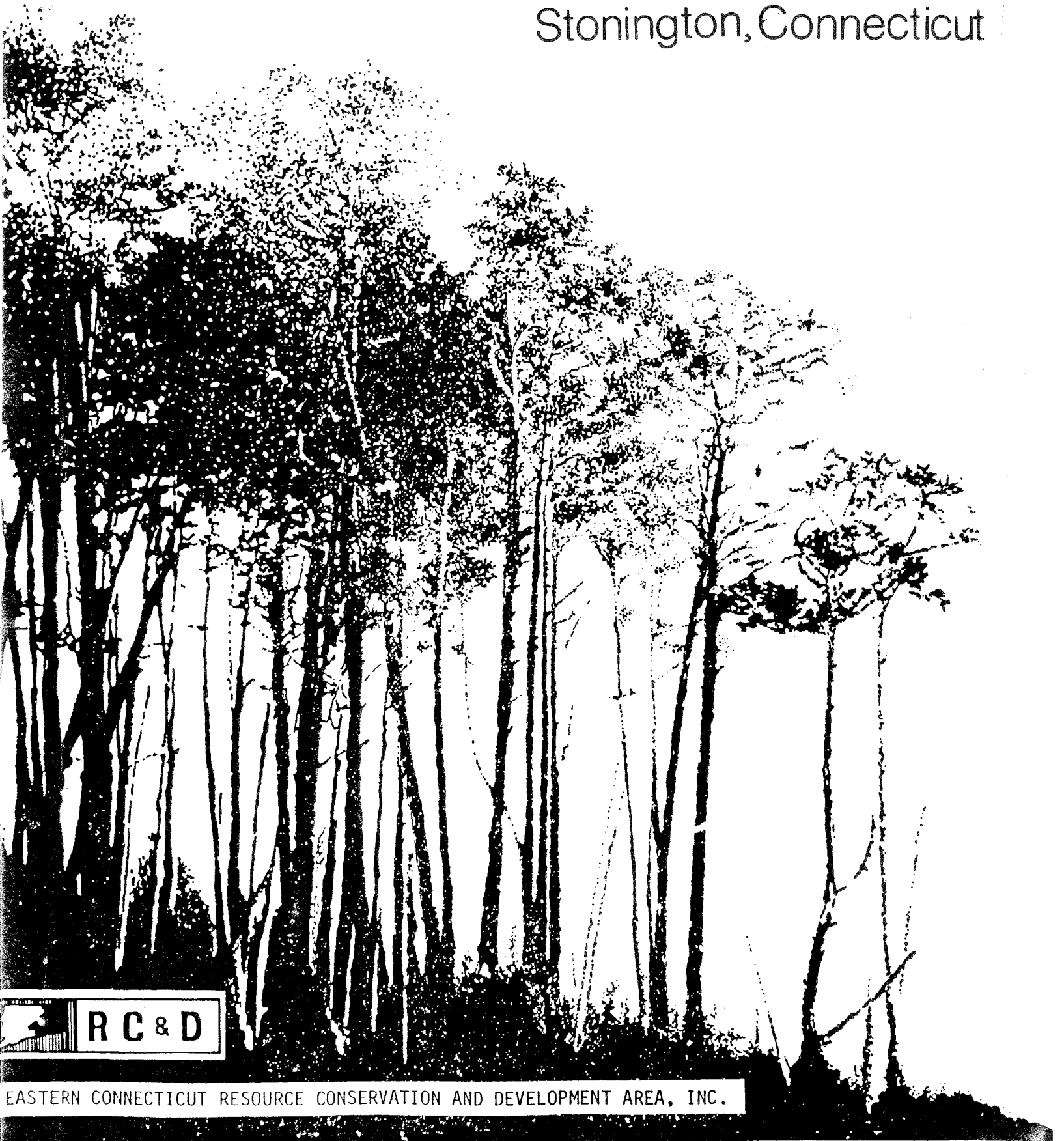


Environmental Review Team Report

Hoffman Evergreen Preserve

Stonington, Connecticut



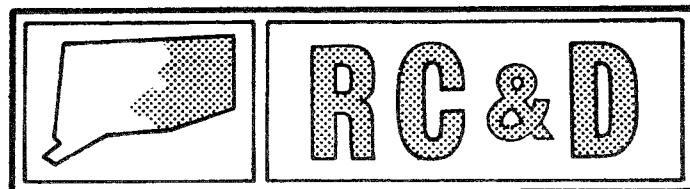
EASTERN CONNECTICUT RESOURCE CONSERVATION AND DEVELOPMENT AREA, INC.

