasted Nuthatch	OSW										1																1	1
	SCE																		1		1						2	2
House Wren	OSW							1	2			3								3	1	1		1	1		13	8
	SCE	1	1		1	1		1	1	2	1	2	2	1	1	1	2	1	1	1	1	1	1		2		26	21
	NH		1	1	1	1		3		1		1						3									12	8
Long-billed Marsh Wren	OSW											1															1	1
Gray Catbird	OSW							1		1		1	1						1	1	1	1					8	8
	SCE	1	2	2	2	2			1	2			1	1	2	1			1	1	1	1	1		1	1	24	19
	NH	1		1	1	1			1		1	1	1						2		1	1	1				13	12
Brown Thrasher	OSW											1					1										2	2
	SCE								1																		1	1
	NH		1																1								2	2
American Robin	OSW	4	2	5	4	2		3	1	2	2	3	3	4			2	2		2	1	2	2	1	1	1	49	21
	SCE	2	1			1			2	2	2	2	2	2	2	1	7	2	2	1	3			2	2	2	40	19
	NH	3	2		3	2	2	2	2		2	1	1			3	3	5				1	1	2			35	16

Table 19 Cont'd.

Species		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	Total Ind.	Stops Present
Wood Thrush	OSW							1					2	1		2	1	1	1	1		1	2	1			14	11
	SCE	1	2	1	1	1	1	1	1	1		2	2	1	1	1	1	2	3	2	2	2	2				31	29
	NH			1	1	1	2	1	1	1		2	1					1	2	2		1	1		1		19	15
Veery	OSW						1							1				1	1					1			4	4
	SCE	1			1	1			1							1		3	2	1		2	2			1	16	11
	NH							1											1								2	2
Cedar Waxwing	OSW										2				2			1	1								6	4
	SCE			2				2			1	1	3	2	1			2									14	8
	NH			2									2		3				1	2							10	5
Starling	OSW	1	1	2		4	1								2		2	5		3							21	9
	SCE					3		1			2	3			2	4							2				17	8
	NH	2	4	1		2	1	3	2	2	3		2		5			1			2	3	2	1	2	3	41	18
Yellow-throated Vireo	NH			1																							1	1
Red-eyed Vireo	OSW						1	1							1												3	3
	SCE	1	1	1	1	1	1	1		2		1		1	1	1	1	1	2		1						18	16
	NH		1				2		1	1					1			1									7	6
Warbling Vireo	OSW												1	1		1							1				4	4
	SCE	1							1	1						1					1					1	6	6
	NH		1	1		1	1	1	1	1	2	1	1	1				1		1				1		1	16	15
Golden-winged Warbler	SCE					1							1													1	3	3
	NH																			1							1	1
Yellow Warbler	OSW	1				1		2	3	1	1	3	2	2		2	5	3	3	2	3	1	2	1	1	1	40	20
	SCE	2	2	2	1	3	2	2	3	2	2	3	3	2	1	2	2	1		1	3	1	1	2	1	2	46	24
	NH	1	1	2	2	2	2	2	3	2	1	3	3	3	1	1	2	2	2	3	1	2	1	3	1	1	47	25
Ovenbird	SCE				1									1													2	2
Common Yellowthroat	OSW					1						1					2		1					1	1	1	7	6
	SCE		1	1	1	1	1	1	1	2		1		1	1	1			1	2	1	1	1	1	1	1	22	20
	NH		1	1	1		2		1	2	1					1	1		1	1	2	1		1	1	1	19	16
American Redstart	OSW								1		1																2	2
	SCE	2			1												1	2	3						1		10	6
	NH						1												1								2	2
House Sparrow	SCE									9																	9	1
	NH			2				10			3	2															17	4
Bobolink	OSW										1										1			1			3	3
	SCE							1	1		1		1		1	1	2	1			1	1		1	1		13	12
	NH					1			1	1	1	1		1	3	3				1	2	1	1	2	1		19	13
Eastern Meadowlark	OSW																				1						1	1
	SCE							1	3									1			2			3			10	5
	NH	1		2					1	3	2	1		2	2	2	1				1	1	1	1	2	1	24	15

Table 19 Cont'd.

Species		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	Total Ind.	Stops Present
Red-winged Blackbird	OSW	1		2	5				3	7		2			7	2		7	6	2		2	3	2		1	52	15
	SCE	1	1		2	2	4	2	2	1	3	1	2	4	2	4	3				2		1	4	4		45	19
	NH	2	4		1	2	3		3	4	6	2	5	2	3	6	3	5	4	4	2	2	6	5	4	2	80	23
Northern Oriole	OSW							1			1		2	2	2	1	1		1		2						12	8
	SCE	2	1		1	1		1		1	2	1		1			1			1		1	1				15	13
	NH			1				1	1	1	1		1	1			1	1		1							10	10
Common Grackle	OSW	1			1		1			1		1								1		2					8	7
	SCE			1		2		1	1	1	1		1	2			1	1	2								7	4
Brown-headed Cowbird	OSW	1										1				1		1		1		1					6	6
	SCE	1												1		4			1		1						8	5
	NH				1		1	1		1	1	1										1					7	7
Scarlet Tanager	OSW																					1		2			3	2
	SCE									1																	1	1
Cardinal	OSW										1										1		1	1			4	4
Rose-breasted Grosbeak	OSW									1												1					2	2
	SCE	1					1																				2	2
	NH											1							1								2	2
Indigo Bunting	OSW											1										1					2	2
	NH			1		1	1		2	1		1							1	1		1					10	9
Purple Finch	NH													1													1	1
American Goldfinch	OSW		1				1					1															3	3
	SCE			1		8	2	1			3	1			2					2		2					22	9
	NH	10	1	2			1					1		1	2		1		1			3		1	2		26	12
Rufous-sided Towhee	OSW															2	2										4	2
	SCE					1	2	1	2		1	1								1	1	1		1			12	10
	NH	1	1			1				1	1								1								6	6
Savannah Sparrow	NH	1					1				1				2	1	1	1				1	1		1		11	10
Henslow's Sparrow	NH																								1		1	1
Chipping Sparrow	OSW			1		1		1									1		1								5	5
	SCE										1					1								2		1	5	4
	NH		1	2				1	1	1	1			2	2			1	1					1			14	11
Field Sparrow	SCE		1	1		2		1					1		1							2		1			10	8
	NH		1	2																1				1			5	4
Swamp Sparrow	NH				1													1									2	2
Song Sparrow	OSW	1			1	1	1				1	1	3	2	2	2	5	3	1		2	1	1	1	1	1	34	19
	SCE	1	1	1		1	2			2	1	1	2	2	2	2	2		1		1		2	2	1	3	30	19
	NH	2	1	2	1	2	1	1		1	1	1	1	2	1	1		1		2	1	1	2	1	1		28	21

Table 20. Breeding bird strip censuses.

First number- number of males on the site
Second number- individuals per observation hour
Third number- males per 100 acres
+- insufficient data to extrapolate
V- visitor to area

Species	Milea Beach	Alcan East	Walker Railroad	Kings Folly	West Ninemile	Shore Oaks	Butter-fly Central	Ramona Woods	Kelly Road
Great Blue Heron							0,.5,V		0,.5,V
Green Heron	0,.2,V		1,.8,+		0,.2,V		7,3,19		1,.5,4
American Bittern							3,1,8		0,.3,V
Canada Goose	2,.4,V								
Brant							0,.1,V		
Mallard	0,.1,V		0,.3,+		0,.2,V	0,.2,V	5,3.5,14	0,.3,V	0,1,V
Black Duck	0,.1,V						1,.2,+		
Blue-winged Teal							2,.8,5		0,.5,V
Wood Duck			0,.3,+				1,.2,3		
Turkey Vulture							1,.5,+		0,1,V
Sharp-shinned Hawk		1,.5,+							
Red-tailed Hawk			0,.3,V				1,.3,+		1,.3,+
Broad-winged Hawk			0, .3,V				0,5,V		
Marsh Hawk			0,.3,V						0,.3,V
American Kestrel				0,.1,V			1,.3,+		
Ruffed Grouse			1,.5,+	1,.2,+			1,.2,+		1,.3,+
Ring-necked Pheasant							1,.2,+		
Virginia Rail							1,.2,+		
Common Gallinule	0,.5,V						1,.5,+		
Killdeer	0,.1,V		1,.3,+				2,1.2,5		
American Woodcock									
Spotted Sandpiper							0,.2,+		
Ring-billed Gull				0,3,V			0,7,V		
Caspian Tern							0,.1,V		
Rock Dove		0,.5,V	0,.2,V				0,8,V		
Mourning Dove			1,.5,+	1,.3,+			2,1.2,5	1,.5,+	
Yellow-billed Cuckoo				1,.3,+			1,.2,+		
Black-billed Cuckoo				2,.6,7		1,.5,+	1,.3,+	1,.3,+	
Chimney Swift				1,.3,+			2,.2,+		0,.5,V
Ruby-throated Hummingbird	0,.2,V					2,.8,.5	1,.3,+		

Table 20 Cont'd.

Species	Milea Beach	Alcan East	Walker Railroad	Kings Folly	West Ninemile	Shore Oaks	Butter-fly Central	Ramona Woods	Kelly Road
Belted Kingfisher	0,.4,+					0,.2,+	1,.7,+		0,.3,V
Common Flicker	2,1,7	1,.5,+	2,.8,+	2,.5,5	1,1,+	1,1,+	2,.8,5	2,2.5,5	2,1.4,8
Pileated Woodpecker				1,.2,+					
Red-bellied Woodpecker		1,.5,+							
Red-headed Woodpecker									1,.8,+
Hairy Woodpecker	1,.3,+		1,.5,+	1,.2,+		0,.5,V	1,.3,+		1,.3,+
Downy Woodpecker	1,.4,+	2,1,7	1,.5,+	2,.5,5	1,.3,+	1,1,+	1,.5,+	2,2,5	1,.5,+
Eastern Kingbird	1,.2,+			0,.2,V			2,1.2,5	1,.5,+	0,.3,V
Great Crested Flycatcher	2,.8,7	2,1,7	2,.3,4	3,2,7	3,2,7	4,6,10	4,2.2,11	2,3,25	4,2.1,11
Eastern Phoebe	1,.3,+		2,.5,4		1,1,+		1,.3,+	1,1,+	
Acadian Flycatcher	0,.1,V								
Willow Flycatcher			1,.3,+	1,.2,+	1,1.2,+	1,.8,+	2,1,5	1,.5,+	1,.3,+
Alder Flycatcher								1,.5,+	1,.3,+
Least Flycatcher	2,.8,7	1,.5,+	2,.6,4	1,.5,+	2,2,7	1,.3,+	2,.7,5	2,.3,8	1,.8,+
Eastern Wood Pewee	3,1.2,10	2,1,7	1,.6,2	3,1.5,7	3,2.7,10	5,4.6,12	3,1.8,8	3,2.6,8	3,2.4,11
Tree Swallow			0,.5,V						0,.3,V
Bank Swallow							0,1.8,V		
Rough-winged Swallow							0,.1,V		
Barn Swallow			0,.5,V			0,4.5,V	0,3,V	0,3.3,V	0,5,V
Purple Martin			0,.5,V				0,.2,V		
Blue Jay	2,.8,7	1,.5,+	1,.5,+		1,.8,+	1,.5,+	2,.3,+	1,.5,+	1,.8,+
Common Crow	1,.5,+	0,.5,+	1,.5,+	2,.8,5	0,.6,+	0,.8,+	2,13,5	2,2.6,5	0,1,+
Black-capped Chickadee	4,2,14	1,.5,+	1,.6,2	2,1,5	1,.6,+	1,1.2,+	2,.7,5	4,6,11	2,1.4,7
White-breasted Nuthatch	1,.5,+			1,.2,+		1,.7,+	2,.7,5		1,.8,+
Red-breasted Nuthatch	0,.1,V						1,.7,+		
Brown Creeper						1,.5,+	1,.7,+		
House Wren	5,3,17	3,1.5,10	5,3.6,10	7,5,17	5,5.6,17	8,9.3,20	4,3,11	4,6.6,11	4,3.6,14
Winter Wren						1,.5,+			1,.8,+
Long-billed Marsh Wren							2,1.3,5		
Gray Catbird	4,2.6,14	2,1,7	5,3.6,10	3,.7,7	2,2.4,7	1,.7,+	7,6,19	1,.5,+	1,.8,+
Brown Thrasher							3,2.5,8		1,.8,+
American Robin	4,2.6,14	2,1,7	2,1.5,4	2,.6,5	8,9.6,27	5,4.5,12	6,4.4,16	4,9.3,11	3,2.9,11
Wood Thrush	6,4.5,20	4,2,14	3,2.1,6	8,5.5,20	2,2.6,7	5,5.5,12	3,1.3,8	2,3.5,5	3,3.1,11
Swainson's Thrush		0,.3,V	0,.1,V						
Veery	9,6.6,31	6,3,20	3,2.7,6	13,8.7,32	3,4.4,10	11,12.3,27	4,3,11	5,2.7,14	3,2.4,11
Eastern Bluebird							1,.3,+		
Blue-gray Gnatcatcher	1,.4,+								
Cedar Waxwing	2,1,7		1,.4,+	2,.7,5	2,2,7	2,1.6,5	3,2,8		

Table 20 Cont'd.

Species	Milea Beach	Alcan East	Walker Railroad	Kings Folly	West Ninemile	Shore Oaks	Butter-fly Central	Ramona Woods	Kelly Road
Starling	2,.3,+		1,.9,+	2,.2,+	2,1,7	1,1,+	7,4.5,19	0,10,V	
Yellow-thraoted Vireo	1,.4,+				1,.5,+				
Red-eyed Vireo	10,8.3,3	4,2,14	3,2.1,6	10,7,25	6,7.4,20	13,15,32	4,2.6,11	5,4.4,14	4,4.5,14
Warbling Vireo	1,.3,+		1,.3,+	1,.2,+	1,1,+	1,.5,+	1,.1,+	1,.3,+	
Black-and-white Warbler			2,1.4,5						
Golden-winged Warbler			1,.3,+		1,1,+		1,.3,+		
Yellow Warbler	8,6,27	2,1,7	6,6,12	3,1.8,7	4,3.8,14	1,.6,+	8,4,22	2,4.4,5	2,2.4,7
Magnolia Warbler	0,.4,V								
Blk.-throated Green Warbler	1,.4,+		1,.3,+						1,.5,+
Cerulean Warbler					1,.8,+				
Blackburnian Warbler				0,.1,V					
Chestnut-sided Warbler	1,.3,+			1,.2,+			1,.3,+		1,.5,+
Ovenbird	1,.4,+	1,.3,+	1,.5,+	6,4.2,15	1,1.8,+	4,4.3,10	1,1.3,+	1,1,+	1,.5,+
Northern Waterthrush				3,1.8,7			1,.2,+		
Mourning Warbler	1,.3,+			2,1.4,5			1,.2,+		
Common Yellowthroat	4,2.6,14	1,.5,+	3,1.3,6	2,11,5	2,2,7	2,2.7,5	5,4,14	3,4.7,8	2,2.1,7
Hooded Warbler	2,1,7			6,4.5,15	1,.3,+	2,1.3,5	1,.3,+		
Wilson's Warbler	0,.1,V			0,.1,V					
Canada Warbler	1,.5,+								
American Redstart	13,10,44	5,2.5,17	3,2.3,6	17,11,3	7,10.4,20	20,23,50	3,1.3,8	6,2.7,14	5,4.6,18
House Sparrow						0,6,V			
Bobolink			1,.3,+				2,1.2,5		
Eastern Meadowlark			1,.3,+				1,.7,+		
Red-winged Blackbird	1,.5,+		1,1.1,+	1,.2,+		1,.1,+	17,11,46		
Northern Oriole	2,1,7	1,.5,+	3,2.3,6	1,.2,+	1,1,+	1,.3,+	2,1,5	1,1,+	1,.8,+
Common Grackle	2,1.1,7		1,.5,+				5,25,14		
Brown-headed Cowbird	0,1,V	0,3,V	0,.3,V	0,.5,V	0,2,V	0,2,V	0,13,V	0,3,V	0,3,V
Scarlet Tanager	2,.8,7	1,.5,+		1,.4,+	1,1,+	2,1,5	1,.7,+		
Cardinal			1,.5,+	1,.3,+		1,.5,+	1,.5,+		1,.3,+
Rose-breasted Grosbeak			1,.5,+	1,.2,+		2,1.3,5	1,.2,+		
Indigo Bunting	1,.5,+							1,.3,+	
Evening Grosbeak	0,1.4,V	0,.5,+							
Purple Finch	1,.2,V		1,.5,+						
American Goldfinch		1,.3,+	2,1,2	1,.4,+	0,3,V	1,1,+	8,4,22		0,.1,V
Rufous-sided Towhee			1,.5,+		1,.8,+		2,1,5		
Savannah Sparrow							1,.5,+		
Dark-eyed Junco			1,.3,+						

Table 20 Cont'd.

Species	Milea Beach	Alcan East	Walker Railroad	Kings Folly	West Ninemile	Shore Oaks	Butter-fly Central	Ramona Woods	Kelly Road
Chipping Sparrow			1,.3,+				1,.5,+		
Field Sparrow			1,.5,+				1,.5,+		
White-crowned Sparrow					0,1,V				
White-throated Sparrow							1,.8,+		
Swamp Sparrow	1,.5,+	1,.3,+	3,2.1,6				4,2.7,11		
Song Sparrow	1,.5,+	2,1,7	2,1,2	1,.5,+		1,1,+	4,2.6,11	4,7.3,11	1,.5,+

Table 21. Bird censuses in 20 acre transects in Lake Ontario Coastal Zone from Snake Swamp to North Pond, Oswego County, New York, during the summer of 1976. Figures represent individuals per observation hour in each area ("+" indicates less than one individual per hour, "v", visitor to the area).

Species \ Transect Location	Snake Swamp Fringe	Burt Point Area	E. Oswego Shrublands	Smith's Beach Area	Milea Beach Camp Colony	West Teal Marsh	Trailer Park Area	Riker Beach Woods	Bayshore Beach Shrubs	Scriba Woods	Parkhurst Woods	Lycoming Area	Bible Camp Area	W. Power Complex Shrubs	N. 9-Mile Point Area	Railroad East	Noyes Sanctuary	Pleasant Point Area	Catfish Woods	Mexico Point East	Derby Hill Area	Selkirk Park North	Chedmardo Area	S. Deer Creek Fringe	Rainbow Shore Woods	E. Rainbow Shores	S. Blind Creek Cove Wds.	South Pond Wetlands	S. Spit, Sandy Pond	Greene Point Area	Elms Area	N. Blind Creek Cove Wds.	Carl Island
Common Loon																		1v			4v												
Double-crested Cormorant																													12v				
Great Blue Heron											+										2								1	+			
Green Heron	1	1	+	1	2	1		3		+		+	+		1	1	2		1	+	3	+		+		+		3	+	1	2	2	2
American Bittern																								1						+			
Mallard	2		1	1	+	3				2			1		1		+	+			+	2				+			5		+		
Blue-winged Teal															1						+												
Wood Duck																										+	1	2	+				
Turkey Vulture						1			+				+								+				+								
Broad-winged Hawk																					4v												
Red-tailed Hawk	1		+	1		+		1		+	1																						
American Kestrel	+		+	+		1			+																								
Ruffed Grouse														1							1	+			1								
Ring-necked Pheasant															1	+		+				+			1								
Common Gallinule				+												+														+			
Killdeer		2	2	2	+	+		+	2		+	1	+	3	1	1	+	+	1	2	2	+		1	3	+	+	2	2		3	1	
American Woodcock																												2					
Spotted Sandpiper		1			+	+					1		1						+										2				3
Herring Gull																									1								12
Ring-billed Gull		3							+						2	v	+																40
Common Tern																																	20
Caspian Tern																																	+
Rock Dove		1		+		+		2		1		1		+		+		2	+		9												
Mourning Dove	+	2	1							1				1	1	2	+	1	+	1	+	+	1		3					1	2	1	
Yellow-billed Cuckoo																1	+																
Black-billed Cuckoo												1	1	1	1	+	+	+		+		1				1		+		+			
Chimney Swift	+	1	3						+					+				2								5							

Table 21 Cont'd.

