Guidelines for Environmental Management

Bulletin No. 6

at
Rice Creek Field Station
State University of New York
College at Oswego

Rice Creek Field Station

Rice Creek Field Station is an instructional and research unit of the State University of New York College at Oswego, providing opportunities for biological and earth science field study throughout the year. Located one and one half miles south of the main campus and Lake Ontario, the field station building contains two lab/classrooms, a lecture room, collection storage and an exhibit area. The labs are equipped for work in both terrestrial and aquatic field biology. Small boats are available for use on ponds and streams, as well as a Boston Whaler for use on Lake Ontario. The field station is surrounded by 400 acres of varied habitats, including open fields, mature forests, 26 acre Rice Creek pond and land in several stages of succession. One of the station's educational features is the area where natural history displays are exhibited. The highlight of this area is an indoor viewing gallery which provides a unique overview of the aquatic/wetland habitats throughout the year. School children visit the station and many individuals and groups use the area for hiking and cross country skiing.

Field Station Staff

Dr. Donald D. Cox, *Director*
Diann Jackson, *Assistant Director*
Nancy Barney, *Caretaker*
Vivian Golding, *Secretary*

Guidelines for Environmental Management at Rice Creek Field Station

Bulletin No. 6, 1988

/Rice Creek Biological Field Station Bulletin/

This report was prepared by John A. Weeks

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9/88

Editor
Donald D. Cox

INTRODUCTION

Planning for Rice Creek Field Station began in 1962 and the station began operating in 1966. At that time much of the land that comprised field station grounds was in hayfields and very young evergreen plantations. Since then the station has gradually become an island of natural growth surrounded by expanding urbanization from the city of Oswego. Plant growth and succession has been rapid with the result that the evergreen plantations have become dense stands and much of the open space has given way to thickets of shrubs and young trees.

By 1984, it had become apparent that a change in management plans was necessary in order to maintain a maximum range of habitats with the accompanying variety of plant and animal species. In order to do this it would be necessary to make a detailed analysis of the current status of field station environments. With the support of a grant from the Institute of Museum Services, John Weeks was employed to make this analysis. John was responsible for the original planning of Rice Creek Field Station and has had extensive experience in conservation, land management and nature education.

The field station provides research, educational, and recreational facilities to the college and the community. The aim of this report is to provide guidelines for maximum long term multipurpose use with minimum adverse affects on field station environments.

Donald D. Cox, Director
Rice Creek Field Station

GUIDELINES FOR ENVIRONMENTAL MANAGEMENT AT RICE CREEK FIELD STATION
Bulletin #6

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AND ADJACENT COLLEGE HOLDINGS

A PLAN FOR LAND MANAGEMENT AT RICE CREEK FIELD STATION

INTRODUCTION

The funding for the development of this report was provided by a Conservation Project Grant from the Institute of Museum Services a unit of the United State Department of Health and Human Services. It is the natural spinoff from an assessment of Rice Creek Field Station by Peter Bristol of the Holden Arboretum, Mentor, Ohio, completed under a Museum Assessment Program Grant. Field work for the present report was completed during the winter of 1986-87 and the spring and summer of 1987. Details of survey and analysis are included in the body of the report and in the appendix.

A CULTURAL HISTORY OF RICE CREEK DEVELOPMENT

Oswego Township was first settled in 1790 by the family of Asa Rice who located his first temporary dwelling near the mouth of Rice Creek within 100 yards of the Lake Ontario shoreline. At that time the acreage of what is now Rice Creek Field Station, was completely covered with forests possibly similar to the mature woodlands in Field 3.

The land along Rice Creek was rapidly cleared, however, for agricultural use, and it is reasonable to suppose that Field Station land has been in continuous use for agriculture from the second decade of the 19th century until 1960, a period of 140 years or more.

In 1961 the college began to acquire the land through its private non-profit Faculty-Student Association, (Later Development Foundation), as a part of a major campus expansion program initiated by President Foster S. Brown.

The Dorwyn Hilton Farm purchased in 1961 makes up the nucleus of the field station property (Fields 9-18). Other acquisitions (Fields 1-5) were also acquired prior to the establishment of the field station.

Acquisitions from Daniel Conway, (Fields 6-8) and Louis DeAmbra (Fields 20 and 21 plus flowage easements) were acquired to provide a damsite for the pond, to provide a buffer zone around the future impoundments, and to secure flowage and floodtide easements. Fields 6, 7 and 8 were originally intended for trail development and for biological field studies. A summary of land acquisitions is included in the appendix.

THE BIOLOGICAL FIELD STATION CONCEPT

By 1960 it became apparent that the specialities of the staff of the growing department of biology at Oswego made the development of a field station for teaching and research a sensible plan. Staff members who provided input and administrative support included, Dr. Carlita (Georgia) Snygg (Zoology, Field Biology), Dr. Donald D. Cox (Palynology, Botany), Dr. Leland Marsh (Botany, Wetlands Ecology) and Prof. John A. Weeks (Zoology, Ecology, Conservation).

Because of experience with wildlife pond development, land management and conservation, John Weeks was chosen to serve as Acting Director of the field station during the early developmental stages.

Prior to 1962, it had been the preference of the Biology Department staff to develop the field station adjacent to Mud Pond, a glacial kettlehole, 3½ miles south of the present field station. In addition to 150 acres of water surface, that property offered shoreline bogs and other wetland features and about 40 acres of upland.

The college administration on comparing the two sites, opted for the Rice Creek site, agreeing to acquire additional needed acreage. Pond control structures and buildings were constructed in 1965 and 1966.

The first full time Director was Dr. George R. Maxwell II. He was appointed in 1966 to replace Mr. Weeks who had left the employment of the college. Dr. Maxwell continued to direct the field station until 1979 when he was replaced by Dr. J. Alden Lackey, who had previously served as resident professor at the field station. Dr. Lackey served until 1981. The present Director, Dr. Donald D. Cox, was appointed in 1981.

Dr. Ronald A. Engel served as Associate Director for research from 1967-75. The position of Assistant Director (technical specialist) was first filled in 1970 by J. Eddy Demers. He was replaced by Robert I. Shearer who served until 1981. Mr. Shearer was replaced by Mr. Shelby Marshall who served as Assistant Director until 1982. Mr. Marshall was followed by Gerald A. Smith who served as Acting Assistant Director until 1982 when Diann C. Jackson was appointed.

LAND USE HISTORY

With the exception of 40 acres of woodland and unworkable ground, all of the approximately 250 acres included in this habitat analysis and management report, were in agricultural use until their acquisition by the SUNY Development Corporation between 1960 and 1965. Fruit farming (orchard), dairy farming (crops, pasture and hay), stock farming (pasture and hay) were the principle uses. The "Land Use August, 1962" map page shows that 168 acres were still in herbaceous cover. Nearly 30 acres of that herbaceous land was reforested previous to August, 1965 with seedling pines, spruce and larch. In 1965 an earth dam with a drop inlet control structure and a stepped spillway (fish ladder) were installed to create a shallow impoundment of approximately 22.8 acres.

The area impounded had been low flat pasture through which Rice Creek cut a meandering course. The major portion of the impoundment was on land acquired from Dorwyn Hilton, a dairy farmer, the dam and spillway site was acquired from Daniel Conway who had used it for horse pasture. Ground was broken for the education building in May of 1966. The building was completed and ready for occupancy by late 1966.

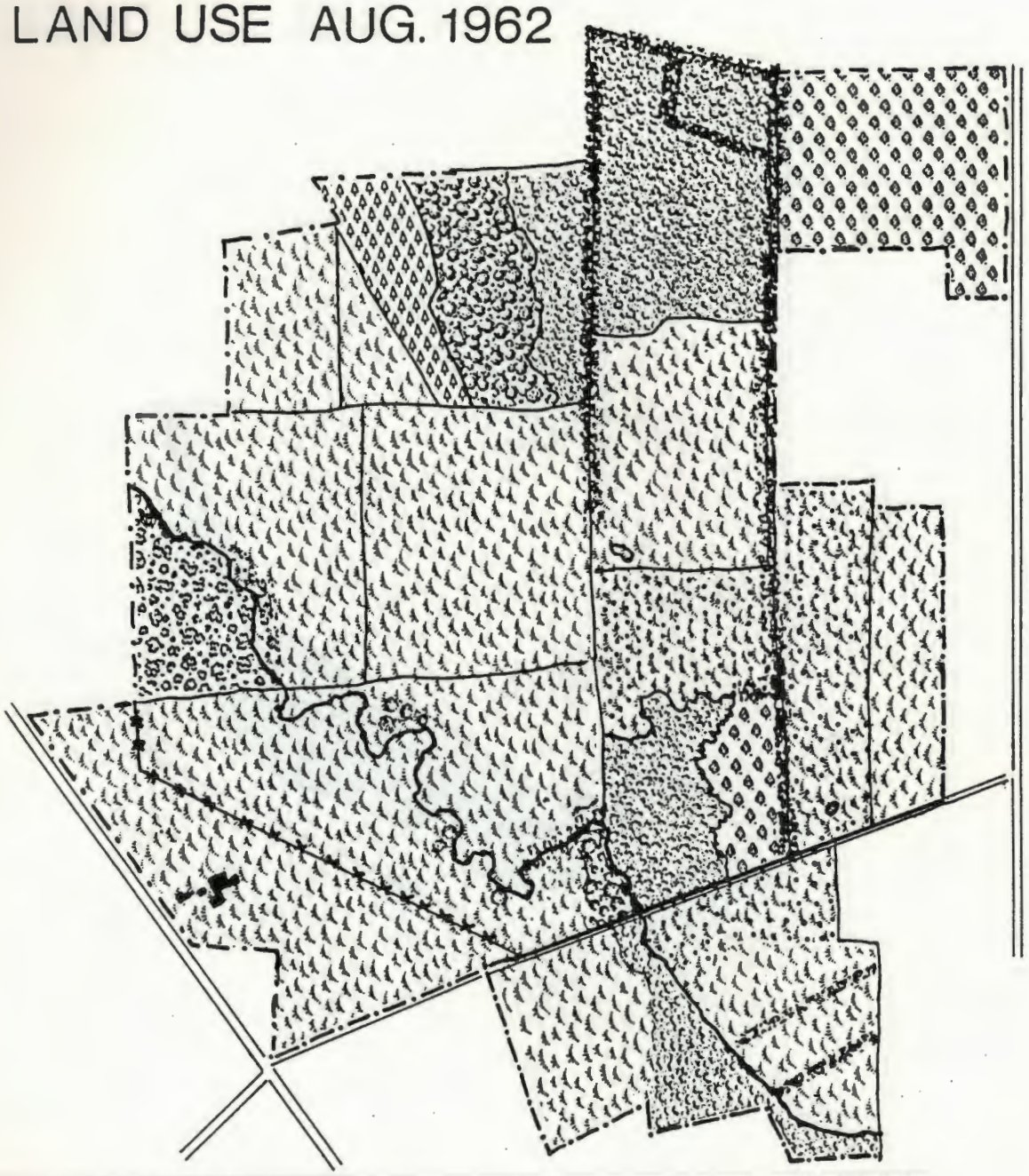
Since that time, with the exception of trail development, very little management work was accomplished on the fields until 1982 when an Oswego County Conservation Corps, (OCCC), crew removed brush and restored meadowland in a portion of Field 8. A small amount of excavation was completed in the impoundment adjacent to the building to facilitate the launching of the research boats.

Maps 2-4 show the changes of ground cover which have occurred during a 24 year period from August, 1962 to August, 1986.

A careful comparison of these maps will show that, except for Fields 7, 8 and 9, and the pond, the fields are now dominated by shrubby fields, pioneer woodlands and plantations. Chart 1 provides a field by field analysis of land use and habitat changes.

In the present analysis, fields have been defined and numbered. The field boundaries are based on former land use. Most field margins are marked by fence rows, hedgerows or distinct changes in the plant cover type. In general, the fields agree with the

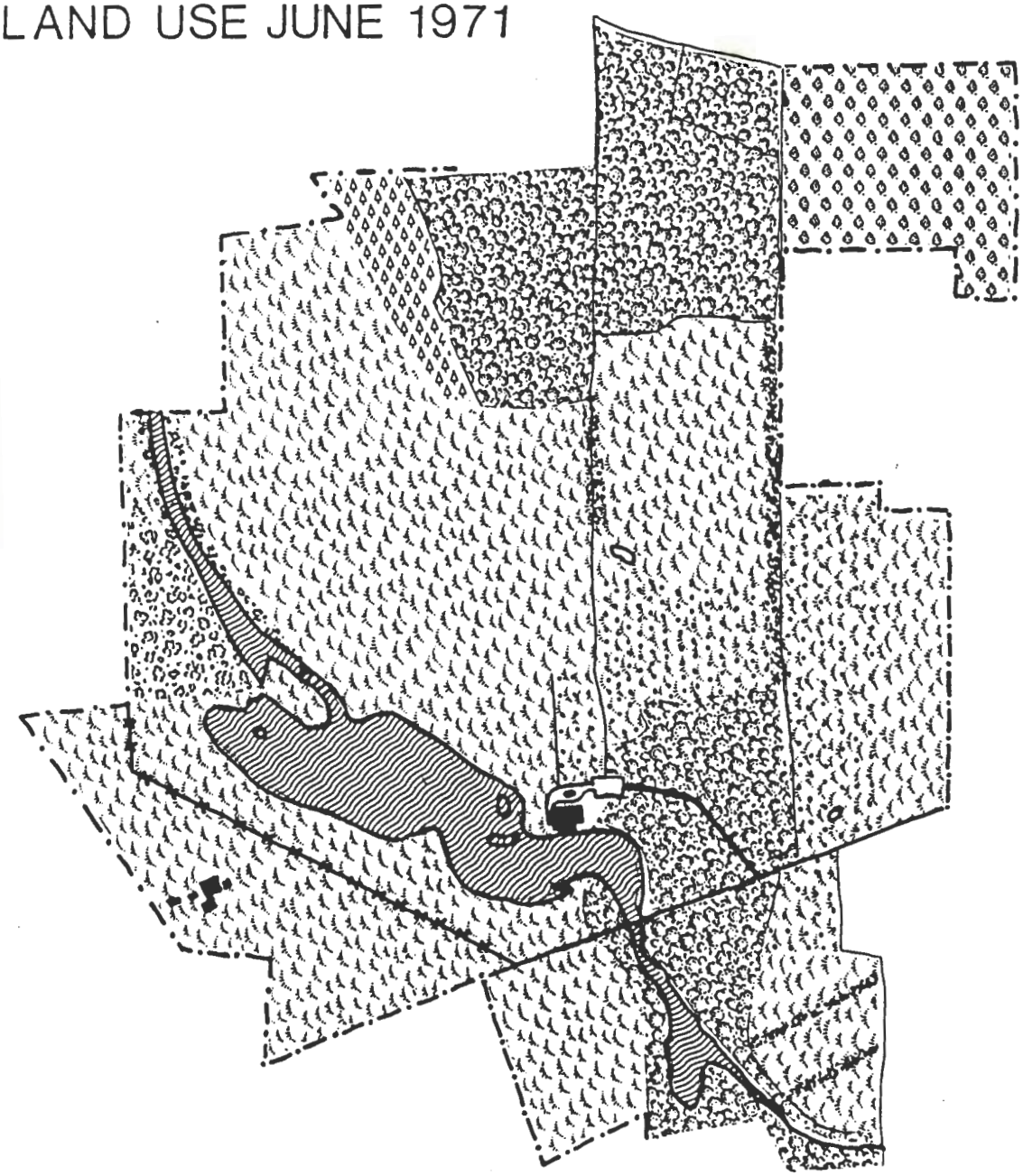
MAP 2
RICE CREEK FIELD STATION
LAND USE AUG. 1962



LEGEND

- GRASSLAND
- MATURE WOODLAND
- PIONEER WOODLAND
- SHRUBLAND
- PLANTATION
- ORCHARD
- HEDGEROW
- REFORESTED CROPLAND
- MARSHLAND
- SWAMPLAND
- FENCE
- S.U.C.O. BOUNDARY
- BUILDINGS
- WATER

MAP 3
RICE CREEK FIELD STATION
LAND USE JUNE 1971



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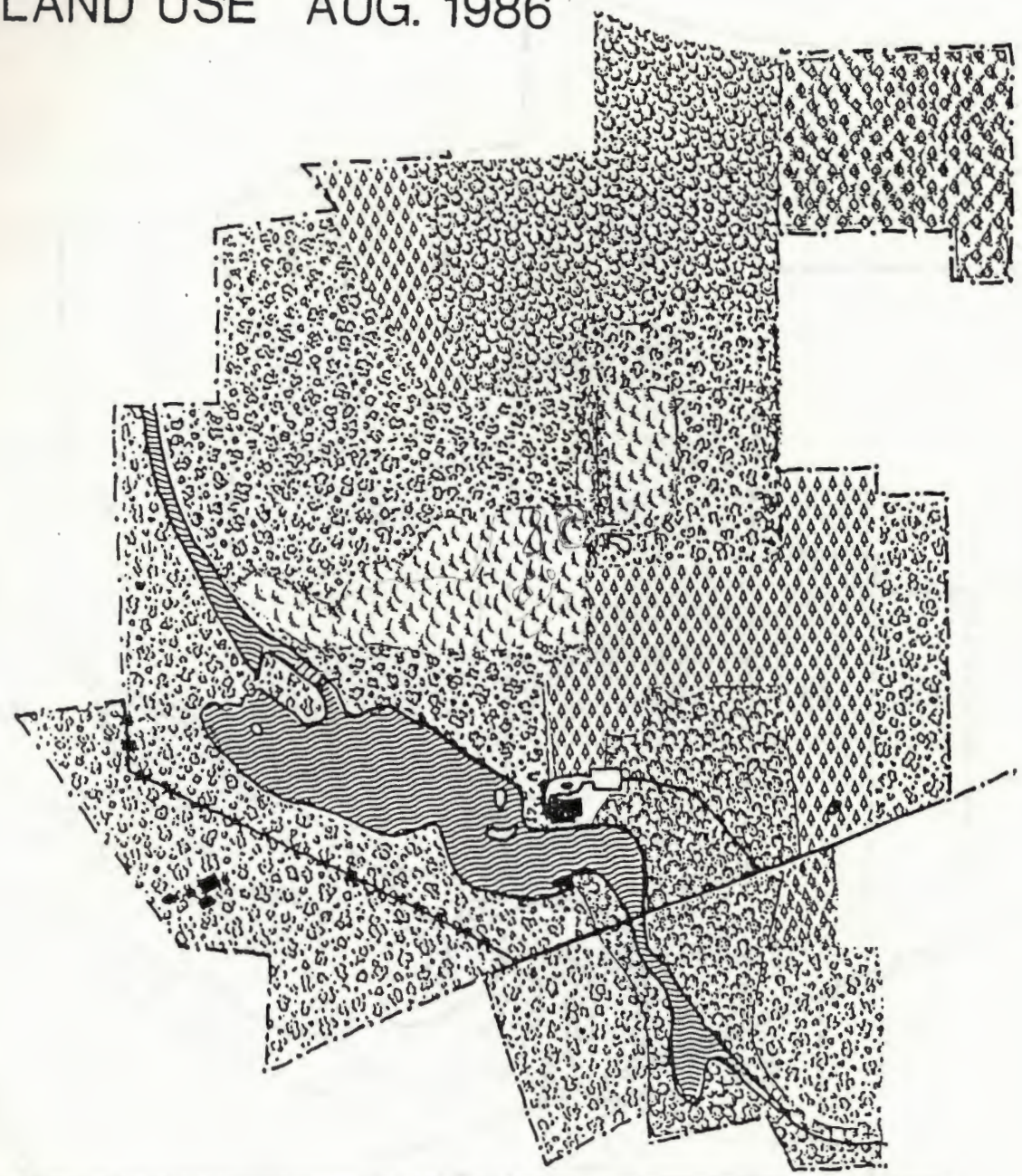
- FENCE
- S.U.C.O. BOUNDARY
- BUILDINGS
- WATER

