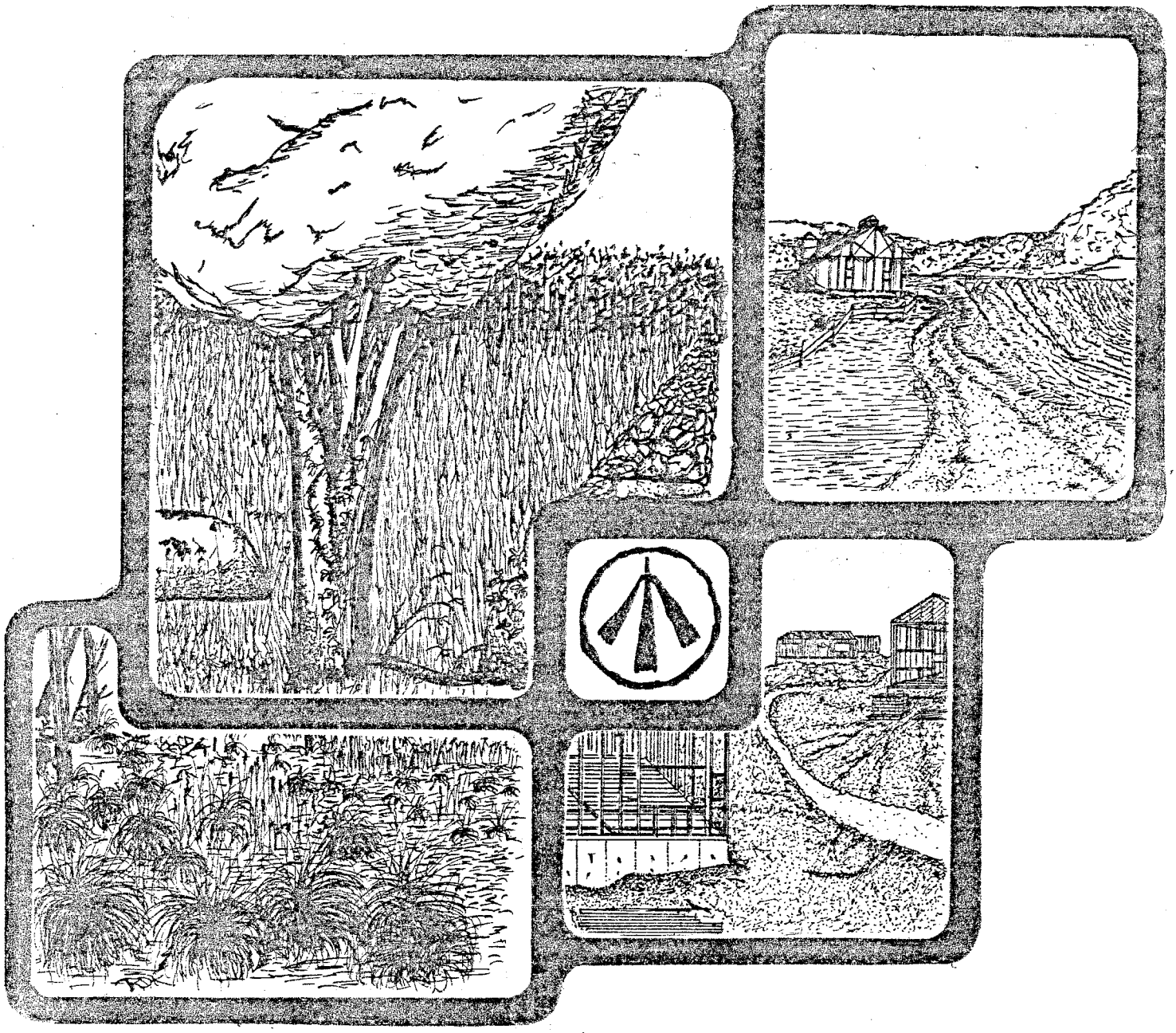
ENVIRONMENTAL REVIEW TEAM REPORT



PIERCE PARK
SOUTHBURY, CT

KING'S MARK
RESOURCE CONSERVATION & DEVELOPMENT AREA

ACKNOWLEDGMENTS

The King's Mark Environmental Review Team operates through the cooperative effort of a number of agencies and organizations including:

Federal Agencies
U.S.D.A. Soil Conservation Service

State Agencies
Department of Environmental Protection
Department of Health
University of Connecticut Cooperative Extension Service
Department of Transportation

Local Groups and Agencies
Litchfield County Soil and Water Conservation District
New Haven County Soil and Water Conservation District
Hartford County Soil and Water Conservation District
Fairfield County Soil and Water Conservation District
Northwestern Connecticut Regional Planning Agency
Valley Regional Planning Agency
Central Naugatuck Valley Regional Planning Agency
Housatonic Valley Council of Elected Officials
Southwestern Regional Planning Agency
Greater Bridgeport Regional Planning Agency
Regional Planning Agency of South Central Connecticut
Central Connecticut Regional Planning Agency
American Indian Archaeological Institute
Housatonic Valley Association

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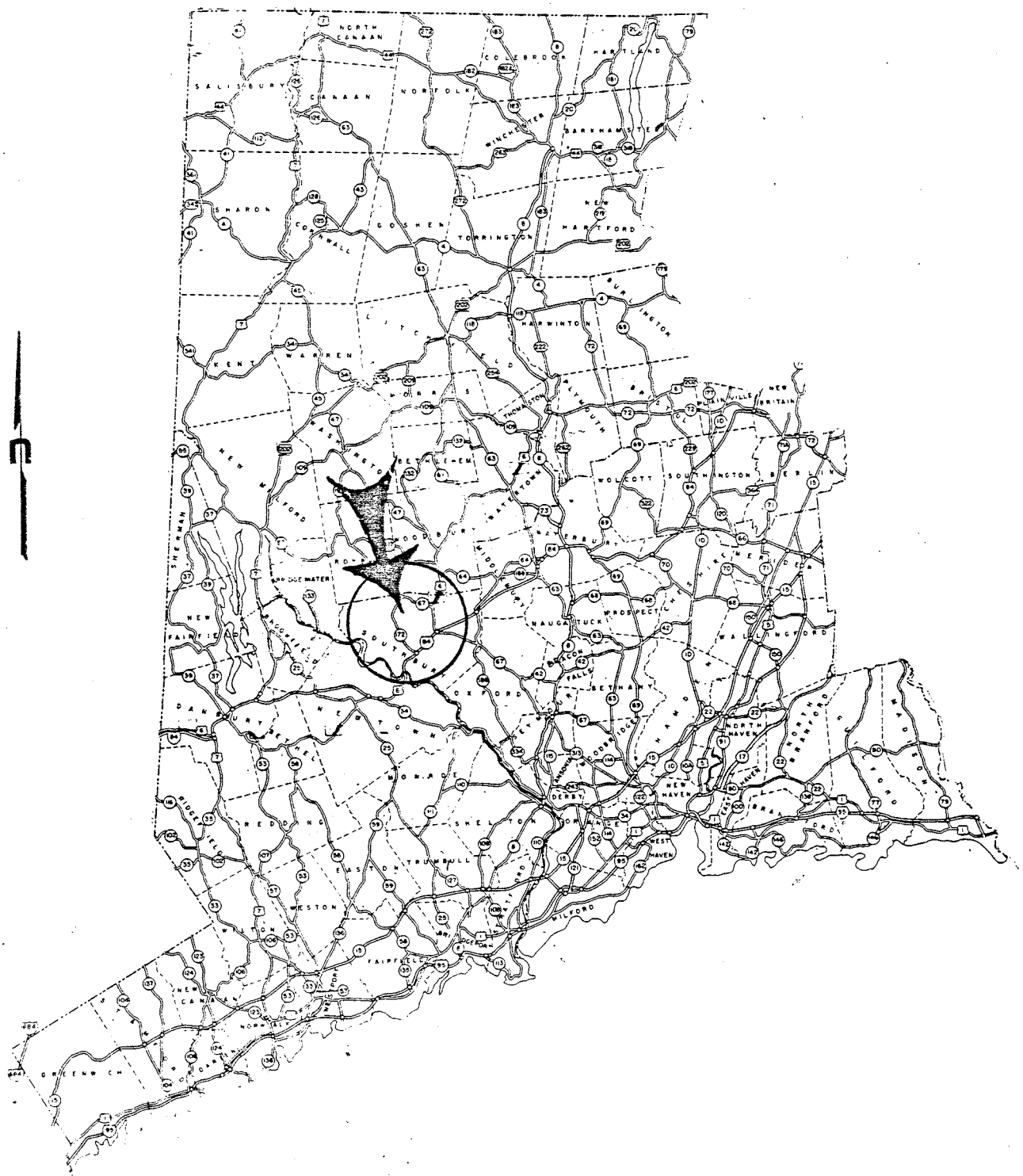
LOCATION OF STUDY SITE



Scale 1" = 10 miles

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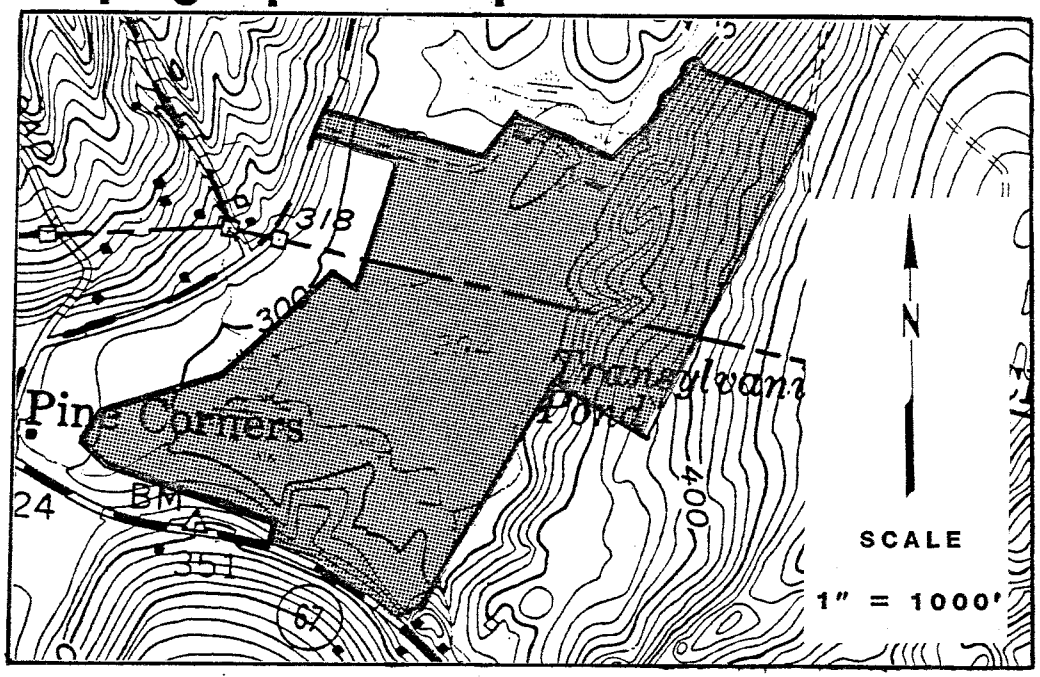
PIERCE PARK

I. Introduction

Pierce Park is ± 105 acres in size and located astride the Southbury and Woodbury town line. Access to the site is available from the south off Rte. 67 and from the west off Transylvania Road (see Figure 1). The land is owned by the Town of Southbury and consists of Transylvania Pond (± 35 acres in size), woodland, open land, and wetland. The site is largely undeveloped but does have an access drive off Transylvania Road, a small parking lot, a well maintained trail around the northern half of the pond, and several picnic tables with barbecue grills on the pennisula at the northern end of the pond.