Species \ Transect Location	Snake Swamp Fringe	Burt Point Area	E. Oswego Shrublands	Smith's Beach Area	Milea Beach Camp Colony	West Teal Marsh	Trailer Park Area	Riker Beach Woods	Bayshore Beach Shrubs	Scriba Woods	Parkhurst Woods	Lycoming Area	Bible Camp Area	W. Power Complex Shrubs	N. 9-Mile Point Area	Railroad East	Noyes Sanctuary	Pleasant Point Area	Catfish Woods	Mexico Point East	Derby Hill Area	Selkirk Park North	Chedmardo Area	S. Deer Creek Fringe	Rainbow Shore Woods	E. Rainbow Shores	S. Blind Creek Cove Wds.	S. Pond Wetlands	S.Spit, Sandy Pond	Greene Point Area	Elms Area	N. Blind Creek Cove Wds.	Carl Island
Ruby-throated Hummingbird		1		+								1	1		+		1	+						1	1						+	
Belted Kingfisher		1		1						+				+			+				1	1		1	1				1			
Common Flicker	1	+	+	+	1	1	+	1	1	+	+	+	1	1	2	1	3	1	+	1	2	1	3	1	2	3		3	1		1	
Pileated Woodpecker	1										+					1	+															
Red-bellied Woodpecker	1																															
Red-headed Woodpecker																	1	+													1	
Hairy Woodpecker	+									1	+													1	1			+	+			
Downy Woodpecker		+	+			+	1			1	+		1	1	1	+	+	1	+	1	2	2	2	1	+	1		1	1		+	2	
Eastern Kingbird	1	1	1	+	+	2	1	+	1	2	+	1		2	2	1	+	2			1			2	2	2	1		4			2	
Great Crested Flycatcher	2		+		+	1	1	1	1	2	+	+	1	1	2	1	2	2	+		1	3										
Eastern Phoebe		+			2		2	+		1	+	1	+	+	1	2	2	2				1					1	+	1	1			
Willow Flycatcher	+	1	4	1		2	+	+	3	2	2	1		2	1		1		1					1	1					1			
Least Flycatcher	1	1	+			2	2	1	+	3	1		1		1	2	1	+	1	+							2	2		4	2	4	
Eastern Wood Pewee	1	1			+	4	2	1		3	2	1	+	2	2	+	4	2	2	+	2	5	1	3	3		2	4		3	2	2	
Tree Swallow			+	1	+		2	1	+				2		1		2		2		2				20	6			16	15		
Bank Swallow																	2			3				2	10	10		2	3			
Rough-winged Swallow															2						2				4							
Barn Swallow		+	5	2		2	2			+	10	1		2	15	2	15	2	2			4	2		14				15			
Cliff Swallow																									v							
Purple Martin	+		3		4		+																		7		2				10	
Blue Jay	2		1	1	1		+		1	2		+	1	+	1	3	1	1	+	1	2	3	1		1	1	1		2			
Common Crow		1	2	1	1	2	2	1	+	1		1	+	1	1	+		+		+		4		1	4	2	2		4	2		
Black-capped Chickadee			1	1	+	1		1		1	1	1	+	1	1	2	2	+	1	3	+	2	2	2	1			1		1			
Tufted Titmouse																		1															
White-breasted Nuthatch	+					+				+	1		+	+	1	1	1	+	1	+		2		1	1	1				1			
Red-breasted Nuthatch																1	2																
Brown Creeper											1																						

Table 21 Cont'd.

Species \ Transect Location	Snake Swamp Fringe	Burt Point Area	E. Oswego Shrublands	Smith's Beach Area	Milea Beach Camp Colony	West Teal Marsh	Trailer Park Area	Riker Beach Woods	Bayshore Beach Shrubs	Scriba Woods	Parkhurst Woods	Lycoming Area	Bible Camp Area	W. Power Complex Shrubs	N. 9-Mile Point Area	Railroad East	Noyes Sanctuary	Pleasant Point Area	Catfish Woods	Mexico Point East	Derby Hill Area	Selkirk Park North	Chedmardo Area	S. Deer Creek Fringe	Rainbow Shore Woods	E. Rainbow Shores	S. Blind Creek Cove Wds.	South Pond Wetlands	S. Spit, Sandy Pond	Greene Point Area	Elms Area	N. Blind Creek Cove Wds. Carl Island
House Wren	2	2	4	3	5	2	4	5	2	5	6	3	2	2	3	7	5	5	3	9	5	6	9	3	4	4	1	4	2	4	5	1
Long-billed Marsh Wren				1																									1	1		
Short-billed Marsh Wren																								1								
Mockingbird													1				1															
Gray Catbird	2	1	2	3	4	7	3	3	2	5	2	2	2	3	4	7	3	3	2	1	1	2	4	5	2	1	4	1		2	3	3
Brown Thrasher			+	1					+				1		+	+		+	1						1							
American Robin	2	3	9	8	9	6	6	5	2	+	7	3	3	7	10	4	6	5	9	10	11	10	8	6	10	8	12	4	1	4	25	3
Wood Thrush	3	2	2	2	4	2	2	3	1	2	5	1	1	2	3	5	2	3	4	5	2	11	3	2	3	1	1		1	4		2
Veery	2			+	1	2	+	6		4	5	2	+	1	2	5	2	4	2	1	1	7	2	4	5	6	1	4				2
Blue-gray Gnatcatcher																															1	
Cedar Waxwing			2	2			+		1	2			+	1	3		4		+	1	1	2		3	2	4		3				
Starling			5	5	15	2	2	5	4	1	4	+	3	2	4	5	1	15	3	8	4	2	10	5		20						
Yellow-throated Vireo	+						1				2		1		1				1													
Red-eyed Vireo	3	2	+	3	4	8	4	4	1	3	4	7	3	2	3	4	8		3	11	5	9	4	3	9	5	1	3		4		3
Warbling Vireo	1	4		1	1		1		1	+	1	1	1	2	2		1	+	1	+	1	1			3	2		1		1	2	2
Black-and-white Warbler																1									1							
Golden-winged Warbler			+							2		1		1	1	3	1	2			+											
Yellow Warbler	4	3	5	6	7	13	3	6	6	6	1	2	5	9	4	17	2	3	4	4	8	1	3	4	11	7	4	6	3	11	7	3
Magnolia Warbler								v																								
Black-throated Green Warbler												1					1								1							
Blackburnian Warbler															v		1															
Chestnut-sided Warbler																3		1							2							
Blackpoll Warbler						v																										
Ovenbird	+			+			1	2		2	3	2	1		2		2	+		1	1	3									
Northern Waterthrush																2	2							1	2							
Mourning Warbler							+	1							+			+														
Common Yellowthroat	3	1	3	4	6	4	2	2	2	5	3	2	1	5	2	5	4	1	3		1	2	4	9	12	5	2	3	6	6	3	2

Table 21 Cont'd.

Species \ Transect Location	Snake Swamp Fringe	Burt Point Area	E. Oswego Shrublands	Smith's Beach Area	Milea Beach Camp Colony	West Teal Marsh	Trailer Park Area	Riker Beach Woods	Bayshore Beach Shrubs	Scriba Woods	Parkhurst Woods	Lycoming Area	Bible Camp Area	W. Power Complex Shrubs	N. 9-Mile Point Area	Railroad East	Noyes Sanctuary	Pleasant Point Area	Catfish Woods	Mexico Point East	Derby Hill Area	Selkirk Park North	Chedmardo Area	S. Deer Creek Fringe	Rainbow Shore Woods	E. Rainbow Shores	S. Blind Creek Cove Wds.	South Pond Wetlands	S. Spit, Sandy Pond	Greene Point Area	Elms Area	N. Blind Creek Cove Wds.	Carl Island
Hooded Warbler							1	1		2	2	1						2															
Wilson's Warbler					v																												
Canada Warbler																		1															
American Rest	2			+	3	3	5	9	1	9	2	1	2	1	1	5	8	10	3	+	1	9	1	5	4	4		2		5	1	6	
House Sparrow				1			6		+						2	7				2						4							
Bobolink			1						1		1				3	1	1	2	2		1					1							
Eastern Meadowlark			1	1			1		2		+		+	1	2	4	1	3	2					2		2							
Red-winged Blackbird	1	10	2	5	20	2	8	1	8	4	9			10	8	8	3	5	9	3	2	6	35	60	24	3	2	4	8	5	5		
Northern Oriole	1	1		1		2	2	2		2	1		2	2	1	3	1	4	2	1													
Common Grackle	2	+	2	7	2	2	2	1	2	1	2			2	+	4	2		2	+	2	5	2	3	15	8	1		1	12	10		
Brown-headed Cowbird	+	+	3	5	1	2	2	1	1	+	1	1	3	1	+	4		3	3		2	1	2	4			1			3	2	1	
Scarlet Tanager	1			+		1		1		2	1	2		1	1		1	1	2	+	1				1								
Cardinal	+		1	1	+	2	1	+		1			1		1	2	1		1			1	1			1							
Rose-breasted Grosbeak	1			+		1		1		2	+	1		1	1		2	2	1		1	1	1		2				1				
Indigo Bunting	1	+	2	1	1	1	1		2	3	1		1	2	1			1	1				1		2	1							
Purple Finch															1						1								1	3	1		
American Goldfinch	2	5	1	1	2	1	2	2	2	3	5	2	2	2	5	2	2	1	1	2	6	2			2	2	1	2			1		
Rufous-sided Towhee	+		1	2		1	1	1	1	1	1	2	1	1	2	1	1	+	1			3		2	2	2		1				3	
Savannah Sparrow			+			1				1					2									2									
Henslow's Sparrow																			2														
Chipping Sparrow	+	1	1	1	3		2			1		+	1	1	2	4	+	1	3	2	3	1		2	2	3	5	1			1	7	
Field Sparrow		+	2	1	1	+	2	1	1	1	1	+	+	1	2	3	2	3	1		3				1	2	1					1	
White-crowned Sparrow						v																											
White-throated Sparrow																1																	
Swamp Sparrow	1															1							1	1		2							
Song Sparrow	2	1	3	3	6	2	3	3	3	3	4	2	2	5	4	2	2	1	4	2	1	3	4	10	12	20	14			3	4	1	

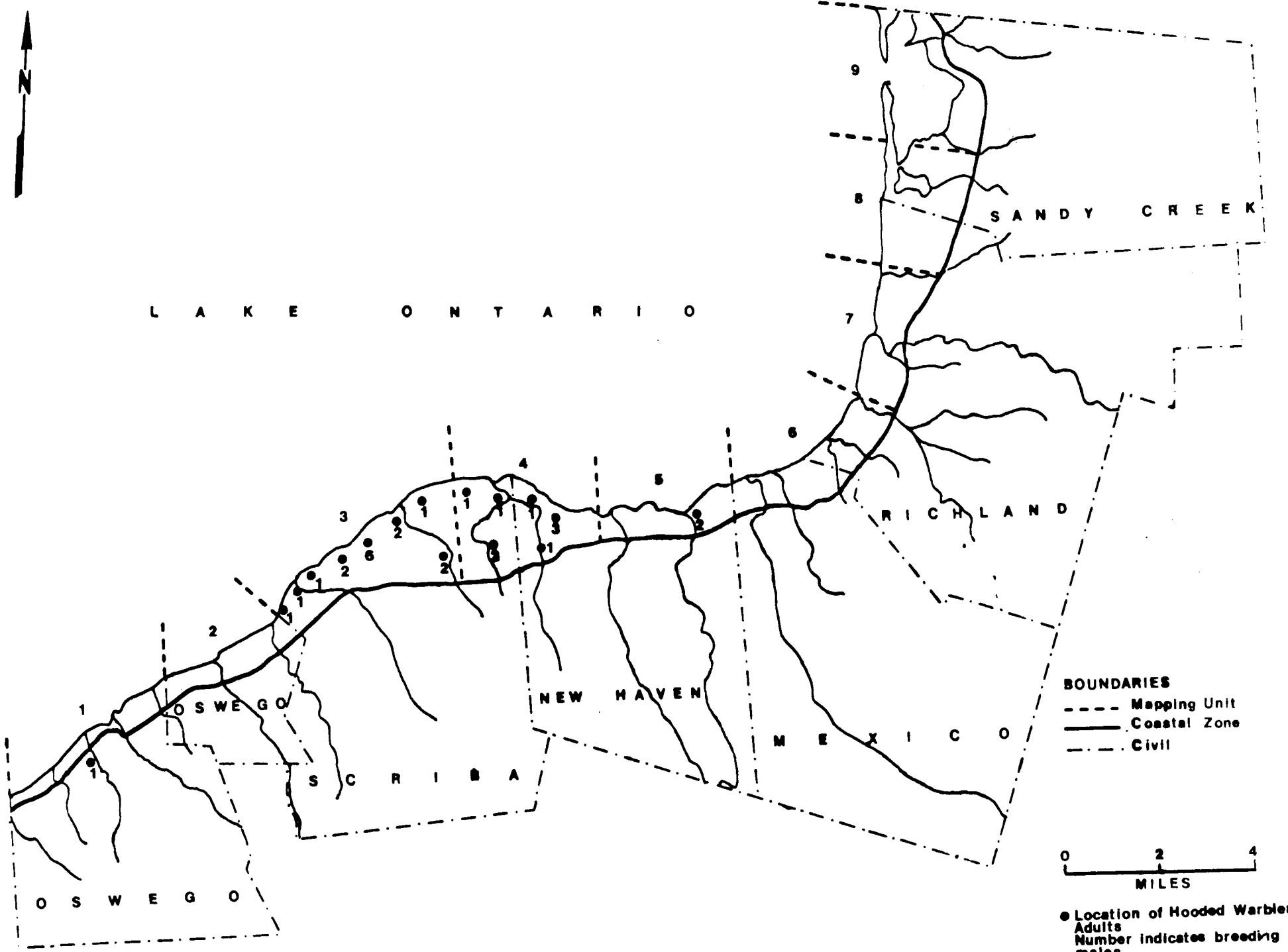
Table 22. Bird of prey nesting locations.[1]

Species	Location and Comment
Turkey Vulture	1- Butterfly Swamp- Pair present 2- Deer Creek Marsh- Pair present
Sharp-shinned Hawk	1- Milea Beach Woods, north of Alcan- Pair present, defense behavior against intruders 2- Noyes Woods- Pair present 3- Kelley Road Woods- Pair present
Cooper's Hawk	1- Milea Beach Woods- Adult female present 2- Butterfly Swamp- Two adults at nest containing two well grown young. Located in a large hemlock on on old dunes in northern section, at least one fledged.
Red-tailed Hawk	1- Snake Swamp Woods- Pair present, nest found 2- Milea Beach Woods, near Central Teal Marsh- Pair present 3- Walker Woods- Pair present 4- Scriba Woods- Pair at nest containing two well grown young 5- Shore Oaks Woods- Pair present 6- Butterfly Swamp Wood Fringe- Pair present 7- Sage Creek Woods- Pair present 8- Deer Creek Area- Two pairs present
Broad-winged Hawk	1- South Blind Creek Cove Woods- Pair present
Marsh Hawk	1- Deer Creek Marsh- Adult female present 2- South Pond Wetlands- Pair present at nest with three large young. All young fledged.
American Kestrel	1- Camp Hollis Area- Pair present at nest 2- West Campus Brushlands- Pair present 3- East Oswego Shrublands- Pair present 4- Central Teal Marsh Fringe- Pair present 5- Bayshore Shrublands- Pair present 6- Power Line Corridor- Pair present 7- South Miner Farm Area- Pair present at nest 8- North New Haven Farmlands at Demster Beach- Pair present 9- Central Butterfly Swamp- Pair present 10- Rose's Farmlands- Pair present 11- East Sandy Pond Farmlands- Pair present

1- Nesting definite only where nest found, other breeding is assumed by adult presence.

Table 22 Cont'd.

Species	Location and Comment
Screech Owl	1- Snake Swamp- Two birds present 2- Teal Marsh- One bird present 3- Nine Mile Point Woods- Two birds present
Great Horned Owl	1- Snake Swamp- Two birds present 2- Milea Beach Woods- Two adults, one fledged young 3- Parkhurst Woods- Two birds present 4- Shore Oaks Woods-Two birds present 5- Sage Creek Woods- Two birds present
Barred Owl	See Wetlands, Table 18.



OSWEGO COUNTY COASTAL ZONE

Figure 1

Conclusions

Data included in the foregoing sections of the bird report provide information on the status and relative abundance of breeding birds within the Oswego County Coastal Zone. In addition, a large amount of specific area use data for breeding species has been collected. Such data are useful in indicating the habitat areas of particular importance to bird populations within the Coastal Zone. It is believed that these data will be useful in aiding decisions relating to habitat preservation as regarding breeding birds. It must be emphasized, however, that a single summer's observations from one observer are only suggestive as to the relative importance of various habitat units. Further studies will hopefully utilize the data assembled here for comparison in an ongoing assessment of the state of bird populations in the area. These data provide only one part of the complete picture of the importance of the Coastal Zone as avian habitat. When combined with existing data on the migration and winter season, a more complete picture appears.

It is hoped that data in this section will serve two purposes. First, it may provide an indication of those habitats most important to breeding birds within the Coastal Zone and aid in the intelligent stewardship of these habitats. In addition, future observers will be able to utilize these data for making comparisons to future breeding bird studies.

Reptiles and Amphibians

The primary goal of the reptile and amphibian portion of this survey was the compilation by field work, of a species list for the Coastal Zone.

What follows does not claim to be a definitive work but is merely a starting point to which additional data can and should be added. Emphasis was placed on the Coastal Zone's wetlands to ascertain, in particular, the status of the Bog Turtle, Clemmys muhlenborgi.

The nomenclature used in this section of the report is drawn from A Field Guide to Reptiles and Amphibians of the United States and Canada East of the 100 meridian by Roger Conant (1958).

Methods

The species list of reptiles and amphibians was compiled by a combination of field and literature work. The field work consisted of trapping and censusing in which two types of traps were employed, one for terrestrial work and the other for aquatic work. The aquatic turtle trap was of standard construction, consisting of black nylon netting with a mesh size of approximately 7.5 cm. and steel hoops for support. The trap was baited with road killed animals and dead fish. Apparently, the more decayed the bait, the better the catch. The trap was placed in as many different environments as possible. During the later part of August, one of the fish teams fyke nets was pressed into service to extend the number of trap days. This smaller meshed net (2.5 cm) worked quite well and permitted the capture of small turtles. The terrestrial trap was a variation of the standard pit trap. A vertical drift fence composed of 120 cm X 56 cm sheets of fiber-board, painted olive green, was positioned in a zig-zag fashion (See Fig. 2). A 40 cm X 15 cm tin can was placed at the base of each bend in the fence in a pit. A layer of sheet plastic assured complete contact with the ground. The erect fence acts as a barrier to movement of organisms, and directs them along its face to the pit traps, which the creatures fall into and are captured for collection. Most of the remainder of the species encountered were collected by hand. The data provided by road-kills was also useful, as were private specimen collections. Further data were also obtained from specimens caught by the fish and mammal teams.

Results

The following forty species of reptiles and amphibians are thought to inhabit portions of Oswego County but only twenty-one of them were (actually observed) in the Coastal Zone during this survey and are indicated by an asterisk (*).