MAP 4
RICE CREEK FIELD STATION
LAND USE AUG. 1986



LEGEND

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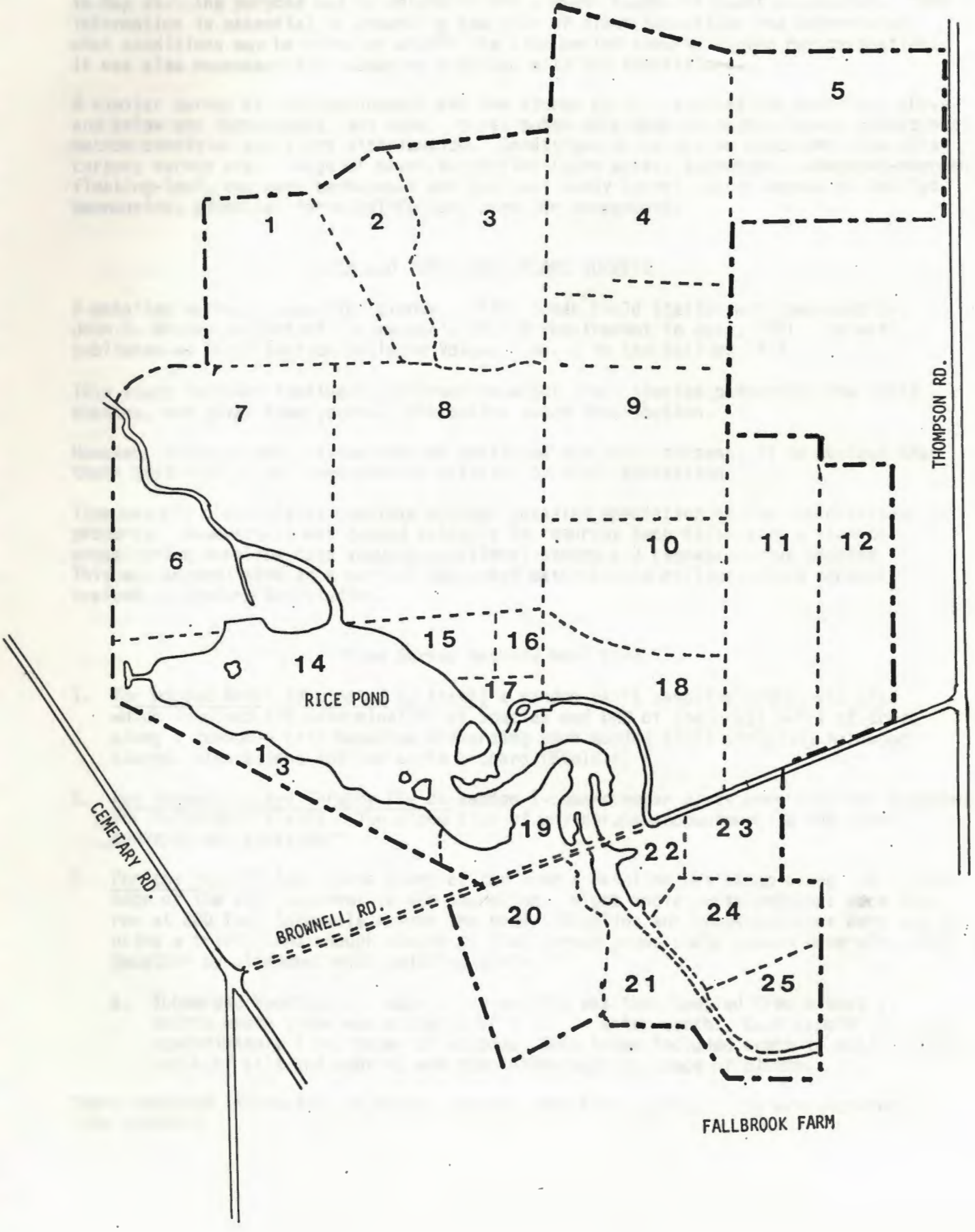
- SWAMPLAND
- FENCE
- S.U.C.O. BOUNDARY
- BUILDINGS
- WATER

MAP 5
RICE CREEK FIELD STATION



breakdown used by John Hickey (1974) but are relabeled to meet the needs of this report. Map #5, page 6 shows the location, extent and acreage of these fields. Surveys of cover types and plant associations were made in each of the fields shown in Map #5. The purpose was to determine the present stages of plant succession. This information is essential in assessing the rate of plant succession and determining what conditions may be expected within the time period covered by the recommendations. It was also necessary for assessing expected wildlife populations.

A similar survey of the impoundment and the stream as it traverses the property, above and below the impoundment, was made. Here, notes were made of depths, cover conditions, bottom condition and plant distribution. Conditions which can be described from this cursory survey are: stage of plant succession (open water, submerged, submerged-emergent, floating-leaf, emergent herbaceous and emergent woody cover); water depths at habitat boundaries; potential for wildlife use; need for management.

DETAILED "BASELINE" PLANT SURVEYS

A detailed survey of vascular plants of Rice Creek Field Station was completed by John T. Hickey as part of his master's degree requirement in June, 1971. It was published as Field Station Bulletin Volume 1 No. 2 in the fall of 1974.

This study includes invaluable information about plant species present at the field station, and gives some general information about distribution.

However, although most of the species mentioned are still present, it is obvious that their distribution has been greatly affected by plant succession.

Time was not available to complete another detailed speciation of the field station property. However, it was deemed valuable to resurvey each field with a view to establishing baseline data about successional stages and representative species. This was accomplished as a part of the grant match by the college, using students trained to preform the studies.

Three Survey Methods Were Used

1. For Wooded Areas (dominated by trees) a random-pairs sampling method was used which involved the determination of species and DBH of (nearest) pairs of trees along a randomly cast baseline traversing each wooded field including hardwood stands, plantations and the apple orchard (Field 5).*

2. For Herbaceous and Shrubby Fields random 1-square-meter plots were cast and surveyed for herbaceous plants. The clone size of any shrubs encountered in the plots surveyed was assessed.*

3. For the Pond To facilitate study of the pond a baseline was setup along the eastern edge of the pond adjacent to the shoreline. Right angle cross-sections were then run at 200 foot intervals across the pond. Baseline and cross-sections were set up using a transit and enough stakes so that survey crews could always determine their location by alignment with existing stakes.

   a. Submerged Vegetation - each cross-section was then sampled from a boat at points where there was a change of 1 ft. in water depth. Each sample included approximately 1 sq. meter of bottom. Data taken included depth to solid bottom, depth of silt and debris, and speciation and abundance of plants.

*more detailed information on survey methods, and field survey notes are included in the appendix.

b. Emergent Vegetation - each 200 foot cross-section of the baseline, was traversed on foot where it crossed the zones of herbaceous and woody emergents. Additional cruises were made at the mid-point of each 200 foot baseline (using tape and compass halfway between these cross-sections), providing sample points 100 foot intervals across all beds of emergents.*

DEVELOPMENT OF RICE POND AND WETLANDS

Although permanent impoundment of Rice Pond occurred in 1966, after completion of the dam and spillway, the flow zone was subject to periodic seasonal flooding over the years, probably dating back to before the time of the settlement by Europeans.

THE IMPOUNDMENT CONDITION

Runoff from the Rice Creek watershed, was probably considerably less per acre before the clearing of the land for agricultural use. Rice Creek arises in the hills and wetlands about 2 miles south of Lake Neatahwanta at Fulton and travels 8.2 miles before it enters the Rice Pond area. Throughout this length, the watershed averages about 2.5 miles in width. Spread throughout this 20 square mile of watershed, are 40-50 road culverts through which water must flow before it can reach the creek. Many of these culverts are restrictive, tending to "cut the top" off flood flow.

During a five year period of observation (1960-65) flooding occurred every year. The duration varied from about two days to two weeks, and the area flooded from about 5 acres to 15 acres.

This long history of periodic spring flooding had three results:

1. The deposition of a thick layer of silt over the flood zone. (With the construction of pond at fallbrook, late in the last century, siltation rates were lessened.)

2. The relocation or restriction of certain non-aquatic mammals from the flood zone.

3. The provision of a substrate for seeds and other reproductive structures of aquatic plants carried in by the flood waters of Rice Creek.

PLANT DISTRIBUTION BEFORE IMPOUNDMENT

Although 90% of the future flood zone was in upland plant cover, (see Appendix for a summary list), there was in the streambed, especially in a small streamside wetland near the future damsite, a "seed bed" nucleus of aquatic plants including most of the species which now inhabit the flood zone. A list of key species found in the streambed, is included in the Appendix.

WILDLIFE DISTRIBUTION BEFORE IMPOUNDMENT

Through numerous independent study projects, undertaken by students between 1960 and 1965, a fairly complete index of species present in the flood zone was developed.

Much of the data from student projects is no longer available, but a summary list by J. Weeks, gives a good indication of resident or nesting species of birds, mammals and fish. It serves mainly to show the changes wrought by flooding and by over two decades of subsequent plant succession.

*Detailed information is included in the Appendix.

DETAILS OF FIRST IMPOUNDMENT

Creation of the earth dike, the drop inlet water control structure and the stepped spillway were intended to create a potential flood zone at the top of the drop inlet (at 274' above mean sea level) of 26.5 acres.

As a result of construction changes or of erosion since construction, the fish ladder currently holds the normal water level at approximately 6" below the top of the drop inlet (273.5' ASL). Thus, the actual area flooded at normal water level is about 994,000 sq. ft. or (22.8 acres).

The pond was first flooded in March of 1966. Although the drop inlet structure allows for drawdown, the pond has remained full, except for drawdown during the summer of 1972 to allow for some dredging. The water level at that time stood at 274' ASL and the flood zone was believed to be 26.5 acres, (about 4 acres more than at present).

CHANGES DUE TO IMPOUNDMENT

Animal Populations

The immediate effect of impoundment was to displace mammals normally inimicable to wetland habitat. Woodchuck, meadow vole, jumping mouse, white-footed mouse, cottontail, long-tailed weasel, skunk, and tree squirrels were immediately deprived of over 16 acres of upland which they had previously occupied or used occasionally. In addition, those species of birds which normally nested in the shrubby weeds, and pasture grasses of the flood zone, such as ring-necked pheasant, meadowlark, bobolink, song sparrow, field sparrow, vesper sparrow, *indigo bunting, yellow throat, Henslow's sparrow* and grasshopper sparrow* would have been forced to relocate.

Of the snakes recorded from the flood zone, only the watersnake would have remained in the flood zone. Spotted and red-backed salamanders were found in the upper reaches of the flow zone before flooding. Two-lined salamanders which inhabited streamside areas above Brownell Road were probably not affected.

Plant Populations

Plants adjust to flooding more slowly than animals. For instance, some pasture grasses and many species of trees will persist for several years in shallow water. Certain shrubs will also survive several years of deeper water before dying. (Elm, alder, buckthorn and thornapple die rapidly in water deeper than 6" while silky cornel, black willow, red maple, pussy willow, basket willow will persist longer even in deeper water.)

The aquatic, submerged and emergent plants react even more slowly. Most of the streambed where the aquatics were found before flooding was now too deep for the emergent species. Cattail, burreed, lizardtail, arrowhead, arrow arum, bulrush, pickerelweed, reeds, sedges, and aquatic grasses reestablished themselves along the shoreline shallows. This required several years and it appears that even today, the zone of emergent herbaceous plants is expanding. Waterweed, coontail, water milfoil, pondweeds and duckweeds formerly quite restricted in extent could spread from their preflood sites in the streambed, because the post flooding water depth, were not excessive for them.

*No nests of these species were found even though the birds presence was recorded.

SHORELINE CHANGES ABOVE THE WATER LEVEL

Over 80% of the shoreline of the pond was in herbaceous cover immediately after flooding. Since the west shoreline was protected from grazing by a fence and all agricultural practices were abandoned on the east shoreline, plant succession took its course in these areas. Within 10 years of the flooding of Rice Pond, the shoreline developed a noticeable fringe of woody cover (silky and red osier dogwood, speckled alder, willow, silver and red maple, elm and ash).

At that time, these woody species were still interspersed with goldenrod, willow herb, Joe-pye-weed, New Engl. aster, blackberry, sedges, rushes and various grasses. Within 15 years of flooding the canopy of trees and shrubs had closed, gradually shading out the herbaceous species over all but a small portion of the shoreline.

Today, with the exception of two small sections of the west shoreline and a small portion of the shoreline adjacent to the building, the trees extend to the waterline and in some areas have even invaded the shallows.

POND HABITATS

The chart shows that the pond at normal waterlevel is approximately 22.8 acres. At that level, the pond averages between 2 and 2.5 feet in depth with a maximum depth of 7.5 feet near the dam.*

VEGETATION

Since the optimum depth for emergent vegetation is less than 1.5 feet, it is not surprising that the zones of herbaceous emergent cover are located between the shoreline and the 1.5' contour (5.5 acres).

Field analysis shows that an excellent intermix of plants exists in this emergent zone. The remainder of the pond is covered with submerged or submerged-emergent vegetation. A detailed list of emergent and submerged vegetation is included in the Appendix.

This combination of plants provides excellent cover for aquatic insects, fish, a amphibians, reptiles, birds and mammals. Of some 70 species of birds which have used the pond and its marshland fringes, during the period of this study, 30 species were present during the nesting season and at least 17 species are confirmed to have built nests, laid eggs and reared young.

WATER SUPPLY AND QUALITY

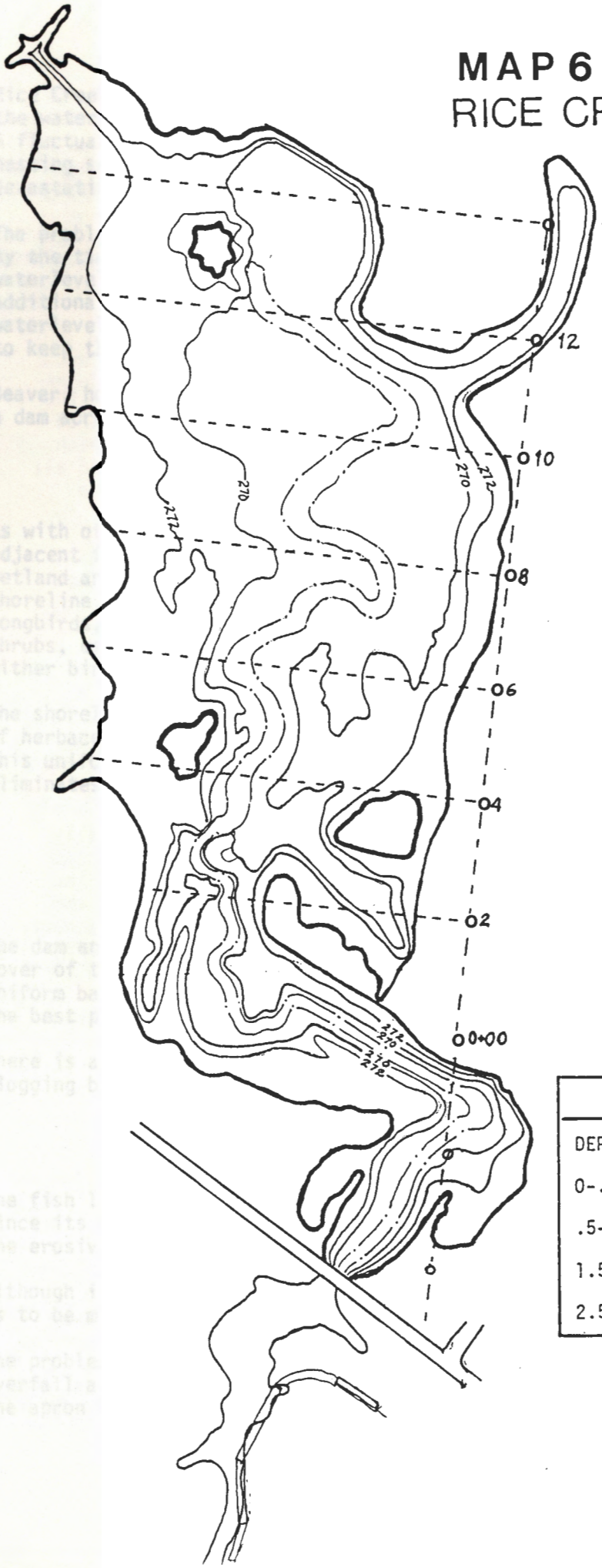
Shallow ponds, choked with vegetation, are extremely changeable environments for fish, insects, and other truly aquatic creatures. Potential problems include oxygen deficit, algae toxemia, nutrient lock, and waterlevel fluctuation.**

Of these problems, low oxygen levels and waterlevel fluctuation are commonest. Because Rice Pond has a large watershed with year around inflow and outflow it has a fairly short flush time. This makes it unlikely that widespread fish kills due to low oxygen or to toxemia will occur. It also reduces the danger of nutrients becoming locked in semi-soluable to non-soluable oxidates, a condition usually related to acid conditions and low oxygen levels.**

*Based on the Lewis-Dickerson Survey - 1964
**See Bibliography at the end of this section.

MAP 6
RICE CREEK FIELD STATION

MAP OF RICE POND
Showing Contours
and Survey Baseline



AREA/WATER DEPTH INCREMENTS			
DEPTH	AREA	DEPTH	AREA
0-.5'	3.7A	3.5-4.5	3.5A
.5-1.5'	5.2A	4.5-5.5	.1A
1.5-2.5'	3.9A	5.5-6.5	.5A
2.5-3.5'	4.9A	6.5-7.5+	.2A

0 200 400

Rice Creek is subject to waterlevel fluctuation during periods of extreme runoff in the watershed. High water levels cause more serious problems than low water levels. A fluctuation of 6-12" can be devastating to wetland nesting, especially early in the nesting season when emergent herbs have not attained full growth. It can also be devastating to mammals, especially muskrats which den at or near the waterlevel.

The problem is reduced to some extent by the large storage basin above normal waterlevel. By the time the waterlevel has risen 6" it has flooded 3.7 acres with an above normal waterlevel storage of 3,428,000 gallons. At one foot above normal waterlevel, 5.9 additional acres are flooded and the total storage is 8,242,660 gallons above normal waterlevel. This storage plus increased outflow capacity as the waterlevel rises tends to keep the fluctuation to 6" except for the most severe storms.

Beaver, however, can provide more serious fluctuations in the waterlevel by placing a dam across the outlet channel and stuffing the control box with sticks.

SHORELINE HABITAT

As with other types of habitats, wetlands are affected by the types of vegetation of adjacent fields. Although the best situation is for variety of fringe vegetation, wetland animal species tend to respond better to herbaceous shoreline than to woody shoreline. A number of ducks, rails and shorebirds as well as several species of songbirds, prefer herbaceous nest sites. A lesser number of wetland birds require shrubs, especially of the lower growing varieties. Very few wetland animal species, either birds, or mammals regularly use trees for nesting.

The shoreline of Rice Creek is rapidly being invaded by tree species. Very few areas of herbaceous or shrubby shoreline remain and most of that is being invaded by trees. This uniform cover of trees influences the quality of this environment, because it eliminates a number of important food and cover species.

CONTROL STRUCTURES AND MECHANICAL HABITATS

Dam and Drop Inlet

The dam and control box appear to be sound, but the dam is beginning to acquire a cover of trees. Tree Roots threaten the integrity of earth dams by disrupting the uniform barrier of the compacted earth. They also prevent proper mowing which provides the best protection against erosion and muskrat work.

There is a grating on the drop inlet which provides enough protection to prevent clogging by floating debris or by beaver activity.

Fish Ladder

The fish ladder is actually the key waterlevel control structure. Over the 23 years since its construction, it has undergone progressive undermining of the aprons by the erosive force of the outlet flow.

Although it is still functional, major renovations are necessary if its integrity is to be maintained.

The problem is at the north end of the structure where the end of the apron and the overfall are exposed and are gradually being undermined by erosion. If this continues, the apron may collapse or break, changing the Rice Pond waterlevel. This exposed end

needs to be properly protected with rip rap and grouting. This could undoubtedly be accomplished in July or August when the total outflow can be handled by the drop inlet control structure. At that time, dropping the waterlevel from 1' to 1½' should intercept the flow which normally goes over the fish ladder. Action could then be undertaken to eliminate the erosion channels under the apron and thus prevent further undermining of the structure. (See diagram for details and repair.)

If the fish ladder cannot be restored, the upper overfall which maintains the waterlevel, must be kept in repair or an alternative structure must be fashioned.

Snags and Loafing Areas

One of the factors that has made Rice Creek especially attractive to wildlife is the combination of dead snags (vertical tree trunks) and floating logs (horizontal tree trunks) that have been available in the pond since its construction. However, each winter these snags are weakened by decay and by ice erosion at the waterlevel and all but three of them have disappeared. It would be very beneficial if they could be replaced with similar structures.

Ospreys regularly visit the pond in migration often staying a week or more. The vertical snags seem to be important in attracting the ospreys. It is possible that a nesting platform might be successful in enticing a pair to stay.

TRENDS

It is to be expected that the zone of herbaceous emergents will increase due to shallowing of the pond by silt deposition and accumulation of organic debris. In addition, tree species such as willow, red ash and red maple, will encroach upon the shoreline and invade the shallows.

Increase of tree and shrub vegetation will change the shoreline habitat, eventually eliminating zones of rice cutgrass, sedges and smartweed, all valuable food sources for waterfowl, rails, native sparrows and muskrat. It is also predictable that the stands of cardinal flower and iris along the eastern shoreline will diminish as the trees advance. Although alders, are more useful for wildlife food than either ash or red maple, they also should be controlled where practical because they will invade the shallows and replace more valuable herbs.