Figure 1 **Topographic Map**



The Southbury Conservation Commission is interested in improving Pierce Park for scientific, educational, recreational, and aesthetic purposes. This ERT study was requested to assist the Commission in this effort by providing a natural resources inventory of the site and discussing opportunities and limitations for forest management, wildlife management, and passive recreational use. This information will assist the Town in developing a long-term management plan for the property. The Team was also asked to comment on the environmental health of Transylvania Pond, alternatives for controlling the weed and

algae growth in the Pond, and how the Pond can be improved for fishing and boating.

The King's Mark Executive Committee considered the town's request and approved the project for review by the Team.

The ERT met and field reviewed the site on August 29, 1984. Team members participating on this review included Ann Burcroff, Lake Ecologist, Connecticut Department of Environmental Protection; William Hyatt, Fishery Biologist, Connecticut Department of Environmental Protection; David Lord, Soil Conservationist, U.S.D.A. Soil Conservation Service; Richard Lynn, ERT Coordinator, King's Mark RC&D Area; Paul Rothbart, Wildlife Biologist, Connecticut Department of Environmental Protection; Don Smith, Forester, Connecticut Department of Environmental Protection; William Warzecha, Geohydrologist, Connecticut Department of Environmental Protection.

Prior to the review day, each team member was provided with a summary of the proposed study, a checklist of concerns to address, and a detailed soil survey map and topographic map of the subject area. During the Team's field review, team members toured the Pierce Park area and met with representatives from the town to discuss the situation at Pierce Park. Following the field review, individual reports were prepared by each team member and forwarded to the ERT Coordinator for compilation and editing into this final report.

This report presents the Team's findings. It is important to understand that the ERT is not in competition with private consultants and hence does not perform design work or provide detailed solutions to land use problems. The ERT concept provides for the presentation of natural resources information and preliminary land use analyses. All conclusions and final decisions rest at the local level. It is hoped the information contained in this report will assist the town of Southbury in making environmentally sound decisions.

If any additional information is required, please contact Richard Lynn, (868-7342), Environmental Review Team Coordinator, King's Mark RC&D Area, Sackett Hill Road, Warren, Connecticut 06754.

* * * *

II. Highlights

1. *The geology of Pierce Park consists of igneous bedrock (i.e., basalt) overlain by surficial deposits of till, stratified drift, or swamp deposits. Although the geology and topography of the park should pose no major problems in terms of passive recreation, disturbance to wetlands and steep slopes should be minimized. (p. 6)*

2. *If there is a desire to drill a well to service the park, the stratified drift deposits covering the western half of the site may be capable of yielding moderate to very large amounts of water (50-2000 gallons per minute). (p. 11)*

3. *As shown in Figure 5, a wide variety of soil types are present at Pierce Park. Approximately one-third of the site consists of inland wetland soils. (p. 12)*

4. *The ± 5 acre open field in the northwestern portion of the site is underlain primarily by a Merrimac soil. This nearly level, well drained soil has excellent potential for a wide variety of uses including recreational buildings, camping areas, ballfields, and growing Christmas trees. Access to this area of the site is good. Should the town ever wish to encourage any of the above uses at Pierce Park, this Merrimac soil area appears to offer the most potential at the site. (p. 13)*

5. *In general, the trail surrounding the northern half of the pond is well designed and maintained. However, on the existing trail just east and north of the outlet structure there is a 50'+ section that is seriously eroding. This is due to the steep slope in this area. Two (2) alternatives exist to correct this problem and are presented in the text of this report. (p. 18)*

6. *Significant expansion of the trail network into the wetland areas of the site would be difficult and expensive. Nevertheless, creating a few short boardwalks both into the pond and the wetland area would enhance access to and enjoyment of these areas, and also improve opportunities for birdwatching, fishing, and plant identification. Creation of a loop trail from the present trail along the eastern shore of the pond into the forestland to the east would be desirable. (p. 18)*

7. *Pierce Park contains 59 acres of forested land which may be divided into 5 distinct vegetative types. Restrictions placed in the deed to the property appear*

to preclude routine forest management practices. It should be noted, however, that the wooded land on the property (particuarly stand #1) does have forest management potential. Should the managing town commission desire to institute routine forest management practices at a later date, the services of the DEP Bureau of Forestry can be secured through contact with the District Forester. (p. 19)

8. *The development of access for emergency vehicles across the dam is restricted by the width and load capacity of the walkway across the spillway. Consideration should be given to improving vehicular access in this area in case of hiking injuries or forest fire. (p. 22)*

9. *Emphasis should be given to locating, brushing out, blazing, and painting all boundary lines. This should help to minimize problems with encroachment and trespass. It would be desirable for the town to make a yearly inspection of the trail system on the property and remove all the hazardous dead limbs and trees in the immediate vicinity of the trail network. (p. 22)*

10. *DEP's Natural Diversity Data Base does not have any records of rare or endangered species at the site. Nevertheless, the property does exhibit a rich variety of flora and opportunities are excellent on the property for plant identification and nature study. (p. 22)*

11. *The Pierce Park property may be divided into three wildlife habitat types. These are mixed hardwood forest, wetlands, and openland. Suggestions for improving the value of each habitat type are presented in the text of this report. (p. 23)*

12. *Transylvania Pond is a 35 acre body of water located within Pierce Park. It was reported in a previous fisheries investigation conducted in 1980 to have a maximum depth of 10 feet, a mean depth of 5 feet, and to be inhabited by largemouth bass, chain pickerel, golden shinner and bluegill sunfish. Additionally, brown bullhead and pumpkinseed sunfish are likely to inhabit the pond. Weed growth was described as extensive along the southern and south-western shores, and water lillies, floating leaf pondweed and American elodea were identified. Continued concern has been expressed with regards to the luxuriant weed growth and its negative impact on the recreational use of the pond. (p. 26)*

13. *A field inspection revealed Pierce Pond to be approximately 30% covered by emmergent and submerged vegetation. It is the opinion of the team's fishery biologist that reducing the weed cover by at least an additional 10%*

would be beneficial to the fisheries value of Pierce Pond. (p. 27)

14. *In an effort to eliminate some of the weed growth, the pond was treated with "Diquat" and "Endothall" two weeks before the King's Mark Team examined the pond. Some other methods which might be tried to change conditions and thus reduce the weed population are: 1) decreasing incoming nutrients, 2) weed harvesting, 3) light control, 4) dredging, and 5) lower water depth by siphoning. Each of these alternatives is discussed in the text. (p. 29)*

15. *Although the major complaint concerning Transylvania Pond has been the heavy aquatic plant growth as it interferes with boating and fishing, the other values of the pond should not be under-rated. The natural, wooded surroundings provide habitat for wildlife for which the pond is of major importance. The whole area is ideally suited to nature study. Paths with benches for pond viewing and labels designating special features along the way would enhance this value. Southbury is fortunate in having such an attractive asset in the town. (p. 31)*

* * * * * * *

III. Topography and Geology

As shown in Figure 1, the land surface in the eastern part of the park rises moderately from Transylvania Pond to the eastern-most boundary line. The terrain in the remaining portions of the park ranges from relatively flat to gently sloping.

Elevations on the site range from 294 feet above mean sea level at the surface of Transylvania Pond to a high of 430 feet above mean sea level at the eastern boundary line.

Transylvania Pond, which is ± 35 acres in size, is located in the central portion of the park. Approximately 35 acres of the remaining parkland, most of which is located in the southern parts, contain inland-wetland soils.

Pierce Park is located in the Woodbury topographic quadrangle. A surficial geologic map, (GQ-896) by Fred Pessl, Jr., has been published by the U.S. Geological Survey for the quadrangle. A bedrock geologic map (QR-3) by Robert M. Gates has been published by the Connecticut Geological and Natural History Survey for the quadrangle. The Preliminary Bedrock Geologic Map for Connecticut by John Rodgers was also referenced in the preparation of this report. All of these maps are available at the Department of Environmental Protection's Natural Resource Center in Hartford.

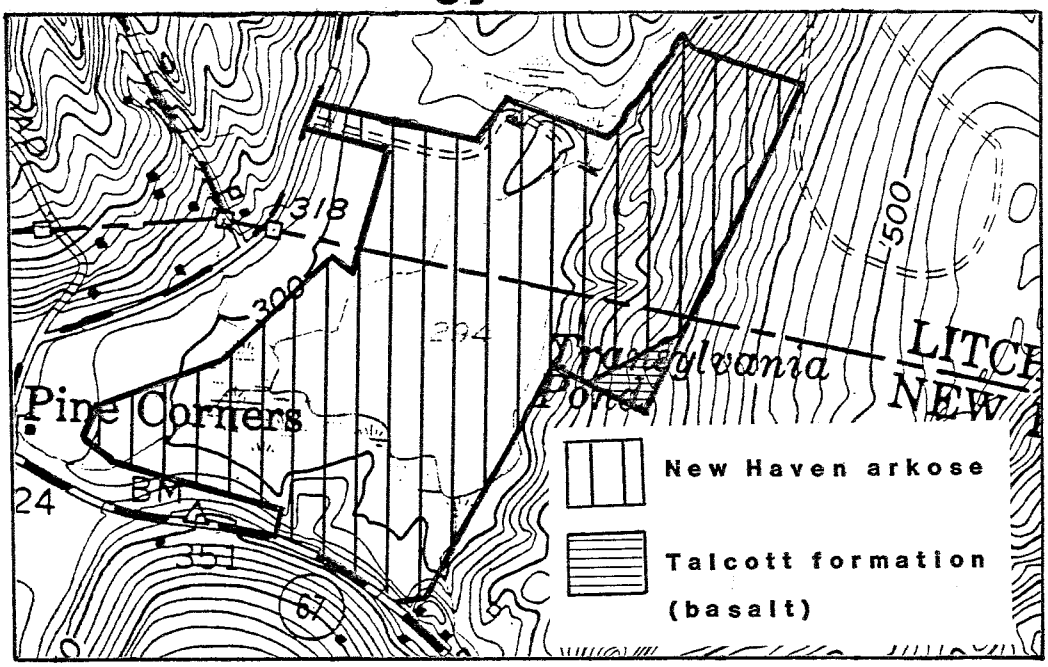
BEDROCK GEOLOGY

No bedrock exposures were visible on the parcel during the ERT's field review. Gate's map, which was published in 1953, classifies the rocks underlying Pierce Park as the Newark Series. Rocks in this series consist mainly of interlayered igneous rock (i.e., basalt) which formed from molten magma, and sedimentary rocks (e.g., sandstones and conglomerates) which formed from broken rocks that were transported, deposited and cemented into a layered rock mass.