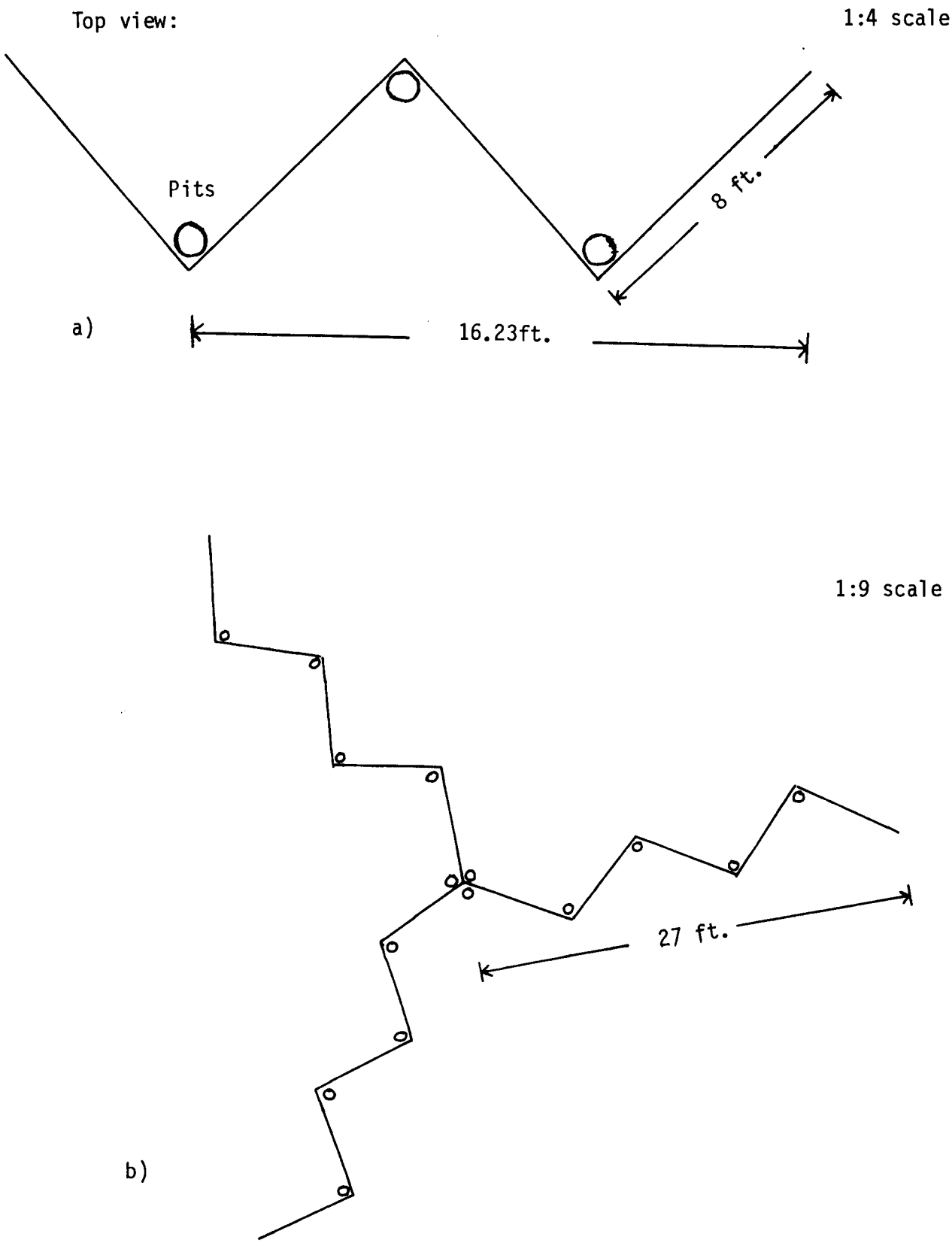


Figure 2. a) Top view of one section of drift fence. b) Overall configuration of drift fence.

Class Reptilia

Order Celonia

Family Chelydridae

*Chelydra serpentina: The common snapping turtle is a frequent resident in most of the open water wetlands in the area. This turtle prefers slow, shallow water with soft bottoms and vegetation and is generally nocturnal.

Family Testudinidae

Sub Family Emydidae

*Chrysemys picta marginata: The midland painted turtle is abundant along the Oswego shoreline and is usually found in or near wetlands and brooks.

Clemmys guttatta: The spotted turtle may be present in the wetlands of the region. Some sources state that it is common in the area but none were found during this study. It is generally found in bogs, ditches, marshy meadows, swamps, small ponds, or other shallow bodies of water (Conant,1958; Ernst,et al.,1973).

Clemmys insculpta: Wright (1919) lists the wood turtle as less common to the west in Monroe and Wayne Counties than either Chrysemys picta marginata or Chelydra serpentina. Conant (1958) indicates that it may well be in the area. It is often found far from any apparent sources of water (Pope,1939).

Clemmys muhlenbergii: The bog turtle was found to be rare in Wayne County sixty years ago (Wright,1919). Its present status along the lake is unknown. If it is present at all, it is probably extremely rare (Forbes,1970) and located in small restricted habitats. The best possibility for its presence appear to be in the Deer Creek and South Pond Marshes.

Graptemys geographica: The map turlte is thought to be rare in this area, due to habitat disruption (Dames and Moore,1973). A siting has been reported at Sterling to the west. This secretive turtle prefers large bodies of open water. Specimens were also taken further west by Wright (1919).

*Pseudemys scripta elegans: The red-eared turtle was found in Snake Swamp in the Town of Oswego and the one specimen was probably a released pet. The species is not indigenous to the area.

Family Trionychidae

Trionyx spiniferus spiniferus: The eastern spiny softshell is more common to the west than along the Oswego shoreline. It is thought to be rare or non-existent in the study zone. This turtle prefers open, quiet waters and sheltered bays along Lake Ontario. Some have been taken from the lake shore around Rochester to the west (Wright,1919).

Family Colubridae

Couber constrictor constrictor: The northern black racer, according to Wright (1919), was becoming rare in areas to the west of Oswego County. Its status along the coastal strip of Oswego County is unverified. Its favored habitats include brush, stonewalls, and out-croppings of rock.

*Diadophis punctatus edwardsi: The northern ringneck snake was discovered in the Town of New Haven. A secretive snake, it can be found under flat rocks on sunny hillsides and is nocturnal.

Elaphe obsoleta obsoleta: The black rat snakes status in the survey area is unknown. It is rare to the west in Wayne and Monroe Counties (Wright,1919). The pilot snake, as it is also known, occurs in habitats that range from rocky timbered hillsides to open farmlands.

*Lampropeltis doliata triangulum: The eastern milk snake is present throughout the study zone. In inhabits many different environments, from farmlands to swamps, and is a valuable predator of small rodents.

*Natrix sipedon sipedon: The northern water snake is a very common resident of the wetlands of the Oswego County shoreline. It may be found along the edges of wet areas or draped in low branches or shrubs.

*Opheodrys vernalis vernalis: The eastern smooth green snake was found among the grasses of open fields in the Town of Scriba.

*Storeria dekayi dekayi: The northern brown snake was found in grassy open successional areas near small ponds in the Town of Scriba, Richland and Oswego.

*Storeria occipitomaculata occipitomaculata: The northern red-bellied snake was found to be present in the Town of New Haven, at the mouth of Butterfly Swamp on a pile of rocks.

*Thamnophis sauritus sauritus: The eastern ribbon snake was found in the wetlands of Oswego, Scriba, and Mexico Townships. This snake is an uncommon species that suns itself along the edges of swamps and ponds and will drop into the water and swim away at the slightest disturbance.

*Thamnophis sirtalis sirtalis: The garter snake is perhaps the most common snake in the area, found in virtually every habitat including roadside open meadows, swamp woods and urban areas.

Family Scincidae

Eumeces anthrancinus: Clausen, in 1938, reported the coal skink to be locally abundant in areas of Central and Western New York. It may be present at the extreme end of its range in Oswego County but its status in the coastal tracts is unknown. It prefers humid, wooded hillsides but may also be found near springs and rock out-croppings.

Class Amphibia

Order Salientia

Family Bufonidae

*Bufo americanus: The American toad was an abundant species along the lake, particularly during the latter part of summer. It is found virtually everywhere.

Family Hylidae

*Hyla crucifer crucifer: The spring peeper is a resident of wooded and successional areas near small ponds throughout the study area.

*Hyla versicolor versicolor: The grey treefrog is locally common. It has a widespread distribution whithin the Coastal Zone. It is usually found in small trees and shrubs near shallow bodies of water.

Pseudacris triseriata triseriata: The western chorus frog is probably common in at least a few localities along the shore. It was seen to the west of Sterling. This frog breeds in shallow bodies of water but the adults are far ranging.

Family Ranidae

*Rana catesbeiana: The bull frog is a very common resident among the wetlands of the area. This large frog is often found on the shore of ponds and creeks sitting on floating vegetation and debris.

*Rana clamitans melanota: The green frog is very common to abundant among the Oswego wetlands, brooks, ditches, and semi-permanent bodies of water along the Oswego Coastal Zone.

Rana palustris: The pickerel frog has been reported near Kasoag, Oswego County but was not discovered along the Oswego shoreline; however, it may have been overlooked around the North Pond.

*Rana pipiens pipiens: The northern leopard frog is less common than the green or bull frog in the regions wetlands, but large numbers of juveniles appear in August. The species inhabits open fields and meadows during the summer months.

*Rana sylvatica: The wood frog is common in moist woods. It has been captured in both deciduous, and to a lesser extent, coniferous woods; often far from water. It breeds in small shallow ponds.

Order Caudata

Family Ambystomidae

Ambystoma jeffersonianum: The Jefferson salamander is suspected to be present in deciduous woods bordering wetlands along the Coastal Zone. This secretive creature is often mistaken for Ambystoma laterale.

Ambystoma laterale: The blue salamander can be found in much the same environments as A. jeffersonianum and is easily confused with it (Minton,1954). They are now thought to be distinguishable only by genetic examination.

*Ambystoma maculatum: The spotted salamander was found in damp wooded hillside situations. It can be looked for in subterranian burrows and under rocks and debris.

Family Plethodonidae

Desmognathus fuscus fuscus: The northern dusky salamander has been taken from inland locations such as Kasoag, Oswego County, but is probably rare or nonexistent along the shoreline. Reports by Wright,et al. (1919), indicate that they became rarer as the lakeshore was approached. They occur among stones and debris near running water.

Desmognathus ochrophaeus: The Alleghany salamander is unverified along the coastal tracts of Oswego County, although specimen have been taken to the west near Rochester. A specimen from Kasoag, Oswego County (Christman,1968) indicates that they are present in the Tug Hill area. This amphibian prefers areas where the soil is saturated with water and there is sufficient cover in the form of rocks and debris.

*Eurtcea bislineata bislineata: Specimens of the northern two-lined salamander were captured and/or observed in the Town of Scriba in the Nine Mile Point Area. It was generally found along the banks of small, shaded brooks underneath flat stones.

Gyrinophilus porphyriticus porphyriticus: The purple salamander was taken near Kasoag, Oswego County (Christman,1968). Bishop (1947) and Wright, et al. (1919) indicate that this salamander is rare along the Lake Ontario shoreline west of Oswego County. Another specimen was captured in Onondaga County to the south. Its status along the Oswego County shoreline is unverified. These agile amphibians are found under logs and stones, or in cavities at margins of streams in hill or mountain country.

Hemidactylium scutatum: The eastern four-toed salamander has been taken in Wayne County, west of Oswego County (Wright,1919). The present status of this species is unknown. Some sources (Central New York Regional Planning Board, 1975) consider it to be uncommon. The species is usually associated with sphagnum moss.

*Plethodon cinereus cinereus: The red-backed salamander is a common resident throughout the study area. It is found mostly among debris in deciduous woods and successional areas.

Plethodon glutinosus glutinosus: Specimens of the slimy salamander have been taken to the south in Onondaga County and to the west in Monroe and Wayne Counties (Wright, et al.,1919). Its presence along the Oswego County shoreline remains unverified. This salamander inhabits moist, wooded areas with much debris and humus.

Family Proteidae

Necturus maculosus: A resident of the Oswego River Drainage Basin, the Mudpuppies presence is strongly suspected among the permanent, open water wetlands of the Oswego County shoreline.

Family Salamandridae

*Diemictylus viridescens viridescens: The red-spotted newt is a common resident along the Oswego County shoreline. It is found in moist forests like those around Shore Oaks Road in the Town of New Haven and the adults are present in permanent or semi-permanent shallow bodies of water, such as those north of Derby Hill in the Town of Mexico.

Discussion

A comparison of the various methods of data collection for the terrestrial portion of the study showed that collection by hand was by far the most productive. The drift fence was found to be effective for frogs and jumping mice.

It can be stated that no unique or particularly rare species were encountered. It should be kept in mind, however, that large tracts of forest and some smaller areas of wetland fringe were not intensively studied.

The bog turtle,which is considered to be an endangered species in parts of New York State, was not discovered in the study area, but the area to the north of Deer Creek offers unexplored possibilities.

The reptile and amphibian populations of the Oswego County shore area are characterized by a limited number of species. Climatic extremes, coupled with severe winters may well have some bearing on the low species diversity. This group of vertebrate occupies a key trophic level in the ecosystem of the survey area. They are instrumental in the control of insect pests (Klungh1972) and many snakes prey on small rodents detrimental to some crops in the area.

Human influence on the reptile and amphibian populations is profound. Habitat modification affects breeding and feeding activities. For example, the common snapping turtle has been found to utilize camp roads that have been cut through wetland habitats, as egg laying sites. The population of map turtles along the Lake Ontario shoreline appears to be on the decline due to habitat destruction (Wright,1919). Another facet of human impact on reptile and amphibian populations is the use of pesticides. These chemicals affect both the food source of these creatures and the creatures themselves.

This area once boasted a more diverse fauna of reptiles and amphibians. As the years have passed by, several species have become increasingly rare. If the unplanned destruction of unique habitats continues at its present rate along the lake shore, these species will be permanently lost to the Coastal Zone.

Table 23. Reptiles and amphibians found in various habitat types in the Coastal Zone of Lake Ontario, Oswego County, New York, in 1976.

Species	Small Brooks	Wet Meadows	Bog	Rock-outcroppings	Agricultural	Residential	Fringes of Large Wetlands	Open Water	Marsh	Swamp	Dry Woodlands	Wet Woodlands	Established Sand Dunes	Successional Areas	Dry Meadows
Snapping Turtle	X		X				X	X	X	X		X			
Midland Painted Turtle	X	X	X				X	X	X	X		X			
Northern Ringneck Snake				X										X	X
Eastern Milk Snake				X	X	X	X			X	X	X	X	X	X
Northern Water Snake	X		X				X		X	X					
Eastern Smooth Green Snake				X	X									X	X
Northern Brown Snake				X	X				X		X			X	X
Northern Red-bellied Snake				X			X				X			X	X
Eastern Ribbon Snake		X	X				X			X					
Eastern Garter Snake		X		X	X	X	X				X		X	X	X
American Toad		X		X	X	X	X				X	X	X	X	X
Spring Peeper							X			X		X		X	
Grey Treefrog										X				X	
Bull Frog			X				X	X	X	X					
Green Frog	X	X					X			X		X		X	
Northern Leopard Frog		X			X		X				X			X	X
Wood Frog	X										X	X			
Spotted Salamander	X											X			
Red-spotted Newt									X	X		X		X	
Northern Two-lined Salamander	X														
Red-backed Salamander	X						X				X	X		X	

Table 24. Reptiles and amphibians found in locations in the Oswego County, New York Coastal Zone of Lake Ontario, in 1976.

	Health Camp Swamp	Hollis Creek	Snake Swamp	Rice Creek	City Line Marsh	Teal Marsh	East Scriba Woods	Parkhurst Woods	West Nine Mile Point	East Nine Mile Point	Shore Oaks	Catfish Creek	Butterfly Creek Mouth	Butterfly Creek	Butterfly Swamp	Mexico Point Swamp	Little Salmon Marsh	Sage Creek	Sage Creek East Marsh	Ramona Beach Marsh	Grindstone Creek Marsh	Deer Creek, East Edge	Deer Creek, South	Deer Creek, North	South Pond Marsh	East of South Pond	South Pond Spit	South Shore, North Pond	Seber Shores	Carl Island	North Spit
Common Snapping Turtle	X		X	X	X	X						X		X	X	X			X	X	X	X	X	X	X						X
Midland Painted Turtle			X	X		X	X	X								X					X	X	X	X							
Northern Ringneck Snake															X																
Northern Water Snake	X		X	X	X	X							X		X				X	X	X	X		X							
Eastern Milk Snake			X		X		X	X	X	X	X											X				X					
Eastern Smooth Green Snake							X		X																						
Northern Brown Snake				X			X															X									
Northern Red-bellied Snake														X						X											
Eastern Ribbon Snake			X				X									X															
Eastern Garter Snake		X	X				X	X	X	X		X			X				X	X		X	X	X		X					
Spotted Salamander											X															X					
Red-spotted Newt			X				X	X			X																				
Red-backed Salamander	X		X				X	X	X		X	X			X							X	X	X		X					
Northern Two-lined Salamander							X		X																						
American Toad	X																					X		X	X	X			X	X	
Spring Peeper				X					X																						
Gray Treefrog																						X									
Bull Frog	X	X	X	X	X	X	X					X	X	X	X	X	X	X	X	X	X	X	X	X	X	X			X	X	
Green Frog	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X
Northern Leopard Frog			X			X							X							X	X	X		X					X		
Wood Frog	X		X			X			X	X		X						X				X									

Fish

Introduction

The ichthyological section of the Coastal Zone Survey concentrated on determining the species complement of fish inhabiting the tributaries of Lake Ontario in Oswego County New York.

Active sampling techniques were employed in the gathering of data for the study. In addition a literature search was also conducted. Information about other species, particularly lake species was provided by Lawler, Matusky and Skelly Engineers, Oswego, New York (LMS) and the New York State Department of Environmental Conservation (D.E.C.).

Methods

The following sampling techniques were employed in obtaining data for this portion of the study: seining, fyke netting, gill netting and electrofishing.

The capture tool most frequently used was seine net. Seining was most efficiently used in water one meter or less and was a method applied in all the creeks and streams as well as around the edges of marshes and swamps.

Fyke nets were employed primarily in a water depth of approximately one to two meters. Two nets were used; a white fyke net with a mesh stretch measure of two inches and a black net with a mesh stretch size of one and a half inches. The hooped portion of the net was normally set in an area of moderate to heavy aquatic vegetation, with the wings spread open toward the deeper water. Areas where conditions were favorable for setting these nets were the mouths of rivers, larger creeks and in swamp areas.

The environments favorable for setting fyke nets in this region (study area) are also favorable areas for snapping turtles, thus they were often a problem. Many times the turtles would enter the trap, eating the catch and sometimes placing holes in the nets allowing fish to escape. Therefore, of the two fyke nets employed, the black net made of heavy treated material was effective in preventing turtles from ripping or tearing the mesh.

Another capture technique used was gill netting. The gill nets are nylon. The first net used consisted of three panels with a stretch measure of one, three, and five inches respectively, the entire net being six feet by seventy-five feet. After this net became unusable it was replaced by another net with four panels. The stretch measures of these panels were one, two, three, and four inches, the entire net being six feet by one hundred feet. The panels of the second gill net were salvaged and patched together from discarded gill nets, thus the discrepancy of stretch sizes between the two nets used.

These nets were set in over two meters of water and generally placed on the bottom parallel to the current. Bottom settings were most often used because of boat traffic over the site. Longitudinal placement of the nets was necessary due to the narrowness of many of the channels where the nets were being set. Only in North Pond in the Township of Sandy Creek was the water deep enough to allow a mid-depth setting. In North Pond, as well as South Pond, the nets were placed away from the shore (near pond centers). Both gill and fyke nets were set over a period of approximately twenty-four hours before being checked and reset, if necessary.