Purple loosestrife, another plant that is inimical to wetland wildlife, is spreading into the valuable herbaceous wetlands on the west shore.

RECOMMENDATIONS

It is desirable that all existing herbaceous shorelines be kept open. Several areas exist where mowing can be used to maintain grassy cover right down to the waterline. (These are located on the Map of Wetland Management. In addition, certain other areas would be improved by clearing trees from narrow bands of upland adjacent to the shoreline.

These are shown on the Map of Wetland Management. The purpose for each of these clearings is slightly different. Clearings on the west shore are intended to favor nesting and release or maintain food species available to wetland wildlife.

Clearings on the east shore are largely to improve conditions for desirable herbs or to promote better wildlife viewing.

ASSESSING THE EFFECT OF SHORELINE CLEARING ON EXISTING HABITAT

At present there are about 8000 feet of shoreline north of Brownell Road. Less than 1000' of these are presently open. If all suggested openings are maintained, the total of herbaceous shoreline would be about 1400' or 18% of the total. Even though this total is modest, it can be expected to produce definite results in terms of increased waterfowl nesting, especially mallards and blue-winged teal, but also rails, swamp sparrow, red-winged blackbird, and to produce the potential for short-billed marshwren nests.

The total of wooded shoreline (100' wide) is about 18 acres. Total acreage of cleared shoreline would be less than two (a band 20' wide); and much of that area would be margined by trees.

BIBLIOGRAPHY

Cook, Arthur H. and Charles F. Powers Early Biochemical Changes in the Soils and Waters of Artificially Created Marshes in New York. New York Fish and Game Journal Vol. 5, No. 1 January 1958

Martin, A. C. and F. M. Uhler Food of Game Ducks in the United States and Canada. Technical Bulletin No. 634, United States Department of Agriculture. Washington, D.C. 1939.

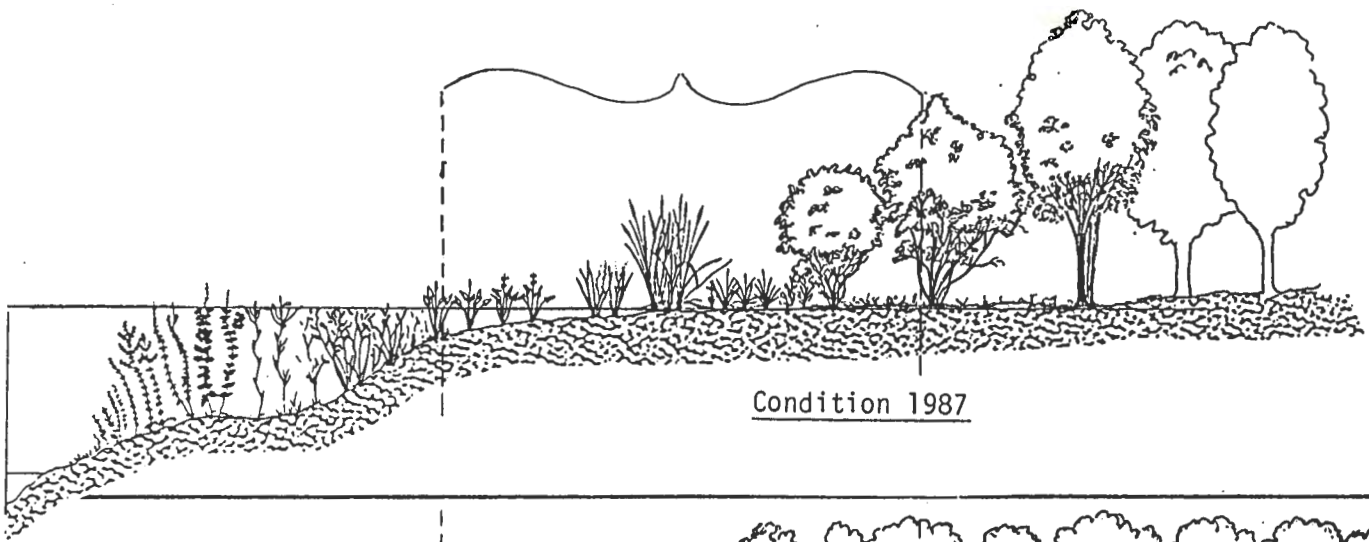
Moyle, John B. Some Chemical Factors Influencing the Distribution of Aquatic Plants in Minnesota. The American Midland Naturalist Vo. 34, No. 2, pp. 402-420, September, 1945.

ANALYSIS OF RICE POND AREA AND VOLUME

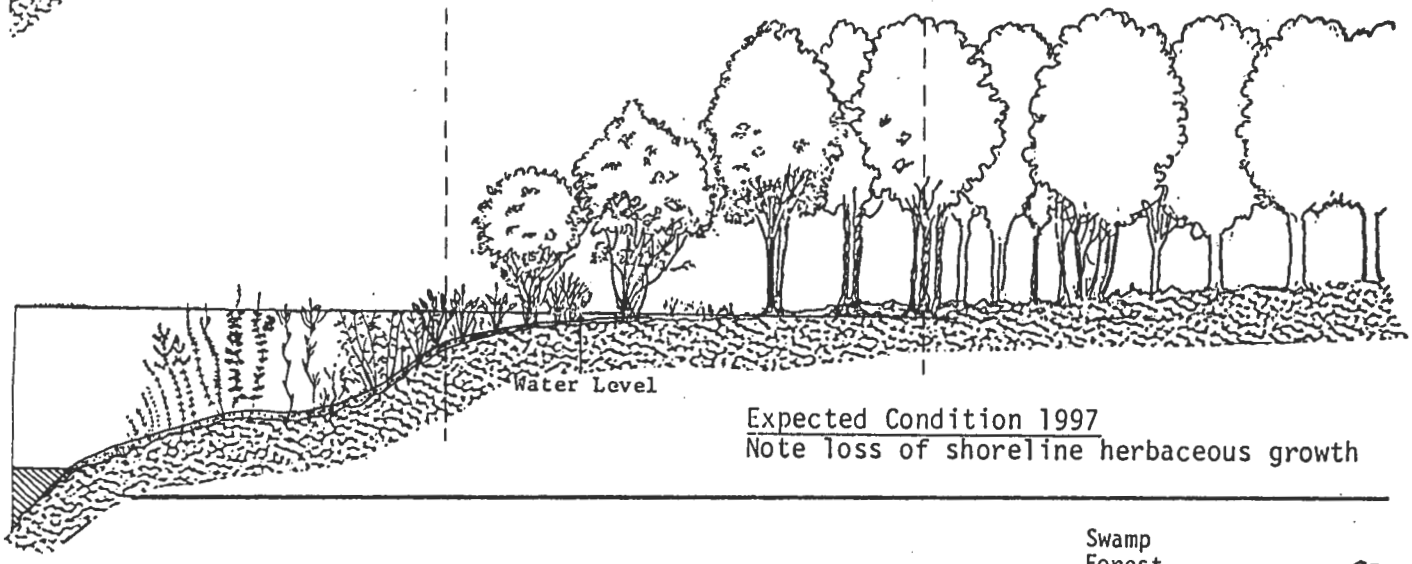
DEPTH IN FEET	SQ.FT./ CONTOUR*	ACRES/ CONTOUR*	INCREMENT SQ. FT.	VOLUME/ CONTOUR CU.FT.	CUMULATIVE VOLUME CU.FT.	GALLONS
-7.5	9,100	.2	9,100	4,550	4,550	33,400
-6.5	22,000	.5	13,900	16,050	20,600	154,500
-5.5	45,000	1.0+	23,000	33,500	54,100	405,750
-4.5	68,000	1.6-	23,000	56,500	110,600	829,500
-3.5	222,000	5.1	154,000	145,000	255,600	1,917,000
-2.5	436,000	10.0	214,000	329,000	584,600	4,384,500
-1.5	604,400	13.9	168,400	520,200	1,104,800	8,286,000
Shoreline	994,200	22.8	160,100	457,050	2,281,100	13,680,375
+.5	1,154,300	26.5	160,100	457,050	2,818.250	21,136,875
+1	1,412,400	32.5	258,100	641,525	3,459,775	25,948,312

*Figures are cumulative

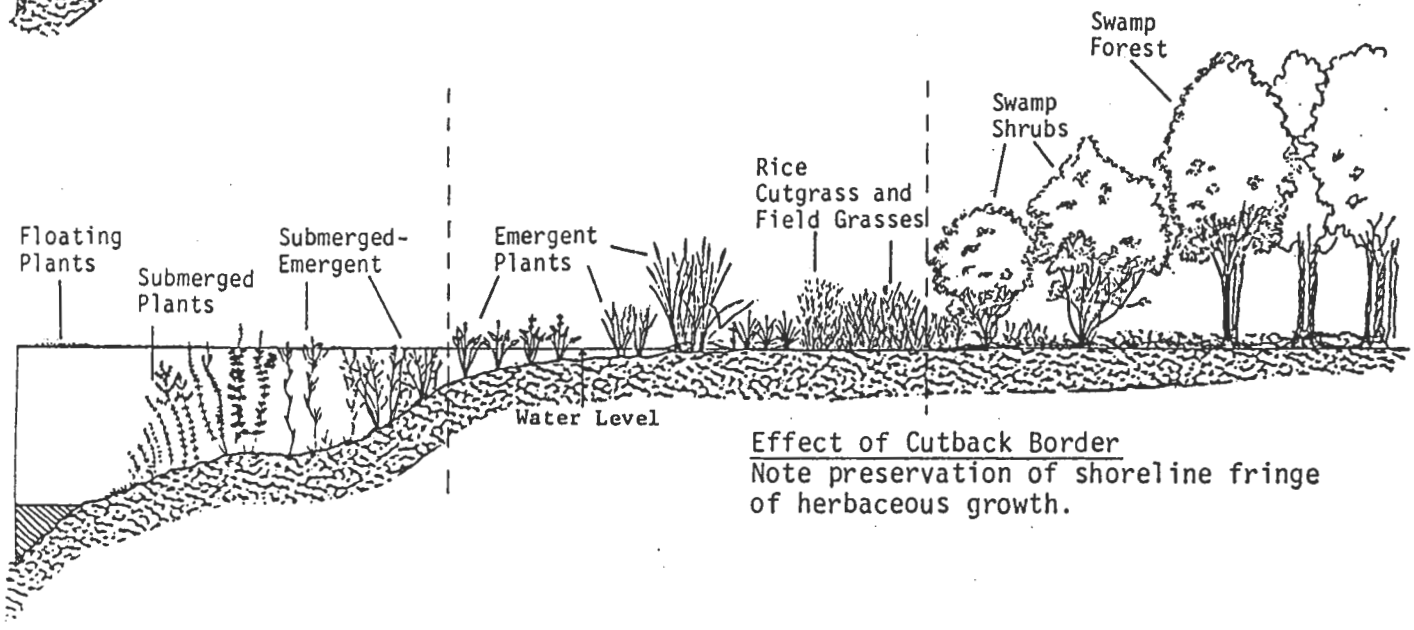
PROFILE OF RICE POND SHORELINE



Condition 1987



Expected Condition 1997
Note loss of shoreline herbaceous growth



Effect of Cutback Border
Note preservation of shoreline fringe of herbaceous growth.

UPLAND FIELDS

ANALYSIS OF COVER CHANGES BY FIELD - 1962-86

FIELD	ACRES	8/1962	8/1971	8/1986	FIELD	ACRES	8/1962	8/1971	8/1986
1	12.2	Crops/Hay	Old Field	Shrub (T,H)	14	0/22.8	Pre-flood	Pond	Pond/Marsh
2	5.7	Conifer (P)	Conifer (M)	Conifer (M)	15	2.9	Pasture (REC)	Old Field (H,S,T)	Woods (P,S)
3	14.7	Woods (.6M/.4P)	Woods (M)	Woods (M)	16	2.4	Pasture (REC)	Conifer (Y)	Conifer (M)*
4	21.3	Old Field (S)	Woods (P)	Woods (P,M)	17	3.6	Pasture (REC)	Bldgs., Lawn	Bldgs., Lawn
5	16.4	Orchard	Orchard (S)	Orchard (T)	18	12.5	Woods (P)	Woods (M)	Woods (M)
6	11.0	Crops/Hay	Old Fields(S)	Shrub (T)	19	2.9	Pasture/ Woods (M)	Old Field/Woods	Woods (P,M)
7	16.0	Pasture (REC)	Old Fields (H,S)	Managed (S,H,T)	20	9.6	Hay	Old Field (H,S)	Shrubs (H,T)
8	25.2	Hay/Grain	Old Fields (H,S)	Managed (H,S,T)	21	5.5	Woods(.7M/ .3P)	Woods (P)	Woods (M)
9	19.4	Pasture	Old Fields (H,S)	Managed (S,H,T)	22	2.0	Woods (P)	Woods (P)	Woods (M)
10	10.2	Hay (REC)	Conifer (Y)	Conifer (M)	23	3.6	Hay (REC)	Mixed Wood (Y,P)	Mixed Woods
11	14.3	Hay (REC)	Conifer (Y)	Conifer (M)	24	6.4	Hay	Old Field (H,S)	Shrubs (T,H)
12	9.8	Hay (REC)	Old Field (H,S)	Shrub (H,T)	25	4.8	Hay	Old Field (H)	Shrub (H,T)
13	29.0/6.2	Pasture	Old Field (S,H)	Shrub (T,H)	TOTAL 261.4				

REC - Abandoned Within 3 Years;' (M) Mature; (Y) Shrub Tree Conifer; (H) Herbs; (S) Shrubs; (T) Trees; (P) Pioneer or Pole Stand

FIELD 3 14.7 ACRES

This plot known as Hiltbrands Woods, has been in forest cover, at least since World War II. It is a mixed hardwood stand. Beech and sugar maple make up 60% of the total by stem frequency. Ash, hophornbeam, hickory, basswood and cherry combine to make up about 15% of the total stems. The remainder is comprised of alder, white pine, apple and chokecherry. Average DBH figures range from 5" in hophornbeam to 12.8" in maple. This is an uneven-aged stand with a great deal of small reproduction especially beech and maple. The largest trees include sugar maple in excess of 24" DBH, beech and ash of 18" DBH, hickory of 16" DBH, basswood of 14" DBH and yellow birch of 12" DBH. This is the best area in which to view spring woodland flowers and ferns.

Trends

This woodlot is the least likely to undergo ecological change in the next 10 years of any of the fields included in this survey. The dominant trees are approaching maturity and the majority of reproduction observed is of identical species to existing mature trees. Principal changes to be expected include:

1. Increase in average DBH of sugar maple, beech, basswood, yellow birch, black cherry, and hophornbeam as pole sized trees continue to mature and reproduction decreases because of increased shade.

2. Increase in damage due to grapevines along the south boundary.

3. Some decrease in white pines at the northeast corner of the woodlot.

4. Improvement of spring wildflower displays.

Recommendations

Management techniques are not indicated for this field. As the woods mature there will be some change in speciation of understory shrubs and herbs and of birds, other vertebrates and insects which inhabit it.

It might be desirable to monitor the development of grapevines, and to accomplish some release cuttings to favor the white pines.

Control of poison ivy along the trail might be desirable, but even this can be expected to improve as the woodland matures.

FIELD 19 2.9 ACRES

This small plot of woodland has developed from a narrow fringe of beech, maple, elm, basswood and birches that once fringed a pasture. About a quarter of the total stems are American beech (Fagus grandifolia), with American elm (Ulmus americana), bitternut hickory(Carya cordiformis), hophornbeam (Ostra virginiana), totaling almost 40%. The remaining 35% consists of sugar maple (Acer saccharum), yellow birch (Betula lutea), sweet birch (B. lenta), basswood (Tilia glabra), black cherry (Prunus serotina), mountain ash (Sorbus americana) and chokecherry (Prunus virginiana). At present the stand is dominated by several large beech, maple and birch. It supports some growth of spring woodland flowers and ferns.

Habitat Evaluation

This stand is slightly different from adjacent wooded plots because of the "over maturity" of a few of its components. The result is a more open forest floor and good foraging for woodpeckers. Beaver have done a considerable amount of cutting of smaller trees. At present this is good habitat for woodpeckers, vireos, thrushes, tanager, rose-breasted grosbeak, oriole, redstart, nuthatch and crested flycatcher.

Trends

A part of this tract is still young and it will continue to mature and improve for woodland species.

Recommendations - None

FIELD 18 12.5 ACRES

Field 18 has developed from abandoned orchards and from pastureland abandoned at least 40 years ago because it was unsuitable for cultivation. It is about 75% white ash (Fraxinus americana), averaging 6" in DBH interspersed with American elm and silver maple of the same size.

About 5% of the stems are of relict apple trees, long since overtopped and shaded. Some of these apple trees, have trunks in excess of 8" DBH, but they are gradually being replaced by the native hardwoods. Scattered mountain ash persist especially at the boundaries of the woodlot. However, they too will eventually be replaced.

Habitat Evaluation

Presently this pioneer woodland provides nesting area and habitat for such birds as woodthrush, red-eyed vireo, wood pewee, downy and hairy woodpeckers, chickadee, rose-breasted grosbeak, nuthatch, redstart, cardinal and cedar waxwing. Mountain ash, wild apple and ash provide food for songbirds. Both red and gray squirrel also inhabit the woods and there are abundant signs of deer in all seasons.

Trends

As this woodland continues to mature, some of the bird species listed above will cease to use it for nesting.

Mountain ash, shadbush (Amelanchier canadensis), apple (Malus sp.) and buckthorn (Rhamnus cathartica), are all species providing valuable food sources for wildlife which will tend to disappear as the woodland matures.

Recommendations

No management is recommended for this woodlot, except for the maintenance of some of the more mature mountain ash to retain this valuable source of food for wildlife.

FIELD 21 5.5 ACRES & FIELD 22 2.0 ACRES

The two fields have not supported agricultural use for many decades. Thirty years ago, they were dominated by elm and willow. The death of the mature elms in the early 1960's has left it open for more rapid growth of white ash (12.1" DBH), black cherry (P. serotina)(15" DBH), silver maple (Acer saccharinum) (7" DBH), mountain ash (S. americana) (7" DBH), and young elms (V. americana) (55" DBH).

Along the creek and in low places alder grows profusely. Where Field 22 borders on Field 24, a volunteer growth of black locust averaging 9" DBH is assuming dominance.

Habitat Analysis

The single most important feature of these two fields is their proximity to the estuary created by the Rice Creek dam. In the estuarian backwater, beaver have chosen to build a dam, further flooding the stream and backing water into adjacent transitional fields. This combination diversifies the habitat and increases the variety of wildlife found there. At present the Beaver have cut many pole-sized hardwoods along the shoreline of the flow, including many white ash. However, white ash is so abundant at Rice Creek (conservatively over 50,000 stems) and so rapidly increasing, that this cutting seems insignificant.

Trends

Over the next few years, this woodlot will continue to mature. Since the tenure of the beaver in this area is somewhat doubtful, due to the limited supply of suitable food, it is difficult to assess their future impact. If they remain, the number of hardwoods adjacent to the stream will be reduced as a result of raised waterlevel and clearing by the beaver.

This will help in maintaining diversity of wildlife cover. It is conceivable that several broods of ducks could be reared annually. However, that would necessitate at least some control of shoreline hardwoods, if natural control by the beaver is not realized.

Management

While the beaver maintain the waterlevel, it would be beneficial to establish at least some herbaceous shoreline to provide for black duck, mallard and blue-winged teal nesting. Wood duck boxes (2) and tree swallow boxes (1-2) would undoubtedly be used if erected.

WOODED FIELDS-CONIFERS

FIELD 2 14.7 ACRES

This is a plantation which existed before the establishment of the field station. The canopy at that time was closed, with trees over twenty feet in height, and an average stem DBH of 4 inches. Some areas of poor conifer survival existed and in these areas saplings of sugar maple, trembling aspen, black cherry, yellow birch and apple could be found.

Today this plantation consists of about 79% Norway and white spruce and balsam fir averaging from 6" to 8" DBH. The remaining 21% consists of about one half aspen (DBH 9.5") and 1/5 sugar maple (6" DBH), the rest scattered yellow birch (7.5"DBH), black cherry (4.6" DBH), wild apple (4.0" DBH), beech 4.25" DBH) and buckthorn (3" DBH). All these percentages are of stem frequency. About 9% of the total consists of depressed spruces averaging less than 5" DBH. Most of these trees are slowly dying. Although the plantation is still dominated by spruce, the growth of only two to three inches in DBH in twenty five years indicates that extreme crowding has existed for many years. Average distance between these trees is only 7 feet.

Hardwoods are gaining codominance with the spruce every place where the distance between trees exceeds the average. Included are shade tolerant species such as sweet birch, black cherry, beech and sugar maple.