Rodger's map (1982) classifies the bedrock underlying most of the site more specifically as New Haven Arkose, which is a subunit of the Newark Series. The New Haven Arkose is a reddish, coarse-grained, poorly sorted arkose interbedded with feldspathic and micaceous sandstones and siltstones. The term "arkose", refers to a variety of sandstone which contains a high percentage of feldspars and quartz. These sedimentary rocks formed by the cementation of sand, silt, and pebbles, which were deposited in a body of water during the Triassic geologic period approximately 200 million years ago.

A small corner of the park in the eastern limits (see Figure 2) is underlain by Talcott Basalt, which is

Figure 2 Bedrock Geology



also part of the Newark Series. This rock unit consists of a dark gray, brown-weathering basalt composed of the minerals plagioclase and pyroxene with lesser amounts of amphibole. As mentioned above, basalt rocks are dark gray but when freshly broken turn an orange, tan or brown color when exposed to weathering processes. The term "basalt" refers to dark-colored, igneous rocks (rocks formed from molten magma) which are commonly fine to medium grained.

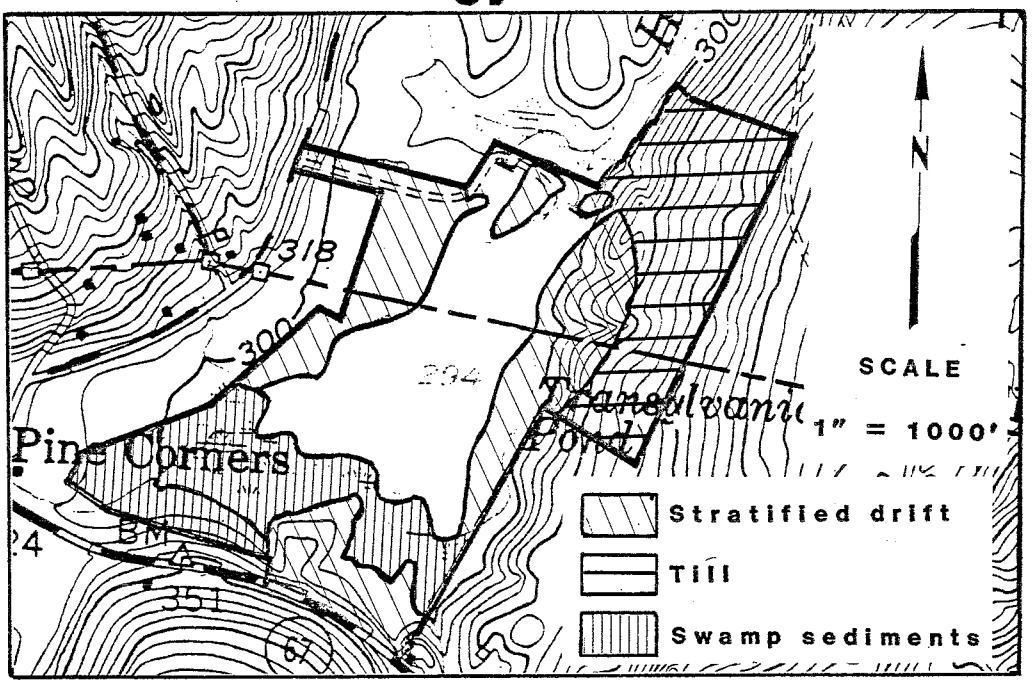
Because of the basalt rocks toughness and resistance to weathering, it is an excellent material for construction uses. At the present time, basalt (also known as trap rock) is quarried in Connecticut and used to produce gravel for building roads, as rip-rap to prevent erosion of stream banks and steep slopes, and is mixed with sand for use in concrete.

SURFICIAL GEOLOGY

Surficial geologic materials are those unconsolidated mineral and organic materials that overlie bedrock. These materials may also be called "overburden". Two types of glacial sediment predominate: till and stratified drift. As the ice sheet advanced through the region, it collected and transported rock particles and fragments as well as the pre-existing overburden. Much of this transported debris was redeposited directly from the ice either by being plastered onto the land from beneath the ice mass or by being let down gently as the ice later wasted. The resulting deposit was till. Because of its mode of deposition, till contains a nonsorted, nonstratified mixture of particles ranging

in size from clay to large boulders. In the upper few feet the till is commonly sandy, stony and loose while at depth it becomes silty, less stony and tightly compact. Till covers the eastern limits and southern limits of the park (see Figure 3). The thickness of the till probably does not exceed much more than 10 feet in the places it covers.

Figure 3 **Surficial Geology**



When the ice sheet began to melt, it sent forth streams of meltwater, often with torrential flows. These meltwater streams were filled with rock debris collected from the ice, and they redeposited this debris as sediments in well sorted to poorly sorted layers. Sand and gravel sized sediments were commonly deposited near the ice, while finer-grained material such as silt and clay were washed further downstream to be deposited in glacial lakes or ultimately into Long Island Sound. The resulting deposits are known as stratified drift.

The stratified drift which covers Pierce Park is composed mostly of sand and gravel. This was deposited by meltwater streams in contact with a stagnant mass of glacier ice in the Hesseky Brook Valley. Thicknesses of the stratified drift probably range from a few inches at the till-stratified drift contact to more than 80 feet near Pine Corners. The log of two test wells drilled at the north end of Transylvania Pond suggested the stratified drift ranges between 31 and 35 feet thick (Source: Connecticut Water Resources Bulletin No's. 19 and 20).

Overlying the stratified drift deposits, mainly in the southern portions of the parcel, are swamp sediments. Swamp sediments are also found north of the spillway for Transylvania Pond. Swamp sediments consist of sand, silt, and clay mixed with organic matter in poorly drained areas. These inland-wetland areas are delineated by the symbols Wa (Walpole soils), Sf and Sr (Scarboro soils) and Rb (Ridgebury soils) on the accompanying soils map (see Figure 5).

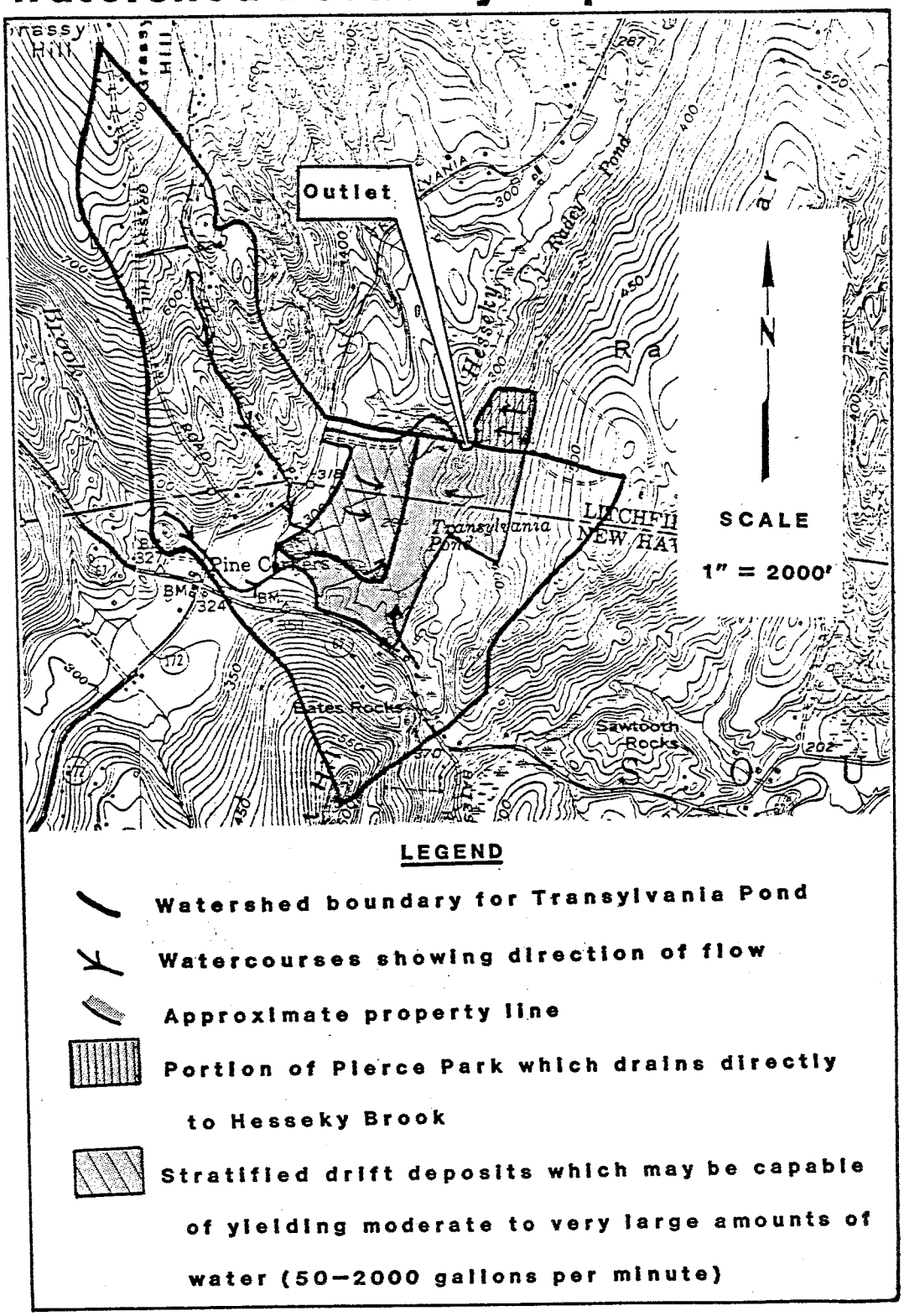
Wetlands serve many valuable hydrological and ecological purposes. They act as natural runoff retention basins, reducing downstream flood flows during storms. They trap sediments from upstream areas. They change water quality through biochemical processes, often resulting in cleaner water. They also serve as habitat for many species of wildlife and plants. For these reasons, wetland fillings and/or modifications on the site should be avoided where possible.

The geology of Pierce Park should pose no major problems in terms of passive recreation. Wetland areas and steep slopes should be avoided where possible. Construction of hiking trails in wetland areas would be difficult since these areas are soggy and muddy much of the year. If there is a desire to establish a trail network through the wetland areas, perhaps an elevated boardwalk could be constructed. Hiking trails in steeply sloping areas may create serious erosion problems if not constructed properly.