The final method employed was electroshocking. The shocker was a gas powered generator with a wattage of 550 (A.C.). It was used in streams in a depth of less than one and one third meters. Water of a greater depth would have been over the protective chest waders worn. Electrofishing was attempted in a heavily vegetated area in Snake Swamp east of Oswego. Heavy aquatic vegetation weakened the current, kept some fish from surfacing when shocked and hindered visibility.

Results and Discussion

Species Composition and Habitats: As a result of the research conducted in the tributaries of Lake Ontario in Oswego County during the summer of 1976, a total of 48 species of fish were found and are listed in Table 25.

Table 26 cites the locations where these species were found, along with additional information supplied by outside sources (Dan Griffiths, LMS; Randy Vaas, Les Wedge, D.E.C.).

Of the species found, fourteen are considered to be sport fish (Scott and Crossman,1973). The most important family of game fish in Oswego County, the Salmonids,are being stocked on a continuous basis by the D.E.C.

Table 27 provides specific stocking information for the salmonids in the study area in 1973 and through the spring of 1976. In addition to stocking Salmonids, the D. E. C. is also stocking walleye fry in Oswego County (R. Vaas, D.E.C.). Under the Great Lakes Fisheries Commission, Environment Canada of Ontario Province in conjunction with the D.E.C., are continuing to treat streams in the area where sea lamprey are spawning in an effort to kill the lamprey ammocetes. Some streams that have been treated in the study area are listed in Table 26 indicated by the letter E.

The sport fishes most consistently found were brown bullhead, northern pike, yellow perch, pumpkinseed sunfish, largemouth bass, and rock bass, with brown bullhead and pumpkinseed appearing to be more abundant than others.

Among non-game species the most frequently occurring fishes were white suckers, golden shiners, and johnny darters. Uncommon species, species that were found in only one or two locations, are listed in Table 29. The species known to be present in the area from data collected, that appear on Millers (1972) list of the threatened species in New York State are: the lake sturgeon and the Atlantic salmon, which are considered to be rare or in such small numbers that they require careful watching; and the lake white fish which appears to be threatened. According to Dan Griffiths (LMS), the cisco is believed to be slightly increasing in Lake Ontario.

Table 30 is a listing of the numbers of species that were caught during this study in each of the areas (ponds, tributaries, streams) and from outside sources cited in Table 26.

Also included are the total number of those fish considered to be of value as sport fish (Scott and Crossman, 1973). The areas are ranked according to the total number of species as well as the total number of those species that are sport fish. The Salmon River ranks first with a high twenty-seven species, fourteen of which are sport fish. Rice Creek Tributary follows with a total of twenty-five species, fourteen being sport fish. The lowest ranking areas are Derby Hill Swamp with a total of three species, with one being considered a sport fish. Wine Creek also had a total of three species, none of which were sport fish.

In the riffle areas of small creeks the following species are likely to be found: blacknose dace, fallfish, creek chubs, bluntnose minnow, cutlips minnow, and fantail darters. Rarely occurring in these small creeks are rock bass, and log perch. The bottom varies from rock to gravel with algal growth normally apparent on the substrate in the summer. The depth is usually less than a quarter meter in these stream areas.

In the slower moving waters or pools of small creeks where the bottom consists primarily of mud, clay or sand and the water is relatively deeper than the riffle areas, the typical fish are: creek chubs, central mudminnows, golden shiners, johnny darters, common shiners, white suckers, brook stickle backs, three spine sticklebacks, pugnose shiners, bluntnose minnows, redside dace, and the fry of redfin pickeral and northern pike.

In the large creeks and rivers of the survey area fallfish, rock bass, cutlips minnows, stonerollers, hogsuckers, smallmouth bass, log perch and bluntnose minnows, were found in the regions above and below and in the riffles. The typical bottom is composed of rock and gravel with varying amounts of algal growth, and the water depth is about one half meter or less. The slower deeper waters and the pools of these large streams and rivers are inhabited by white perch johnny darters, yellow perch, largemouth bass, pumpkinseeds, rock bass, smallmouth bass, redfin pickeral, northern pike, brown bullhead, common shiners, bluntnose minnows, fantail darters and mottled sculpin. The bottom consists chiefly of mud or sand, and patches of weeds are not uncommon.

In shallow warmer waters of river mouths, swamps and ponds the following species occur: pumpkinseeds, tadpole madtoms, blue gill, black crappie, brown bullhead, black bullhead, lake chubsuckers, yellow perch, central mudminnows, white suckers, bowfin, and the fry of the redfin pickeral. The bottom is typically mud or silt with a water depth of up to a meter and an half, with no noticeable current.

In the deep areas (two meters or more) with little or no current the inhabiting species are: northern pike, smallmouth bass, largemouth bass, common shiners, golden shiners, gizzard shad, alewife, yellow perch, black crappie, a few pumpkinseed, white perch, coho salmon, brown trout, bowfin, brown bullhead, lake chubsuckers, brassy minnows and fresh water drum. Banded killifish, johnny darters, and sand shiners are commonly found in the sandy to gravelly edges of these aquatic regions.

Table 31 indicates the relative abundance of fish for each area listed according to the average number of individuals in a catch per day per net. Gill nets set in the Sandy Pond area and Little Salmon River resulted in the largest catches. South Pond, North Pond, and Little Salmon River had catches of 274, 139, and 164 individuals per day per area, respectively. The other areas had fewer fish and of them, Snake Swamp ranked highest with 13 individuals per day per net. The fyke nets and gill nets in Sandy Pond and Little Salmon River did not show similar results in terms of abundance of fish in relation to other areas. Fyke nets that were set in Salmon River had the highest catch, 31 individuals per day per net.

Of the two fyke nets used the black hoop net was more effective. The white hoop net was frequently found empty and these results lowered the number of individuals per day per net.

Spawning: According to Scott and Crossman (1973), the approximate total lengths for young of the year by their first fall for smallmouth bass, largemouth bass, northern pike and rock bass are 5.1 to 10.2 cm, 5.1 to 12.7 cm, 15.2 cm and 2.0 to 5.1 cm; respectively. Brown bullhead fry are about 5.1 cm several weeks after hatching. At the age of one, longnose gar are usually around 44.2 cm (males) and 51.3 cm (female), and redfin pickerel are 11.1 cm (fork length). Table 32 gives the range of total lengths for those individuals which would be considered one year or less along with the numbers caught while seining in these tributaries. Gravid females were noted in only two areas, Catfish Marsh (smallmouth bass) and Grindstone Marsh (coho salmon). The data suggest that of the areas where young were found that Grindstone is the better spawning area, followed by Deer Creek Marsh. The largemouth bass fry were found in more of the tributaries (eight) listed than any other species. Carp were sighted spawning in the shallow vegetated waters of Rice Creek Marsh. As previously mentioned, some tributaries were treated this summer for lamprey larvae (see Table 26).

The various aquatic environments of the study area provide spawning grounds for many lake species of fish as well as for indigenous species. Shallow, vegetated waters of marshes, ponds, and estuaries provide a suitable spawning habitat for many species. Most centrachids construct their nests among the emergent vegetation in the sandy, gravelly or mud bottoms in these areas, either in late spring or early summer. Other species which may be found building nests in these areas in the spring are bowfin, black bullhead, brown bullhead and brook sticklebacks. Spring spawners such as carp, goldfish, brassy minnows, esocidae, clupeidae, banded killifish and yellow perch are known to strew their adhesive eggs over vegetation. (Scott and Crossman,1973)

The gravel areas of estuaries or ponds provide a favorable environment for smallmouth bass to build its nests in late spring or early summer. The white sucker has been known to utilize these areas for scattering its eggs which stick to the substrate. (Scott and Crossman,1973)

Percichthyids may move into estuaries to spawn in late spring. Their eggs become attached to rocks, boulders, vegetation and other obstructions. In the summer the freshwater drum may be found depositing its bouy and eggs in deep water over sand or mud bottoms (Scott and Crossman,1973).

The streams and rivers in the area provide spawning ground for many fish species. The suckers move into gravelly areas or riffles in the spring and scatter their adhesive eggs over the substrate. During this season lake sturgeon spawn in the rapinds or in the swift waters of rivers strewing their eggs over rocks or logs. The blacknose dace, longnose dace and pearl dace scatter their eggs over gravel in the flowing waters of streams or rivers, while other cyprinids (cutlips minow, fallfish, creek chub, redside dace, common shiner) lay their eggs in gravelly nests. The tadpole madtom and channel catfish build their nest in dark cavities in the moving waters, while the stonecat lays her eggs beneath stones in shallow areas.

In spring, rainbow smelt and trout perch migrate into streams and rivers to spawn in the rocky and gravelly areas. The sea lamprey also migrates, and builds its nest in areas of slight current with a sand, rubble and gravel bottom. At various times, from fall to spring, different species of salmonids aggregate at the mouths of rivers and streams. They then head up the stream to shallow, gravelly areas where they lay their eggs in a nest and then cover the eggs with the substrate (Scott and Crossman,1973).

Table 25. Checklist of fish species found in the Lake Ontario Coastal Zone of Oswego County, New York, Summer 1976.

Key

P - Pools
R - Riffels and rapids
S - Shallow warmer waters of river mouths, swamps and ponds
D - Deeper water of river mouths, swamps and ponds
G - Sandy to gravelly edges of river mouths, swamps and ponds.
* - Sport fish

Petromyzontidae
- Petromyzon marinus - Sea lamprey

Lepisosteidae
- Lepisosteus osseus - Longnose gar S (fry)

Amidae
- Amia calva - Bowfin S, D

Clupeidae
- Alosa pseudoharengus - Alewife D
- Dorosoma cepedianum - Gizard shad D

Salmonidae
- *Salmo trutta - Brown trout D
- *Oncorhynchus kisutch - Coho salmon D

Catostomidae
- Actostomus commersoni - White sucker P,S
- Erimyzon sucetta - Lake chubsucker S, D
- Hypentelium nigricans - Hogsucker R

Cyprinidae
- Cyprinus carpio - Carp S
- Carassius auratus - Goldfish
- Semotilus corporalis - Fallfish R
- Semotilus atromaculatus - Creek chub R, P
- Rhinichthys atratulus - Blacknose dace R
- Rhinichthys cataractae - Longnose dace
- Exoglossum maxillingua - Cutlips minnow R
- Clinostomus elongatus - Redside dace P
- Notemigonus crysoleucas - Golden shiner P, D
- Notropis cornutus - Common shiner P,D
- Notropis stramineus - Sand shiner G
- Notropis anogenus - Pugnose shiner P

Table 25. Cont'd.

Cyprinidae (cont'd.)
- Hybognathus hankinsoni - Brassy minnow R,D
- Pimephales notatus - Bluntnose minnow P, R
- Campostoma anomalum - Stoneroller R

Ictaluridae
- *Ictalurus melas - Black bullhead S
- *Ictalurus nebulosus - Brown bullhead P, S, D
- Noturus gyrinus - Tadpole madtom S

Umbridae
- Umbra limi - Central mudminnow P, S

Esocidae
- *Esox americanus - Redfin pickerel P, S
- *Esox lucius - Northern pike P, S, D

Anguillidae
- Anguilla rostrata - American eel

Cyprinodontidae
- Fundulus diaphanus - Banded killifish G

Pericichthyidae
- *Morone americana - White perch D

Percidae
- *Perca flavescens - Yellow perch S, D
- Percina caprodes - Logperch R
- Etheostoma nigrum - Johnny darter P, G
- Etheostoma flabellare - Fantail darter R, P

Centrarchidae
- *Micropterus dolomieui - Smallmouth bass R, P, S, D
- *Micropterus salmoides - Largemouth bass P, S, D
- *Lepomis gibbosus - Pumpkinseed sunfish P, S, D
- *Lepomis macrochirus - Bluegill sunfish S
- *Ambloplites rupestris - Rockbass R,P
- *Pomoxis nigromaculatus - Black crappie S, D

Sciaenidae
- Aplodinotus grunniens - Freshwater drum

Cottidae
- Cottus bairdi - Mottled sculpin P

Gasterosteidae
- Eucalia inconstans - Brood stickleback P
- Gasterosteus aculeatus - Threespine stickleback P

Table 26. Location of fish species in the Lake Ontario Coastal Zone, Oswego County, New York.

Key

X - found as a result of summer study
A - personal communication: Dan Griffiths, L.M.S.
B - personal communication: Randy Vaas, Les Wedge, D.E.C.
O - information obtained from Rice Creek Biological Field Station, State University College at Oswego
R - reliable sources
E - Environment Canada, treatment for lamprey larva

Family / Species	Bible Creek	Blind Creek	Butterfly Creek	Butterfly Swamp	Catfish Creek	Catfish Marsh	Deer Creek	Deer Creek Marsh	Ramona Beach Marsh	Grindstone Creek	Grindstone Marsh	Little Salmon River	Teal Marsh	9-Mile Point Creek	North Pond	Rice Creek	Rice Creek Marsh	Sage Creek	Sage Creek Marsh	Salmon River	Sandy Creek	Snake Creek, East	Snake Swamp, East	Snake Creek, West	Snake Swamp, West	South Pond	Wine Creek	Lake Ontario
Petromyzontidae																												
Sea lamprey		E				E	E											E			E							A
Acipenseridae																												
Lake sturgeon																												A
Lepisosteidae																												
Longnose gar											X									X								A
Amidae																												
Bowfin				X		X					X	X			X		X						X		X	X		A
Clupeidae																												
Alewife						X						X			X											X		A
Gizzard shad															X				X							X		A
Salmonidae																												
Brown trout																	R			X								A
Rainbow trout												R					R											A
Brook trout																O												A
Lake trout																												A
Cisco																												A
Coho salmon											X	B					R			B								A
Chinook salmon																												A
Kokanee																				B								B
Splake												B								B								A
Lake whitefish																												A
Osmeridae																												
Rainbow smelt																												A
Catostomidae																												
White sucker		X	X	X		X		X		X	X	X		X			X	X		X	X			X				A
Longnose sucker																												B
Lake chubsucker							X								X					X			X					

Table 26. Cont'd.

Family / Species	Bible Creek	Blind Creek	Butterfly Creek	Butterfly Swamp	Catfish Creek	Catfish Marsh	Deer Creek	Deer Creek Marsh	Ramona Beach Marsh	Grindstone Creek	Grindstone Marsh	Little Salmon River	Teal Marsh	9-Mile Point Creek	North Pond	Rice Creek	Rice Creek Marsh	Sage Creek	Sage Creek Marsh	Salmon River	Sandy Creek	Snake Creek, East	Snake Swamp, East	Snake Creek, West	Snake Swamp, West	South Pond	Wine Creek	Lake Ontario
Catostomidae																												
Creek chubsucker																				B								
Shorthead redhorse																												B
Hogsucker					X					X		X								X	X							
Cyprinidae																												
Carp																0	X						X					A
Goldfish																												A
Fallfish			X	X	X					X		X								X	X	X						
Creek chub	X	X	X										X	X										X			X	A
Pearl dace																												A
Bridle shiner																0												
Lake chub																												A
Blacknose dace			X																									
Longnose dace																				X								A
Cutlips minnow			X		X							X						X			X	X						
Redside dace		X																										
Golden shiner	X												X	X		0	X		X	X		X	X	X	X		X	A
Emerald shiner																0												A
Common shiner			X		X													X	X	X	X							
Spottail shiner																												B
Spotfin shiner																												B
Sand shiner															X													
Pugnose shiner				X												0						X						A
Brassy minnow												X																
Bluntnose minnow			X	X								X						X		X		X						A
Fathead minnow																												A
Stoneroller																					X							
Ictaluridae																												
Channel catfish																												A
Black bullhead												X													X			A
Brown bullhead					X	X	X	X		X	X	X			X		X	X		X	X		X		X			A
Stonecat																												A
Tadpole madtom											X						X			A								
Umbridae																												
Central mudminnow	X		X						X				X									X	X	X	X			A
Esocidae																												
Redfin pickerel		X	X	X				X	X				X			0	X			X	X		X					
Chain pickerel												B																
Northern pike				X		X	X	X		X	X	X				0	R		X	X	X		X					A
Anguillidae																												
American eel										X																		A

Table 26. Cont'd.

Family / Species	Bible Creek	Blind Creek	Butterfly Creek	Butterfly Swamp	Catfish Creek	Catfish Marsh	Deer Creek	Deer Creek Marsh	Ramona Beach Marsh	Grindstone Creek	Grindstone Marsh	Little Salmon River	Teal Marsh	9-Mile Point Creek	North Pond	Rice Creek	Rice Creek Marsh	Sage Creek	Sage Creek Marsh	Salmon River	Sandy Creek	Snake Creek, East	Snake Swamp, East	Snake Creek, West	Snake Swamp, West	South Pond	Wine Creek	Lake Ontario
Cyprinodontidae																												
Banded killifish								X			X				X													
Gadidae																												
Burbot																												A
Percopsidae																												
Troutperch																												A
Pericichthyidae																												
White bass						X																				X		A
White perch												X			X		X											
Percidae																												
Yellow perch		X				X		X			X	X	X		X		X	X	X	X	X					X		A
Walleye																												A
Logperch					X						X			X				X		X								A
Johnny darter			X	X			X	X			X	X			X		X	X		X	X							A
Fantail darter			X															X										
Centrarchidae																												
White crappie																												A
Smallmouth bass					X	X					X		X			X			X		X							A
Largemouth bass							X	X			X	X	X			X		X			X		X	X	X			A
Pumpkinseed sunfish						X	X	X			X	X	X			X		X	X		X	X	X		X	X		A
Bluegill sunfish												X		X		X		X			X					X		A
Rockbass			X		X	X					X		X			X		X	X		X	X						A
Black crappie						X		X								X		X			X					X		A
Sciaenidae																												
Freshwater drum												X																A
Cottidae																												
Mottled sculpin																	X	X										A
Gasterosteidae																												
Brook stickleback	X								X				X											X				A
3-spine stickleback													X			0											X	A
Total species	5		12		10		6		3		12		7		16		20		5		16		11		7		3	
		6		7		11		10		13		22		4		9		14		27		7		6		8		59
Total sport fish	0		2		3		4		1		7		2		9		13		2		8		6		4		0	
		2		2		8		7		7		13		0		3		5		14		1		1		5		23

Table 27 Recent stocking of Salmonids in Lake Ontario study area showing deployment of finclipped groups

Species	Year Class	Locations	Dates Stocked	Size Class	Total Number	Finclip
Coho	1974	Pulaski Pond	12/74	Fall fing.	17,200	LV
Coho	1974	Pulaski Pond	3/75	Yearling	50,000	AD
Coho	1975	Salmon River Estuary	9/75	Sum. fing.	53,800	LV
Coho	1975	Beaverdam Brook Salmon River Proper Orwell System	9/75	Sum. fing.	123,000	none
Coho	1975	Pulaski Pond	10/30/75	Fall fing.	37,500	LV-AD
Coho	1975	Sandy Creek (0.130) Estuary	10/28/75	Fall fing.	25,000	LV
Coho	1975	Pulaski Pond	1/76	Early Yearling	27,300	AD
Coho	1975	Sandy Creek (0.130) Estuary	1/76	Early Yearling	26,000	AD
Coho	1975	Pulaski Pond Crib #1 Beaverdam Brook Pond of Mexico Salmon River Estuary	1/76	Early Yearling	113,000	none
Coho	1975	Pulaski Pond	5/76	Late Yearling	11,300	LP
Chinook	1973	Pulaski Pond	10/73	Fall fing.	9,300	AD
Chinook	1973	Salmon River System	5/73	Spring fing.	690,000	none
Chinook	1974	Salmon River System	5/74	Spirng fing.	965,000	none
Chinook	1975	Salmon River Upstream	6/75	Spring fing.	35,000	AD
Chinook	1975	Salmon River Estuary	6/75	Spring fing.	35,000	LV
Chinook	1975	Salmon River Pond of Mexico Grindstone Creek	5-6/75	Spring fing.	850,000	none
Chinook	1976	Salmon River System	6/76	Spring fing.	593,000	none
Rainbow	1973	Salmon River Orwell branch	4/74	Yearling	40,000	RV
Rainbow	1973	Webster and Selkirk beaches	5/74	Sm. Yearling	70,000	AD
Rainbow	1973	Webster and Selkirk beaches	5/74	Sm. Yearling	57,400	none
Rainbow	1975	Salmon River Area	4/76	Yearling	24,000	LV
Brown Trout	1974	Selkirk Beach	5/75	Yearling	17,500	LP
Lake Trout	1972	Eastern Basin	4/73	Yearling	66,000	LV
Lake Trout	1973	Eastern Basin	5/74	Yearling	127,300	LP
Lake Trout	1974	Eastern Basin	10/74	Fall fing.	265,300	AD
Lake Trout	1974	Central Basin	10/74	Fall fing.	251,600	AD
Lake Trout	1975	Eastern Basin	10/75	Fall fing.	272,400	LV-AD
Lake Trout	1975	Central Basin	10/75	Fall fing.	242,000	LV-AD
Lake Trout	1975	Eastern Basin	5/76	Yearling	57,000	Dorsal
Lake Trout	1975	Central Basin	5/76	Yearling	5,700	Dorsal AD

Key to finclips:
LV - left pelvic
RV - right pelvic
LP - left pectoral
RP - right pectoral
AD - adipose

Information supplied by Les Wedge and Randy Vaas, New York State Department of Environmental Conservation, Cortland, New York

Table 28. General habitats contained in the tributaries of the Lake Ontario Coastal Zone in Oswego County, New York.