It was also observed that this crowding has resulted in poor crown development of the conifers as a result of self-pruning underneath.

Habitat Evaluation

At present, although it has been completely self-pruned underneath, this plantation provides a valuable block of winter cover adjacent to the mature hardwoods. It is used by grouse, mourning doves and chickadees in winter, as well as by migrants and visitants such as kinglets, red breasted nuthatch, winter finches, and certain warblers. It also provides a source of food for tree squirrels, especially the red squirrel.

Trends

Eventually, this plantation will be overtopped and crowded out by the hardwoods. Since this will take decades, these conifers will continue to serve their function as winter cover for many years. However, except for the plantation edges, or places where natural thinning has occurred, the crown quality is diminishing as a result of crowding and physical abrasion.

FIELD 10 10.2 ACRES

This field was reforested about 25 years ago with Norway spruce (Picea abies). It has never been thinned or pruned and it remains a dense stand. Average distance between stems 6.3', (average DBH 4.4"). In places where spruce trees have died, volunteer white ash, established about the same time as the spruce planting, has prospered over-topping the spruce. The average DBH of these trees (about 1% of the total stems) is 8.5", nearly twice the size of the spruce. An average annual increment of only .18 inches in such a young stand, indicates severe depression for many years. This field is in the same condition today, as was Field 2 in 1961.

Habitat Evaluation

This field provides another substantial block of winter cover used by approximately the same species of birds and mammals as was Field 2. However, a dense tangle of dead but unpruned branches throughout the plantation, makes penetration by man almost impossible. This provides a rather unique protection to the central block of hardwoods. There is indication of use of this block by both birds and mammals.

Trends

See comments following Field 11.

FIELD 11 14.3 ACRES

This field was reforested about 25 years ago with scotch pine (Pinus sylvestris). It has never been thinned or pruned and remains a dense stand of almost solid conifers. The average distance between trees, as planted, was between 5.0 and 6.0 feet.

There has been a moderately greater die-off in this plantation than in Field 10 which, has resulted in an average interval between stems of over 8 feet.

The average DBH of 6.2 inches, is 1.5 inches greater than that for Field 10, but since scotch pine is normally faster growing than spruce, this increased growth is not considered signigicant. Field 11 is another overcrowded and depressed stand of softwoods.

Less than 2% of the total stems are hardwoods, mostly box elder (Acer negundo) and silver maple (Acer saccharinum). In some places the silver maple overtops the pine trees and is almost as large in girth.

Habitat Evaluation

The principal value of this stand is similar to that of Fields 2 and 10--winter cover and food. Pines in general, are somewhat more palatable to wildlife than spruces,

and the more open growth pattern makes the stand more suitable for nesting birds. Robins, blue jays, mourning doves, purple finches, cardinals, grackles and chipping sparrows, are thought to have nested there based on sightings of adult males but only the first three are confirmed.

Winter signs show that squirrels, deer and cottontail have frequented the plantation.

Trends - Fields 10 and 11

Because of the extreme crowding in both of these plantations, and the resultant self-pruning, there will be a narrowing (vertically) of the band of cover provided by the live pine or spruce needles. Because of the denseness of the stands (especially the spruce) the ground will continue to be so shaded that there will be very little herbaceous or woody growth underneath.

MANAGEMENT RECOMMENDATIONS
Field 2

This field provides valuable winter cover for wildlife that may den or nest in adjacent hardwood stands. There is some doubt that this solid block of overcrowded trees represents the best mixture for wildlife. It seems that if at least 1/3 of this plantation was clear cut, a better intermixture of habitat would be produced (see diagram page 23). In addition, an effort should be made to reduce crowding in the trees remaining to improve their vigor.

It should be remembered, that thinning would shorten the period of softwood dominance (the more open the stand the more rapidly beech, birch, maple and ash will become established) so hardwoods as well as softwoods, may need to be controlled in some places. It may be desirable to reforest the clearcut space to provide replacement winter cover near the ground or to establish herbaceous cover maintained by rotational mowing.

Field 10 and 11

This 24 acre block, 21 acres of which is in overcrowded softwood, is too large a stand to make sense in terms of value for wildlife cover. Both thinning and clear-cutting in a checkerboard pattern would enhance the value of these fields both in attracting wildlife and providing for greater diversity of plant cover.

The three acre portion left unplanted in Field 10, was a poorly drained area originally considered for a farm pond. A pond might still be an option for this acreage, even though extensive site preparation would be required.

"Warning"

Care must be taken in the thinning of long-crowded softwoods which are normally top heavy with weak stems and root systems and therefore, subject to windthrow and stem breakage. A forester should be consulted to determine the best plan of action. It is important at that time, that the desire for habitat diversity and winter cover, not forest products, be made clear to him. The diagrams on page 43 , outline a possible plan.

FIELD 23 3.6 ACRES

This field was reforested with scotch pine and white pine, about 25 years ago. When trees were planted, the field already had a heavy invasion of white ash seedlings. These hardwoods have more than kept pace with the pine trees, gradually overtopping and crowding out a good percentage of them. At present, this is a mixed stand with remnant pines composing about 25% of the total.

Trends

As time goes on the hardwoods will continue to overtop and replace the pines, resulting in the establishment of a typical beech-maple hardwood stand. For the next 10 years, the scattered pines will continue to provide some winter shelter and food for birds and mammals.

Recommendations

It would be possible by thinning, to maintain or improve the quality of selected pines and therefore, enhance cover diversity in this field. Because of the size of the hardwoods, however, this is probably not feasible considering Field Station staff and cost-benefit returns. It may be the best plan to concentrate on release of the white pine trees, because the competing hardwoods are smaller in that area.

FIELDS ADJACENT TO THE BUILDING

FIELD 15 2.9 ACRES

This field adjacent to both the building and the pond, is a prime one for public use. It also represents a potential area for expansion of facilities. The willow "plantation" and the herb garden are located here.

It consists largely of young hardwoods, dominated by white ash (Fraxinus americana), red ash (F. pennsylvanica), and red maple (Acer rubrum), adjacent to the pond. The northern portion of the field, has developed a cover of shrubs (cornels, viburnum, buckthorn, sumac) and temporary tree species (cherry, aspen, alder).

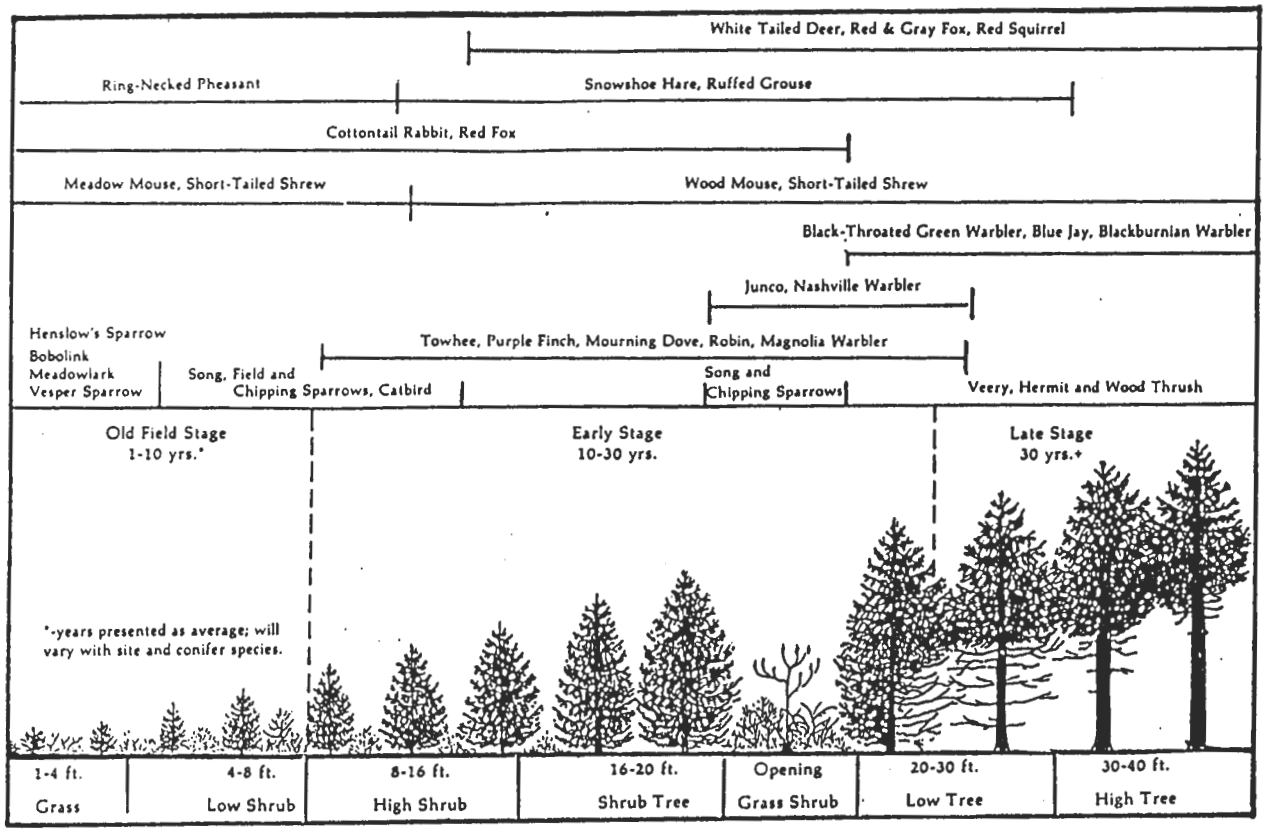
Habitat Evaluation

Although its value as nesting and foraging area for birds is good, its most unusual asset is the stand of cardinal flower and wild iris which grow in the saturated soils next to the shoreline.

Management Recommendations

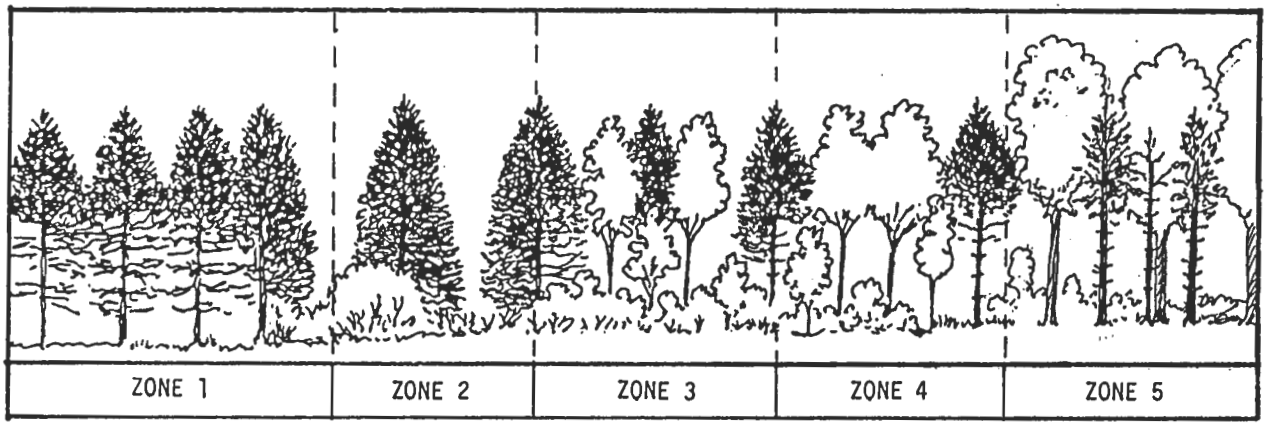
The shoreline of the pond is gradually being overtaken by ash, alder and maple. Selected thinning of these hardwoods would help to maintain suitable cover for the cardinal flower and the iris and would also encourage the growth of herbaceous shoreline cover for waterfowl nesting.

WILDLIFE SUCCESSION AND CONIFER HEIGHT



This diagram from "Integrating Timber and Wildlife Management,"* shows the changes in wildlife use which occur as conifers mature. Note the relative diversity of users in Grass, Low Shrub and Opening-Grass Shrub stages, and diminution of species diversity in the high tree stage. Fields 10 & 11 are still in low tree stage.

COVER CONDITIONS IN CONIFER PLANTATIONS



Existing conditions in Field 16 - The total amount of evergreen cover is important in maintaining diversity of bird life. Compare Zone 2 with Zone 4. The present trend in Field 16 is toward Zone 4 conditions. Suggested management is to maintain as much of the Zone 2 conditions as possible. Compare Zone 2 above with Opening-Grass Shrub in the previous diagram. Zone 1 is typical also of Fields 2, 10 and 11. Zone 5 shows eventual conditions in these fields.

*Chambers, Robert E.
Integrating Timber and Wildlife Management
SUNY College of Forestry/N.Y.S. Department of Environmental Conservation

FIELD 16 2.4 ACRES

This field was originally reforested with a mixture of scotch pine, white spruce and Norway spruce. Spotty survival has resulted in a combination of crowded pines and spruce intermixed in places with openings, and some places where the spruces are more scattered, retaining foliage to the ground. The principal hardwood invader is white ash with an average DBH of 6 inches. Average DBH of spruce is 4.6 inches and of scotch pine is nearly 8 inches.

Habitat Evaluation

Although this field is adjacent to the Field Station grounds, and therefore is always a prime target for development, it has some of the most effective intermix of hardwoods, softwoods and open space to be found on the Field Station grounds. It provides some of the best bird watching and is, combined with Field 15, one of the better places for environmental studies for school groups.

Trends

The establishment of competing hardwoods surrounding the isolated spruces, threatens to cause shading which will gradually destroy the existing ground to treetop evergreen foliage.

Recommendations

Removal of competing hardwoods and thinning of evergreens would enhance and perpetuate the favorable habitat intermix that exists here.

SHRUBBY FIELDS - NO SUCCESSIONAL CONTROL AT PRESENT

1.	12.2 acres	20.	9.6 acres
6.	11.0 acres	24.	6.4 acres
12.	9.8 acres	25.	4.8 acres

These fields, totaling 53.8 acres, are not identical as to stage of succession. However, all are now dominated by shrubs and saplings and/or scattered pole-sized hardwoods. Fields 6 and 12 are remote from the Field Station and little used by people whose activities are centered on the Field Station. However, Field 6 is traversed by a number of trails, used illegally by motorized vehicles and in addition includes the damsite and control structures for Rice Pond. Fields 1, 20, 24 and 25 are more nearly in the mainstream of student and general public activity. (NOTE: Fields 7, 8, and 9 are also classed separately because they already have cover-control programs in operation.) All of these fields are in advanced stages of old field succession. The principal shrubby species by frequency are cornels (Cornus stolonifera, C. amomum , C. racemosa), viburnums (Viburnum trilobum, V. recognitum?, V. lentago), sumac (Rhus typhina), European buckthorn (Rhamnus cathartica), hawthorns (Crataegus sp.) and buttonbush (Cephalanthus occidentalis).

Up to 60% of these fields still support varied herbaceous growth, including goldenrod, asters, milkweed, yarrow, vetch, strawberry and various grasses.

Vines and brambles (wild grape, Virginia creeper, blackberry, raspberries and poison ivy) are distributed throughout these fields.

Habitat Analysis

These are among the richest of all units of the Field Station for wildlife use. Found in these fields are reptiles (snakes), mammals (cottontail, woodchuck, chipmunk, weasel and deer) and a variety of song birds. Of the 81 species of birds listed as probable nesters for 1987, (based on the presence of territorial males and/or females), 20 species are directly related to the wetlands, 27 species prefer woodlands, and 35 species are primarily birds of the shrubby fields.

These figures do not fully indicate the difference in nesting productivity of the various habitats, since nesting in both wetlands and fields is more concentrated than in woodlands. Winter surveys of the shrubby fields indicate many instances where several nests per acre can be located. Nesting of goldfinch, yellow warbler and catbird are particularly concentrated.

Trends

All of these brushy fields have heavy infestations of tree species, especially ash, maple, cherry and aspen. It is estimated for instance, that these fields average from 250-500 stems of white ash saplings per acre, a total for these fields of over 30,000 ash saplings. It is clear that within 10-15 years these fields will support pole-sized transitional woodlands from which most of the present shrubby species would disappear. When this occurs at least 15 of the 36 species listed as nesting primarily in the shrubby areas, will have disappeared. Within a few additional years, most of the rest will have left. No species can be expected to be added to the Rice Creek list as a result of the transition from shrubby fields to woodlands.

Recommendations

From the foregoing, it is evident that methods for sustaining some areas in the shrubby stages are even more important than maintaining herbaceous cover. The ideal situation would be, to set up a rotation of control or release cuttings to remove some hardwood tree species and favor those shrubby species which support the majority of the song bird nesting. Since a few expanses of primarily herbaceous or of finger-stemmed shrubs exist in every one of these fields, it would be possible using equipment already available to the Field Station, to control further invasion of tree species by rotational mowing of the herbaceous and finger-stemmed hardwoods. If this mowing follows the natural pattern of herbaceous openings, it would leave many shrub islands which could easily be kept free of tree species. A problem with this practice is that some shrubs tend to become less attractive for nesting as they mature and that young tree saplings are extremely attractive to some bird species in a shrubby field. This problem can be alleviated by extending the mowing interval as long as possible (6-8 years).

SHRUBBY FIELDS - WHERE CONTROL IS BEING PRACTICED

7. 16 acres (7a-1.7A, 7b-14.3 A)
8. 25.2 acres (8a-10A, 15.2A)
9. 19.4 acres (9a-3.5A, 9b-11.8A, 9c-4.1A)

These 3 adjacent fields, totaling over 60 acres, were among the last of the fields in which agriculture was abandoned. These fields were mowed or cultivated until 1960. Therefore, although they resemble the fields in the last section, the shrubs and invading trees here are somewhat less mature.

Three years ago, however, nearly 40% of Field 8 was cleared of brush and trees, and a rotational mowing schedule was introduced into Fields 7 and 9, both of which had been kept open by occasional mowing. This sequence, a 4-year mowing rotation was also introduced into Field 8. (See mowing schedule chart.)

Shrubs, trees and herbaceous species are similar to those found in Fields 1, 6, 12, 20, 24 and 25. However, rotational mowing favors grasses and herbs which prosper under mowing.

Habitat Analysis

These fields provide the only large blocks of herbaceous upland cover still existing at Rice Creek. It is anticipated that eventually such birds as meadowlark, bobolink, vesper sparrow, grasshopper sparrow and Henslow's sparrow, which have long been missing from the Rice Creek habitat, will take advantage of this newly available nesting habitat.

A number of mammals not found in forest situations, may also be expected to return to these fields. There is already evidence of considerable use by cottontail, deer and woodchuck. This open expanse will also make good foraging for raptors and predaceous mammals. The shrubby (uncleared) portions of these fields are used intensively by song birds for nesting and for winter feeding. The average concentration is several nests per acre.

Because of more recent abandonment, there are some fairly large areas, especially in Field 7 and 8, which are still dominated by herbaceous growth. This provides valuable habitat diversity and is worth maintaining.

Trends

Field 7 is presently about 10% mowed and has approximately 30% of unmowed herbaceous cover. Field 8 is nearly 40% mowed and has from 25-30% of the unmowed portions (about 20% of the total field) dominated by herbs. Field 9 has about 4.1 acres (21%) in pioneer woodland, similar in stage and speciation to Field 18. The remaining 15.3 acres is about 23% (3.5 A) mowed and 11.8 acres (77%) in advanced shrub-tree cover. The shrub cover has few contiguous herb-dominated openings.

Maintenance

It would improve the habitat if some of the presently unmowed herbaceous cover could be included in the mowing rotation. In addition, some control of tree species would be necessary in the unmowed portions to prevent eradication of the shrubs which are so important to song bird nesting, a third practice of cutting back of overmature shrubs to maintain some younger growth, would also be beneficial. More information on these is contained in the "Action" section.

BUILDINGS AND LAWNS

FIELD 17 3.6 ACRES

This field includes the buildings, lawns and parking facilities, that represent the headquarters area. Management of these areas is critical in shaping the statement which the Field Station makes to the public. Also the location of the building with gallery windows facing on the pond provides an unusual opportunity for viewing of wildlife by the public, visiting school groups and college students.

At times remarkable opportunities to view unusual birds and mammals exist. J. Weeks has reported sightings of muskrat, beaver, red fox, deer, red and gray squirrels, chipmunks, woodchucks, and weasels, numerous waterfowl, including geese, mergansers, 10 species of dabbling ducks, 5 species of diving ducks, as well as dozens of species of woodpeckers and songbirds--all from the gallery windows.

However, at present it is possible for this viewing to be completely disrupted by individuals or groups strolling along the pond edge directly in front of the gallery windows. This openness not only disrupts viewing opportunities, but also inhibits shy wildlife species from approaching the viewing area.