IV. Hydrology and Water Resources

Most of Pierce Park lies within the watershed of Transylvania Pond. The watershed boundary is shown in Figure 4. This watershed, which comprises all land areas from which ground or surface water may ultimately enter the pond, is approximately .7 square miles (or 452 acres) in size. At least three watercourses traverse Pierce Park on their way to Transylvania Pond. The largest stream originates in the northern parts of the watershed and flows generally parallel to Grassy Hill Road #2 enroute to Transylvania Pond. The next sizable stream is an outfall stream for a small pond northwest of Pierce Corners which flows eastward into the pond. The smallest feeder stream to the pond which traverses the park is located in the southern portions of the watershed. It flows northward into Transylvania Pond. All three streams are unnamed. Based on soil survey maps, air photos and visual inspection of the property, several intermittent streams flow downslope to Transylvania Pond in the eastern portion of the property. The surface and ground waters in the park flow generally downslope toward these watercourses. Once water reaches these watercourses, it is then transported into Transylvania Pond.

Figure 4 Watershed Boundary Map



Approximately 10 acres in the northern part of the parcel drains downslope directly to Hesseky Brook, which is the outlet stream for Transylvania Pond.

According to Town Commission members, Transylvania Pond has an average depth of 5 feet and a maximum depth estimated to be 10 feet.

Maximum volume of the pond is estimated to be 65.3 million gallons. Mean annual outflow from Transylvania Pond is estimated to be .34 million gallons per day, or about .53 cubic feet per second.

WATER SUPPLY

If there is a desire to drill a well to service the Park, the stratified drift deposits covering the western half of the site may be capable of yielding moderate to very large amounts of water (50-2000 gallons per minute according to: "Ground Water Availability Map for Connecticut" by Daniel Mead, DEP, 1978.) These deposits consist mainly of coarse grained stratified drift overlain by finer-grained stratified drift. The stratified drift area on this site is delineated on Figure 3.

Bedrock underlying the parcel would probably be a suitable source of water to the park also. Bedrock based wells generally produce only small to moderate yields (3 to 5 gallons per minute), but these yields should be adequate for recreational purposes. The sedimentary rock (New Haven Arkose) underlying the site is generally more productive than the igneous rock (Talcott Basalt).

The natural quality of groundwater should be satisfactory, although there is a chance the water may have an elevated mineral content, particularly iron and manganese. If well water proves to be high in these mineral contents there are several filtration methods available to overcome the problems.

V. Soils

The Appendix of this report contains a Soils Map of the site plus a Soils Limitation Chart which identifies limitations for various land uses. By comparing the Soils Map with the Soils Limitation Chart, the general suitability of various portions of the property for alternate recreational land uses can be determined.

A brief description of each of the soils on the site is presented below, followed by a discussion of additional trail potential and erosion concerns.

A. SOIL DESCRIPTIONS (refer to Figure 5)

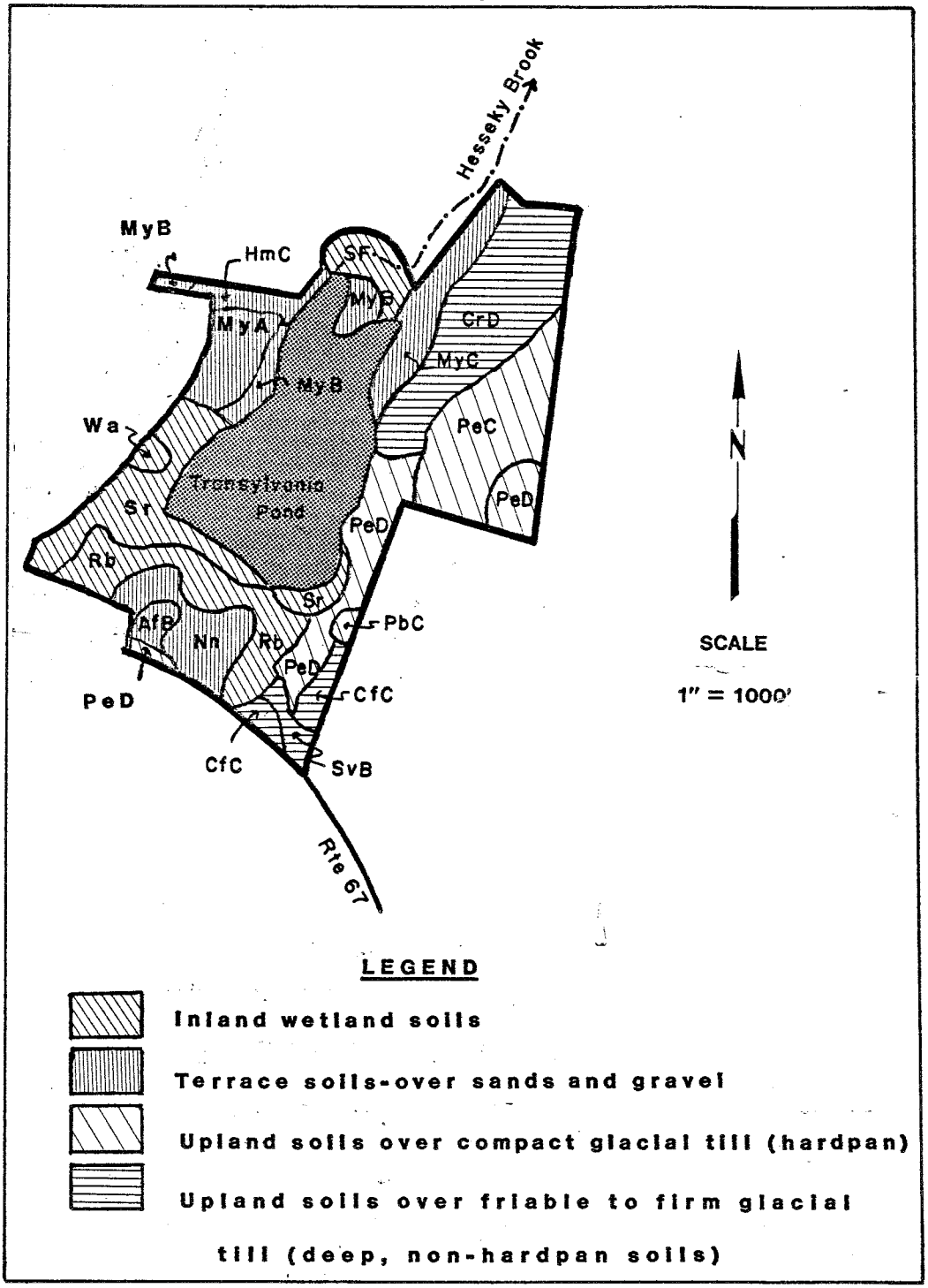
1. Terrace soils over sands and gravels -
(AfB) Agawam fine sandy loam, 3 to 8 percent slopes -
(MyA, MyB, MyC) Merrimac sandy loam, 0-15% slopes -

These gently sloping, well drained soils are on outwash terraces of stream valleys. As shown in Figure 5, these soils occupy the land surrounding the northern shore of Transylvania Pond.

Typically, the surface layer of these soils are dark brown fine sandy loam 8 inches thick. The subsoil is dominantly dark brown and dark yellowish brown fine sandy

loam 24 inches thick. The substratum, to a depth of 60 inches, is yellowish brown gravelly sand.

Figure 5 General Soils Map



Permeability is moderately rapid in the surface layer and subsoil and rapid in the substratum. These soils have a moderate available water capacity. Runoff is medium. These soils tend to dry out and warm up fairly early in spring. They have a low shrink-swell potential.

These soils are well suited for passive recreational use with no significant limitations for nature paths and trail development.

The soils are well suited to trees. Productivity is moderate. Trees to favor in woodlots are eastern white pine, sugar maple, and northern red oak. Trees to plant are eastern white pine, white spruce, and Norway spruce.

The ± 5 acre open field in the northwestern portion of the site is underlain primarily by a Merrimac soil. This nearly level, well drained soil has excellent potential for a wide variety of uses including recreational buildings, camping areas, ballfields, and growing Christmas trees. Access to this area of the site is good. Should the town ever wish to encourage any of the above uses at Pierce Park, this Merrimac soil area appears to offer the most potential at the site.

(HC) Hinckley gravelly loamy sandy, 3-15% slopes - This sloping, excessively drained soil is also on outwash terraces in stream valleys. This soil occupies the northwestern border of the park along the access drive.

Typically, the surface layer is dark brown gravelly sandy loam 8 inches thick. The upper part of the subsoil is strong brown gravelly sandy loam 5 inches thick, and the lower part is brown gravelly loamy sand 3 inches thick. The substratum, to a depth of 60 inches, is yellowish brown stratified sand and gravel.

This soil has a seasonal high water table at a depth of about 20 inches from late in fall until mid-spring. Permeability is moderately rapid in the surface and subsoil and rapid in the substratum. This soil has a moderate available water capacity. Runoff is slow. This soil dries out and warms up rather slowly in spring. It has a low shrink-swell potential. Unless limed, this soil is very strongly acid through medium acid.

This soil is well suited to growing trees. Productivity is moderately high. This soil has no major limitations for growing or harvesting trees. Machine planting is feasible in open areas. Wetness may restrict the use of some equipment during the wetter parts of the year. The trees to favor in existing woodlots are eastern white pines. Trees to plant in open areas are eastern white pine and white spruce.

2. Upland soils over compact glacial tills (hardpan) - (PbC) Paxton fine sandy loam, 8-15% slopes -

This sloping, well drained soil is on the sides of drumlins, ridges, and hills of glacial uplands. On the Pierce Park site, it occupies a small area on the eastern

border of the tract.

Typically, the surface layer is dark brown fine sandy loam 8 inches thick. The subsoil is dark yellowish brown and olive brown fine sandy loam 18 inches thick. The substratum, to a depth of 60 inches, is olive, very firm gravelly fine sandy loam.

Permeability is moderate in the surface layer and subsoil and slow in the substratum. The available water capacity is moderate. Runoff is rapid. This soil tends to dry out and warm up slowly in spring. It has a low shrink-swell potential. Unless limed, this soil is strongly acid through slightly acid.

This soil is well suited to trees. Productivity is moderately high. Machine planting of trees is practical in open areas. Trees to favor in existing woodlots are eastern white pine, sugar maple and northern red oak. Trees to plant in open areas are eastern white pine, European larch, and Norway spruce.

This soil has only slight limitations for passive recreational development.

(PbD) Paxton fine sandy loam, 15-25% slopes -

This moderately steep, well drained soil is on the sides of drumlins, hills, and ridges of glacial uplands. This soil type only occupies a small area along the southern border of the tract.

Typically, the surface layer is dark brown fine sandy loam 8 inches thick. The subsoil is dark yellowish brown and olive brown fine sandy loam 15 inches thick. The substratum, to a depth of 60 inches, is olive, very firm gravelly fine sandy loam.