Key

R - Riffels of creeks and rivers
P - Pools
M - Marsh and/or swamp areas characterized by shallow, warm, moderately to heavily vegetated water.
D - Deep areas of approximately two meters or more in depth.

Area	Habitat
1 Bible Creek	R, P
2 Blind Creek	R, P
3 Butterfly Tributary	R, P, M, D
4 Catfish Creek Tributary	R, P, M, D
5 Deer Creek Tributary	P, M, D
6 Ramona Beach Marsh	M
7 Grindstone Creek Tributary	R, P, M, D
8 Little Salmon River	R, P, M
9 Teal Marsh	M
10 Nine Mile Point Creek	R, P
11 North and South Ponds	M, D
12 Rice Creek Tributary	R, P, M, D
13 Sage Creek Tributary	R, P, M, D
14 Salmon River	R, P, M, D
15 Sandy Creek	R, P, D
16 Snake Creek East	R, P, M, D
17 Snake Creek West	R, P, M, D
18 Wine Creek	R, P, M

Table 29. Species found in only one or two locations in the Lake Ontario Coastal Zone, and the total number of each species.

Species	Location	Total Number
Stoneroller	Sandy Creek	1
Longnose dace	Salmon River	1
American eel	Grindstone Creek	1
Mottled sculpin	Rice Creek Marsh, Sage Creek	2
Sand shiner	North Pond	2
Tadpole madtom	Grindstone Marsh, Rice Creek Marsh	2
Freshwater drum	Little Salmon River	2
Longnose gar	Grindstone Marsh, Salmon River	6
Blacknose dace	Butterfly Swamp	6
Brassy minnow	Little Salmon River	12
Threespine stickleback	Wine Creek, Teal Marsh	35

Table 30. Ranking of streams, tributaries and ponds by total number of species and sport fish found from this study and sources cited in Table 26.

	Area	Species Total	Total Sport Fish
1	Salmon River	27	14
2	Rice Creek Tributary	25	14
3	Little Salmon River	22	13
4	Grindstone Creek Tributary	19	9
5	North and South Ponds	18	9
6	Catfish Creek Tributary	16	8
7	Sandy Creek	16	8
8	Sage Creek Tributary	17	6
9	Snake Creek East Tributary	15	6
10	Butterfly Swamp Tributary	15	3
11	Deer Creek Tributary	11	7
12	Snake Creek West Tributary	11	3
13	Teal Marsh	7	2
14	Blind Creek	6	2
15	Bible Creek	5	0
16	Nine Mile Point Creek	4	0
17	Ramona Beach Marsh	3	1
18	Wine Creek	3	0

Table 31 Relative abundance of fish in the tributaries of Lake Ontario in Oswego County, New York, during the summer of 1976.

Location	Number of individuals/day/net	
	Gill Net	Fyke Net
Butterfly Swamp	--	.5
Catfish Creek Marsh	4.5	13.0
Deer Creek Marsh	3.0	1.5
Grindstone Marsh	2.0	10.3
Little Salmon River	164.0	4.5
North Pond	139.0	10.5
Rice Creek Marsh	2.0	1.3
Sage Creek Marsh	7.0	--
Salmon River	8.0	31.0
Snake Swamp East	13.0	0.0
Snake Swamp West	--	2.3
South Pond	274.0	8.2

Table 32 Spawning data obtained from tributaries in the Oswego County Coastal Zone during the summer of 1976. "X" indicates that spawning was noted.

Location	Ranges in total lengths in cm - (number of individuals caught)								
	Brown Bullhead	Carp	Coho Salmon	Large-mouth Bass	Longnose Gar	Northern Pike	Redfin Pickerel	Rock Bass	Small-mouth Bass
Butterfly Creek							5.3-8.2 (8)		
Butterfly Swamp						5.8-11.5 (5)	5.7-6.4 (6)		31.0-41.5 (2)*
Catfish Marsh									
Deer Creek Marsh	3.1-4.0 (6)			2.9-4.5 (21)		7.2-10.7 (4)	8.5 (1)		
Grindstone Creek				3.5 (1)		10.1-13.2 (6)			
Grindstone Marsh	2.8-3.5 (30)		47.5 (1)*	3.3-3.7 (7)	8.5-12.2 (2)	10.3-12.5 (4)			8.5-19.5 (4)
Little Salmon River								3.5-4.0 (4)	3.7-4.9 (4)
North Pond				5.1 (1)					
Rice Creek Marsh		X		3.5-5.8 (33)					3.0-5.7 (5)
Salmon River				3.6-9.1 (3)					2.7-9.6 (6)
Sandy Creek				5.0-6.8 (4)					
Snake Swamp East						6.4-10.3 (4)	7.2-8.3 (6)		
Snake Swamp West				3.8-7.8 (6)					

* gravid females caught, size and number caught are given

CONCLUSIONS, EVALUATIONS AND RECOMMENDATIONS

Introduction

This section evaluates the present state of the habitats in the study area and recommends possible actions by government and private citizens to protect these habitats.

The evaluations are based upon the summer study, using the data to provide assessments of the present state of the habitats in specific areas of the Coastal Zone. The recommendations are based upon these evaluations and on previous field work done by the student project director during the last ten years. They are designed to provide a brief comment on those practices that tend to degrade the habitat. These evaluations represent our best assessments of the situation using information presently at hand. As with other areas of the study, additional investigations should be undertaken to provide a better understanding of the relationship of human activities to habitat.

It should be noted that shoreline areas along the Great Lakes are a very valuable and limited resource important to all citizens of the United States. Many people who do not own land there use the area for recreation, of which environmental quality is a vital part. In view of this, any owner of such land possesses the rights of ownership, but also a responsibility to their fellow citizens. During our study, we noted that a majority of the landowners are responsible persons. Much of the land is being used for today and being preserved for tomorrow's enjoyment by future generations. Unfortunately, a small minority of landowners are causing degradation of important habitat areas due to ignorance or lack of concern.

We hope that this report will be of some value in aiding all persons in the preservation of these habitats. If a minority of landowners continue destructive practices, the loss to all citizens will be very high. We also hope that the report will aid the government agencies charged with protection of the habitat resource. If so, then our purposes in undertaking the study will be accomplished.

Practices Affecting Habitat In The Oswego County Coastal Zone

This section includes a list of land use practices noted during the study and our general assessment of the effects of each on the habitats of the area. We believe that these effects are real and observable, however, many times our evidence is not complete. Further detailed studies are required to ascertain the exact effects upon the quality of habitats and the potential sensitivity of the ecosystem to disruption.

Logging: Much of the second growth woods in the study area is being affected by timber cutting, which may adversely affect the habitat. In areas such as Mexico Bay West Woods, logging roads are being cut through the forest with little concern for limiting habitat damage. Roadside trees and brush are often randomly damaged and destroyed. Many roads have been cut through wet areas where the land is easily damaged. Slash and casually downed trees litter the area and at the least are aesthetically unpleasing. Some erosion results from cover removal particularly during heavy rainfall. In areas where logging disruption is extensive some reduction in densities of woodland species of birds and mammals seems to occur. However, the Hooded Warbler, one of the rare breeding bird species in the area, favors areas where selective cutting has allowed a greater growth of undercover. While logging is likely to continue, great care should be given to avoid damage to the habitat caused by incidental activities. A more thorough investigation of the relationships of logging to the ecology of areas, particularly very wet areas, should be undertaken.

Industrial development: Most of the problems related to industrial development are of a direct nature, such as habitat destruction and disturbance of animals due to construction and plant operation. In addition, increased traffic in an area will often cause increased mortality of vertebrates due to collisions with vehicles. Although the Oswego County Coastal Zone is not at present a heavily industrialized area, some increase will probably occur in the near future. Any increase may have considerable effects upon some habitats particularly if they were to occur in or near sensitive areas. Further studies should be conducted in areas where developments are planned.

During our study only limited time was spent near the Nine Mile Point Power Complex and our observations are limited. There are indications that such developments could have greater impact than general industrial development. It is unfortunate that our data were further limited by the refusal of the Niagra Mohawk Power Corporation to permit field work on all but one small portion of their land. We regret this refusal and in our opinion, the reasons given were totally inadequate. Permission was received from the Power Authority of the State of New York to work on their land for which we are grateful.

The long term potential environmental impacts of such plants will be one of the major land use questions in the future. Our studies indicate that a potential impact appears to involve herbicide use along power line corridors. In addition, G.A. Smith has previously noted some bird of prey mortality, possibly due to collisions with power lines. Not only should the effects of a single plant in the area be considered, but also the cumulative effects of a number of plants to the overall area. Such considerations as the destruction of public shoreline access, possible effects of herbicide use under power lines and a multitude of other aspects merit study. Industrial development may be one of the more important factors affecting Coastal Zone habitats in the future. While we are not in a position to more than suggest the apparent effects, we strongly recommend that further study be undertaken.

Recreational and residential development: Perhaps the primary human activity affecting the environment is residential development. Permanent homes create problems such as habitat removal and sewage disposal, however, development is occurring at a slow rate. While effects on habitat areas are similar to those caused by seasonal houses, they are less extensive. Also, permanent homes are usually placed in less remote areas and thus tend to affect isolated habitats less often.

Diverse effects upon many habitats are due to seasonal homes and associated development. The number of areas being affected by such developments is increasing rapidly. During the short period of our study, several new camps and a large recreational development were begun. The effects of camp construction and its resultant habitat removal are often less significant than the increase in human activity in the area. Increasing noise disturbance often forces sensitive species such as nesting hawks to depart. On sand dunes, human activity destroys vegetation and leads to erosion. This is very evident on the North Pond Spits and along the dune areas fringing Deer Creek Marsh.

Other effects of seasonal home developments include increased use of pesticides for the comfort of the human inhabitants. Also, shoreline camp colonies require access roads which cut large habitat areas into smaller ones. Access roads, in fact, are one of the most serious disruptive practices in such area. We noted that small areas of woodlands and marshes appeared to have lower densities and diversities than did larger ones. Teal Marsh and Butterfly Swamp are good examples of areas partially disrupted by road construction. In the latter area, the roads have caused ecological disruptions of a subtle nature, the primary example of which is the snapping turtle. Summer residents often shoot female snapping turtles that are laying eggs in the sand and gravel roadside in an attempt to reduce the species' predations upon young ducks. But the turtles are still increasing in number. Snappers need dry sites to lay their eggs and it is probable that the limited supply of such sites in this very wet area might be a limiting factor to species populations. Construction of camp roads has increased nest sites and probably allows the turtle population to grow.

Other adverse effects of access roads include wildlife roadkill, pollution of wetlands by oil runoff from roads and increased access to domestic pets. It appears that habitat quality is affectd, often severely, by proliferation of camp colonies.

Large scale recreational developments such as those in sand dune areas and east of Butterfly Swamp have severe effects. Developments along the dunes near Deer Creek Marsh threaten the productivity and quality of this valuable area. The problems attendant to camp colonies are even more prevalent in such developments.

The areas of the Coastal Zone require a comprehensive plan relating to recreational, seasonal and permanent residence development. The impact of such developments must be considered. In most areas major developments should require indepth impact assessments, particularly if new roads are to be built. While the potential effects of camp colonies are less obvious than those of major industrial developments, they may, in a cumulative sense, be more important.

Off-road vehicles: The use of off-road vehicles has increased in recent years. During the study we noted them often in all parts of the Coastal Zone. In certain areas such as sand dunes, they are very damaging to the habitat. On the dunes, frequent use of such vehicles destroys vegetation and destabilizes the dunes. Such destabilized dunes may migrate and further destroy habitat by filling marshes. Restrictions should be placed upon the use of such vehicles in certain areas at various seasons. Their use when combined with other human disturbances such as excessive recreational use, can expirate species from an entire area. The elimination of Piping Plover and Common Tern as nesting species on the North Pond Spits is probably due to excessive disturbance, in which vehicles being driven on the beaches played a part. If the use of such vehicles increasesin the future, a number of sensitive habitats will be adversely affected.

Motorboats: In certain areas the use of motorboats can cause adverse effects on the ecology of an area. For example, Black Terns which nest in cattails only in Ramona Beach Swamp and Deer Creek Marsh, are affected. We noted this summer that the wake from a 6 h.p. engine rocked the suspended tern nests along Deer Creek. If the use of larger crafts becomes prevalent in this area, the entire tern colony could be disrupted.

In other areas, shy species such as the Least Bittern may be eliminated from an area due to excessive boat traffic. We also noted that species diversities and densities of ducks in the Catfish Marsh, where there is heavy boat traffic, were reduced.

It is necessary to protect fragile areas such as Deer Creek Marsh from all but the smallest engines. In other areas where pleasure boating causes problems, restrictions should be placed on engine size. Regulations are required to make recreational use compatible with the protection of important habitats.

Mineral use: Mining at the south end of the Deer Creek dunes is an example of limited foresight resource exploitation. The mining is destroying part of a unique ecosystem and endangering the very important Deer Creek. Marsh. The sand dune ecosystem is a unique area and the destruction of any part of it is unwise. The Deer Creek dunes are among the highest dunes along the Coastal Zone and represent a priceless resource to all citizens. Allowing their destruction for private gain is inexcusable. We strongly urge the appropriate agencies and private organizations to take legal action to prevent any further loss of this resource. Such action must be immediate as any significant delay will result in rapidly escalating destruction of these resources and increasing danger to Deer Creek Marsh. In view of the extremely limited nature of the dunes, we feel that any additional removal of sand should be prohibited.

Tall structures: The building of tall structures such as college campus buildings and smoke stacks within a half mile of the lake shore causes problems. During migration, small birds moving at night fly at very low altitudes over the water, then rise gradually as they encounter land. This is true for fall birds flying south as low as a few feet above Lake Ontario. During adverse weather conditions, many strike tall buildings and are killed or injured. Such mortalities may be extensive and future

lake shore development should consider the height of nearshore structures and take steps to reduce mortality. Further studies would add to the existing information on the causes of mortality and could provide ideas to reduce the problem.

Shoreline protection structures: The potential effects of breakwall and rip-rap are too varied and numerous to fully discuss here. For example, they may affect the habitat by increasing silting in nearshore waters and make hiking in the area difficult. Since many shore protection structures are below high water line, they raise questions regarding usurption of public domain for private purposes. The potential impacts of such structures on the environment is probably not well known and should be investigated intensively in the future. The recent period of high water along Lake Ontario has led to an increase of structures, so assessment of the environmental cost to economic benefit ratio should be undertaken.

Ecological and Environmental Education and Planning

There is a long term solution to a compatible blending of human activities with the preservation of ecological values. This will require a great increase in the level of public awareness and increased land use planning where important ecological considerations are put on an equal footing with the traditional socio-economic considerations.

During the study, we found a general interest in our work on the part of many people in the area who seemed favorably inclined toward outdoor resources including wildlife. Many of these people's activities, such as brush clearing, camp road expansion and marsh filling are significantly affecting the quality of the habitats around them. Much of the adverse activity is probably inadvertant and is done in ignorance of its effects. It will require the education of all citizens to reduce the unnecessary degradation of habitats.

In addition to education, an increasing amount of ecologically enlightened planning is required to protect extant resources. Such planning can aid the citizen by providing counseling on the protection of the environment. In addition, the public must be protected from thoughtless persons who abuse irreplaceable resources for private gain.

There must be future planning decisions based on awareness of ecologically important areas. Such decisions cannot simply be based upon the presence of game or endangered species, but upon a complex variety of factors in the overall picture of an area's importance. During our study, we have gained increasing familiarity with the many varied natural factors within the Oswego County Coastal Zone, and have appreciated them for the many features they encompass.

The protection and preservation of undamaged habitats and the restoration of damaged areas is a responsibility for all. Ever increasing understanding, planning and education will be required if the quality of life is to be maintained and enhanced for future generations of residents and visitors to the Oswego County Coastal Zone.

Criteria Used In Evaluating Specific Areas

For each of the specific areas in the recommendation section, the following criteria were applied:

Name: The area name of the sector under discussion. These areas may include several smaller sub-areas.

Location: A general outline of the boundaries of the area.

Ownership: The ownership of the larger portions of the tract, as could be ascertained from posted signs and local residents.

Habitat: A brief, general description of the dominant types of habitat found over most of the area.

Present use: Present human use of the area, and the state of the activity.

Vulnerability: A value judgement of the probability of disruption or destruction of the habitats in the area; based upon observations of disruptive activities. The degree of vulnerability was rated as follows: high - immediate danger of disruption; medium - not in immediate danger, but problems appear possible in the near future; low - probably in little danger in the near future.

Life form importance: A summary of the importance of the areas in relation to specific taxonomic groups. Where no data appears, either no particular comment on the group was deemed necessary or insignificant data prevented comment.

General ecological importance: A summary of a number of factors, including species density, species diversity, and extent of the area, that affect the importance of the habitat.

Habitat importance rating: Our assessment of the relative importance of habitats within the Coastal Zone; based upon a scale of 0 - 4 where 0 is extremely high, 1 is high, 2 is medium, 3 is medium-low, and 4 is low. A fraction assessment, such as 2.5, provides for close areas of overlap.

Recommendations and comments: Our recommendations related to the more important factors affecting the habitat and pertinent comments regarding them.

Specific Area Evaluations and Recommendations

Health Camp Swamp

Location: Oswego Town; along West Lake Road; approximately 0.5 miles east of the Cayuga County line.

Ownership: Private.

Habitat: The small northern section is mainly shrub swamp, while the southern section consists largely of open water and marsh, surrounded by extensive woodlands.

Vulnerability: Medium.

Life Form Importance: Vegetation: The southern section of the swamp is surrounded, on most sides, by a wet, intermediate woods. This woods has a dense understory and the ground cover is abundant, providing a good buffer zone around parts of the swamp.

Mammals: The area has a large population of muskrats, and some beaver are present. Deer and cottontail rabbit are present along the swamp fringes and an occasional red fox has been observed.

Birds: The area is important to nesting Red-bellied Woodpecker and Barred Owl, and is heavily used for nesting and feeding by water birds and waterfowl. This area also provides an important link in the chain of lake shore wetland areas and is potential nesting habitat for Red-shouldered Hawk, if that species re-establishes in the area.

Reptiles and Amphibians: An average diversity of species present.

General Ecological Importance: This medium sized wetalnd is well used by a variety of life forms. The wooded swamp provides nesting areas for a variety of locally rare bird species. This is important as a wetland simply due to to the overall scarcity of wetlands, which are virtually irreplaceable once destroyed. A diverse variety of habitat existing in a relatively small area provides an excellent area for nature study.