Environmental Review Team
Report

Hoffman Evergreen Preserve

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September 1984

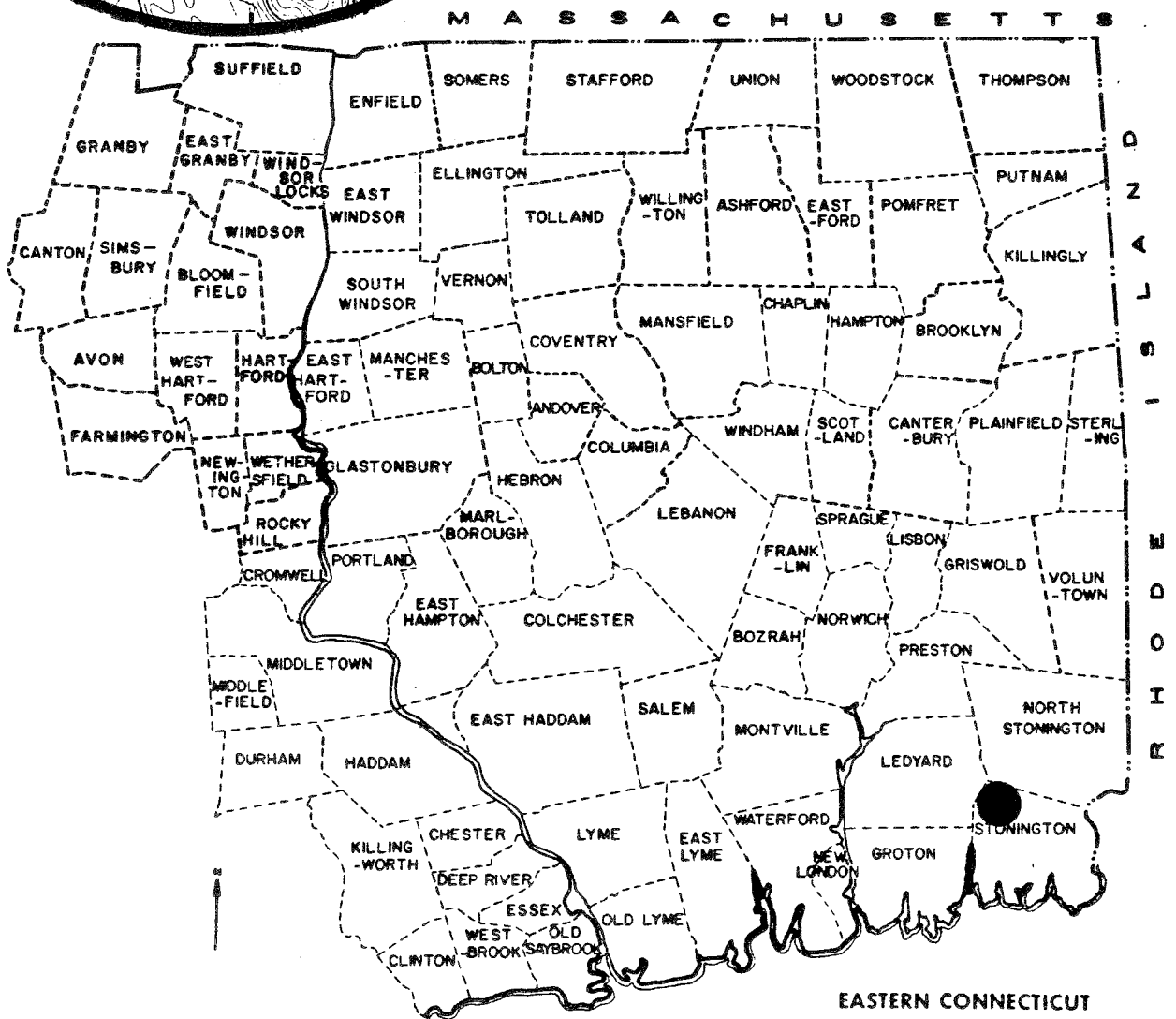
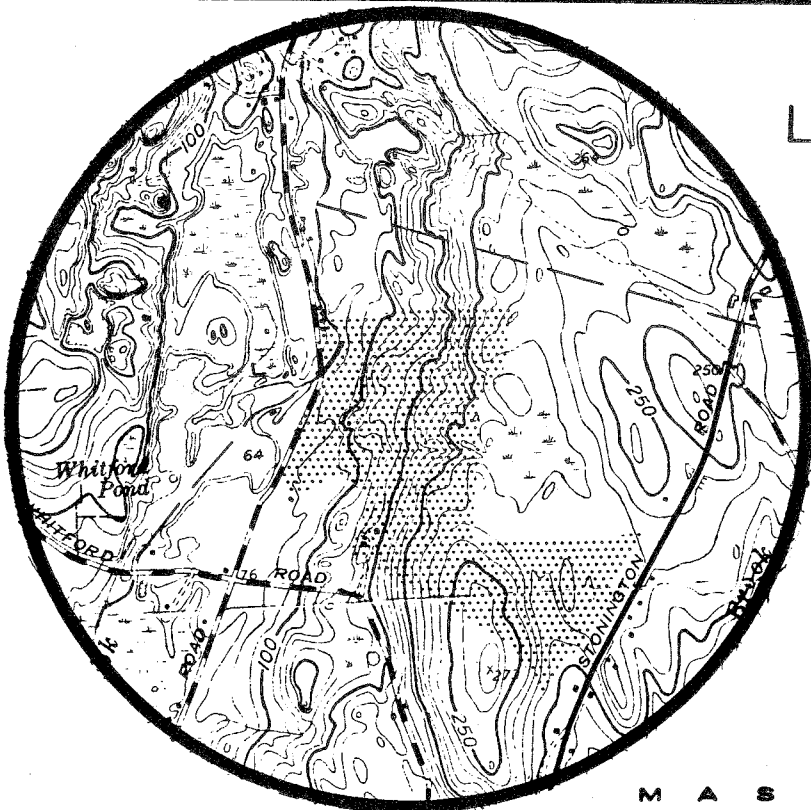