Permeability is moderate in the surface layer and subsoil and slow in the substratum. This soil tends to dry out and warm up slowly in spring. It has a low shrink-swell potential. Unless limed, this soil is strongly acid through slightly acid.

This soil is suited to trees. Productivity is moderately high. Use of equipment is somewhat limited by the steepness of slopes. Machine planting is practical in the open areas, although it is hampered somewhat by slope. Trees to favor in existing woodlots are eastern white pine, northern red oak, and sugar maple. Trees to plant in open areas are eastern white pine, European larch, and Norway spruce.

(PeD) Paxton very stony fine sandy loam, 15-35% slopes -
(PeC) Paxton very stony fine sandy loam, 3-15% slopes -

These are gently to steeply sloping, well drained soils on drumlins, ridges and hills of glacial uplands. The surface is 3-25% stones and boulders. As shown in Figure 5, these soils occupy much of the eastern hillside of the tract.

Typically, the surface layer is dark brown fine sandy loam 2 inches thick. The subsoil is dark brown, dark

yellowish brown, and olive brown fine sandy loam 24 inches thick. The substratum, to a depth of 60 inches, is olive, very firm gravelly fine sandy loam.

Permeability is moderate in the surface layer and subsoil and slow in the substratum. The available water capacity is moderate. Runoff is medium to rapid. This soil tends to dry out and warm up slowly in spring. It has a low shrink-swell potential. Unless limed, this soil is strongly acid through slightly acid.

These soils have fair to poor potential for recreational development. They are limited mainly by stoniness and, in places, by the steepness of slopes. Removal of stones and boulders is costly. Stoniness severly limits the use of this soil for landscaping; however, large boulders are sometimes desired for their aesthetic value and are left undisturbed. During periods of construction, conservation measures are needed to prevent excessive runoff, erosion and siltation.

This soil is suited to trees. Productivity is moderately high. The stones and boulders are a hindrance to the use of some harvesting equipment, and they make machine planting generally unfeasible. Trees to favor in existing woodlots are eastern white pine, sugar maple, and northern red oak. Trees to plant in open areas are eastern white pine, European larch, and Norway spruce.

3. Inland wetland soils -

(Rb) Raypol silt loam -

This nearly level, poorly drained soil is in depressions on broad glacial lake and outwash terraces. Slopes are 0-3% and are smooth and concave. As shown in Figure 5, this soil type occupies a ± 10 acre area in the southern half of the site.

This soil has a seasonal high water table at a depth of about 8 inches from fall until mid-spring. Permeability is moderate in the surface layer and subsoil and rapid or very rapid in the substratum. This soil has a high available water capacity. Runoff is slow. This soil dries out and warms slowly in the spring. It has a low shrink-swell potential. Unless limed, this soil is very strongly acid or strongly acid through the surface layer and subsoil and strongly acid to slightly acid in the substratum.

This soil is suited to trees. It has moderate productivity. It is limited by wetness. The use of equipment is restricted when the soil is wet. Seedling mortality is high, and tree windthrow is common because the high water table restricts rooting depth. Machine planting is feasible when the soil is not wet. Trees to favor in existing woodlots are eastern white pine and red maple. Trees to plant are eastern white pine, northern white cedar, white spruce and eastern hemlock.

This soil has poor potential for recreational development due to wetness. Trails in this area will be difficult

to construct and maintain especially during the months of November to May.

(Sr) Scarboro muck -

This nearly level, very poorly drained soil is in depressional areas of broad outwash terraces and narrow stream valleys. Slopes are 0-2%. This soil abuts the southern end of Transylvania Pond.

Typically, this soil has a 12 inch layer of black muck over the mineral surface layer. The surface layer is very dark gray loamy sand 5 inches thick. The substratum, to a depth of 60 inches, is gray fine sand over grayish brown, mottled sand.

This soil has a water table at or near the surface most of the year, especially from fall through spring and after heavy rains in summer. Permeability is rapid or very rapid. This soil has a low available water capacity. Runoff is very slow. This soil is commonly ponded in places for several weeks in winter. It has a low shrink-swell potential. Unless limed, it is very strongly acid through medium acid.

This soil is poorly suited to trees although woodland may be one of its best uses. Productivity is low. There are major limitations to the use of equipment, seedling mortality is high, and tree windthrow is common - all because of the high water table. Trees to favor in existing woodlots are eastern white pine and red maple. Trees to plant are northern white cedar.

This soil has poor potential for recreational development due to wetness. Trail systems will be difficult to construct and maintain.

(Wa) Walpole sandy loam -

This nearly level, poorly drained soil is in depressions on broad outwash terraces and narrow stream valleys. Slopes are 0-3% percent. Just a small area of this soil type is present on the site.

From late in fall until mid-spring, this soil has a water table at a depth of about 8 inches. Permeability is moderately rapid in the surface layer and subsoil and rapid or very rapid in the substratum. The available water capacity is moderate. This soil dries out and warms up slowly in the spring. It has a low shrink-swell potential. If the soil is not limed, it is very strongly acid through medium acid.

This soil has poor potential for recreational development.

4. Upland soils over friable to firm glacial till (deep, non-hardpan soils) -

(SvB) Sutton fine sandy loam, 3-8% slopes -

This gently sloping, moderately well drained soil is in slight depressions on glacial till plains and near the base of slopes on glacial uplands where the relief is

affected by the underlying bedrock. This soil type occupies only a small area in the southeastern corner of the site.

Typically, the surface layer is dark brown fine sandy loam 8 inches thick. The subsoil is dark brown and yellowish brown, mottled fine sandy loam 20 inches thick. The substratum, to a depth of 60 inches, is brown and light olive brown fine sandy loam and gravelly fine sandy loam that has a few firm lenses up to 4 inches thick.

This soil has a seasonal high water table at a depth of about 20 inches from late in fall until mid-spring. Permeability is moderate or moderately rapid. The available water capacity is high. Runoff is medium. This soil tends to dry out and warm up slowly in spring. It has a low shrink-swell potential. In areas that are not limed, this soil is very strongly acid through medium acid.

This soil is well suited to trees. Productivity is moderate. Machine planting is practical in open areas. Trees to favor in existing woodlots are eastern white pine, sugar maple, northern red oak, and black cherry. Trees to plant in open areas are eastern white pine, European larch, white spruce and Norway spruce.

(CfC) Charlton fine sandy loam, 8-15% slopes -

This is a well drained soil on side slopes of hills and ridges and at the foot slopes of steep slopes. As shown in Figure 5, this soil is found in the southeastern corner of the park.

Typically, the surface layer is dark brown fine sandy loam 8 inches thick. The subsoil is yellowish brown and light olive brown fine sandy loam 28 inches thick. The substratum, to a depth of 60 inches, is grayish brown gravelly fine sandy loam that has a few firm lenses up to 4 inches thick.

Permeability is moderate or moderately rapid. This soil has a high available water capacity. Runoff is medium to rapid. This soil tends to dry out and warm up fairly early in spring. It has a low shrink-swell potential. Unless limed, this soil is very strongly acid through medium acid.

This soil has no significant limitations for passive recreational development.

This soil is well suited to trees. Most of this soil that is woodland was cropland at one time but was left to grow back to woodland. Productivity is moderate. Machine planting is practical in open area. Trees to favor in existing woodlots are eastern white pine, red maple, and northern red oak. Trees to plant are eastern white pine, European larch, white spruce, and eastern hemlock.

(CrD) Charlton extremely stony fine sandy loam, 15-35% -

This moderately steep and steep, well drained soil is on the sides of hills, ridges and steep valleys where the relief is affected by the underlying bedrock. It has 3-25%

of the surface covered with stones and boulders. About 14 acres of this soil type is present in the northeastern quarter of this site.

Typically, the surface layer is dark brown fine sandy loam 2 inches thick. The subsoil is dark brown, yellowish brown, and light olive brown fine sandy loam 21 inches thick. The substratum, described to a depth of 60 inches, is grayish brown gravelly fine sandy loam with a few firm lenses up to 4 inches thick.

This soil has moderate or moderately rapid permeability. It has a high available water capacity. Runoff is rapid. This soil tends to dry out and warm up fairly early in spring, except for the northly sloping areas, which take longer to warm up. This soil has a low shrink-swell potential. Unless limed, it is very strongly acid through medium acid.

This soil is suited to growing trees. Productivity is moderate. The use of harvesting equipment is somewhat limited by the stoniness and steepness of slopes. Machine planting is generally not feasible. Trees to favor in existing woodlots are eastern white pine, northern red oak, and red maple. Trees to plant in open areas are eastern white pine, European larch, white spruce, and eastern hemlock.

Due to the steep slopes and large stones present, this soil has significant limitations for passive recreation development. Soil erosion potentials are high and careful design of any improvements is necessary to prevent erosion of trails and paths.

B. TRAIL POTENTIAL AND EROSION CONCERNS

In general, the trail surrounding the northern half of the pond is well designed and maintained. However, on the existing trail just east and north of the outlet structure there is a 50'+ section that is seriously eroding. This is due to the steep slope in this area. Two (2) alternatives exist to correct this problem.

The first alternative would be to relocate the trail in this section to eliminate the steep grade. Moving this section of trail to the north a short distance and removing a sharp bend to the left in the trail should correct the erosion problem.

The second alternative would include the construction of an earth and timber stairway in the eroding section. Should the town decide to pursue this alternative, the New Haven Conservation District is available to provide technical assistance on specific design options. The Conservation District can be reached at 269-7509.

Significant expansion of the trail network into the wetland areas of the site would be difficult and expensive. Nevertheless, creating a few short boardwalks both into the pond and the wetland area would enhance access to and enjoyment of these areas, and also improve opportunities for bird-watching, fishing, and plant identification.

Creation of a loop trail from the present trail along the eastern shore of the pond into the forestland to the east would be desirable. To assist in both maintaining existing trails and creating new trails, the following guidelines are offered for consideration:

1. Trails should follow the existing contours as much as possible to minimize grades. This will keep trail erosion to a minimum and reduce trail requirements for erosion and sediment control.

2. All trees, shrubs and fallen timber should be removed for a distance of 2 feet each side of the trail centerline. Stumps should be cut close to the ground. All protruding limbs should also be removed for a distance of 2 feet each side of the trail centerline. Where other than foot traffic is planned, protruding limbs should be removed to a height of 10 feet. Limbs removed should be cut off as close to the trunk as possible.

3. All undesirable material such as soil high in organic matter, stumps and large stones should be removed from the tread area of the trail.

4. The trail surface should be finished to a uniform firm surface and be free of loose material.

An excellent reference on trail construction and maintenance is the Appalachian Mountain Club's "Field Guide to Trail Building and Maintenance" (available from the AMC at 5 Joy Street, Boston, Massachusetts, 02108 for $6.95).