Habitat Importance Rating: 2.0

Recommendations and Comments: 1) This relatively undisturbed wetland should be preserved in its present state, a job which the private owners appear to be doing well. 2) The northern section is of limited importance. 3) The southern section is of considerable importance, due, in part, to heavy wildlife use. 4) The swamp could be partly managed to provide a recreational nature education area for the western part of Oswego Town. 5) Steps should be taken to prevent habitat degradation by activities such as dumping.

West Bluff Farmlands

Location:	Oswego Town; along West Lake Road; about 0.75 miles east of the Cayuga County line.
Ownership:	Private.
Habitat:	Mostly active farmlands with some shrubland.
Present Use:	Active farming with some residential development present along roadsides.
Vulnerability:	Medium.
Life Form Importance:	Mammals: Typical farmland species including opossum, woodchuck, shorttail shrew and field jumping mouse occur. Red fox probably feeds in this area. Birds: Typical farmland species including Eastern Meadowlark and Field Sparrow occur here. Red-tailed Hawk, which nests nearby, feeds on a variety of rodents found in the area. In fall, migrant waterfowl and gulls feed in field areas.
General Ecological Importance:	This area provides habitat for typical open country inhabiting vertebrates which are a valuable part of the farmland ecosystem. Species including the meadow vole and Upland Sandpiper would disappear from the area if such habitat were not available. The presence of these wildlife species provide significant benefits to the farmer and other users of these lands.
Habitat Importance Rating:	3.0-3.5
Recommendations and Comments:	1) All farmlands should be reserved mainly for agricultural use only, in the future. If these lands decline in extent, associated life forms also decline. Some species such as Upland Sandpiper and Vesper Sparrow have declined substantially throughout the area, possibly due to the reduction in farmlands and/or some agricultural practices. Some practices, such as excessive pesticide use and early mowing, could be altered, which would probably increase wildlife in the area. Certain developments, such as trailerparks, on agricultural land, remove such areas from future farming and greatly reduce wildlife presence. The impacts of such developments should be seriously considered, for in the future this land may be badly needed to provide food for large human populations.

Camp Hollis Area

Location: Oswego Town, about 1.25 miles east of Cayuga County, north of West Lake and Lake Shore Roads.

Ownership: Public and private.

Habitat: A mixed area of mostly shrublands, with some fields and intermediate woods.

Present Use: A county park occupies much of the area, with extensive summer homes along the fringe.

Vulnerability: Medium to low.

Life Form Importance:

Vegetation: Much of this area is composed of shrubalnds, but the publically owned Camp Hollis area maintains a series of foot trails through an older intermediate woods that borders Lake Ontario. If properly maintained, this area could mature into a valuable, lake shore forest.

Mammals: This habitat is utilized by cottontail rabbit, white-tail deer and white-footed mouse. Some squirrels are present and their population should increase as the forest matures.

Birds: Typical shrubland species, including Grey Catbird and Yellow Warbler, occur in large numbers, and Brown Thrasher are frequent. The area provides a feeding and resting area for many species during migration.

General Ecological Importance: This area is typical of the 20-30 year old successional sites that occur throughout the Coastal Zone, which will become forest if left undisturbed. These areas have a good variety of wildlife, and species diversity of vertebrates is quite high. Such areas provide ecological niches for numbers of individuals of many species. The transitional nature of shrubland habitats tends to make them less sensitive to long term disruption than more mature areas. Most successional areas can recover from most damage in 15-30 years.

Habitat Importance Rating: 3.0

Recommendations and Comments: 1) The areas should be protected from unnecessary "management" practices such as brush removal, poison ivy eradication and pesticide use. Such practices will reduce the areas' value to wildlife. 2) Since much of the area is a park, nature education should be further developed by construction of well-planned nature trails. Such development would be a compatible use of the area. 3) Private landowners in the vicinity of Hollis Creek should be encouraged not to alter the streamside habitat by brush removal or dumping as these alter the areas' ecological balance.

Snake Swamp Area

Location: Oswego Town; off Lake Shore Road; about 0.5 miles east of West Lake Road.

Ownership: Private.

Habitat: A large wetland with a mix of shrubswamp and marsh, bordered by an extensive woodland, forming an integrated habitat complex.

Present Use: Mainly undisturbed in interior areas, but with considerable disruption around the fringe from housing developments, recreational developments and dumping. The access provided by Lake Shore Road allows for habitat disruption.

Vulnerability: High.

Life Form Importance:

Vegetation: Marsh, shrubswamp, swamp woods and upland intermediate woods comprise the Snake Swamp area, yielding a high habitat diversity. The upland and swamp woods which border the swamp provide a very effective and essential buffer zone between this wetland and the developed areas around it.

Mammals: The area has a high species diversity. Important species include muskrat, red fox, white-footed mouse and cottontail rabbit. Starnose mole, shorttail shrew, masked shrew, longtail weasel, raccoon and deer are also present.

Birds: A very important waterfowl and marsh bird habitat. Least Bittern, Sora, Virginia Rail and Long-billed Marsh Wren are frequent. Several species of heron have been noted using the area. The wooded sectors attract a variety of species including Red-bellied Woodpecker and American Redstart. Several species of declining marsh birds such as Pied-billed Grebe find refuge here.

Reptiles and Amphibians: This area had the highest number of species noted within the Coastal Zone. Species present included ribbon snake and red newt.

General Ecological Importance: This large wetland is of great importance to marshland species which are, as a group, declining. The area is important to wildlife of surrounding areas as well as to that of the marsh areas, for feeding purposes. It provides a sheltered resting and feeding area for waterfowl and a variety of mammals. The area is probably the most important habitat complex in Oswego Town, and is one of the most productive areas in the study sector. Such areas are virtually irreplaceable if destroyed.

Habitat Importance Rating: 1.0

Snake Swamp Area (Continued)

Recommendations and Comments:

1) This area should be preserved as a complete unit including both the marsh and wooded areas. All methods of preservation including easements and outright purchase of this land should be investigated. 2) Further habitat degradation caused by encroachment of roads (ie. those behind housing developments), should be prevented through the establishment of buffer zones. 3) Disruption and potential adverse effects of nearby human activities should be carefully monitored and regulated. For example, nearby housing developments should be prevented from pesticide use for the purpose of the residents' comfort. Initial development of residential complexes in close proximity to large important habitats is a questionable practice and further disruptions of these habitats cannot be justified. 4) The northwest sector of the swamp near a local tavern should be monitored to prevent the continuing filling that is occurring. 5) All aspects of human effects on the area should be further investigated. 6) Potential for nature education exists through the construction of an observation tower along Lake Shore Road. This would provide the opportunity for public viewing of the area without any adverse effects on the ecosystem.

Lake Shore Road Shrublands

Location:	Oswego Town; a strip along Lake Shore Road from west of Rice Creek mouth (about 0.75 miles) to the east edge of Snake Swamp.
Ownership:	Private and public.
Habitat:	Mostly shrublands with some woodlands and residential areas.
Present Use:	Residential development is occurring in the area and some recreational use occurs.
Vulnerability:	High
Life Form Importance:	Mammals: Raccoon and opossum are present in the area as are typical field and shrublands species including shorttail shrew, meadow vole, meadow jumping mouse and two species of weasels. Birds: Typical shrubland species such as House Wren and Grey Catbird are frequent. The many fruiting shrubs present provide abundant food for a number of species during fall and winter. The thickets also provide considerable cover for many species.
General Ecological Importance:	Shrubland areas provide important wildlife and open space areas and as previously mentioned, have high species diversities. These undeveloped areas also provide buffer zones for less disturbed areas (ie. Snake Swamp). Such buffers prevent disturbance of concentrations of wildlife using the area.
Habitat Importance Rating:	3.0-3.5
Recommendations and Comments:	Good planning could enable this area to retain most of its present value, even in the face of development.

Rice Creek Mouth Area

Location: Oswego Town; along Washington Boulevard (County Route 89); about 0.1-0.4 miles east of Lake Shore Road.

Ownership: Private.

Habitat: A stream with marsh areas, fringed with shrublands and woods, including the shrubs and woods near Burt Point. A highly mixed area of habitat.

Present Use: A variety of uses including nearby residential development, recreational use, such as fishing, and some dumping.

Vulnerability: High.

Life Form Importance:

Vegetation: The woods that fringe the mouth of Rice Creek at Burt Point are remnants of the woods that formerly bordered the lake. However, these woods have received much human traffic and are highly disrupted.

Mammals: Muskrats and an occasional beaver are found in the marsh. The area is too disturbed to be heavily used by many mammals.

Birds: Of generally limited value to waterfowl and marsh birds for nesting, although some waterfowl breeding does occur. Used as a resting and feeding area for a variety of species during the migration season. This is one of the least valuable wetlands from an avian standpoint as several factors limit its use.

Reptiles and Amphibians: An average diversity of species is present.

Fish: The Rice Creek Tributary as a whole had the second highest number of species, with 25 species present, including 14 game species.

General Ecological Importance: The area is of value as an undeveloped area surrounded by heavy development. It has considerable importance to local fish populations as a high diversity, heavy use area. The are provides fairly good quality habitat for this section of Oswego Town, where most habitats are highly disturbed. Two miles farther upstream the Rice Creek Biological Field Station provides an important area of protected habitat.

Habitat Importance Rating: 2.5

Recommendations and Comments: 1) Encroachment of development upon the immediate stream fringe should be controlled to maintain present wildlife use levels.
2) Public access to nearby wooded areas for birdwatching and hiking should be secured or preserved.

Rice Creek Mouth Area (Continued)

Recommendations and Comments: 3) The effects of heavy outboard motor use should be monitored and it should be ascertained if some effects, such as oil pollution, are detrimental to the area's ecology. 4) The area has a dense algal growth which may be due to eutrophication caused by human activities. If so, then then the causes of this eutrophication should be investigated.

State University College Campus Area

Location: Oswego Town; north of U.S. Route 104; along the western edge of the City of Oswego.

Habitat: The area includes campus lawns and developed areas in most sectors, with shrublands along the western edge of the campus.

Present Use: College campus and surrounding recreational fields.

Vulnerability: Low.

Life Form Importance: Vegetation: Although much of the campus vegetation is planted, the western fringe of the SUNY- Oswego land is a relatively large tract of naturally succeeding fields and shrublands.

Mammals: Species frequent in the area include opossum,shorttail shrew, weasels, meadow voles, meadow jumping mouse and cottontail rabbit.

Birds: The shrublands are moderately used by a variety of species including Brown Thrasher. Open lawn areas provide habitat for Killdeer and Horned Lark. The level of bird use decreases from west to east across the campus. A major problem of bird mortality due to collisions with buildings exists.

General Ecologcial Importance: The SUNY-Oswego campus provides an area of moderate to low quality habitat. Although the heavily developed eastern sector is little used, the western shrublands provide good habitat for many species. The area is useful as open space amidst a heavily developed area.

Habitat Importance Rating: 3.5-4.0

Recommendations and Comments: 1) The area should be monitored to note the effects of construction of tall structures in lake shore areas. The effects on bird mortality during migration due to collision with these structures requires further study. Such studies would probably bear out the conclusion (G.A. Smith; C.G. Spies,per. com.) that future construction of tall structures within 0.5-1.0 miles of the lake shore should be restricted. 2) Undeveloped campus areas should remain so if possible, to provide open space in the area.

Oswego City Parks

Location:	Northwest sector of the City of Oswego.
Ownership:	Public.
Habitat:	Park areas planted with a variety of exotic vegetation.
Present Use:	City parks.
Vulnerability:	Low.
Life Form Importance:	Birds: These areas provide stopping areas for migrants and observation points for birdwatchers to view the harbor.
General Ecological Importance:	These areas provide temporary habitat for wildlife wandering into the urban area, and open space for human use.
Habitat Importance Rating:	4.0
Recommendations and Comments:	1) Additional plantings with shrubs would increase the area's value to wildlife and, if possible, such plantings should be species native to the Coastal Zone. 2) Certain activities, such as motorbike use, should be limited to certain areas.

Lower Oswego River Area

Location:	City of Oswego, including the mouth of the Oswego River and Oswego Harbor.
Ownership:	Public.
Habitat:	Open water.
Present Use:	Navigation etc.
Vulnerability:	Medium.
Life Form Importance:	Birds: This is a very important wintering area for waterfowl and water birds, from mid-November to late March. Gulls and terns also use the area in large numbers during other seasons for resting and feeding. This makes it one of the most important non-breeding water bird concentration points in the Coastal Zone.
General Ecological Importance:	Waterfowl, water birds and fish occur in great diversity and abundance throughout the river mouth. The artificial conditions (ie. warm water discharge from electric power plants, protection from lake storms) encourage many birds and fish to use the area.
Habitat Importance Rating:	2.5
Recommendations and Comments:	1) Because of the high concentrations of birds, the area is a critical one for avoiding oil discharges and spills. A major oil spill in winter could kill thousands of gulls and waterfowl, which could have a significant effect on species population levels. Care should be taken to prevent spills, and plans should be available for control, particularly in winter. Carelessness which results in damage to the area should be dealt with harshly. 2) In view of the artificial concentrating effect on waterfowl, no hunting should be allowed in the harbor, including the breakwalls, after mid-Novenber.

Oswego City Shrubland Areas

Location: The northeast section of the City of Oswego; east of Wine Creek and along its fringes.

Ownership: Private and public

Habitat: Mainly shrublands in various stages of succession, ranging from old field to young woods.

Present Use: A variety of uses ranging from a cemetery to a dump. Generally a very disturbed area under a great deal of pressure from development.

Vulnerability: High.

Life Form Importance:

Mammals: Shrubland and field species including shorttail shrew, woodchuck, meadow vole and cottontail rabbit are present.

Birds: Shrubland species including Yellow Warbler and Song Sparrow occur in substantial numbers. The fringe of Wine Creek is used by a variety of species including the Belted Kingfisher. In sections where shrublands and fields are mixed, Field Sparrow and Willow Flycatcher are common. American Kestrel frequents the area for hunting and often nests in dead elms. The St. Paul's Cemetery area is important for waterfowl, water birds and shore birds along the shoreline. During years of "winter finch" invasions, flocks often use the area for feeding purposes. City Line Marsh provides suitable marshbird and waterfowl habitat.

Reptiles and Amphibians: An average number of species found here.

Fish: Wine Creek had the lowest number of species of any stream in the area, with three species, none of which were game species. No fish were found in the section between Lake Ontario and Mitchell Street. Chemical pollution was noted in the area.

These shrublands and associated areas comprise the largest open space area within the City of Oswego and provide considerable habitat. Areas such as City Line Marsh are important habitat units that should be preserved. These areas could remain productive even if surrounding areas are developed, and could provide miniature wildlife refuges adequately buffered from disturbances. Although their small size may limit use by some species, many others will be able to use the area.

Habitat Importance Rating: 3.5

Recommendations and Comments: 1) As much of the shrublands as possible should be preserved as urban open space and protected from dumping. 2) City Line Marsh and Wine Creek fringe should be preserved, having potential as nature education area for local use.

Teal Marsh Area

Location: Scriba Town; along the Lake Ontario shore; about 0.75 miles north of County Route 1, just east of the City of Oswego line.

Ownership: Private.

Habitat: Mostly shrub swamp and upland wood fringe areas with some cattail marsh present.

Present Use: The interior is fairly undisturbed, but fringe areas along the shore are being developed for summer camp colonies. Camp access roads are dissecting the area into smaller pieces and dumping, filling and other disruptive activities are occurring.

Vulnerability: High.

Life Form Importance:

Vegetation: This area has a high diversity of habitats. Buttonbush dominates the large wetland area. The rich woods surrounding the marsh range from swamp woods to drier upland woods. Teal Marsh Central is fairly inaccessible and supports a mature mixed woods. Showy ladyslipper, a protected native orchid, was found near the marsh edge.

Mammals: An excellent diversity occurs in the area including opossum, masked shrew, shorttail shrew, gray fox, weasels, red squirrel, gray squirrel, eastern chipmunk, beaver, white-footed mouse, meadow jumping mouse, muskrat, porcupine, cottontail rabbit and whitetail deer.

Birds: The large marsh provides habitat for wetland breeding species including Common Gallinule, Blue-winged Teal and Common Snipe. Both cuckoos are frequent in the wet shrubby areas. A variety of land bird species feed in the area. A number of aerial insectivores including Barn Swallow and Chimney Swift feed upon insects produced here. The size of the area provides habitat for species with large territorial requirements such as American Bittern.

Reptiles and Amphibians: The area has an average number of species, with the small, pond flecked,wooded habitat well suited to tree frogs and salamanders.

General Ecological Importance: Teal Marsh is the largest shrubswamp within the study area and is a valuable habitat. A high density and diversity of vertebrates are present including numbers of birds and mammals from nearby areas which feed in the marsh. Large wetlands are among the most productive of habitats and are of great importance. Once a unique area such as Teal Marsh has been destroyed, it cannot be replaced.

Teal Marsh Area (Continued)

Habitat Importance Rating: 1.0-1.5

Recommendations and Comments: 1) The construction of additional roads in the area should be restricted. The disruptive effects of these roads are degrading the habitat, particularly in western sections. 2) Steps should be taken to preserve the area and prevent additional degradation particularly by filling and dumping. 3) The areas of shoreline where camp development has not occurred should be protected from such development. 4) All activities that will further subdivide large habitat sections into smaller parts should be restricted.

Scriba Northwest Woods

Location: Scriba Town; consisting of a wood strip north of County Route 1 and 1A, extending from the City of Oswego line east to Riker Beach.

Ownership: Mostly private.

Habitat: A diverse area consisting of an extensive belt of woods fringed with shrublands on all sides. A layered effect is present with younger areas close to the county routes, progressing in maturity towards the lake shore.

Present Use: Varied in uses. The area is dissected by numerous roads leading to camps, by industrial development and by lumbering. Away from the immediate area of camp colonies and Alcan, much of the area is free from disturbance.

Life Form Importance: Vegetation: The extent and relative maturity of the woods in this area make it a very valuable habitat.

Mammals: This area has a high porcupine population. Other species present include common woodland species such as squirrels, eastern chipmunk and white-footed mouse.

Birds: The wooded areas provide the most important nesting area for woodland birds within the study sector. Most of the nesting Hooded Warblers in upstate New York occur in this area. This area also provides the best habitat for hawks of the genus Accipiter within the Coastal Zone. Population densities of woodland nesting species such as Wood Thrush, Veery, Ovenbird and American Redstart are very high here.

Scriba Northwest Woods (Continued)

Life Form Importance:	Reptiles and Amphibians: The varied environment of this area supports a considerable variety of species, exhibiting one of the highest number of species in the Coastal Zone.
General Ecological Importance:	This is probably the most extensive wooded area in the study sector and many sections are undisturbed. The area provides extensive habitat for all species of woodland vertebrates. Some species of woodland birds occur in unusually high densities and diversities. There are some fairly mature woods at least 60-90 years old. This strip is broken mainly by camp roads which may affect the use of the area by shy species such as nesting hawks. Considered in conjunction with Teal Marsh, this united area represents an extensive important habitat tract.
Habitat Importance Rating:	1.5-2.5
Recommendations and Comments:	1) Additional industrial development in areas near Alcan may significantly affect important habitat. Such development should be restricted in scale to minimize damage. 2) Additional division of the area by road construction and seasonal home building should be limited to prevent further disruption and reduction in the value of the area to some species. 3) Many part of the tract are extremely wet and probably not suitable for most development. Such sections should be preserved. 4) Incidental activities such as road widening should be conducted in a manner that restricts habitat damage.