At present, the vistas from the windows are very good. However, the growth of trees and shrubs along the intervening shorelines tend gradually to obscure views of the open pond and wetlands beyond. Screening vegetation was cut back 4 years ago to provide the present viewing of open water and distant marshy fringes. This vista should be maintained perhaps even enlarged.

In winter, when the pond is covered with ice and snow, attention focuses mainly on wildlife attracted by the feeders, all of which are open platforms vulnerable to wind. Natural screening for windchill control is at a minimum to reduce interference with pond vistas.

None of the feeders are hopper-type feeders which means that they must be filled regularly. There are some disadvantages in this, especially considering that at present the Field Station building is closed on most winter weekends.

The feeders are used by students for independent studies of winter birds and feeder activities. Some of the following recommendations may be in conflict with present instructional practices and should therefore, be used only as quidelines for developing a feeder complex that is compatible with research and instructional needs.

Recommendations

In general, the distribution of cover around the building is attractive and appropriate. This area existing as it does between woods, plantation and pond, is extremely attractive to wildlife. The recommendations listed below are designed mainly to improve the viewing and enjoyment of plants and animals normally found there.

Many of these recommendations, are predicated on the Field Station eventually being more open to public visitation on weekends,

Wetland Shoreline - The establishment of tree species, especially alder, interferes with visual access to the wetlands. It would be desirable, especially west of the Field Station building, to remove tree species along the shoreline to favor the development of low growing shrubs (cornel, viburnum) to separate the lawn from the wetlands. The value of this practice will be enlarged upon under trail management recommendations.

Landscaping Plants - In general, the choice of species and the location of shrubs and herbs is attractive and appropriate. The flower beds and herb garden provide relevant interest points.

Viewing Gallery - The best treatment of the land visible from the viewing windows, would be:

Fence and Hedge - It is important that the pond area opposite the viewing gallery be seen or approached only from the gallery windows. (Except for authorized personnel and activities.) This could be best achieved by a combination of solid board fencing accompanied by shrubs or trees which would screen the bare fence. A sturdy door/gate would allow access for authorized uses and grounds care. The map on page 29 shows a suggested location for the fence. The fence is designed to limit only unplanned, unscheduled invasion of the area by public and students. It is not intended to interfere with presently scheduled student or class activities.

Plantings Within the Screened Area - Once the area is secluded by fence and hedge, the atmosphere will change significantly even without additional planting. Establishment of low growing, low-care evergreens on the pond side of the fence would help to increase the attractiveness of the inner face of the fence.

The establishment of flower beds with plants attractive to wildlife would be desirable.

Feeder Complex - Where feeders are located between the pond and the gallery windows, no change in the present arrangement is recommended.

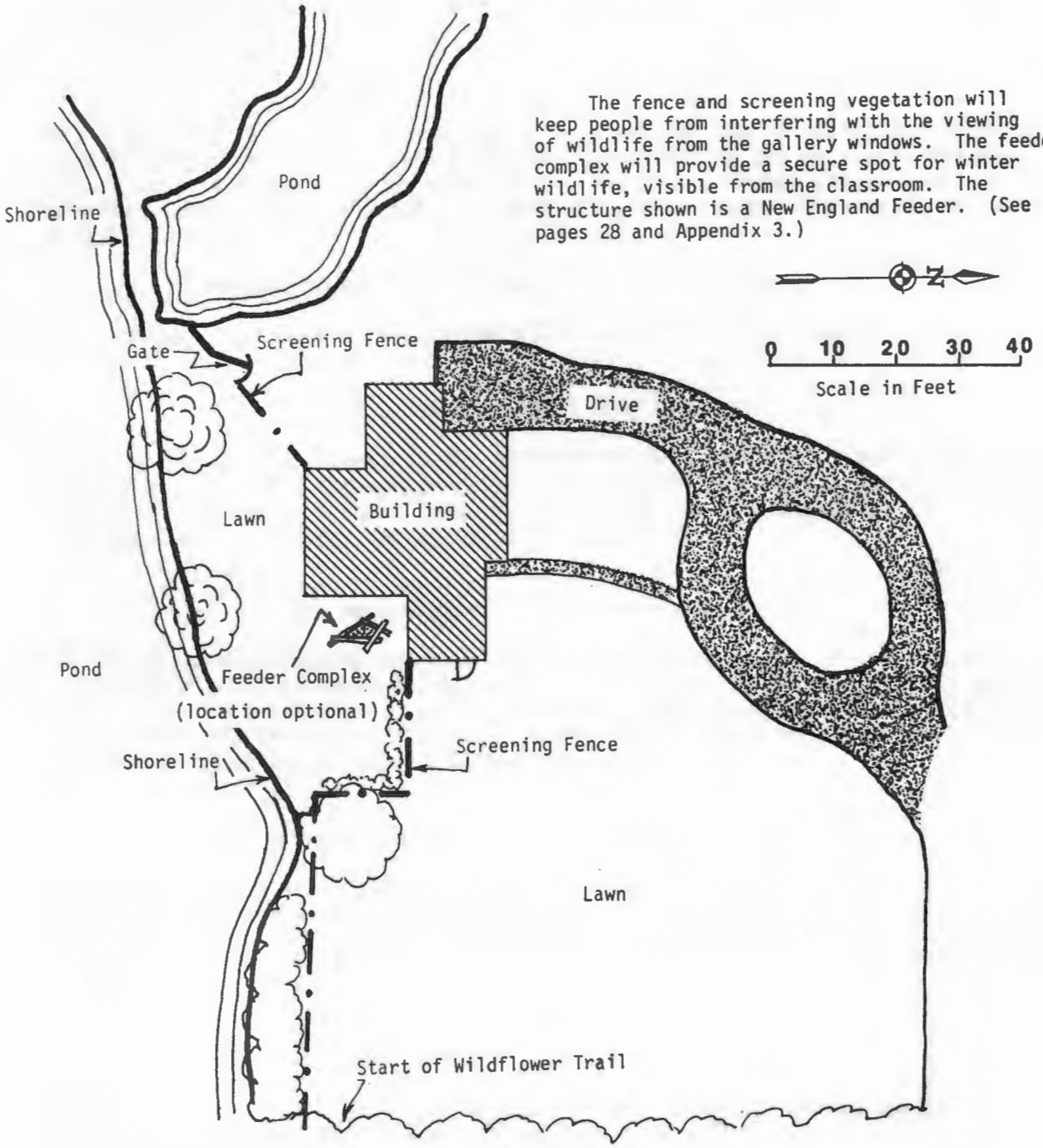
However, to the east of the classroom is an expanse which offers excellent opportunity for the development of a more esthetic and effective feeder complex. The combination of shrubs along the fence and windbreak effect of the building.

Several designs for ground located feeders are illustrated on page . The rustic "New England" feeder is based on a small section of rail fencing, ideally a triangle or a corner section. The platform hopper feeder, is built of rough cut lumber with several sturdy branches attached to the base to provide perches and add a rustic appearance. The hollow log hopper-feeder, is less rustic than the above feeders but is especially appropriate where space is limited.

The advantage of a ground located feeder is especially noted in times of heavy winds when elevated unscreened feeders are difficult for small birds to use. The disadvantage of ground based feeders is, messiness and rodent problems. The latter can be reduced by creating a grouted stone or concrete block base for the feeder, or by setting the feeders or blocks large enough to show light penetration and allow cleaning of debris from under the feeder. (See drawings on page 43.)

Windows - One hindrance to proper viewing, especially in cold weather, is fogging and icing of the gallery windows. Since this condensation is largely on the outer windows, it is apparently due mainly to leakage through the inner (storm) window. More effective sealing of the problem windows should greatly lessen, if not eliminate fogging of the viewing windows.

MAP 7
RICE CREEK FIELD STATION
BUILDING AND LAWNS
Showing Location of Screening Fence



The fence and screening vegetation will keep people from interfering with the viewing of wildlife from the gallery windows. The feeder complex will provide a secure spot for winter wildlife, visible from the classroom. The structure shown is a New England Feeder. (See pages 28 and Appendix 3.)

TRAILS AND STRUCTURES

An assessment was made of trails and structures such as bridges and walkways to determine condition and appropriateness of the trails.

The trail system consists of three interpretive loops, and some additional perimeter trail segments used by hikers and cross country skiers.

Although the Field Station information booklet, outlines over 9 miles of trails, this includes several segments used by more than one trail loop.

The trail system consists of the following loops and segments as listed in the Rice Creek Field Station brochure. (Map #8, pg. 34.)

Carlita Snygg Trail (Green Markers)

The Snygg Trail - 1 mile - Enters wood's edge east of the buildings and traverses the woodlands east and south of the Field Station, crossing the entrance road and embarking on a figure-of-8 traverse of the woods and shrubby fields south of the entrance road, before returning to the Field Station lawn. The trail has two special features:

A two-unit raised walkway which follows along the creek bank.

A wildflower trail where displays of wildflowers have been created.

The Succession Trail (Red Markers)

This trail-1.5 miles-starts at the parking lot just east of the maintenance shed travelling northward through transitional (pioneer) woodlands, plantation and open field, it then makes a short loop through the mature woodland before returning southward across fields, and transitional woodlands.

The Meadow-Hardwood Trail (Blue Markers)

This trail-2 miles-starts out from the parking lot just west of the Succession Trail, following a parallel route to the plantation (Field 2). It then travels westward nearly to Rice Creek before turning southward again parallel to the stream, the fish ladder and the outlet channel. Thereafter, it turns eastward and joins the Succession Trail as it returns to the headquarters area.

Cross-Country Ski Trail (Orange Markers)

The Cross-Country Ski Trail enters the Field Station property from Fallbrook Lands into the evergreen plantations in Field 11. It continues northward until it reaches the north line of the Field Station property, following a perimeter route westward and southward to join the Meadow-Hardwood Trail and return to the headquarters area.

Assessment of the Trail System

This is a fine trail system. It traverses most of the Rice Creek habitats, and is well marked and well maintained. It serves quite well the purposes for which it was originally intended. However, it does have shortcomings for general public use.

1. Two of the main trail loops (Meadow-Hardwood and Succession) are very repetitious. For instance, 42% of the Succession Trail uses the same trail bed as the Meadow-Hardwood Trail.

2. There are many persistant wet areas, some of which make use and maintenance of the trail difficult throughout the rainy periods of the year.

3. Despite the attractiveness and rich wildlife resources provided by Rice Pond, there is no good view of the pond from any trail.

4. The surface of the Cross-Country Ski Trail is deteriorating badly, due to its location in drainage channels, and use by all terrain vehicles and snowmobiles.

5. The Cross-Country Ski Trail is not a complete loop centered on the Field Station building. It is necessary to cross the entrance road or to retrace ones steps to enjoy a large portion of the trails.

Trends

Trail surfaces in the persistant wet areas will continue to deteriorate and depress, making traverse or maintenance increasingly difficult. Portions of the Cross-Country Ski Trail where they follow natural drainage channels, will become nearly impossible to use, especially if motorized vehicles continue to ignore prohibitions.

Except where periodic mowing is practiced, the trail environments will become increasingly wooded, reducing the variety of plants and animals encountered while greatly restricting the viewing.

The need for shorter trail loops, will become increasingly evident, if general and public school use increases.

Recommendations

Considering the commendable amount of trail maintenance done each year by the Field Station, it makes sense to develop a year-round trail surface wherever possible.

This can be accomplished with reasonable expenditure of time and materials by a combination of drainage and a rerouting of trails to avoid the most difficult of the poorly drained areas. A suggested rerouting of trails, is show on Map #9.

The advantages of these new routes, is summarized in the following charts. Detailed information on ditching techniques and on methods for construction of walkways and observation platforms, is shown in the appendix.

On the following analysis chart, it can be seen that the new trail design cuts the total amount of overlap on the three basic trails numbered 1, 2, & 3, from 2,500' to 500'.

COMPARISON OF EXISTING AND PROPOSED TRAIL SYSTEMS							
EXISTING TRAIL SYSTEM				PROPOSED TRAIL SYSTEM			
	Length*	Spurs	Overlap/ One-Way	Length	Spurs	Overlap/ One-Way	New Trail
1-Succession Trail	4,400'	800'	1,100'	5,600'	600'	0	1,500'
2-Meadow-Hardwood Trail	6,600'	200'	1,100'	5,600'	600'	200'	1,960'
2a-Wetland	600'#	-	-	**	200'	-	200'
3-Snygg Trail	3,600'	225'	300'	3,800'	500'	300'	1,000'
4-X-Country Ski Trail	12,200'	N/A	4,600'	12,200'	N/A	650'	640'
TOTALS	27,400'	1,225'	7,100'	27,200'	1,900'	1,150'	5,300'

*All Measurements in Feet; # Usable Only Mid-Summer; ** Incorporated Into Meadow-Hardwood Trail.

In addition, the seldom useable Wetland Trail, is rerouted to make it an allweather trail with a view of the pond. Two short spur trails are suggested leading to the pond. One is a raised walkway with an observation platform at the end. The other is located on dryland with a graded, gravel observation area with restraining rails to minimize disturbances of pond life. This trail becomes a part of the Meadow-Hardwood Trail.

The new trail system would have the following features:

1. Each of the basic trails (1-3) would now be a complete independent loop with no cross-overs and a minimum of overlap (two-way traffic) see map.

2. Each trail explores a slightly different habitat.

3. Each trail can be shortened for guided walks. (See the chart on page 24.)

4. All of the entrapped wet spots are eliminated. The wet situations that remain can all be cured by minimal ditching and fill. Specific plans and locations are included in the appendix.

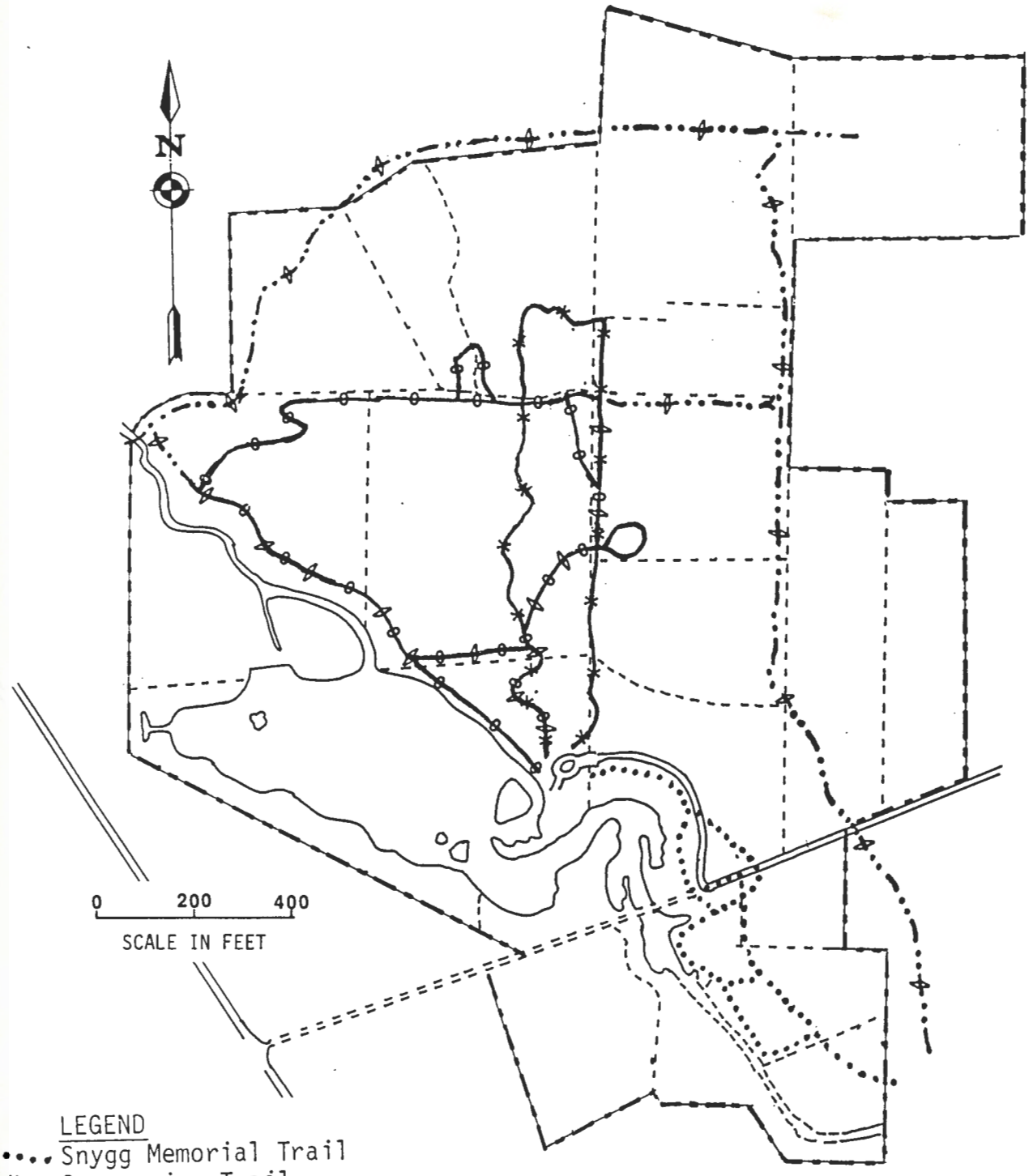
5. The Cross-Country Ski Trail, makes a complete loop centered on the Field Station. It is not necessary to cross and recross the entrance road to use this trail.

SHORT LOOPS OF TRAILS USING EXISTING SHORTCUTS AND/OR SPURS

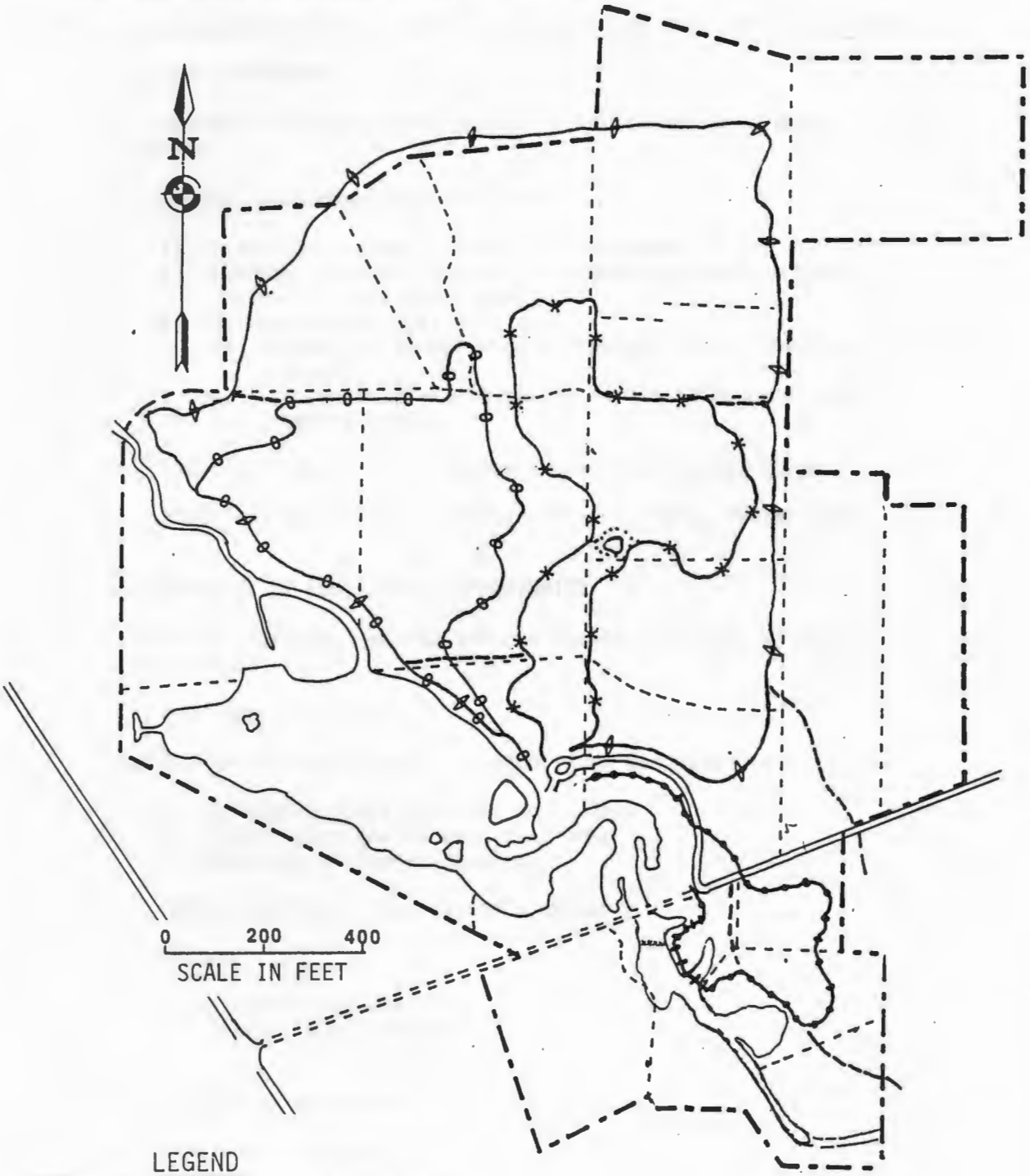
TRAIL	LENGTH	FEATURES
1. Succession Trail	2,500'	Evergreen-hardwood boundary, farm pond, meadow, shrub-conifer habitat, mature wildlife hedge
2. Meadow-Hardwood Trail	2,000'	View of Rice Pond, observation platform, fish ladder, willow glade, herb garden
3. SNYGG Trail	2,800'	Wildflower garden, second growth hardwoods, beaver dam, flow and lodge

Although the rerouting or clearing of 1 mile of trail might seem a formidable challenge, it should be noted that only 1,200' of the new trail would require any significant amount of cutting and clearing. About half of the new trail traverses semi-open brushy fields where a line of least resistance (curving route) can be followed, entailing only the removal of small shrubs and the mowing of the trail surface.