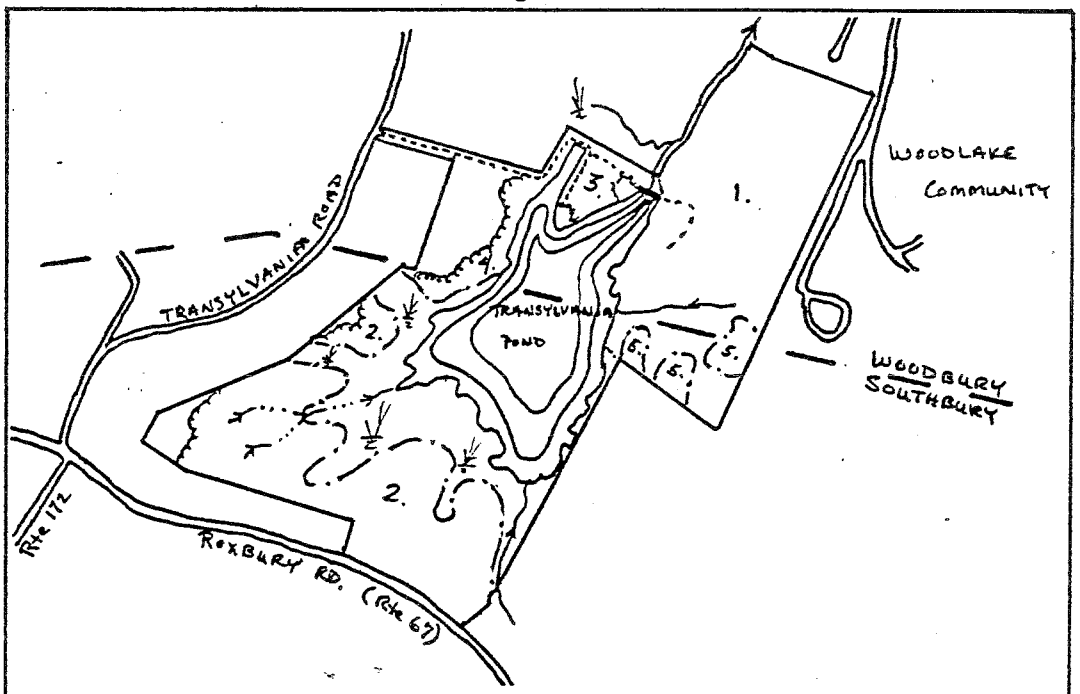
VI. Vegetation

A. FOREST STANDS

Pierce Park is ± 105 acres in size. Aerial photo interpretation reveals that 46 of those acres are either open field, pond, or marsh. The remaining 59 acres are forested and may be divided into 5 distinct vegetative types (see Figure 6).

As restrictions placed in the deed to the property appear to preclude routine forest management practices, management of the individual vegetative types is not covered in this report. It should be noted, however, that the wooded land on the property (particularly stand #1) does have forest management potential. Should the managing town commission desire to institute routine forest management practices at a later date, the services of the DEP Bureau

Figure 6 Forest Stand Map



LEGEND

- Road
- Access road
- Forest edge
- Town line
- Stand boundary
- Wetland
- Stream
- Vernal stream
- Pond

ACREAGE BREAKDOWN

Stand	Acres	Description
1.	29	Oak/Mixed hardwood
2.	23	Mixed hardwood (sawtimber)
3.	2	Oak (poles)
4.	3	Mixed hardwood (lg. poles-sm. sawtimber)
5.	2	Softwood/Hardwood
	59	Total Forested
Open	8	
Pond	23	
Marsh	15	
	46	Total Non-forested
	105	TOTAL ACRES

of Forestry can be secured through contact with the District Forester at: DEP Western District Headquarters, Plymouth Road, RFD #4, Harwinton, CT, 06791, 485-0226.

The 5 vegetative types found in the Pierce Park forestland are discussed in the following paragraphs (refer to Figure 6).

Stand #1. Oak/Mixed Hardwood, 29 acres - This fully stocked stand is composed of good quality,*sawtimber sized red oak, chestnut oak, hickory, ash, beech, black birch, and scattered white oak. These trees are growing at an average rate on a medium quality growing site and are approximately 70-90 years old.

The understory species encountered include mountain laurel, maple-leaved viburnum, beech, black birch, and hemlock saplings and poles, and witchhazel.

The ground cover here includes wild geranium, various ferns in the dampest areas, lily of the valley, and ground pine.

Stand #2. Mixed Hardwood, 23 acres - This fully stocked stand is composed of good quality, large pole to sawtimber sized sugar maple, red maple, ash, and scatterd oaks, hickory, beech, black birch, and cherry in the more open areas. These trees are growing at a moderate rate on a good quality growing site and are approximately 50-70 years old.

The understory species encountered include sugar maple and red maple saplings to small poles, and spicebush. In the boundary between this stand and the marsh, small areas of red maple thickets occur as a gradation to the marsh type.

The ground cover here, especially under thick crown cover, tends to be sparse. Heavy fern growth, touch-me-not, and barberry may be found. A large patch of wild leek can be found near Roxbury Road.

Stand #3. Oak, 2 acres - This under stocked old field is composed of fair quality, large pole sized red oak, white oak, black oak, red cedar, hickory, and black birch. These trees are growing at a good rate on a medium quality growing site and are approximately 20-40 years old.

The understory species encountered include highbush blueberry, and sapling sized grey birch in more open areas. Saplings of the same species as the overstory can be found throughout.

The ground cover here includes lowbush blueberry, huckleberry, lily of the valley, ground pine, and scattered tufts of grass.

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*seedling size - less than 1" in diameter at breast height (D.B.H.)
sapling size - 1" to 5" in D.B.H.
pole size - 5" to 11" in D.B.H.
sawlog size - 11" and greater in D.B.H.

Stand #4. Mixed Hardwood, 3 acres - This well stocked stand is composed of medium quality, large pole to small sawlog sized red oak, white oak, red maple, hickory, beech, black birch, and cherry. These trees are growing at a fair rate on a medium quality growing site and are approximately 30-50 years old.

The understory species encountered include dogwood, maple-leaved viburnum, highbush blueberry, spicebush, and occasional elderberry.

The ground cover here includes sassparilla, ground pine, raspberry, poison ivy, dewberry, virginia creeper, golden rod, lily of the valley, and various ferns.

Stand #5. Softwood/Hardwood, 2 acres - This stand is similar in composition to stand #1 with the exception that a high percentage of both hemlock and white pine can be found here. These softwood species have also reproduced naturally and can be found in the understory, as well. A large specimen-type white pine can be found in the eastern most section of the stand.

MANAGEMENT

The development of access for emergency vehicles, (ambulances, police, and fire vehicles), across the dam is restricted by the width and load capacity of the walkway across the spillway. Consideration should be given to improving vehicular access in this area in case of hiking injuries or forest fire. A spillway crossing could be designed to accommodate emergency vehicles with a moveable device incorporated to restrict the width of access during times of non-emergency use. Alternately, emergency access could be secured to the site from the Woodlake community road system just east of the park.

Emphasis should be given to locating, brushing out, blazing, and painting all boundary lines. This should help to minimize problems with encroachment and trespass.

It would be desirable for the town to make a yearly inspection of the trail system on the property and remove all the hazardous dead limbs and trees in the immediate vicinity of the trail network.

B. VEGETATION DIVERSITY

The DEP's Natural Diversity Data Base does not have any records of rare or endangered species at the site. A thorough field investigation by a competent biologist would be desirable however as the area does have potential habitat for such occurences. The Natural Diversity Data Base would be interested in the findings of any such biological field investigations as this would add to their baseline data.

While it is outside the scope of the ERT to provide a comprehensive vegetation inventory of the site, it should be noted that the property does exhibit a rich variety of flora. The major trees, shrubs, and groundcover inhabiting the site were identified above. Additional species noted

on the property the day of the team's field review are listed below. As can be seen from this listing, opportunities are excellent on the property for plant identification and nature study.

OPEN FIELDS

grey dogwood
queen anne's lace
cinquefoil
goldenrod
flowering dogwood
wild strawberry
cottonwood
black cherry
viburnum
vetch
milkweed

WOODLAND AND SHRUBLAND

peat moss
grass hummocks
cinnamon fern
sensitive fern
jewelweed
skunk cabbage
maple-leaved viburnum
hankweed
goldenrod
meadowrue
poison ivy
trillium
willow
rose
New York fern
bracken fern
sassafras
groundpine
lily of the valley
rattlesnake plantain
blueberry
partridgeberry
Christmas fern
sassaparilla
daisy fleabane
grapevine
indian tobacco
lady fern
spicebush
royal fern
marsh fern
virginia creeper
barberry
solomon's seal
sweet fern
pipsissewa
doc
elderberry
indian cucumber root
wild oats
maidenhair fern
dayflower
wild leek
knotweed
sedge
dodder
cattails
wood aster
Canada mayflower
alder
sweet pepperbush

VII. Wildlife Habitat

A. WILDLIFE HABITAT TYPES

The Pierce Park property may be divided into three wildlife habitat types. These are mixed hardwood forest, wetlands, and openland.

Mixed Hardwoods

This habitat type consists of a well diversified hardwood stand comprised of red oak, white oak, chestnut oak, hickory, ash, beech, black birch, red maple, sugar maple, witchhazel, and cherry. Scattered cedar, hemlock, and pockets of white

pine exist within this type.

The understory vegetation includes mountain laurel, spicebush, poison ivy, jack-in-the-pulpit, dogwood, virginia creeper, viburnum, nettle, blueberry, and grasses.

Wildlife typically utilizing such sites include deer, turkey, squirrels, rabbits, raccoon, ruffed grouse, and various non-game species.

Wetlands

This type consists of a ± 35 acre pond and associated seasonally flooded wetlands. There are at least 3 perennial streams associated with this habitat type.

The hardwood composition is dominated by red maple, white oak, birch and alder. The understory consists of barberry, rose, pepperbush, spicebush, ferns and grasses.

The open water vegetation consists of cattails, pondlillies, water shield and duckweeds. The pond was approximately 30 percent covered by weeds the day of the team's field review.

Wildlife frequenting such habitat types include woodcock, deer, raccoon, woodpeckers, kingfishers, herons, waterfowl, swallows, songbirds, and numerous amphibians and reptiles.

Openland

This habitat consists of one field comprised of goldenrod, milkweed, grass, birch and cherry. The diversity created by this type within a forest-pond situation is very beneficial to numerous wildlife species such as deer, mourning doves, raccoon, robins, sparrows, and rufous-sided towhees.

B. DISCUSSION AND MANAGEMENT SUGGESTIONS

In a small but heavily developed and highly populated state like Connecticut where available habitat continues to decline on a daily basis, it is critical to maintain and enhance existing wildlife habitat. The following practices will help to improve conditions within the various habitat types.

Forestland Guidelines

1. Create a diversity of habitat by making small (¼ to 1 acre) irregularly shaped openings in an east to west direction (to obtain maximum sunlight). This will encourage fruit producing shrubs valuable to many types of wildlife. Edges of openings should be feathered (gradually blended into the forest type).