Lakeview Area

Location:	Scriba Town; north of County Route 1A; from 0.25 miles east of Riker Beach , east to Lakeview Road.
Ownership:	Private.
Habitat:	Mostly intermidiate woods with shrubland and farmlands along the fringes.
Present Use:	Many shoreline camp colonies are present and many roads to these colonies dissect the area.
Vulnerability:	Medium.
Life Form Importance:	Mammals: Common species include opossum, raccoon, weasels and woodchuck. These and other farmland-shrubland species abound. Birds: This area is utilized by migrating and wintering waterfowl and water birds along the shore. Typical shrubland species are present in substantial numbers. The wooded sections east of Riker Beach have a few Hooded Warbler sites and may provide nesting areas forSharp-shinned Hawks which were present. Common woodland species including Veery and American Redstart are present in numbers, andBlue-gray Gnatcatcher frequents the area.
General Ecological Importance:	The area is a continuation of Scriba Northwest woods, but it is generally more disturbed. It provides habitat for many species and western sections serve as a buffer zone for more mature areas further west.
Habitat Importance Rating:	2.5-3.0
Recommendations and Comments:	1) If left undisturbed, much of the woods will become similar to Scriba Northwest woods in the next 20-35 years. Additional development and disturbance will reduce its value to some wildlife. 2) The creek mouth near the north end of Lakeview Road has been very disturbed by brush clearing of streamsides and these activities should be restricted. Such activities result in increased water temperatures and siltation which degrade the habitat. 3) In this section of the study area, there has been much construction of shoreline protection structures. Such structures affect habitat and cause difficulty of citizen access to the public domain of the lake shore. Among the worst examples of these structures are those at the north end of Lakeview Road. For a variety of reasons, we feel that in the future, public domain should not be usurped for private purposes to conduct shoreline alteration of questionable value.

Walker Woods

Location:	Scriba Town; south of County Route 1A; north of County Route 1; west of Lakeview Road.
Ownership:	Private.
Habitat:	A large woodland with some shrublands mainly along the western fringes.
Present Use:	Relatively undisturbed except for some lumbering.
Vulnerability:	Medium to low.
Life Form Importance:	Vegetation: A diverse area including a swamp forest of considerable extent. Mammals: Shorttail shrew, gray squirrel, eastern chipmunk and white-footed mouse are present. Birds: Some Hooded Warblers breed here, as does a pair of Red-tailed Hawks. Typical woodland species are present including Northern Waterthrush and Rose-breasted Grosbeak. The breeding warblers include Black-and-white, Black-throated Green and Canada Warbler. The area provides potential habitat for several birds of prey.
General Ecological Importance:	This large woodland supports a variety of species and the size and extent of the ecosystem has considerable potential.
Habitat Importance Rating:	2.0-2.5
Recommendations and Comments:	1) The railroad bed that passes through the area has excellent potential as a hiking trail to provide public access through the woods.

Scriba Woods

Location: Scriba Town; from east of Lake View Road to north of County Route 1 and west of County Route 29.

Ownership: Public and private.

Habitat: A large woodland that is separated into two sections by a successional strip artificially maintained as a power line. corridor. Other smaller successional belts are located under smaller power lines and the southern fringes are mainly shrublands.

Present Use: The area is influenced most by the power plant complex presently on the northern fringe of this woods. The power line corridors, running south from the power plant area, disturb substantial portions of the area. The remainder of the tract is fairly undisturbed.

Vulnerability: Medium to high

Life Form Importance: Vegetation: The interior woods, east of the main power corridor, contain a substantial section of climax beech-maple forest, which is found in very few parts of the Coastal Zone.

Mammals: Due to its size, this area supports a diverse mammal fauna and is particularly important to species which require extensive areas, such as gray fox and southern flying squirrel.

Birds: This is an important area for woodland species including Hooded Warbler, Great Horned Owl and Black-throated Green Warbler. An interesting mix of northern and southern species including Blue Gray Gnatcatcher and Black-and-white Warbler are present, and three species of vireos breed here.

General Ecological Importance: This area contains the most mature section of forest within the study area and is the best example of the climax habitat. Areas of this maturity require at least a century to replace. The most mature section of Scriba woods lies to the east of the power line corridor and west of County Route 29. Unfortunately due to access problems, the western areas of this woods were not studied.

Habitat Importance Rating: 1.5-2.0

Recommendations and Comments: 1) The mature wooded areas should be preserved and any future plans for development, such as power corridors, should not involve areas to the east of the present power corridor. 2) The presence of the power plants nearby may encourage additional development in the area, which should be carefully placed to avoid damage to these habitats. 3) We hope that in the future all investigators will be granted permission to work on all parts

Scriba Woods (Continued)

Recommendations and Comments: (continued)	of Niagra Mohawk land. We regret that despite considerable efforts on our part, we were unsuccessful in obtaining access to a majority of the area. We appreciate the permission of the Power Authority of the State of New York to work on their land. 4) In view of the factors such as raptor mortality along power line corridors,much additional work is required.

Power Complex Area

Location:	Scriba Town; north of Lake Road; east of Lakeview Road; west of County Route 29.
Ownership:	Public and private.
Habitat:	The area is mainly concrete and stone with landscaped lawns near the power plants. The tracts to the east and west of the plants have some shrublands dissected by many service roads.
Vulnerability:	Medium to low.
Life Form Importance:	Birds: This area is of little importance to birds at present, although the wet brushlands contain numerous American Woodcock. A considerable variety of species utilize the area during migration. The lawns around the power plants are used by Killdeer, American Robin and Starling. Snow Buntings and a few Red-tailed Hawks frequent the area in the fall and winter. The tall stacks near the plants may cause mortality during migration due to collision. Waterfowl and gulls are attracted to the warm water discharge areas during winter, although the effects of such artificial concentrations are little known.
General Ecological Importance:	Most of the developed land in this area is a wildlife desert. The shrublands, however, are of some value. In general, the area represents a man-made island among the more natural Coastal Zone areas.
Habitat Importance Rating:	4.0
Recommendations and Comments:	1) As large a buffer zone as possible should be maintained around the power plant complex to prevent disruption of nearby habitats by further construction. 2) The fringe areas should be maintained in a natural state rather than being landscaped with exotic plants.

West Nine Mile Point Area

Location: Scriba Town; north of Lake Road; east of the intersection of Lake Road and County Route 29; west of Nine Mile Point Road.

Ownership: Private.

Habitat: Shrublands in the fringe areas with a wooded area in the central section.

Present Use: Most of the area is relatively undisturbed except for a lake shore camp colony and camp roads.

Vulnerability: Medium.

Life Form Importance:

Vegetation: The woods in the interior of this section are the mature remains of what used to be a large forest. Although they are relatively undisturbed, they are small in extent.

Mammals: Species of successional habitats including white-tailed deer, cottontail, red fox and weasels are present. Mink occur along the streamsides.

Birds: Probably the only nesting Cerulean Warblers in the area, and perhaps the only Oswego County site, occur here. The wooded areas provide habitat for Wood Thrush, Least Flycatcher and American Redstart. The large old field along Nine Mile Point Road contains nesting Willow Flycatcher and Golden-winged Warbler.

Reptiles and Amphibians: This was one of the areas in which the eastern smooth green snake was found.

General Ecological Importance: The area provides a diverse habitat mix and may be of considerable value as a buffer zone between the power plant complex and the Mexico Bay West area. The stream that flows through the area is of some value to fish and seems relatively undamaged by human activity.

Habitat Importance Rating: 2.5

Recommendations and Comments: 1) Most shoreline areas are being used for camp colonies. Where possible, inland development should be limited as it will probably reduce the present value of the habitat. 2) The Cerulean Warbler nesting area should be strictly protected.

South Scriba Area

Location:	Scriba Town; east of the railroad; south of Burt Miner Road; north of County Route 1; west of Nine Mile Point Road.
Ownership:	Private.
Habitat:	A mixture of habitat mostly shrublands in various stages of succession, with some developed areas.
Present Use:	Mainly abandoned farmlands with some residential developments along roadsides, and a power line corridor.
Vulnerability:	Medium to low.
Life Form Importance:	Birds: The habitat diversity of the area provides niches for a variety of breeding species. The woodlands harbor several wood warblers including scarce species such as the Black-and-white and Black-throated Green Warblers. The size of the area provides habitat for nesting raptors. Both cuckoos occur, with the Black-billed Cuckoo occurring in numbers. The fringe of the old railroad bed passes through a diverse habitat for birds.
General Ecological Importance:	The area's diversity and extent make it valuable to many species.
Habitat Importance Rating:	3.0
Recommendations and Comments:	None.

Mexico Bay West Area

Location: New Haven Town; east of Nine Mile Point Road; north of County Route 1; west of County Route 44.

Ownership: Private.

Habitat: Mostly a large mixed woods of vaired age, bissected by Shore Oaks Drive. A large shoreline camp colony is present as Shore Oaks, with a smaller colony at Pleasant Point. The eastern sector is being actively farmed.

Present Use: A highly disturbed area, with much lumbering and dissection by roads associated with several activities. Active farming and residential development is occurring along roadsides. The Onondaga Audubon Society's Noyes Woods Sanctuary is the main undisturbed area.

Vulnerability: High.

Life Form Importance:

Vegetation: Traveling east through the Coastal Zone, the Mexico Bay west area is the last fairly large tract of forest. The extent of this woods makes it valuable, except, as mentioned above, its dissection by Shore Oaks Road. Fifty acres of this forest is preserved as Noyes Woods Sanctuary, a mixture of white pine plantations, mature mixed woods and swamp woods. The sanctuary borders the lake, and is one of the too few areas in the Coastal Zone that is forested to the lake shore.

Mammals: This area contains a good sized population of raccoons and deer, along with a variety of woodland species.

Birds: This is the second most important shoreline wooded area to birds, with an excellent variety of species including Hooded Warbler, Blue-gray Gnatcatcher and Northern Waterthrush. The habitat disruption that is occurring may seriously reduce the area's value to breeding species. The size of the area provides potential nesting space for woodland Accipiter species. A Goshawk was sighted in the area during June and if it was nesting, it would be the only breeder of this species in the study area.

Reptiles and Amphibians: This is one of the two areas in which the spotted salamander was found.

General Ecological Importance: This area is a typical large second growth woodland and associated areas which provide considerable habitat. The area is being disturbed in many places by lumbering and would provide a good study area of a disturbed Coastal Zone Woods. As with other shoreline woods, this area provides the most important type of upland habitat found in the Coastal Zone. These areas have the replacement time among upland habitats and their large extent provides habitat for some of the rarer wildlife of the area.

Mexico Bay West Area (Continued)

Habitat Importance Rating: 2.0

Recommendations and Comments: 1) The value of this area will be greatly reduced if disturbance and development continue at present rates. Perhaps disturbed habitats could be preserved rather than developed to allow natural repair processes to occur. Large undisturbed tracts should be preserved, particularly west of Shore Oaks Road, as such areas provide a buffer zone for the Onondaga Audubon Society's Noyes Woods Sanctuary. 2) The Noyes Woods Sanctuary contains much valuable habitat including nesting areas for Red-headed Woodpecker, Blackburnian Warbler and Barn Swallow. The latter species is at one of two natural nesting sites in New York State. This sanctuary should be protected from encroachment near its perimeter. The sanctuary assures that a portion of natural shoreline will be protected from development, and is due to a gift from Mr. Richard Noyes. The many people who will enjoy this area in the future owe a debt of gratitude to this most foresighted and generous man.

West Catfish Creek Farmlands

Location: New Haven Town; to include farmlands and associated areas west of Catfish Creek.

Ownership: Private.

Habitat: Mainly active farms with some camp colonies along the shore and permanent residential developments in other areas.

Vulnerability: Medium to low.

Life Form Importance: Birds: Common breeding species include Bobolink, Eastern Meadowlark and Eastern Kingbird. Red-tailed Hawk and American Kestrel nest nearby and frequent the area for feeding. The uncommon breeding Horned Lark is present. This area, as are other farmlands, is important to species of open-country birds which will decline as farming declines in the area.

General Ecological Importance: See comments on West Bluff Farmlands, page 155

Habitat Importance Rating: 3.5

Recommendations and Comments: 1) Areas of active agriculture should be reserved as such in the future. Farm areas are important as part of a diversified habitat and land use pattern in the Coastal Zone. Usurption of farmland for other uses affects the wildlife of such areas and removes from food porduction areas which may be needed in the future. If such areas are altered, other habitats may be converted to agricultural land, which is very short-sighted planning.

Catfish Creek Woods and Marsh

Location:	New Haven Town; to include Catfish Creek and associated woods.
Ownership:	Private.
Habitat:	The creek contains a marshy area at the mouth and is fringed by shrublands. The area is partly wooded, with residential developments in sections.
Present Use:	The interior wooded areas along the creek are little disturbed, but the fringes have considerable human use. The rapid flow sections of the creek are fairly undisturbed, but slower flowing areas at the mouth suffer considerable recreational use.
Vulnerability:	Medium to high.
Life Form Importance:	Vegetation: The woodlands contain two remnant trees of exceptional size; a 17 foot circumference sugar maple and a 14 foot circumference red oak. Mammals: This area contains some of the smaller woodland species such as chipmunk, white-footed mice and shorttail weasels. Muskrats occur in small numbers at the mouth of the creek. Birds: This area has wooded habitat surrounded by extensive farmlands and shrublands. The marsh is of limited importance to marsh birds and waterfowl due to a high level of disturbance which restricts use of the area by Least Bittern and Black Duck. Fish: Smallmouth bass probably use Catfish Creek for spawning as evidenced by the presence of gravid females.
General Ecological Importance:	This small woodland is most notable for the presence of the large trees mentioned above. The areas along Catfish Creek provide an interesting location for nature oriented recreation.
Habitat Importance Rating:	2.0-2.5
Recommendations and Comments:	1) The large trees should be protected from damage as they are of considerable interest. Very few trees this large are present in the second growth woods in our area. 2) If Catfish Marsh is to provide viable habitat some reduction in boat traffic should be required. 3) The shoreline areas not presently developed for camps should be maintained as natural shoreline.

Demster Woods

Location:	New Haven Town; just southeast of the east end of the Demster Beach Camp Colony.
Ownership:	Private.
Habitat:	A very disturbed woodland surrounded by farm areas.
Present Use:	Some dumping and lumbering is occurring, mostly along the northern fringe.
Vulnerability:	Medium.
Life Form Importance:	Birds: A variety of breeding species occur, including typical woodland forms, however, densities are rather low.
General Ecological Importance:	Generally, a small isolated disturbed woodland of limited value.
Habitat Importance Rating:	4.0
Recommendations and Comments:	None.

Butterfly Swamp Area

Location: New Haven and Mexico Towns; consisting of a large area north of County Route 1 and U.S. Route 104B, east of Demster Beach camp colony and west of Dowie Dale Beach.

Ownership: Private.

Habitat: A large marsh fringed by wooded areas and shrublands. In wetland sections, marsh habitats dominante with some shrubswamp pockets.

Present Use: The eastern third of the area has been dissected in three places by roads leading to summer camp colonies along the lake shore. In this area the roadside vegetation has been greatly disturbed. Some logging is occurring in central sections where larger trees are present. The western sections are quite wild, being disturbed only in fringe areas.

Vulnerability: Medium to high.

Life Form Importance:

Vegetation: This swamp area is the second largest wetland within the Coastal Zone. A unique secondary dune system is in the western section of the swamp. Some of these dune "islands" are being clear cut. Many of the hemlocks logged out were aged at 140 years old.

Mammals: This area supports good populations of deer, raccoons, muskrats and fox along with many of the smaller woodland and field species. A bobcat has been reported in the area in recent years.

Birds: The area is very important to breeding marsh birds, including a variety of herons and rails. Non-breeders such as the Great Blue Heron utilize the area for feeding. The only Cooper's Hawk nest found in the Coastal Zone is located here. An extremely high diversity of breeding species exists here, one of the highest in the study area. Common Snipe and American Woodcock breed in numbers. A great variety of land birds breed in all habitats. The area is probably of much importance to many other species such as waterfowl, including Black Duck, during migration and in winter.

Reptiles and Amphibians: The northern ringneck snake is present in the area.

General Ecological Importance: This large area of diverse habitat is one of the most important areas within the Coastal Zone. A great variety of upland and wetland habitats allow for many communities containing a great abundance and diversity of species. These habitats are very important for reproduction in a variety of vertebrates.

Butterfly Swamp Area (Continued)

General Ecological Importance: The size of the area provides a unity which is relatively undisturbed and would probably provide habitat for a number of species requiring large areas. Such species, including Bald Eagle and Red-shouldered Hawk, may utilize the area if they reoccupy the Coastal Zone. The importance of this unit is due, in part, to its large extent, which plays an important role in determining an areas productivity. Among the unique habitats found in the area are two old sand dunes covered with large hemlocks located near the lake shore in the western half of the swamp.

Habitat Importance Rating: 0.5-1.0

Recommendations and Comments: 1) The area should be immediately protected from further disruption, by whatever means required. If necessary, New York State should pruchase the area. 2) Any further expansion of shoreline camp colonies should be restricted, and any construction of new roads should be prohibited. Traffic on existing roads should be reduced and if possible, the western most road should be phased out of existence. 3) Efforts should be directed to guide landowners in sound land use practices and discourage habitat abuses. 4) The entire area including the shoreline, wetlands and surrounding uplands should be treated as an integrated unit in future land use planning. 5) The old sand dunes should be preserved and further logging should be restricted. Contact should be made with the persons presently cutting the area to prevent similar occurrences before it is too late.

Dowie Dale Beach Area

Location:	Mexico Town; to include the area around Dowie Dale Beach, and the eastern tip of Butterfly Swamp east to the Mexico Point West area.
Ownership:	Private.
Habitat:	Patches of shrubland, conifer plantations, and a mixture of small areas of other habitat, including wetlands.
Present Use:	Most of the area is affected by the large recreational development at Dowie Dale Beach.
Vulnerability:	Medium to low.
Life Form Importance:	Birds: This extremely disturbed area is utilized by a small number of common species including American Robin and Downy Woodpecker.
General Ecological Importance:	This area is of little value as habitat due to its highly disturbed state, and is a fine example of the effects of large recreational developments.
Habitat Importance Rating:	4.0
Recommendations and Comments:	1) This area is an excellent example of large-scale habitat alternation due to recreational development. Immediate lake shore areas are nearly as heavily developed as some suburban sites. Study of the effects of such developments on the ecology of an area should be conducted prior to the establishment of any similar areas. 2) Any such developments should be located in the ecologically least valuable shoreline areas. 3) Further examination of shoreline alteration by recreational developments must be considered in land use decisions.

Mexico Point Area

Location: Mexico Town; to include the area bordering the Little Salmon River east of Mexico Point Drive, north of U.S. Route 104B and west of County Route 40.

Ownership: Private.

Habitat: The Little Salmon River consists of areas of open water and marsh, and the nearby uplands are a mix of woods and shrublands.

Present Use: The stream mouth has nearly closed off from the lake by a breakwall constructed by New York State. The wildlife use levels of the marsh seem to be affected by the heavy boat traffic. The nearby lake shore has been heavily developed for summer camps. Along the main roads, considerable permanent residential development is occurring. The general effect of these developments has been to dissect the area into smaller units.

Vulnerability: High.

Life Form Importance:

Vegetation: The woods here contain areas of fairly mature habitat, but many of the largest trees were being cut out when we studied the area.

Birds: The Little Salmon River Marsh provides moderate value habitat for marshbirds and waterfowl. The pine plantation along Mexico Point West Road contains nesting Black-throated Green Warbler and possibly Red-breasted Nuthatch. This area is heavily used during migration by a large number of land birds and is an important land bird wintering area. A colony of Henslow's Sparrow is present in field areas.

Reptiles and Amphibians: One of the three areas in which the eastern ribbon snake was present was just off Pond Drive. The common snapping turtle and the midland painted turtle are present as breeders.

Fish: The Little Salmon River had the third largest number of species of any stream in the area, with 22 species including 13 game fish. The river also had the highest number of individuals per gill net of any stream in the study area.