MAP 8
RICE CREEK FIELD STATION
SHOWING EXISTING TRAILS



MAP 9
RICE CREEK FIELD STATION
SHOWING REDESIGNED TRAIL SYSTEM



ACTION RECOMMENDATION SECTION

The recommendations in this report can be divided into three categories:

I. HABITAT IMPROVEMENT

By control of plant succession and forest stand improvement or release cuttings.

A. Removal of unmowable woody plants

1) Thinning or clear cutting of evergreens
2) Release cuttings--removal of competing trees to favor growth of desirable plants
3) Cutbacks-clear cutting
   a) Removal of shrubs and/or trees to favor herbaceous growth
   b) Cutting back of overmature shrubs to promote young sprout growth

B. Rotational mowing of herbaceous plants and small shrubs

C. Installation of nesting sites, loafing areas, winter cover

II. ENCHANCEMENT OF EDUCATIONAL OPPORTUNITY

Those practices designed to improve viewing or study of plants and and animals.

A. Redesign of trails.

B. Facilities development-for pond study and wildlife viewing

1) Screening fence for viewing gallery
2) Trail spurs and viewing platforms
3) Redesign of feeder complex

C. Outdoor self-guiding visitor's center

D. Museum

1) Specimen collection
2) Library acquisitions

III. MAINTENANCE OF FACILITIES

A. Repair of spillway

B. Trail drainage

I. HABITAT IMPROVEMENT

A. Removal of undesirable woody plants

1) Thinning or clear cutting of softwoods

Fields 2, 10, 11, and 23 all have evergreen stands which need attention:

a) The trees are too crowded for good growth
b) The existing blocks are too large to provide optimum cover interspersion for wildlife.
c) Competing hardwoods threaten their wintercover potential.

ACTION--Consult a professional forester* to obtain assistance with the following:

1. A plan for thinning to increase the vigor of existing softwoods.
2. A plan for rotational clear cutting to enhance the interspersion of habitats for wildlife (see diagram).
3. The potential for marketing of products derived.

2) Release cuttings

Fields 1, 7-9, 15, 16, 20, 23, 24, and 25 all have situations where desirable plants are being crowded by less desirable species. In most cases the problem is that of imminent progression from one successional stage to another, with the loss of significant portions of the earlier stage (i.e. shrubs-to-trees). Because release cuttings are extremely labor intensive, it is understood that such control must be strategically planned. Recommendations here will be limited to removal of trees from among shrubs which border mowed plots. Fields 16 and 23 are special cases because they involve the removal of competing hardwoods to favor the vigorous growth of evergreen cover. See diagrams and ACTION Recommendations following Section b., Rotational Mowing.

In Field 16, the problem is that of hardwoods gradually overtopping spruce trees, shading them and causing the needles on lower branches to die. Removal of competing hardwoods will help the conifers to maintain evergreen foliage to the ground.

3) Cutbacks-clearcutting of hardwoods

a) Removal of shrubs and trees to favor herbaceous growth.

Fields 13, 15 and the Islands of Rice Pond, could all be improved, especially for waterfowl and marsh bird nesting, by the creation of cutback borders to remove trees and shrubs and promote herbaceous plants. (See diagrams pg.15.) The desire is to create conditions which can be maintained by periodic mowing with a rotary brush cutter. (Although the extensive use of herbacides is not recommended, it might still be beneficial to use some local application to control resprouting from stumps of trees.) See Map #11

*Contact the N.Y.S. Department of Environmental Conservation Regional Office

b) Cutting back of overmature shrubs

In shrubby fields, there is a need not only to remove competing tree species, but also to maintain an uneven-aged intermix of shrubs. This can be achieved by periodic cuttingback and lowering to the ground of the overaged shrubs. While this practice would definitely have lower priority than the other successional control measures, it is still desirable since certain species of birds require younger shrubs for nesting. (See diagrams) (Refer to Section below for cutback ACTION Recommendations.

B. Rotational Mowing

The most critical habitat needed at Rice Creek is herbaceous cover. The clearing of over eight acres of brush and trees from Field 8 is an important achievement. The most practical way to maintain this herbaceous growth is rotational mowing using a rotary brush cutter.

1) Shoreline control

The purpose of this practice is to maintain herbaceous shoreline to promote the natural growth of important food and cover herbs for wetland wildlife. A short section of shoreline on the east side of Rice Pond harbors an unusual growth of cardinal flower. Some thinning of trees is recommended there to maintain suitable habitat for cardinal flower and wild iris.

2) Herbaceous clearings in shrubby fields

Fields 1, 7-9, 20, 24 and 25 all have major portions dominated by shrubs. Fields 7-9 have substantial acreages which have been cleared of shrubs. However, in all of the shrubby fields there are still good sized herbaceous plots which could be included in the mowing sequence.

ACTION Recommendations

1. Shoreline Management - Mow the two west shore herbaceous expanses (Field 13) shown on the Shoreline Management Map. Include these in the rotational mowing schedule below. Carefully assess the condition of the east shoreline 200' long by 30' wide (2+50 - 4+50 on map, page 11). Remove the more mature trees, as needed, to maintain suitable cover for cardinal flower and iris on the southern half of this band. Clear cut the northern half to promote herbaceous shoreline plants.

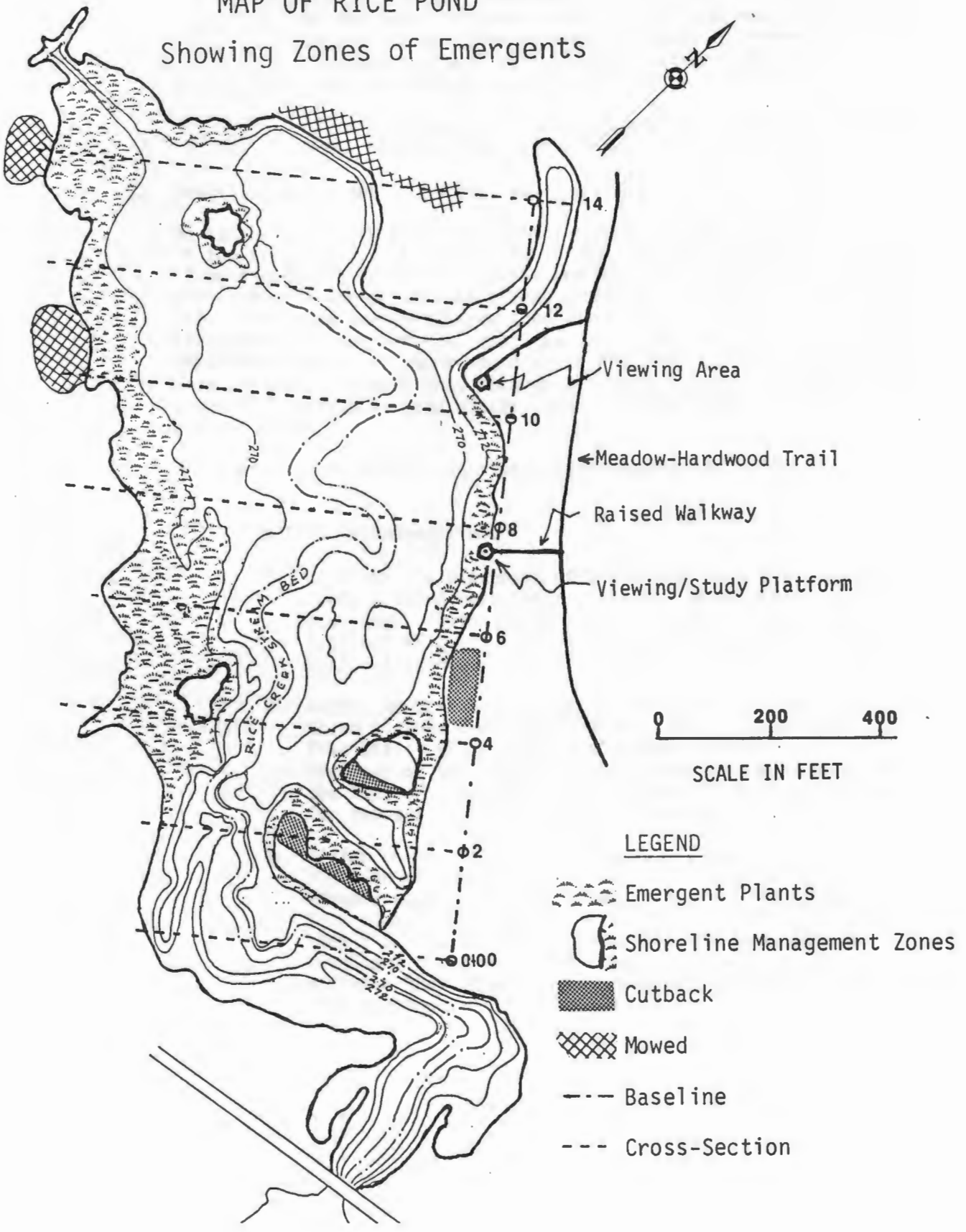
2. Rotational Mowing - Set up a 4-year rotational mowing schedule for as much of the herbaceous areas as is possible.

   a. Fields 1,20,24 & 25 - set a goal of mowing no less than 10% and no more than 20% of the total area (3.5 to 7.0 acres). Complete the mowing in 3 years or less.

   b. Fields 7, 8 & 9 - Using a rotary brush mower, open as many of the still herbaceous portions of the fields as is practical.

MAP 11
RICE CREEK FIELD STATION

MAP OF RICE POND
Showing Zones of Emergents



Field 7 - Set a goal of from 1.5-3.0 acres of additional mowing.

Field 8 - Set a goal of from 2.0-4.0 acres of additional mowing. Offset this additional mowing by allowing some of the shrub islands in the presently mowed area to expand. Also allow at least 4 maples or other forest tree species to attain full size, creating a shrub-tree savannah. (See also Section C.(2) Winter Cover below.)

Field 9 - Continue rotational mowing of existing herbaceous area. Refer to map and chart of rotational mowing schedules.

C. Installation of nesting sites, loafing areas and winter cover

As is the case with plant and animal resources, the physical attributes of the area change, as biodegradable and erodible materials break down. Of particular interest to wildlife are dead or "overmature" trees (those with butt rot and/or partially dead crowns). In mature natural woodlots, these are being constantly replaced but in Rice Pond there is no replacement of the vertical snags as they fall. Many of the transitional woodlands consist of young sound trees with few suitable nest sites for hole nesters. In addition, despite the large blocks of evergreen cover, there is a dearth of good winter cover in those fields remote from the conifer plots.

An assessment of these conditions might suggest the following:

ACTION Recommendations

1. Consider the placement of artificial nest boxes in the newly cleared herbaceous plots and in the transitional woodlands. Both the National Audubon Society and the National Wildlife Federation have publications which provide both design and placement instructions.

2. Anchor some floating logs in strategic locations especially those visible from the viewing gallery. Investigate the feasibility of location one or more vertical snags on each one of the islands in Rice Pond. Note comments in the body of the report page 13 about a nesting platform for ospreys. (See diagram in appendix.)

3. Winter cover - Fields 7-9 would all benefit from the location of one to several small plots of conifers, managed to maintain evergreen foliage to the ground. Each clump would consist of 8-9 trees (spaced no closer than 8'). As the trees grow, thin the trees with a resultant clump of 3 or 4 trees. This will help to minimize loss of evergreen crown through shading and self-pruning.

II. ENHANCEMENT OF EDUCATIONAL OPPORTUNITY

A. Redesign of trail system

The chart on page 33 and map # 8 outline a redesign of the trail system which incorporates the elimination of low wet areas.

B. Rice Pond provides unusual opportunities for viewing wildlife, however:

1) Viewing from the gallery window is often interrupted by people walking along the pond shoreline opposite the gallery windows. This could be corrected by the erection of units of solid fencing at least 5½' in height. Note the map and diagrams on page

2) At present, the trail system provides no apportunities to view the pond. The map on page shows a suggested modification which includes a short raised walkway with an observation-study platform at the end. It also includes a short overland spur which ends in a ground level viewing area. Construction techniques are shown in the appendix.

3) Redesign of feeder complex - the body of the text outlines reasons for the redesign of the feeder complex. If the screening fencing 1) above, is installed, as suggested it will provide an excellent opportunity for the installation of a feeder complex which is well screened from weather and will provide instructive and entertaining viewing for visitors, as well as creating a much more satisfactory area for student independent study.

ACTION Recommendations for II. A. and II. B. Although the practices do little to enhance the area in terms of its living collections, they will do a great deal to increase the opportunity for both study and enjoyment of the natural wealth of the Field Station with diminished disruption of flora and fauna. Because of sizeable, capital outlay involved, it is recommended that these be discussed by the staff and the Field Station advisory committee with the view in mind of developing a 3-year or 5-year or other plan for achievement of these goals. It is possible that some of the developments suggested below under C.and D., might be factored into the plan. With that accomplished, it should be possible through cooperative effort of the college and Rice Creek Associates, to develop any of the suggested practices which are favorably received.

C. Outdoor self-guiding visitor's center

The map on page 6 shows a weekend visitor's parking lot and a self-guiding visitor's center which would greatly improve the visitation opportunity for weekend visitation whether the building is open or not. Such a visitor's center, is available at the Baltimore Woods center at Marcellus, N.Y. Since there are obviously many problems relating to security and liability engendered by increasing non-supervised visitation, this is offered only as a suggestion. Again, Rice Creek Associates might be willing to assist with such visitation.

D. Museum addition

Rice Creek Associates has a committee discussing the creation of a museum for the use of the general public. Such a facility would greatly enhance the area in its service to the general public.

1) Speciment collection

Rice Creek has outstanding collections of preserved biological specimens. These could serve as a rich resource for museum displays. However, since they are primarily scientific and instructional collections, measures must be taken to avoid conflict between these uses. Ronald Giegerich of SUNY College of Environmental Science and Forestry, has prepared an excellent assessment and operational plan for the collections. Copies may be obtained for a nominal fee by contacting the Field Station.

2) Library additions

Rice Creek has a very fine small library covering botany, zoology, ecology and environment. However, in some areas it is holdings are largely taxonomic. It lacks in general life histories of mammals, fish, amphibians reptiles and to a lesser degree birds. If its holdings are to be used by the general public for on-site reference work some additions would be useful. This might be considered by the Field Station Advisory Committee or undertaken as a project by Rice Creek Associates.

III. MAINTENANCE OF STRUCTURES AND FACILITIES

A. Repair of the spillway

The upper overfall of the fish ladder, is also the waterlevel control structure. Since its construction in 1965, it has been progressively deteriorating due to erosion. It is essential that this be addressed as soon as possible. If it should break apart, the waterlevel of the pond would no longer be maintained at its present level.

B. Trail drainage

The suggested rerouting of the trails, eliminates most of the soft wet areas, which cannot be repaired without great expense. This still leaves a few places where ditching combined with the installation of tiles and modest amounts of fill, will provide an all weather surface. The map on page shows the locations. Instructions for repair are included in the appendix.

RICE CREEK FIELD STATION

APPENDICES

RICE CREEK FIELD STATION

APPENDICES

SUMMARY OF FIELD SURVEYS - OLD FIELDS

FIELD ACREAGE	1 12.2A	6 8.3A	7 18.8A	8 24.2A	9 19.3A	20 10.4A	24 6.0A	25 4.8A
Fern, Sensitive				* UNC				* UNC
Aster	* UNC		* COM	* COM	* COM	* AB	* LOC	* LOC
Coneflowers				* UNC				
Goldenrod	* AB	* UNC	* AB	* AB	* COM	* AB	* COM	* COM
Grasses, Foxtail	* UNC		* LOC	* LOC	* UNC	* LOC	* UNC	* UNC
Milkweed, Com.		* UNC	* UNC	* UNC	* LOC	UNC		* LOC
Strawberry, Wild	* COM	* LOC	* UNC	* UNC	* UNC	* UNC	* UNC	* UNC
Thistle				* FEW	* FEW			
Vetch	* UNC			* LOC	* UNC			
Yarrow	* UNC			* UNC	* UNC			
Blackberries	* COM	* COM	* COM	* AB	* COM	* COM	* UNC	* UNC
Grape, Wild	* LOC	* UNC		* LOC	* LOC			
Raspberries	* COM	* UNC		* COM	* LOC	* UNC	* UNC	* UNC
Rose, Wild		* UNC	+ 15STM	+ 16STM	+ 15STM	* LOC	* FEW	# FEW
Arrowwood	+ 5STM	#15STM		+ 15-20 STM	# 15-20 STM	+	+ 15	
		#15STM					#10STM	
Buckthorn	+ 2-3STM	#10STM			# 15STM	# 10STM	# 5STM	+ 5STM
Buttonbush	+ 2-3STM		+ 5-10STM	+ FEW				
Dogwood, R.O.	+ 5-10STM	+15STM		+ 13STM	# 20STM	+ 5-10STM	+ 10STM	+ 5STM
Dogwood, Silky		+15STM			# 20STM		+ 10STM	+ FEW
Hawthorn	+ UNC	#10STM			# 10STM		# 5 STM	5
Honeysuckle		+15STM			# 20STM		10STM	+10STM
Nannyberry	# 12STM	#5 STM			# 10STM		# 5STM	+ FEW
Sumac	+ 8STM	#10STM		+ UNC	# LOC	# LOC	# LOC	#10STM
Ash	#+ COM	# COM		#+ LOC	# COM	# LOC	# COM	# COM
Aspen		# FEW		# LOC	# LOC		# UNC	
Cottonwood								
Maples	+ FEW	# COM			# COM	# COM	# COM	# COM
Cherry	# FEW	# COM			# COM	# COM	# COM	# COM
Juniper	+ FEW	+ FEW				+ FEW		
Scotch Pine				+ FEW				

over 10' tall; + under 10' tall; #+ both mixed most over 10'; +# both mixed most under 10'

SUMMARY OF FIELD SURVEYS - WOODED FIELDS

FIELD ACREAGE CRUISE LINES	2 14.7A 8		3 21.3A *		10a 7.1 8		10b 3.1 2		11 14.1 7		13 6.2 6		16 2.4 3		18 12.5 1		19 2.9 2		21 & 22 6.6 4		23 3.9 3	
	NO	DBH	NO	DBH	NO	DBH	NO	DBH	NO	DBH	NO	DBH	NO	DBH	NO	DBH	NO	DBH	NO	DBH		
NORWAY SPRUCE	89	7.25			132	4.4																
WHITE SPRUCE	2	5.85											9	4.6								
MISC.	12*	4.3																				
SCOTCH PINE									134	6.2			13	7.9							11	7.8
WHITE PINE			1	?							2	6.1									3	4.1
BALSAM	1	5.5																				
LARCH											1	8.8										
HEMLOCK																						
ALDER			3	?			11	3.1			2	3.1							5	2.9	4	3.0
APPLE		4.0	1	?											1	8.3					4	3.0
ASH, WHITE			102	7.5	1	8.5	5	4.6					10	5.9	14	5.8			15	8.2	15	6.1
ASH, RED																						
ASPEN																						
BASSWOOD			17	7.6													1	3.3				
BEECH	2	4.25	402	5.7							13	6.5					5	4.8				
BIRCH, SWEET																	2	10.8			4	4.8
BIRCH, YELLOW		7.7	5	12													2	6.8				
BUCKTHORN		2.8	150	2.2																	2	2.0
CHERRY, BLACK	2	4.6	15								1	5.5							3	15	2	6.0
CHERRY, CHOKE, FIRE			1	?			1	5.5			1	5.3					1	5.2			4	4.1
COTTONWOOD	5	7.8																				
CRANBERRY BUSH.							1	2.2													1	2.0
ELM											5	6.7			2	5.5	5	5.7	6	5.5	9	5.2
HICKORY, B.N.			27	2.8													3	6.1			1	3
HOPHORNBEAM			38	5.0													2	3.9			4	5
LOCUST, BLACK																			6	6.9		
MAPLE, BOX ELDER									1	1.5												
MAPLE, RED											36	5.1										
MAPLE, SILVER							3	5.5	1	6.3	7	7.7			2	6.1			3	7	3	6
MAPLE, SUGAR	5	5.7	304	12.8									12	6.2			2	26.				
MOUNTAINASH											1	6.8					1	3.7	1	7	1	5
TOTAL/AVE. DBH	130	8.5	1075	6.3	133	4.4	21	4.1	136	6.1	69	5.9	44	5.7	19	6.1	24	7.9	39	7.2		
DIST.BETW.PRS.(FT)	17.9		?		6.3		8.6		8.4		10.6		6.6		11.9		13.1		8.7			

*See attached sheet for Field 3; ?-Not provided in field data

Random Pairs Sampling Method

A predetermined compass line pattern, was set up for the study area and the distance between sampling points predetermined so that each point samples diffeeent trees. Nearest tree from the first point is chosen (Tree "A") and the diameter and species of the tree noted. The 180° sector including tree "A" was excluded from consideration in chosing the second member of the pair (Tree "B"). Tree B is the nearest tree to tree"A" outside the excluded 180° sector. Species and DBH of Tree "B" are noted. Sampler then proceeds along his compass line, sampling pairs at the predetermined intervals, until all of the zigzag baselines are sampled.