2. Pile brush along edges of openings for small mammals and birds.

3. Maintain 5 to 7 snag trees per acre as they provide nesting and escape cover.

4. The practice of installing bluebird boxes in the forest type should cease. Bluebird nesting habitat is a field type.

5. If a timber harvest is a future consideration, these practices should be followed:

a. Encourage mast producing species (oak, hickory, beech).
b. Leave 5 to 7 snags per acre.
c. Exceptionally tall trees are utilized by raptors for nesting and perching and should be encouraged.
d. Trees with vines (berry producers) should be encouraged.
e. Create small openings with feathered edges.
f. Construct small brush piles.
g. Leave pockets of cedar, hemlock, and white pine for winter cover.

Wetland Guidelines

1. Leave buffer strips (50-100 feet) of natural vegetation along wetland areas to help filter and trap silt and sediments which might otherwise reach the site.

2. Several (3-5) wood duck boxes should be installed.

3. Current weed cover on the pond is not a problem from a wildlife point of view. If the pond is to be chemically treated, the team's wildlife biologist would recommend doing partial treatments. This will maintain portions of aquatic habitat and prevent possible suffocation of fish due to decaying vegetation using up a large percentage of the oxygen present in the water.

4. Development of a trailguide pamphlet with designated stops at points of interest around the pond. Topics of discussion should include pond ecology and the concept of vegetation succession.

Openland

1. The field should be mowed every three to five years to maintain an early vegetative successional stage.

2. Maintain some shrub component within the field.

3. Bluebird boxes should be erected at field edges.

It should be recognized that for optimum wildlife habitat a variety of successional stage vegetation should be encouraged. Proper maintenance of openings, field edges, brush piles, etc. needs to be conducted to protect established habitat.

For any further wildlife related assistance, the town is encourage to contact the team's wildlife biologist at the Western District DEP Office, 485-0226.

VIII. Fisheries

Transylvania Pond is a 35 acre body of water located within Pierce Park. It was reported in a previous fisheries investigation conducted in 1980 to have a maximum depth of 10 feet, a mean depth of 5 feet, and to be inhabited by largemouth bass, chain pickerel, golden shinner and bluegill sunfish. Additionally, brown bullhead and pumpkinseed sunfish are likely to inhabit the pond. Weed growth was described as extensive along the southern and south-western shores, and water lillies, floating leaf pondweed and American elodea were identified. Based on the recommendations of the 1980 study, golden shinner were stocked into the pond on a periodic basis to enhance the sport fishery. Largemouth bass fingerlings, which were also recommended for stocking, were found to be too expensive and were not stocked by the town.

Continued concern has been expressed with regards to the luxuriant weed growth and its negative impact on the recreational use of the pond. In August of 1984, Northeast Tree and Pond Services was contracted by the Southbury Conservation Commission to treat the north end of the pond with liquid potassium endothall and Diquat (note: both are contact herbicides, not systemic as reported in the August 17, 1984 Newtown Bee article on Janie Pierce Pond). Treatment with these chemicals is effective against floating leaf pondweeds and elodea but not water lilies. Weed growth was allowed to remain in the south end of the pond to provide cover for fish.

Weed growth becomes detrimental to the fisheries of a lake at a density where efficient predation by bass and pickerel on forage species is inhibited. When this density is reached, overcrowded and stunted populations of sunfish, bullheads and perch (where present), and depressed growth rates in bass, often result. Additionally, large numbers of stunted sunfish tend to prey heavily on bass eggs and fry, drastically reducing spawning success and the subsequent recruitment of bass into the fishery. A population made up of a few old bass, unable to produce a large successful spawn and insufficient in number to support truely good fishing, often results. Moderate weed growth however, should be considered beneficial in that it provides escape cover for all fish species, and spawning habitat for pickerel, largemouth bass and yellow perch. Recent research has shown that the total biomass of largemouth bass, and the numbers of legal sized bass, increase with corresponding increases in the amount of macrophyte cover until vegetation covers roughly 20% of the entire lake surface. Once weed cover exceeds 20% of the total lake acreage, decreases in the capture rate of prey are likely to lead to prey overabundance and a decrease in bass biomass.

A second means by which weed growth may become detrimental to the fisheries of a lake or pond is via the

inducement of "winterkill" in bodies of water having marginal depth. Winterkill occurs when light penetration into the water is reduced under cover of ice and snow. This results in conditions where life supporting oxygen is being removed from the water by bacterial decay of abundant plant matter, while it is not being added by photosynthesis. A fish kill results when oxygen concentrations drop to critical levels. A bass fishery can be severely impacted by winterkill as the larger fish present are particularly sensitive to low oxygen concentrations.

A field inspection revealed Pierce Pond to be approximately 30% covered by emmergent and submerged vegetation. It is the opinion of the team's fishery biologist that reducing the weed cover by at least an additional 10% would be beneficial to the fisheries value of Pierce Pond. It is also recommended that the dense weed growth found in the south end of the pond be divided up to increase the "patchiness" of the habitat. This will most likely increase the number of bass the pond is capable of supporting and will allow anglers access to some of the best bass cover.

The most economical means by which the town of Southbury can control the weed growth in Pierce Pond in the short-term is by treatment with aquatic herbicides. Granular 2,4-D Ester (a true systemic herbicide) may be applied in the spring to control water lillies in specific areas of the pond, and Diquat may be applied later in the spring/early summer to control floating leaf pondweeds and elodea (treatment may have to be repeated on a yearly or bi-yearly basis). Still, it should be noted that the application of herbicides may result in a quick release of nutrients into the water as dead plant matter decays. This is usually accompanied by an increase in phosphorous levels and may result in greater plankton productivity. Additionally, in a lake or pond ecosystem, macrophytes act as buffers of exogenous nutrients and may thus repress phytoplankton productivity by limiting nutrient availability. If the biomass of plants and the corresponding foliar uptake of nutrients is reduced, runoff will proceed to enrich the water column. Phytoplankton may increase due to the greater availability of limiting nutrients. Algae blooms and turbidity may then serve to reduce both the fishing quality and aesthetic value of the pond, particularly if blue-green blooms occur. The DEP has available a publication entitled "Control of Water Weeds and Algae" which provides information on the chemicals available for controlling different types of nusiance vegetation, instructions for determining the proper dosage, and the procedures to apply for a permit. Copies of the publication are available at 485-0226.

Alternatives to chemical treatment are more effective but unfortunately also much more expensive, at least initially (i.e, initial layout is greater, but chemical treatment must be repeated so long term cost difference is not as great as appears). Extensive dredging of the pond bottom offers the most permanent method of weed control available.

A depth of 10 feet or more is best for preventing the development of nuisance vegetation as sunlight penetration is usually insufficient for the stimulation of plant growth. Concurrent with this should be the construction of drawdown facilities which would allow the water level of the pond to be dropped by at least 3 or 4 feet. Water level could then be reduced during the late fall and allowed to remain down until early February. Exposed plant material would be killed by freezing and should be physically removed from the lake basin (lily pad roots and tubers are resistant to freezing and would require the removal of up to 12 inches of exposed sediment or chemical treatment with a systemic herbicide the following spring). Additionally, periodic drawdowns often benefit fish populations by concentrating all fish into a smaller volume of water, temporarily increasing the efficiency of predation on sunfish and perch and thus helping to prevent overpopulation. A drawdown should not be attempted in Transylvania Pond unless the ponds depth is increased, however, as it will exacerbate the chances of a fish winterkill.

Commercial weed harvesters may also be used to remove weeds from selected areas of the pond. As with the drawdown technique, plant material should be transported far enough from the pond so as to prevent the reentry of nutrient rich leechate. Done correctly this will prevent the quick release of nutrients into the water from decay, however an increase in the concentration of nutrients from runoff would still occur and some slight increase in turbidity may result.

Some new methods of weed control are being developed, as discussed in the next section of this report. Information of the use and relative success of "Dartex" (semi-permeable plastic) and "Aquashade" (photosynthesis retarding dye) have been requested by the Fisheries Bureau of DEP and will be forwarded to the Southbury Conservation Commission when available.

The introduction of weed eating fish species is prohibited by law as the effects of such introductions on the complex biology of lakes, ponds and rivers has not yet been adequately quantified. The danger that introduced fish may be caught and subsequently transported to other bodies of water must also be considered.

IX. Additional Pond Management Considerations

Pierce Park provides an attractive wooded setting for Transylvania Pond. The watershed includes moderate to steep wooded slopes to the east, a wetland with rich soil and lush plant growth to the west and a swampy area south of the pond. Three incoming streams enter the pond from the south and southwest through nutrient rich soils. There is one farm on the inflowing stream from Pine Corners and a few houses on the stream paralleling Grassy Road #2. Cows are

pastured on the steep southeast shore and cow manure was obvious down to the lake shore. Ducks and geese were seen on the pond and were reported to be frequent visitors. The banks of the pond are stable and no erosion problems were seen.

Transylvania Pond is a shallow, (averaging approximately five feet), man-made, 35 acre pond with two dams: an earthen dam on the northwest fork and a concrete dam on the northeast fork. There is no mechanism to open the dam and lower the water level; outflow is through the sluiceway on top of the concrete dam. The pond bottom appeared to be highly organic, mucky soil, supporting lush plant growth. Specimens collected included: Brasenia (watershield), Nuphar (spatterdock), Nymphaea (waterlily), and Ceratophyllum (coontail).

The abundant plant growth is probably due to a natural eutrophic condition resulting from plentiful nutrients, and shallow, warm water where the sunlight penetrates down to the substrate. These are optimum conditions for plant production and it is unlikely that any major, long term change can be made in the pond's weed growth without extensive control measures (e.g., dredging). In an effort to eliminate some of the weed growth, the pond was treated with "Diquat" and "Endothall" two weeks before the King's Mark Team examined the pond.

Some other methods which might be tried to change conditions and thus reduce the weed population are:

1) Decreasing incoming nutrients:
   - implement appropriate agricultural "best management" practices in the watershed
   - discourage geese and ducks from using the pond
   - have local sanitarian oversee timely corrective measures for any septic system failures along tributary streams.

2) Weed harvesting
   - Mechanical cutting and removal of aquatic weeds will give immediate results. To show longer lasting results by this method, it should be done for at least three years. The repeated nutrient removal should have a beneficial effect on limiting weed growth by that time. There are private contractors doing weed harvesting and small harvesters are now available. Consideration should be given to implementing and continuing this method on a yearly maintenance basis.

3) Light control
   - "Aquascreening" - vinyl coated fiberglass mesh placed on pond bottom can be effective in compressing weeds and blocking sunlight. Thus existing weeds are killed and potential weeds inhibited

from growing. The screen was most effective against Eurasian watermilfoil (biomass reduction of 75%) when used in shallow Union Bay, Washington. This can be a very expensive method for a pond of any size; for more information, see article by Perkins, Boston & Curren, "The Use of Fiberglass Screens for Control of Eurasian Watermilfoil", in the Journal of Aquatic Plant Management, Vol. 18: 13-19, 1980; and brochure from Menardi-Southern Corp., Box 240, Augusta, Georgia, 30903.