General Ecological Importance: This area has a considerable diversity of habitats, which provides niches for a large number of species, but is surrounded by extensive recreational developments.

Habitat Importance Rating: 2.5

Mexico Point Area (Continued)

Recommendations and Comments: 1) Many shoreline structures are present in the area and may be affecting the waterfowl use of the near shore littoral area due to soiling of the bottom and increased sedimentation. Study of the possible effects of such structures should be conducted prior to any additional construction. 2) This area is among those being heavily developed for recreational purposes, and immediate planning is required.

Sage Creek Area

Location: Mexico Town; east of Sage Creek; north of U.S. Route 104B; approximately west of the Richland Town line.

Ownership: Private.

Habitat: Mostly a large shrub-fringed woodland in the area east of County Route 40, west of Sage Creek. Between Sage Creek and Sage Creek Drive, the area is mostly shrubland. The area east of Sage Creek Drive is a mix of farmlands and woodlands.

Present Use: The lake shore is heavily developed for summer camps and along Sage Creek, on the west side, a number of private drives enter the woods. A variety of human activities occur in different sectors. Approximately 50 acres of the area are preserved as a sanctuary by the Onondage Audubon Society.

Vulnerability: Medium to high.

Life Form Importance: Vegetation: The wooded habitat in this area is mature and relatively undisturbed, especially the section that borders the western edge of Sage Creek. The remainder of the area comprises a good variety of habitats, including many successional stages of fields and young woods.

Mammals: Muskrats are found near the mouth of Sage Creek and whitetail deer frequent the fields in the vicinity of Derby Hill.

Birds: The area around Derby Hill is extremely important to the study of bird migrations. Further imformation on the details of bird migration at Derby Hill and studies conducted there may be obtained from G.A. Smith. The area is also utilized by a number of breeding species including Green Heron and Mallard in Sage Creek Marsh. A small Green Heron roost was located in the marsh after the breeding season. A number of typical shrubland and farmland breeding species such as Grey Catbird and Eastern Meadowlark occur. Great Horned Owl and Red-tailed Hawk nest in the woods along the west shore of Sage Creek.

Sage Creek Area (Continued)

General Ecological Importance:	This area is of considerable value as a mixed habitat of considerable extent and moderately undisturbed. The marshland and woodlands are important natural areas. In general, the habitat is typical of a semi-developed stretch of lake shore in the farmland sectors. The Onondaga Audubon Society sanctuary at Derby Hill provides an important scientific study area.
Habitat Importance Rating:	1.5-2.0
Recommendations and Comments:	1) Given the importance of the Derby Hill area to migratory bird study, any development in the area should consider potential effects upon birds and bird study. This area is one of the most important areas on the North American continent for bird study and should be considered in all land use planning decisions. 2) The vista in all directions from the bluff at Derby Hill should be preserved. The construction of tall structures and any large-scale alteration of the areas along Sage Creek should be restricted. 3) During spring migration (15 February to 10 June) all activities that disturb migrants should be prohibited. Unacceptable activities include crow shooting, any other gunfire and loud noises such as blasting. 4) The marsh requires protection from the filling and dumping that has been occurring in the area.

Ramona Beach Woods and Marshes

Location: Richland Town; to include Sage Creek Marsh East, Ramona Beach Marsh and surrounding woodlands and shrublands.

Ownership: Private.

Habitat: A mixed area of wet woodlands and shrublands surrounding two wetlands; Ramona Beach Marsh and the mainly shrubswamp, Sage Creek East.

Present Use: The lake shore is developed for extensive camp colonies. Interior areas are less disturbed, except near Ramona Beach Drive where residential construction and some lumbering are occurring.

Vulnerability: Medium to high.

Life Form Importance:

Vegetation: The woods in this area are quite different in composition from the woods to the west. Red oak is the dominant species, and mature sassafras are also found here. This area is probably the northern limits of the range of sassafras, which was found in only one other part of the study area.

Mammals: This area supports a diversity of mammal species including whitetail deer, raccoon, fox, beaver, muskrat and southern flying squirrel.

Birds: The woodlands harbor a variety of breeding species including birds of prey. The marsh areas are important to marshbirds. Ramona Beach Marsh has one of the two Black Tern colonies in the Coastal Zone. Waterfowl such as Wood Duck and Black Duck are present as breeders. Yellow-throated Vireo and several species of warblers including the Black-and-white Warbler breed in the area. The Ramona Beach woods are the only place where both the Red-headed and Red-bellied Woodpeckers were present.

Reptiles and Amphibians: This is one of the two areas where the red-bellied snake was present.

General Ecological Importance: This is a very diverse area with many habitats present in a limited geographical area. The marshes are extremely important habitats and the upland areas contain typical vertebrates. This is the area where the woodland composition changes from the type typical of south shore woodlands. The tract is heavily used by migrating birds as a resting and feeding area.

Habitat Importance Rating: 1.0-1.5

Ramona Beach Woods and Marshes (Continued)

Recommendations and Comments: 1) The area is heavily developed along the shoreline for camp colonies. These developments should not infringe on nearby areas, such as the wetlands. 2) The east end of Sage Creek Drive should never be connected to the west-southwest end of Ramonal Beach Drive. Such a connection would seriously affect Sage Creek Marsh East and would affect other areas by increased traffic and development. 3) Shoreline alteration is very prevalent in the area and further expansion of this questionable practice should be carefully considered.

Grindstone Creek-Selkirk-Salmon River Area

Location: Richland Town; north of the north end of Ramona Beach Drive; west of N.Y. Route 3; south of the north shore of Salmon River.

Ownership: Private and public.

Habitat: Areas south of Grindstone Creek and its marshes are mainly shrublands with some young woods sand dunes. The tract between Grindstone Creek and the Salmon River includes Selkirk State Park. This area consists of large woodlands, much of which has been replanted with conifers forming plantations of several different species. Such constituents make this area very different from all other habitats of the Coastal Zone. The Salmon River contains extensive marshes bordered by woodlands and shrublands.

Present Use: The shoreline is heavily developed for camp colonies and a private trailer park is present along the south shore of Grindstone Creek. Most of the remainder of the area consists of Selkirk Shores State Park. The fringes of the Salmon River have a variety of recreational developments.

Life Form Importance: Vegetation: From this area northward, the lake shore of the Coastal Zone consists of primary sand dunes, a very unique and fragile habitat.

Mammals: A large number of whitetail deer and striped skunks were observed in the area along with fox, raccoon, opossum, beaver and muskrats. The smaller field and woodland species can also be found here.

Birds: The mouth of Grindstone Creek is an important nesting, resting and feeding area for waterfowl and marshbirds. An Osprey summered in the area, but it is unlikely that this species will nest in the Coastal Zone. A variety of typical breeders, such as the Yellow Warbler, frequent this area The only nesting area for the Grasshopper Sparrow found during the study was south of the Chedmardo campground.

Grindstone Creek-Selkirk-Salmon River Area (Continued)

Life Form Importance:

Birds (continued): The wet shrublands contained numbers of American Woodcock and Willow Flycatchers. A variety of herons, including Great Egret, use the marsh area for feeding. The state park has an interesting variety of breeding species of northern affinities due to the conifer plantations. Among the species not noted elsewhere in the Coastal Zone were the Golden-crowned Kinglet and Pine Warbler. A pair of Pine Warblers present in the "Pine Grove" at Selkirk are the only members of that species breeding in this part of central New York.

Reptiles and Amphibians: This is the only area where the grey treefrog was positively identified.

Fish: The Salmon River has the highest number of species of any area studied, with 27 species in total, including the longnose dace and 14 game species. The highest per day fyke net totals (31 individuals) occurred here. Grindstone Creek ranked fourth in the number of different species, with 19 species, including 9 sport fish. It was also the only area where American eels were taken. The data on coho salmon from this stream suggests that it is an important spawning ground for this species.

General Ecological Importance:

The area south of the park is a transitional area between habitats typical of south shore areas and that of the northeast shore. A stabilized old sand dune, located just south of the Chedmardo camp grounds, is only one of the interesting variety of habitats present. The conifer plantations of the state park attract a number of breeding birds of more northern affinities generally not found elsewhere in the Coastal Zone.

Habitat Importance Rating:

1.0-2.0

Recommendations and Comments:

1) Grindstone Creek Marsh should be protected from encroachment by nearby recreational development. 2) Extensive shoreline development reduces the habitat quality by excessive disturbance and destruction of vegetation. 3) The Chedmardo camp ground should not expand to the south as it will encroach upon a unique relatively undisturbed habitat; the stabilized secondary sand dune. 4) Some pesticide use was noted around developed areas, which should be limited as much of the spraying appeared to be for comfort only. 5) The "Pine Grove" at Selkirk Shores State must be rigorously protected from any practice that could affect the Pine Warblers nesting there. Recent tree cutting here is totally unreasonable and must be stopped.

Deer Creek Marsh Area

Location: Richland Town; to include Deer Creek Marsh and the woodlands and shrublands along its fringes; north of Selkirk Light Road; west of Route 3; south of Rainbow Shores Road.

Ownership: Private.

Habitat: The extensive Deer Creek Wetland Area dominates this sector. Along the eastern and northern fringe of the marsh is a woodland, and the lake shore is fringed by strips of sand dunes. A great variety of habitats occur in this area, including a bog-like area.

Present Use: The majority of the area is at present relatively undisturbed, however, the northwest and southwest fringes are being developed in a way that could seriously affect the entire area. Large-scale recreational developments are being constructed and in the southwest sector, the high dunes are being destroyed by irresponsible sand mining operations. Increasing human use associated with developments is destroying vegetation and destabilizing the dune areas. This development threatens to seriously affect the entire area and may destroy this area's ecological balance if not immediately restricted.

Vulnerability: Extremely high.

Life Form Importance:

Vegetation: The woods that surround all sides of Deer Creek Marsh form an important buffer zone, however, the woods on the north and south sides are being extensively developed for recreational purposes.

Mammals: Almost every mammal found within the Coastal Zone can be found in the Deer Creek Marsh area. This area is particularly important to larger mammals such as the whitetail deer, beaver, muskrats, fox, mink and weasels.

Birds: This is the most important waterfowl and marshbird breeding and feeding area in the Coastal Zone. The numbers of individuals of those species present in the area are far higher than any other lake shore marsh. This is one of two areas within the Coastal Zone where the Bald Eagle could possible re-establish as a nesting species. Marsh Hawk was present in the area, but no breeding was proven. A Green Heron roost is located in the marsh. If the marsh and fringe areas are treated as a unit, the diversity of species breeding in the area is very high. Large numbers of swallows and blackbirds use the area for nesting, resting, roosting and feeding. The Black Tern colony is the largest nesting concentration of this species in the Coastal Zone and only one of two colonies present. I feel that the population levels of marsh nesting species in the entire Coastal Zone are closely tied to this area's populations. It is impossible to overemphasize the importance of the area to nesting marshbirds and waterfowl and other aspects of bird communities.

Deer Creek Marsh Area (Continued)

Life Form Importance:	Reptiles and Amphibians: The large size of this wetland and the many diverse habitats found here are unique in the study area and support a considerable variety of reptiles and amphibians. The bog-like area is capable of supporting populations of four-toed salamanders and bog turtle. Fish: Some spawning of several fish species occurs in the area.
General Ecological Importance:	Any comment on the importance of this area is at best an understatement. This huge area of diverse habitat is probably very important to the vertebrate populations in the eastern section of the Coastal Zone. The ecological diversity makes this the most outstanding area studied. Nowhere else in the Coastal Zone is there such a little disturbed and highly productive area of habitat. These factors increase the value of the ecosystem as a unique and valuable habitat area. Such areas provide habitat for a number of species which are intolerant of disturbances, and are important in maintaining population levels of specialized species requiring large territories.
Habitat Importance Rating:	0.0
Recommendations and Comments:	1) All acitivities which threaten to disrupt this critical habitat must be prohibited, including: a) all sand mining, which is threatening to destroy the unique dune systems and affect other areas by altering water levels, must be prohibited; b) destruction and alteration of buffer zones such as woodlands should be restricted pending development of a comprehensive land use plan for the entire area; c) consideration should be given to limiting some types of public access to sections of the area which may be damaged by excessive use. 2) Immediate action is required to obtain this area and place it under public domain. This must be done immediately by whatever legal methods required. It must be done as quickly as possible to prevent rapidly escalating destruction of the area. 3) Further in depth analysis of this unique ecosystem should be conducted in the future to provide further data for use in a comprehensive land use plan.

South Pond Wetland Area

Location: Sandy Creek Town; to include the area north of Rainbow Shores Road; west of Tryon Road; south of Ouderkirk Road.

Ownership: Private.

Habitat: Includes a variety of wetland types including shrubswamp, bog and marsh with woodlands on the fringes. The tract of bog-like areas consists of a bog which has been recently flooded.

Present Use: The fringes of Lake Ontario and South Pond are heavily developed for camp colonies and the western interior has been disturbed by roads. Most other sections are less disturbed but it appears that they have been affected by alterations in water levels.

Vulnerability: High.

Life Form Importance:

Mammals: Beaver and muskrats are found in the pond area and field species such as whitetail deer, shorttail weasel and meadow vole can be found in the surrounding farm fields.

Birds: This is the only definite breeding area for Marsh Hawk in the Coastal Zone and perhaps the only site within a five county area in central New York. A pair raised three young at this site which should be fully protected to prevent total expiration of the species from the Coastal Zone. Other wetland nesting species, including Alder Flycatcher, are uncommon species, and occur in numbers in the area.

Reptiles and Amphibians: This is one of a very few Coastal Zone areas where bog turtle could be found.

Fish: This area had a medium-high number of species and exhibited the highest gill net per day total of individuals at 274.

General Ecological Importance: The area is a unique wetland with a bog-like habitat present. Access to the area is limited by dense vegetation and wet conditions in interior sections, which provides seclusion necessary to a number of species. This is probably an important reason why the Marsh Hawk nested here. A number of diverse vegetational types are found in close proximity to this area.

Habitat Importance Rating: 1.0

East Fringe of North Pond

Location:	Sany Creek Town; north of County Route 15; east of the east shore of North Pond; south of the Jefferson County line.
Ownership:	Private.
Habitat:	A mixture of habitats including woodlands, shrublands and developed areas such as camp colonies, marinas and a golf course. A number of small marshes are present in various embayments along the east shore of North Pond.
Present Use:	Much of the area is abandoned farmland in various successional stages, which is being developed for a variety of recreational uses. Most of the areas are highly disturbed with the woodlands the least disturbed habitat.
Vulnerability:	Medium to high.
Life Form Importance:	Mammals: Beaver and muskrat can be found in the pond area and in Blind Creek. Smaller mammals such as redback vole, woodland jumping mouse and white-footed mouse can be found in the woodlands in the vicinity of Blind Creek. Birds: The major epicenter for nesting Purple Finch in the study area occurs in this sector with the species using evergreen plantations and dune evergreens. A pair of Broad-winged Hawks are apparently nesting in this sector. The woodlands contain a fair variety of breeding species such as American Redstart. The many small marshes in the area are of reduced value to breeding birds due to high disturbance levels and probably will remain so as this situation appears unlikely to change.
General Ecological Importance:	This sector consists of a variety of disjunct habitats interrupted by developed areas. Only the woodlands are fairly undisturbed, except along the fringes, and provide open space amidst more developed areas.
Habitat Importance Rating:	2.5
Recommendations and Comments:	1) The extant woodlands should be maintained as habitat units. 2) The marshes present should be preserved and where possible their value enhanced by a variety of methods.

South Pond Wetland Area (Continued)

Recommendations and Comments:

1) The area should be protected from any further dissection by road construction which may further alter the water levels. 2) Fringe areas should be disturbed as little as possible so that they may provide an adequate buffer zone for interior areas. 3) Existing dunes should be protected from ill-advised alteration, and present dune damage should be corrected. Destabilized areas should be planted with appropriate native species to stabilize them. 4) Water levels should be maintained and protected from man-made fluctuations which may severely alter vegetation. 5) Long term protection for the largest part of the area possible should be explored. 6) Extensive further studies should be conducted to provide data to aid in the formulation of a land use plan for the area.

Tryon Road Fringe

Location:	Sandy Creek Town; including the area south of Oudenkirk Road, west of Tryon Road, north of Rainbow Shores Road and east of the South Pond wetlands area.
Ownership:	Private.
Habitat:	A wooded fringe along the south and east of South Pond, mixed with farmlands and recreational areas to the north.
Present Use:	The wooded areas are fairly undisturbed except along camp roadsides. There is an extensive strip of camps along the fringe of South Pond and some active farming occurs in the northeastern sector.
Vulnerability:	Medium.
Life Form Importance:	Birds: The area has an average diversity and density of a variety of species.
General Ecological Importance:	This area provides a buffer zone for the South Pond wetlands area and is of importance as open space in a section under heavy developmental pressure.
Habitat Importance Rating:	2.5
Recommendations and Comments:	1) The southern sections have been well managed under the stewardship of the present owner and hopefully will remain so. 2) Most sections are being developed and such development will hopefully be conducted in a manner that will minimize habitat damage.

North Pond Sand Spits

Location: Sandy Creek Town; to include the sand spit barrier beach areas along the west side of North Pond, north of County Route 15 as well as Carl Island in North Pond.

Ownership: Private.

Habitat: A series of barrier island type sand dune areas with associated habitats. Parts of the spits are long stabilized and covered with forests, while other parts are unstable and sparsely vegetated. These sand dominated ecosystems are unique within upstate New York.

Present Use: The entire area is being heavily developed for recreational uses such as summer residences, and much human use occurs. The recreational use levels are perhaps the highest in the Coastal Zone.

Vulnerability: Very high.

Life Form Importance:

Vegetation: The sand dunes represent an ecosystem that is unique in upstate New York and the Lake Ontario basin. Species such as beach grass, beach wormwood, sea-rocket and beach pea are endemic to sand dunes, and thus found in very few other areas of New York State. Succession on sand dunes is a very slow process that is vulnerable to any disturbances. Summer residences and heavy human traffic on primary sand dunes has already caused severe blowouts on the dune spits.

Mammals: Grassy areas of the dunes support a good population of meadow jumping mouse, and wooded areas contain a high population of chipmunks and gray squirrel.

Birds: These sand dune areas once provided habitats for unique nesting species including Piping Plover and Common Tern. The former has been expirated and the latter has been reduced to a small, unstable relict colony on Carl Island. These effects are due to the increasing heavy human use of the area. The area is an outstanding locale for concentrations of migrant birds, particularly shorebirds, passerines and hawks. Large concentrations of gulls and terns congregate around the inlet area from April to early December. This area has probably been the site of the occurrence of more accidental wanderers than any other area in the Coastal Zone, except perhaps Derby Hill. The North Pond spits area is very important to a variety of birds particularly from May to November.

North Pond Sand Spits (Continued)

General Ecological Importance: This is a vital, unique habitat not only to Oswego County, but to the entire Lake Ontario basin. The sand dunes along the east shore are of limited extent and are a priceless resource, harboring a number of unique plants and animals. Such areas are extremely sensitive to disturbances and much of this area has already been disrupted. It is extremely important to preserve this unique area to the greatest degree possible. The evolution of these areas requires several thousand years, while at present rates, their thoughtless degradation and eventual destruction may require less than a century.

Habitat Importance Rating: 0.0-1.0

Recommendations and Comments: 1) All further development of camps on dune areas must be restricted. These areas are extremely fragile and such disruptions degrade habitat quality and threaten the integrity of the dunes. 2) All use of vehicles of any type on dunes and beaches must be prohibited as these activities are extremely destructive. 3) The area of North Pond inlet includes the temporary islands, the inlet and the northern half mile of the south spit should be set aside as a natural preserve. This area is relatively undisturbed and of great importance to the ecological stability of the area. 4) As much additional area as possible should be protected from development and all disruptive practices prohibited. 5) Any alteration of the dynamics of the barrier island geology by activities such as shoreline protective structures should be prohibited.

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