FIELD #3

ANALYSIS OF MATURE WOODS*

	POINTS	# OF TREES	TOTAL BASAL AREA	RELATIVE DENSITY	INDEX R^2	RADIUS	DBH INCHES	MAXIMUM BASAL AREA	R^2	$\bar{R}$	D
SUGAR MAPLE	20	8	1022 sq.in.	20%	40.68	6.4	12.8"	531	169	13	26
ASH	20	4	178 sq.in.	10%	14.17	3.75	7.5"	254	81	9	18
HOPHORNBEAM	20	7	136.5 sq.in.	17.5%	6.2	2.49	5.0"	46.6	14.8	3.85	7.7
BEECH	20	11	278 sq.in.	27.5%	8.05	2.84	5.7"	266	84.7	9.2	18.4
YELLOW BIRCH	20	1	113 sq.in.	2.5%	35.98	6.0	12.0"	128	40.8	6.4	12.8
BUCKTHORN	20	8	29.9	17.6%	1.19	1.08	2.2"	37.4	11.9	3.45	6.9
HICKORY	20	1	5.94 sq.in.	2.9%	1.89	1.38	2.8"	201.1	64	8	16
BASSWOOD		1	46.2 sq.in.	2.9%	14.7	3.8	7.6"	160	51	7.15	14.3

DATA FROM ALAN WOODIN SURVEY FIELD #3
(1066 Trees)

SUGAR MAPLE	304	28.5%	YELLOW BIRCH	5	<.5%
BASSWOOD	17	1.6%	HICKORY	27	2.5%
ALDER	3	<.5%	BLACK CHERRY	15	1.4%
BEECH	402	37.7%	WHITE PINE	1	<.5%
HOPHORNBEAM	38	3.6%	APPLE	1	<.5%
BUCKTHORN	150	14.%	CHOKECHERRY	1	<.5%
ASH	102	9.6%			

*Data from 1983 Report, Timothy S. Bowen, Plant Ecology, Dr. Donald D. Cox

SUMMARY

SURVEY OF EMERGENT VEGETATION - RICE POND, OSWEGO, NEW YORK*

Station		Description of Plant Community
3+00	L550	Burreed, Pickerelweed, Water Smartweed, Sedges, Loosestrife toward shore
3+50	L550	Cattails start flow northward
4+00	L444	Pickerelweed, Woodl. Bulrush, scattered
4+00	L481	Island - Willow, Ash, Silky Cornel
4+00	L522	Island
4+00	L531	B-L Cattail, Pickerelweed under
4+00	L564	Edge of cattailstand (west) Est 8'tall., Loosestrife, Rice Cutgrass
4+00	L584	Loosestrife, Scattered Cattail, Arrowhead, Shoreline at 5+00 L629
5+00	L465	Pickerelweed
5+00	L480	Soft Bulrush, Loosestrife,(scattered), Burreed (scattered)
5+00	L515	Burreed meadow, Pickerelweed interspersed.
5+00	L565	Woodl. Bulrush, large clump to north, scattered clumps to south
5+00	L630	30' sq. clump of Pickerelweed, Spikerush scattered
5+00	L600	Willows, Loosestrife, Burreed and Sedges intermixed.
5+00	L655	Saturated soil, Woodl. Bulrush, Rice Cutgrass, Loosestrife
5+00	L705	Shoreline, Trees
6+00	L498	Cattail, Sedges
6+00	L575	Mixed Loosestrife and Cattail
6+00	L596	West edge of Cattail, Burreed, Loosestrife,Arrowhead, Sedges
6+00	L628	Increasing Loosestrife density toward shore
6+00	L673	Shoreline, Ash, Alder, Red Maple
7+00	L498	Open Water
7+00	L548	Pickerelweed, Arrowhead,Spikerush(abundant),Burreed intermixed
7+00	L601	Beaver canal. Open Burreed Meadow beyond, extends to south
7+00	L613	Scattered Cattail, clumps of Woodl. Burreed
7+00	L638	Cattail, Loosestrife intermixed
7+00	L653	Dense Rice Cutgrass, B-L Cattail
7+00	L673	Shoreline,Shrubs,Willows,Ash, Cornel
8+00	L572	Needlerush,Woodl. Bulrush,Pickerelweed,Burreed,Loosestrife,Arrowhead
8+00	L620	Cattail,B-L and N-L intermixed
8+00	L639	Mixed Spikerush,Sedges,Woodl. Bulrush
8+00	L672	Mixed Cattails
8+00	L707	Shoreline
9+00	L650	Pickerelweed,Arrowhead Dense band, Woodl. Bulrush(scattered clumps)
9+00	L680	Water Parsnip,Spikerush (dense),Loosestrife (scattered)
9+00	L700	Band of Woolgrass with Loosestrife and Pickerelweed Intermixed
9+00	L712	Scattered Cattails
9+00	L723	Cattails,Loosestrife intermixed
9+00	L740	Cattails,Burreed,Rice Cutgrass,Soft. Bulrush
9+00	L750	Shoreline,Rice Cutgrass,Bulrush,N-L Cattail
10 00	L650	Pickerelweed
10+00	L665	Dense mixture-Cattails,Arrowhead,Swamp Smartweed,Spikerush
10+00	L690	Beaver Canal,Woolgrass,Loosestrife
10+00L	L704	Loosestrife,Spikerush,Rice Cutgrass,N-L Cattail -Dense Mixture
10+00	L715	Shoreline - N-L Cattail,B-L Cattail mixed
10+00	L795	Rice Cutgrass,Tearthumb
10+00	L830	Joe-pye-weed,Cornels,Herbaceous expanse to fence at 10+00L910

11+00 L745 Pickerelweed with mixture of Dotted Smartweed,Arrowhead,Bulrush
11+00 L761 N-L and B-L Cattail intermixed,Swamp Smartweed under
11+00 L801 Loosestrife,Woolgrass,Arrowhead all intermixed
11+00 L836 Saturated Soil, N-L Cattail increases
11+00 L871 Shoreline, west edge of Cattails, Water Hemlock
11+00 L891 Upland, Rice Cutgrass, willowherb,Joe-pye-weed, Mannagrass
11+00 L936 Cutgrass, Ironweed to Fence at L976
12+00 L900 Pickerelweed,Arrowhead, Bulrush,Spikerush
12+00 L918 Some Spikerush intermixed with above
12+00 L930 Cattails,sparse,Spikerush,Woodl. Bulrush
12+00 L955 Shoreline, Narrow-leafed Cattail to Fence at L996 Wooded beyond
13+00 L830 Pickerelweed, Arrowhead,Swamp Smartweed abundant
13+00 L840 Cattails, mostly Narrow-leafed
13+00 L867 N-L Cattails
13+00 L899 N-L Cattails,Willow saplings- soils saturated
13+00 L912 N-L Cattails,Sensitive Fern,Iris,Cornels
13+00 L920 Ash, Cornels,Rice Cutgrass, Willowherb,Ironweed,dense shrubs beyond

LIST OF PLANTS REFERRED TO ABOVE

HERBS

Arrow Arum - Peltandra virginica
Arrowhead - Safittaria latifolia
Bulrush, Soft - Scirpus validus
Bulrush, Woodl - S. expansus
Woolgrass - S. cyperinus
Burreed - Sparganium eurycapum
Cattail, B-L - Typha latifolia
Cattail, N-L - T. angustifolia
Joe-pye-weed - Eupatorium maculatum
Iris - Iris versicolor
Ironweed - Vernonia novaborascensis
Loosestrife - Lythrum salicarea
Mannagrass - Glyceria
Needlerush - Juncus effusus
Pickerelweed - Pontederia cordata
Rice Cutgrass - Leersia oryzoides
Sedges - Carex lupulina
Sedges - C. lurida
Sedges - C. retrorsa
Sedges - C. vulpenoidea
Smartweed, Dotted - Polyganum punctatum
Smartweed, Swamp - P. hydropiperoides
Tearthumb - P. sagittatum
Spikerush - Eleocharis calva
Water Hemlock - Cicutum bulbifera
Water Parsnip - Sium suave
Willowherb - Epilobium hirsutum
Sensitive Fern - Onoclea sensibilis

WOODY PLANTS

Alder - Alnus rugosa
Ash, Red - Fraxinus pennsylvanicum
Ash, White - F. Americana
Cornel, Silky - Cornus, amomum
Cornel Red Osier - C. stolonifera
Maple, Red - Acer rubrum
Willows - Salix sp.

ANNOTATED LIST OF SUBMERGED PLANTS

Hornwort - Ceratophyllum demersum - common throughout pond from 1'-3' depth; often dominant. Scattered from 4'-6" depth.
Curly Pondweed - Potamogeton crispus - common throughout pond from 1'-4' depth. Occasionally codominant with hornwort.
Leafy Pondweed - Potamogeton foliosus - locally common, mostly scattered.
Waterweed - Elodea canadensis - common throughout the pond, dominant at depth greater than 4'.

ANNOTATED LIST OF FLOATING PLANTS

Water Fern - Azolla caroliniana - Periodically common in protected shallows. Usually develops in mid to late summer when present.
Duckweed - Lemnaminor - abundant especially in protected leeward embayments. May cover a majority of pond in mid to late summer.
Great Duckweed - Spirodella polyrhiza - commonly intermixed with L. minor. Ratio 1987 1 s.p. to 4 l.m.
Watermeal - Wolffia columbiana - normally present with duckweeds often more numerous (no fronds) than L. minor or S. polyrhiza.

APPENDIX II - ANIMAL STUDIES

APPENDIX

BIRDS OF RICE CREEK FLOOD ZONE

1964-66 X-seen; F-overflights only; M-migration; N-nesting; W-winter; ?-present in breeding season, no nests located.

Mallard Duck N
Black Duck X
Wood Duck N
Blue-Winged Teal X
Hooded Merganser X
Red-Tailed Hawk X
Broad-Winged Hawk M
Rough-Legged Hawk W
Kestral N
Cooper's Hawk X
Sharp-Shinned Hawk X
Harrier X
Ring-Necked Pheasant N
Great-Blue Heron X
Green Heron X
Least Bittern X
Common Galinule X
Killdeer X
Spotted Sandpiper X
Least Sandpiper X
Woodcock. N
Common Snipe M
Solitary Sandpiper X
Herring Gull F
Ring-Billed Gull F
Black Tern F
Common Tern F
Mourning Dove N
Yellow-Billed Cuckoo X
Screech Owl X
Great Horned Owl X
Snowy Owl W
Night Hawk F
Chimney Swift F
Red-Throated Hummingbird X?
Bobolink N
Meadowlark N
Red- Winged Blackbird N
Rusty-Blackbird M
Common Grackle N
Cowbird N
Baltimore Oriole N
Scarlet Tanager X?
Cardinal X
Rosebreasted Grosbeak S
Indigo Bunting X?
Goldfinch N
Belted Kingfisher X
Yellow-Shafted Flicker X?
Downy Woodpecker X
Hairy Woodpecker X
Phoebe N
Kingbird X?
Great-Crested Flycatcher X
Alder Flycatcher N
Least Flycatcher X?
Wood Pewee X
Horned Lark W
Tree Swallow N
Barn Swallow X?
Blue Jay X
American Crow X
Black-Capped Chickadee X
White-Breasted Nuthatch X
Brown Creeper X
Housewren N
Catbird N
Robin N
Woodthrush X
Veery X
Eastern Bluebird X?
Cedar Waxwing N
Starling N
Warbling Vireo N
Red-Eyed Vireo X?
Yellow Warbler N
Myrtle Warbler M
Northern Yellow Throat N
Chestnut-Sided Warbler X?
Canada Warbler M
American Redstart X
House Sparrow X
Towhee X
Song Sparrow N
Savannah Sparrow X?
Vesper Sparrow X?
Henslow's Sparrow X?
Grasshopper Sparrow X?
White Crowned Sparrow M
Tree Sparrow W
White-Throated Sparrow M
Field Sparrow X?
Chipping Sparrow X
Slate-Colored Junco W

MAMMALS OF RICE POND FLOOD ZONE - 1962-66

X-seen; X+-evidence of denning; T-tracks (winter); U-seen, species unknown; X?-present, no den's found; T?-identification probable

Bats U
Raccoon X
Bobcat T?
Red Fox X?
Grey Fox X
Skunk X
Long Tailed Weasel X
Mink X?
Red Squirrel X
Grey Squirrel X
Chipmunk X?
Jumping Mouse +
Woodchuck +
Muskrat X+
Norway Rat X
White Footed Mouse X+
Meadow Vole X+
Cottontail X+
White-Tailed Deer X

REPTILES AND AMPHIBIANS OF RICE CREEK FIELD STATION *

Garter Snake
Dekay Snake
Water Snake
Ribbon Snake
Red-Bellied Snake
Leopard Frog
Spring Peeper
American Toad
Pickerel Frog
Spotted Salamander
Red-Backed Salamander
Two-Lined Salamander

FISH

Brook Lamprey
Common Sucker
Northern Creek Chub
Balcknose Dace
Common Shiner
Bluntnose Minnow
Brown Bullhead
Mud Pickerel
Johnny Darter
Common Sunfish
Rock Bass

*This list is compiled from fragmentary field notes. No study of herpetofauna was made during the period 1962-66. See Appendix II for more detailed study made in 1987 by Peter Rosenbaum.

PRELIMINARY INVENTORY OF THE REPTILES & AMPHIBIANS IN THE VICINITY OF THE RICE CREEK FIELD STATION STATE UNIVERSITY OF NEW YORK-COLLEGE AT OSWEGO

by Peter A. Rosenbaum

INTRODUCTION

The following is the preliminary report on the present status of the herptofauna (reptiles and amphibians) that have been documented during the period of this study (March-October, 1987) on the State University of New York-College at Oswego's Rice Creek Field Station (RCFS). This report is exclusively limited to the RCFS. Many anticipated species were not found. The most parsimonious reasons for their absence during this study are (a) local extirpation of previous populations at this location; (b) present and/or historical absence of certain species to this particular locale; or (c) species were present, but not found during the one season survey. Additional species will be added to this species inventory during the course of an ongoing study of the herptofauna of the RCFS, Oswego County, and Central New York. It must be noted that certain species known from the vicinity of RCFS were not found on the Field Station property. Whether this represents the true absence of these species from RCFS, or merely a limited sample during a limited time interval is uncertain at this time. Many reptiles and amphibians are extremely secretive and/or are seen rarely by humans due to a variety of possible reasons (beyond the scope of this report). Future reports will elaborate on the diversity, distribution, and conservation programs that impact RCFS.

The author is actively engaged in conservation projects to survey, make recommendations on habitat preservation, captive breeding and reintroduction of some native Central New York herps in collaboration with researchers at the Burnet Park Zoo. During the course of this preliminary survey, many more questions regarding the actual status and distribution of Central New York herptofauna were raised than can be addressed in this report. Possible research projects, reclaimation programs, etc. have been identified that may be feasible at RCFS. These data and ideas are on file at RCFS.

Herpitiles are integral components of most, if not all Oswego County habitats. This is a result of the variety of habitats and vast wetlands. For many reptiles and amphibians, survival is intimately tied to a fresh water aquatic habitat of one type or another. Indeed the impact of land and resource management on herptofauna is generally poorly studied and/or understood. From what is known, the impact of human habitat alteration is variable among herps, but quite devastating to many based on the biological requirements of a given species' for survival.

METHODS AND MATERIALS

Between late March, 1987 thru late October, 1987, formal collections were made toward this survey. Over 90% of the collections were made on the SUNY-Oswego Rice Creek Field Station property. Approximately ten (10) days were spent reviewing the literature and in study design. On the Field Station property, two drift fences were set up: (1) on a spit of peninsular land adjacent to the lagoon. This fence was 24" high and ran approximately 40 feet (14 meters). On each end was a metal funnel directing organisms encountering the fence, into the five gallon bucket below. Likewise, similar "pits" were placed about midway down the drift fence on each side. (2) a smaller drift fence was erected in the woods adjacent to a temporary pool that was fed by a seasonal stream.

Additionally, several types of aquatic traps were used. All had similar design, but varied in size from minnow trap size, to roughly 55 gallon drum size. Aquatic traps were baited with fish, bread, lettuce (and other plant material), cat food, and dog food at different times.

Effort was made to explore seasonal variations, weather related events, etc. Numerous field collecting trips, by night and day, under various weather conditions, and various times during the season, were used as survey techniques. Where appropriate, road kills were evaluated for the relative amount and timing (and under what environmental conditions) of species movement (seasonal, mating, etc.). Aquatic turtle traps were set out periodically throughout the season to assess pattern of change in species, species frequency, dietary preference, etc. Meadows, forest, pond, pond edge, stream, stream edge, human disturbed areas, and various "wetland" habitats were explored.

In the annotated checklist below, distribution maps were sought for this vicinity (e.g.: Carr, 1952; Bishop, 1941, 1947; Blair and Cagle, 1968; Leviton, 1972; Oliver, 1955; pope, 1937; Schmidt and Davis, 1941; Smith, 1946; Wright and Wright, 1949, 1957). When unavailable, Conants's (1975) Field Guide to the Reptiles and Amphibians of Eastern and Central North America was used. Nomenclature for both common and scientific names used follow either the Society for Study of Amphibians and Reptiles (SSAR) publication The Standard Common and Current Scientific Names for North American Amphibians and Reptiles (1978), Conant's (1975) field guide, or other more recent citation. Where there are discrepancies, the SSAR publication takes priority.

ANNOTATED CHECKLIST OF THE REPTILES AND AMPHIBIANS OF OSWEGO COUNTY, NEW YORK STATE UNIVERSITY OF NEW YORK-COLLEGE AT OSWEGO RICE CREEK BIOLOGICAL FIELD STATION AND ADJACENT ENVIRONS

CLASS: REPTILIA

Order: Testudines

Family: Chelydridae-Snapping Turtle

1. Chelydra serpentina serpentina (Common Snapping Turtle): Almost any permanent body of freshwater is a potential home for snapping turtle. Rarely bask. Generally inoffensive underwater and commonly partially buried by mud in shallow

water. On land, they are aggressive. Omnivorous. Often used for making soups and stews in human kitchens. Adults average 10-35 lbs., but may approach 100 lbs.

Abundant at Rice Creek Field Station (RCFS). Females are observed annually digging nests and laying eggs within a few yards of the main building. Regretably, most of the diurnal turtle reproductive activity is devastated at dusk/night by various nocturnal predators (e.g.: raccoons, fox, opossum, etc.), and the diurnal scavenger birds finish the job. However, this type of total devastation is avoided in other less exposed areas around the pond. RCFS may consider exhibiting this turtle nesting in more depth by gathering, incubating and hatching some portion of the eggs doomed to predation.

Family: Emydidae-Box and Water Turtles

2. Clemmys guttata (Spotted Turtles): A wetland turtle. No recent records from RCFS. Consideration should be given to its reintroduction from adjacent populations. Good condidate for captive breeding and being used by researchers at SUNY-Co. in cooperation with Burnet Park Zoo to pilot a "head start program" for this species for its own recovery and as a model for reintroducing the rare and endangered bog turtle (Chemmys muhlenbergi) into its historical range. NOTE: Species known from areas east, west and south of the Oswego River.

3. Chrysemys picta marginata (Midland painted turtle): One of the two turtle species (along with the snapping turtle) that most people in our area know of or see. Often encountered crossing road, basking, and as pets. Unknown how much genetic "pollution" has occurred with pet store released turtle of other subspecies. Another egg layer within site of the RCFS buildings. This behavior could be used in various experimental and descriptive projects at RCFS.