"Black plastic" with perforations to allow gases to escape is another, less expensive, product used to control weed growth. This can be weighted down to keep it on the pond bottom.

"Dartek" is a black nylon film which has negative buoyancy, making it easier to keep on the bottom. This material absorbs water, making it more flexible for contouring to a lake bottom. For more information, contact DuPond Canada, Inc., Box 2200, Streetsville, Mississauga, Ontario L5M 2H3, telephone 416-821-5276.

"Aquashade" is an inert blue liquid dye, registered by EPA as a "general use" pesticide for small natural or man made ponds. This substance is not a poison and has no direct chemical action on plants or animals, but controls aquatic plant growth by absorbing the sunlight which would otherwise get to the plant tissue and stimulate growth. It lasts from six to ten weeks in a pond and is slowly broken down into carbon dioxide and water. Of course, its effectiveness would be diminished in proportion to the flow through rate in the pond. Approximately 75% reduction of Nymphoides (waterlily-like plants) was accomplished using "Aquashade" in one pond in southeastern New York. For more information, see "Summary of Aquashade trials in Myriophyllum spicatum (milfoil)" by Dr. John Peverly of the Dept. of Agronomy, Cornell University, Ithaca, New York, 14853; or contact Brad Robinson, Senior Analyst, Pesticide Compliance Section, DEP, 122 Washington St., Hartford, CT., 06106/

4) Dredging

- Given the shallowness of Transylvania Pond, it would seem futile to dredge out bottom material unless a major excavation is planned. Light could still penetrate to the bottom, encouraging plant growth, even if two or three

feet of bottom material was removed. Since, according to town officials, there is no plan at present to make a swimming area at the pond, that reason for dredging does not exist.

5) Chemical Weed Removal
   - A program of macrophyte elimination by the addition of "diquat" and "endothall" has been used at Transylvania Pond. This method provides temporary cosmetic relief from excessive weed growth. However, as the dead vegetation decays, it uses oxygen and releases nutrients to the water, feeding new plant growth. The chemical dosing has to be repeated at least once every year and in the long run it may be more effective and less expensive to use a different method.

6) Lower water depth by siphoning
   - Although often recommended as an inexpensive, non-toxic method of decreasing plant growth by exposing submerged roots to freezing, in this case the negative results might outweigh the gains. Since Transylvania Pond is shallow, lowering the water level a foot or two, plus the ice formed during the winter might not leave sufficient oxygenated water to support the fish population and could result in major fish kills.

To conclude, Transylvania Pond would benefit from both watershed control of incoming nutrients and an in-lake management program. Weed harvesting and some light limiting method might be used in combination to try to cut down the weed population.

Although the major complaint concerning Transylvania Pond has been the heavy aquatic plant growth as it interferes with boating and fishing, the other values of the pond should not be under-rated. The natural, wooded surroundings provide habitat for wildlife for which the pond is of major importance. The whole area is ideally suited to nature study. Paths with benches for pond viewing and labels designating special features along the way would enhance this value. Southbury is fortunate in having such an attractive asset in the town.

X. Appendix

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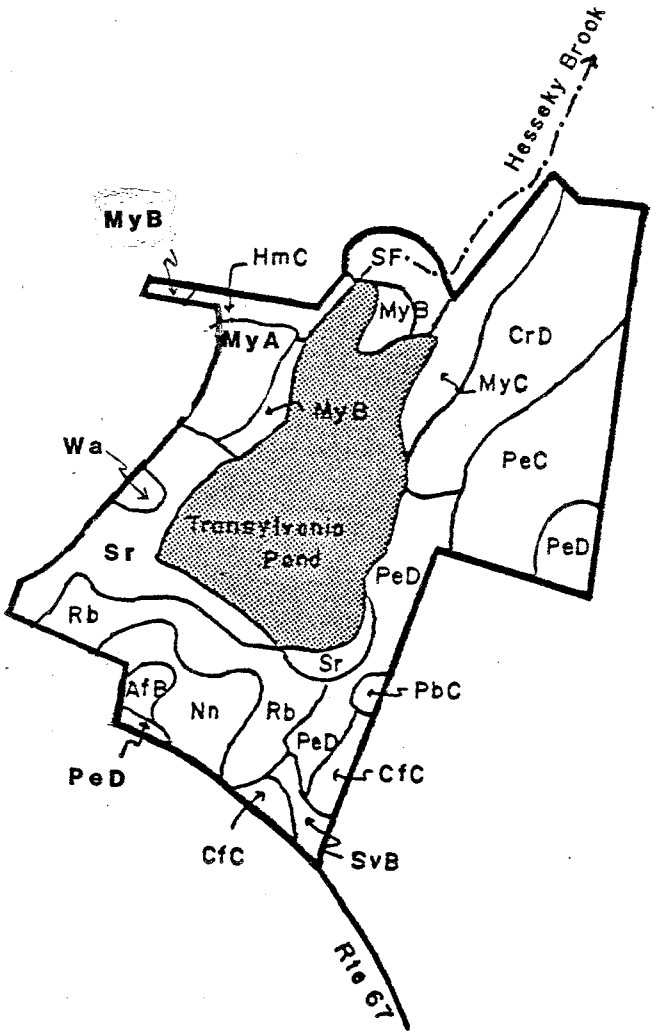
SOILS MAP


Hesseky Brook
MyB
HmC
SF
MyB
MyA
CrD
MyC
MyB
Wa
PeC
Transylvania Pond
Sr
PeD
PeD
Rb
Sr
PbC
AfB
Nn
Rb
PeD
PeD
CfC
CfC
SvB
Rte 67
N
SCALE
1" = 1000'

SOILS LIMITATION CHART - PIERCE PARK - SOUTHBURY, CT

MAP SYMBOL	SOIL NAME	Limitation/Ratings for: BUILDINGS WITHOUT BASEMENT	SEPTIC SYSTEMS	PICNIC AREAS	PATHS & TRAILS
AfB	Agawam fine sandy loam, 3-8% slopes	Slight	Slight	Slight	Slight
CfC	Charlton fine sandy loam, 8-15% slopes	Moderate: slope	Moderate: slope	Moderate: slope	Slight
CrD	Charlton very stony fine sandy loam, 15-35% slopes	Severe: slope, depth to rock	Severe: slope, depth to rock	Severe: large stones, slope	Severe: large stones
HmC	Hinckley gravelly loamy sandy, 3-15% slopes	Moderate: slope	Moderate: slope	Moderate: small stones, slope	Moderate: small stones
MyA	Merrimac sandy loam, 0-3% slopes	Slight	Slight	Slight	Slight
MyB	Merrimac sandy loam, 3-8% slopes	Slight	Slight	Slight	Slight
MyC	Merrimac sandy loam, 8-15% slopes	Moderate: slope	Moderate: slope	Moderate: slope	Slight
Nn	Ninigret fine sandy loam	Moderate: wetness	Severe: wetness	Slight	Slight
PbC	Paxton fine sandy loam, 8-15% slopes	Moderate: frost action, slope	Severe: percs slowly	Moderate: slope	Slight

SOILS LIMITATION CHART - PIERCE PARK - SOUTHBURY, CT - CONT'D

MAP SYMBOL	SOIL NAME	Limitation/Ratings for: BUILDINGS WITHOUT BASEMENT	SEPTIC SYSTEMS	PICNIC AREAS	PATHS & TRAILS
PbD	Paxton fine sandy loam, 15-25% slopes	Severe: slope	Severe: slope, percs slowly	Severe: slope	Moderate: slope
PeC	Paxton extremely stony fine sandy loam, 3-15% slopes	Severe: large stones	Severe: percs slowly large stones	Severe: large stones	Severe: large stones
PeD	Paxton extremely stony fine sandy loam, 15-35% slopes	Severe: slope large stones	Severe: slope, percs slowly, large stones	Severe: slope, large stones	Severe: slope, large stones
Rb	Ridgebury fine sandy loam	Severe: wetness, frost action	Severe: wetness	Severe: wetness	Severe: wetness
Sf	Scarboro loamy fine sand	Severe: wetness	Severe: wetness	Severe: wetness	Severe: wetness
Sr	Scarboro muck	Severe: wetness	Severe: wetness	Severe: wetness	Severe: wetness
SvB	Sutton fine sandy loam, 3-8% slopes	Moderate: wetness	Severe: wetness	Slight	Slight
Wa	Walpole sandy loam	Severe: wetness, frost action	Severe: wetness	Severe: wetness	Severe: wetness

NOTES: 1) Limitation ratings from USDA Soil Conservation Service criteria.

EXPLANATION OF RATING SYSTEM: SLIGHT LIMITATION: indicates that any property of the soil affecting use of the soil is relatively unimportant and can be overcome at little expense.
MODERATE LIMITATION: indicates that any property of the soil affecting use can be overcome at a somewhat higher expense.
SEVERE LIMITATION: indicates that the use of the soil is seriously limited by hazards or restrictions that require extensive and costly measures to overcome

ABOUT THE TEAM

The King's Mark Environmental Review Team (ERT) is a group of environmental professionals drawn together from a variety of federal, state, and regional agencies. Specialists on the team include geologists, biologists, foresters, climatologists, soil scientists, landscape architects, recreation specialists, engineers, and planners. The ERT operates with state funding under the aegis of the King's Mark Resource Conservation and Development (RC&D) Area - a 47 town area in western Connecticut.

As a public service activity, the team is available to serve towns and developers within the King's Mark Area --- free of charge.

PURPOSE OF THE TEAM

The Environmental Review Team is available to help towns and developers in the review of sites proposed for major land use activities. To date, the ERT has been involved in the review of a wide range of significant activities including subdivisions, sanitary landfills, commercial and industrical developments, and recreation/open space projects.

Reviews are conducted in the interest of providing information and analysis that will assist towns and developers in environmentally sound decision-making. This is done through identifying the natural resource base of the project site and highlighting opportunities and limitations for the proposed land use.

REQUESTING A REVIEW

Environmental Reviews may be requested by the chief elected official of a municipality or the chairman of an administration agency such as planning and zoning, conservation, or inland wetlands. Requests for reviews should be directed to the Chairman of your local Soil and Water Conservation District. This request letter must include a summary of the proposed project, a location map of the project site, written permission from the landowner/developer allowing the team to enter the property for purposes of review, and a statement identifying the specific areas of concern the team should address. When this request is approved by the local Soil and Water Conservation District and the King's Mark RC&D Executive Committee, the team will undertake the review. At present, the ERT can undertake two reviews per month.

For additional information regarding the Environmental Review Team, please contact your local Soil Conservation District Office or Richard Lynn (868-7342), Environmental Review Team Coordinator, King's Mark RC&D Area, P.O. Box 30, Warren, Connecticut 06754.