Order: Squamata
Suborder: Serpentes - Snakes

Family: Colubridae

4. Nerodia (Natrix) sipedon sipedon (Northern water snake): The only large water snake in our region. Highly variable morphological coloration of the local population is interesting both to the ecologist and the geneticist. At home in virtually every waterway in our area. A good research snake, as it is common, easily kept in captivity, and has an interesting ovoviviparious reproductive habit.

5. Thamnophis sirtalis sirtalis (Eastern garter snake): Highly variable morphologically and very wide ranging (Canada to the Gulf of Mexico), variability is both clinal as well as within a given population. Abundant in our area and like water snake, ovoviviparous. Good captives. Still many questions to be addressed regarding this already highly studied species.

6. Thamnophis sauritus septentrionalis (Northern ribbon snake): More aquatic than the garter snake and less abundant even in our wetland environment, this species does have the capability to withstand environmental extremes as evidenced by its presence when no other serpentes are in certain wetland habitats. Details of the ecological barriers between this ribbon snake and the sympatric garter snake would prove interesting in our nothern wetland county. Also ovoviviparous, but more "nervous" and hence not as good a captive. A current inhabitat of RCFS.

7. Diadophis punctatus edwardsi (Northern ringneck snake): This thin, glossy dark snake with a golden collar is a secretive woodland species feeding on many of the inhabitants (e.g.: salamanders, earthworms, frogs, smaller snakes, etc.) of rotten logs. Their fossorial habits make them appear more uncommon than they are in actuality. RCFS appears to have a modest and widely ranging population.

8. Storeria dekayi dekayi (Northern brown snake): While found in bogs, swamps, freshwater marshes, hillsides and moist woods, this species is quite hardy and is commonly found in and around human habitation. Common at the RCFS and in Oswego Co. in general. Sympatric with closely related, but generally less abundant red-bellied snake.

9. Storeria o. occipitomaculata (Northern red-bellied snake): A secretive snake with a broad, but spotty distribution. Sympatric over much of its range with a variety of Storeria dekayi subspecies. An inhabitant of RCFS. Population status and distribution undertain at this time.

10. Lampropeltis triangulum triangulum (Eastern milk snake): The "type" subspecies of a very broad ranging and ecologically diverse species that ranges from Canada to Central America, and from Atlantic to the Pacific coast. The group given the erroneous name "milk snake" due to our native subspecies association with human habitation leading to the mythology surrounding the name "milk snake." While somewhat secretive, apparently relatively abundant at the RCFS as well as throughout the county. Its worst enemies appear to be garden tools used by humans who believe what appears to be an excellent copperhead mimic, habitat destruction, road kills, and in some areas, being mistaken for venomous coral snakes.

CLASS: AMPHIBIA

Order: Caudata (Salamanders)

Family: Ambystomatidae-Mole Salamanders

11. Ambystoma maculatum (Spotted salamander): A relatively common inhabitant of RCFS and the surrounding Oswego area. Emerges early in spring.

Family: Salamandridae-Newts

12. Notophthalmus viridescens viridescens (Red-spotted newt): Both the larval "red efts" and the adult newts were found at the RCFS. Status of the population needs updating, but appear stable.

Family: Plethodontidae-Lungless Salamanders

13. Desmognathus fuscus fuscus (Northern dusky salamander): Known from RCFS as well as elsewhere in the county (notably in the hilly Tughill region) in streams (permanent and temporary), and spring fed brooks. Only one specimen from RCFS was found. Abundance appears greater where there is a hilly habitat with streams. as is found in the Tughill. More quantitation is needed to determine distribution within the county.

Plethodon C. cinereus (Red-backed salamander): As with the northern dusky, a small number of specimens were collected at RCFS. Needs further study as to current status and distribution within the county. NOTE: Two color morphs are known from our area; one "red backed;" the other "lead-backed."

Plethodon glutinosus glutinosus (Slimy Salamander): A common woodland species distributed from Mexico to New England. While a small number of specimens were obtained at the RCFS, the abundance seemed greater in the Tughill region.

Hemidactylium scutatum (Four-toed salamander): Also widely distributed, specimens were found in the wooded area of RCFS and also in the Tughill region. Current status and relative distribution needs quantification.

Eurycea b. bilineata (Northern two-lined salamander): Specimens found along streams at RCFS in the early spring, and elsewhere in the county. Appears common in Oswego city area. Like other salamanders, this species status and current distribution needs review and updating.

der: Anurans-Toads and frog

Family: Bufonidae-Toads

Bufo americanus (American toad): The only toad found in this area, this species is common at the RCFS and throughout the county. More details of current status and distribution would be valuable.

Family: Hylidae-Tree frogs

Hyla crucifer (Spring peeper): Their vocalizations indicate the ending of winter and the beginning of spring. One of the first herpitiles to emerge and begin the business of reproduction. Abundant county wide, with a high density in the vicinity of RCFS. Spring dispersals are more impressive in volume per unit time than fall movement back to wintersites of aestivation. Investigation of intra-individual color variation under different conditions could be a research project.

Hyla versicolor (Grey tree frog): A larger, less numerous native to our area. Specimens were located by sound both at RCFS and elsewhere in the county. Actually collections occurred only at RCFS followed by release. Highly variable coloration. Diagnostic field character is a bright orange skin patch concealed on hind limbs. Experts at camouflage.

Family: Ranidae-True frogs

Rana catesbeiana (Bullfrog): The largest frog in our area. Native, aquatic. Males call with deep base note. Tadpoles may take up to three years to undergo metamorphosis. Common throughout the region; specimens collected at various locales throughout the county, including the RCFS.

22. Rana clamitans malanota (Green frog): A common species in our area. Collected at various locales, including RCFS. A highly variable and abundant frog in our region.

23. Rana pipiens (Northern leopard frog): More abundant in western Oswego Co. (vicinity RCFS) than in eastern portion of the county. Common in the vicinity of RCFS.

24. Rana palustrus (Pickeral frog): Uncommon, but present at RCFS.

25. Rana sylvatica (Wood frog): A woodland native of the RCFS and adjacent area. Exists in at least two color morphs. May intergrade with Mink frog (Rana septentrionalis) in as where their ranges are sympatric.

DISCUSSION

Many questions regarding the herpetofauna of the RCFS and Oswego Co. remain. Several species in need of protection exist within RCFS and Oswego County. It is a county with wetlands covering nearly 20% of the surface area, of which nearly 15% are registered with the N.Y. State Department of Environmental Conservation.

Human impact on herpetofauna can be great and needs further study. Habitat modification, habitat destruction, insufficient management strategies or none at all, the effects of pollutants, etc., all impact profoundly on native herpetofauna. Central New York was once considered an area of diverse and plentiful reptile and amphibian species. Habitats must be preserved, and long range, well planned management programs need to be set in place for each species. It is important for wildlife managers to recognize the vital role that herps play in the environment, as prey and as predators.

SELECTED BIBLIOGRAPHY

Bellaris, Angus. (1969) The Life of Reptiles. Weidenfeld & Nicolson, 2 vols.

Bieber, Andrew, et. al. (1976) Habitat and Wildlife Inventory: Guide to Coastal Zone Lands, Oswego County, New York. Rice Creek

Bishop, Sherman S. (1921) "The Map Turtle Graptymys geographica in New York." Copeia No. 100, pp. 80-81.

_____ (1923) "Notes on the Herpetology of Albany County. New York. III. The Snakes and Turtles." Ibid., No. 125, pp. 117-120.

_____ (1941) "The Salamanders of New York." New York State Museum Bull. No. 324. Albany Univ. Press.

_____ (1947) Handbook of Salamanders. Cornell Univ. Press (Comstock).

Blair, Albert P., and Fred R. Cagle (1968) Vertebrates of North America. 2nd. ed. McGraw-Hill

Carr, Archie F. Jr. (1952) Handbook of Turtles Cornell Univ. Press.

Collins, Joseph T. et. al. (1978) Standard Common and Current Scientific Names for North American Reptiles and Amphibians. SSAR.

Conant, Roger (1975) A Field Guide to Reptiles and Amphibains of Eastern and Central North America. Houghton Mifflin Co.

DeGraaf, Richard M. and Deborah D. Rudis. (1983) Amphibians and Reptiles of New England. Univ. of Mass. Press.

Ernest, Carl H. & Roger W. Barbour (1973) Turtles of the United States. Univ. of Kentucky Press.

Goin, Coleman J. & Olive B. Goin (1971) Introduction to Herpetology. Freeman.

Levitaon, Alan E. (1972) Reptiles and Amphibians of North America. Doubleday.

Jones, Susan A. et.al. (1983) The Wetlands of Oswego County, New York: The Interrelationship of Glaciation, Surficial Geologica Deposits, and Wetland Forestation. Oswego County Environmental Management Council.

Jones, Susan A. et.al. (1983) The Oswego County Wetlands Mapping and Inventory Project: Introduction and Summary. Oswego County Environmental Management Council.

Minton, Sherman A., Jr., and Madge R. Minton (1969) Venomous Reptiles. Schibner.

Oliver, James A. (1955) The Natural History of North American Amphibians and Reptiles. Van Nostrand.

Pope, Clifford H. (1937) Snakes Alive and How they Live. Viking.

_____ (1939) Turtles of the United States and Canada. Knopf.

_____ (1955) The Reptile World. Knopf.

Porter, Kenneth R. (1972) Herpetology. Saunders.

Schmidt, Karl P. (1953) A Checklist of North American Amphibians and Reptiles. 6th ed. ASIH.

_____and D. Dwight Davis (1941) Field Book of Snakes of the United States and Canada. Putnan.

_____and Robert F. Inger (1957) Living Reptiles of the World. Hanover House.

Smith, Hobart M. (1946) Handbook of Lizards. Comstock.

Stebbins, Robert C. (1954) Amphibians and Reptiles of Western North America. McGraw Hill.

Wright, Albert Hazen (1918a) "Notes on Muhlenberg's Turtle." Copeia No. 52, pp. 5-7.

_____ (1918b) "Notes on Clemmys." Proc. Biol. Soc. Washington, 31:51-57.

_____ (1919) "The Turtles and Lizards of Monroe and Wayne Counties, New York." Copeia No. 66, pp. 6-8.

_____ and J. Moesel (1919) "The Toads and Frogs of Monroe and Wayne Counties." Copeia No. 74, p. 81.

_____ (1919) "The Salamanders of Monroe and Wayne Counties, New York." Copeia No. 72, P. 63.

Wright, Albert Hazen & Anna Allen Wright (1949) Handbook of Frogs and Toads of the United States and Canada 3rd ed. Comstock.

_____(1957) Handbook of Snakes of the United States and Canada. vol. 3 cornell Univ. Press.

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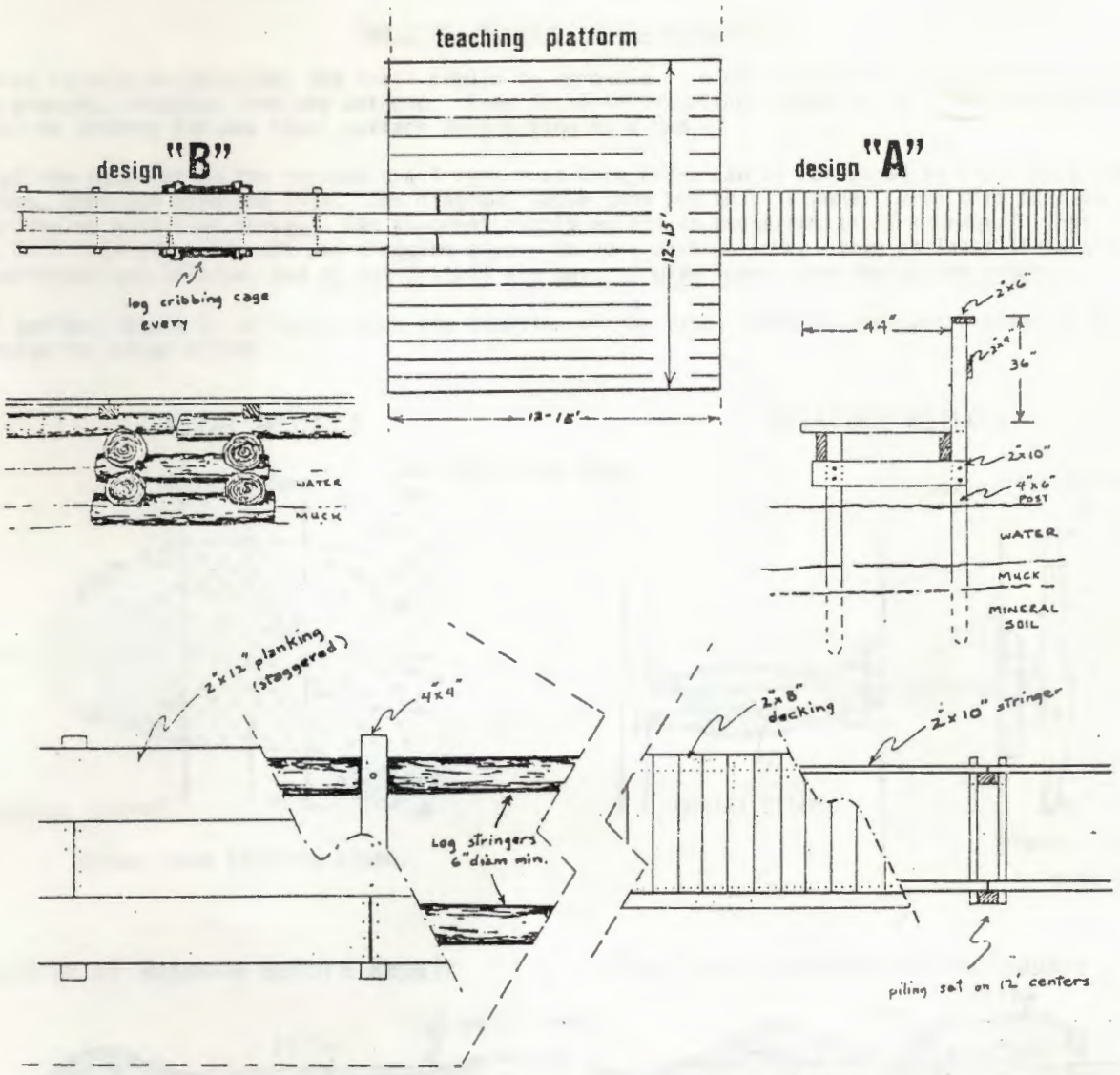
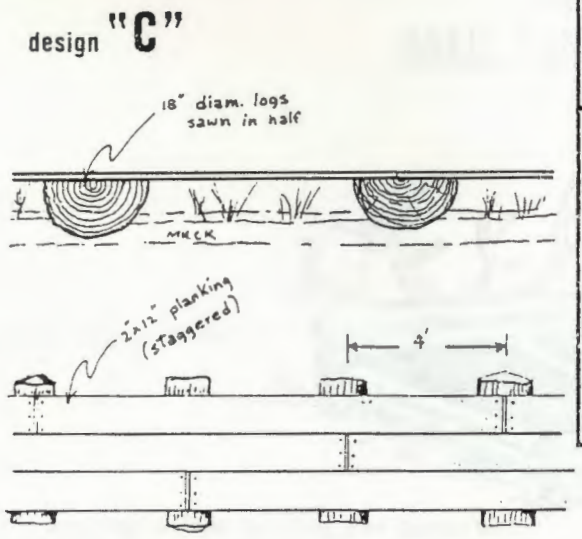
APPENDIX III - PLANS AND SPECIFICATIONS

APPENDIX III





Wet Area Walkways and Assembly Platform

design **A** - for areas with constant water depths between 10" and 25"

design **B** - for areas with constant water depths between 5" and 10"

design **C** - an inexpensive design for areas with no year-round standing water but subject to periodic flooding.

METHOD FOR REPAIRING WETHOLES IN TRAIL

Most of the wetholes are places where water accumulates without any proper release. In places the trail fill creates a dam since there is no way for the water to be drained out.

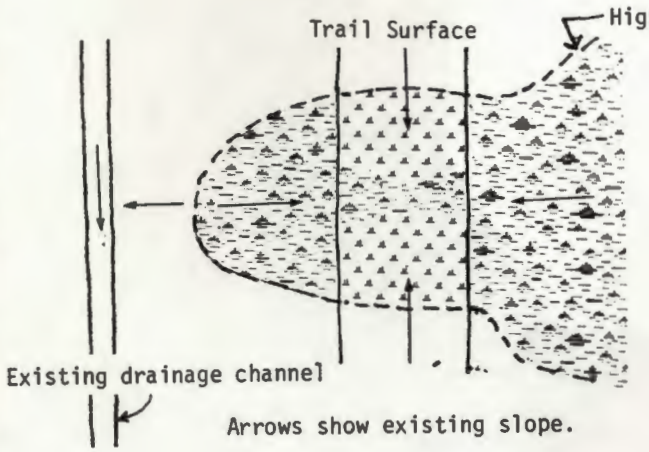
Two Kinds of Solutions are Possible:

1) Where no release is possible, the trail should be rerouted. In most cases it can be shifted to the high point which prevents drainage from the wethole. Even in these situations, however, a small drainage tile should be located to prevent the new trail surface from acting as a dam.

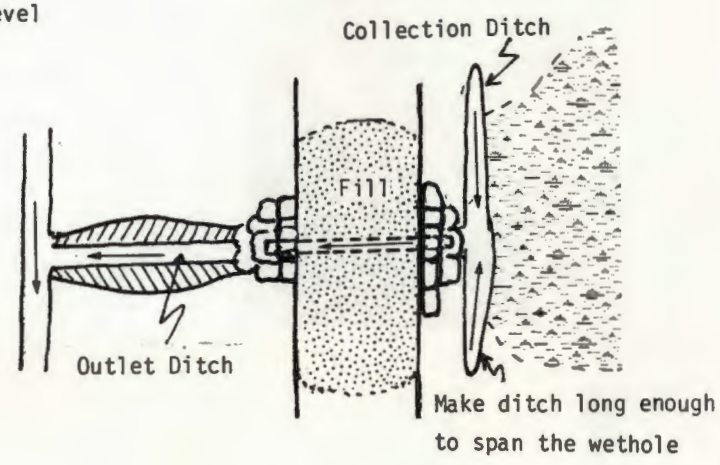
2) Most of the wetholes on the revised trail system at Rice Creek can be corrected in situ, by a combination of ditching, drainage pipe and fill. The diagrams above show how this is done. Note that both ends of the pipe are protected with flat stones. (An abundant supply exists in hedgerows at Rice Creek.) This is to prevent trail fill from sloughing off and clogging pipe. Be very careful to maintain at least 1" fall from upstream to downstream end of pipe, and do not install any part of pipe lower than the outlet ditch.

   Trail surface should be at least twice the diameter of the pipe. (4"x10' corrugated steel pipe can be purchased for under $10.00.)

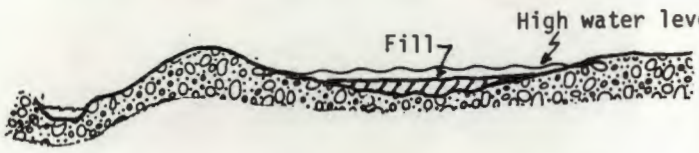
TYPICAL WETHOLE



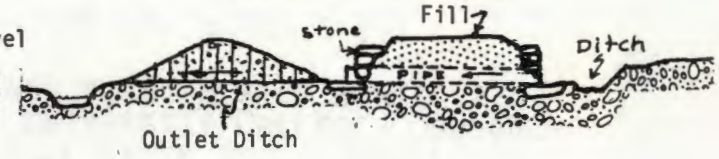
REPAIRED WETHOLE



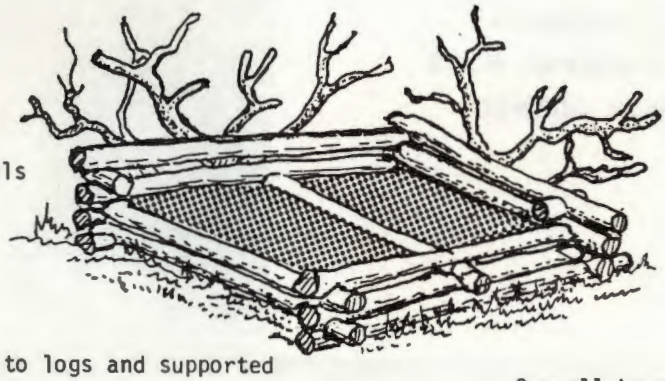
Profile of Wethole Before Repair



Profile of Wethole After Repair



RAIL FENCE FEEDER



Fine mesh screening nailed to logs and supported by 2x2's or smaller logs.

Overall Length of feeder 8 - 10 feet