Eastern Connecticut Resource Conservation & Development Area

Environmental Review Team
PO Box 198
Brooklyn, Connecticut 06234

Location of Study Site

HOFFMAN EVERGREEN PRESERVE
STONINGTON, CONNECTICUT



EASTERN CONNECTICUT
RESOURCE CONSERVATION AND DEVELOPMENT PROJECT

ENVIRONMENTAL REVIEW TEAM REPORT
ON
HOFFMAN EVERGREEN PRESERVE
STONINGTON, CONNECTICUT

This report is an outgrowth of a request from the Stonington Planning and Zoning Commission to the New London County Soil and Water Conservation District (S&WCD). The S&WCD referred this request to the Eastern Connecticut Resource Conservation and Development (RC&D) Area Executive Committee for their consideration and approval as a project measure. The request was approved and the measure reviewed by the Eastern Connecticut Environmental Review Team (ERT).

The soils of the site were mapped by a soil scientist of the United States Department of Agriculture (USDA), Soil Conservation Service (SCS). Reproductions of the soil survey map as well as a topographic map of the site were distributed to all ERT participants prior to their field review of the site.

The ERT that field-checked the site consisted of the following personnel: Liz Rodgers, Soil Conservationist, (SCS); Bill Warzecha, Geologist, Department of Environmental Protection (DEP); Pete Merrill, Forester, (DEP); Judy Wilson, Wildlife Biologist, (DEP); Bob Dlugolenski, Recreation Specialist, (DEP); and Jeanne Shelburn, ERT Coordinator, Eastern Connecticut RC&D Area.

The Team met and field checked the site on Thursday, April 26, 1984. Reports from each Team member were sent to the ERT Coordinator for review and summarization for the final report.

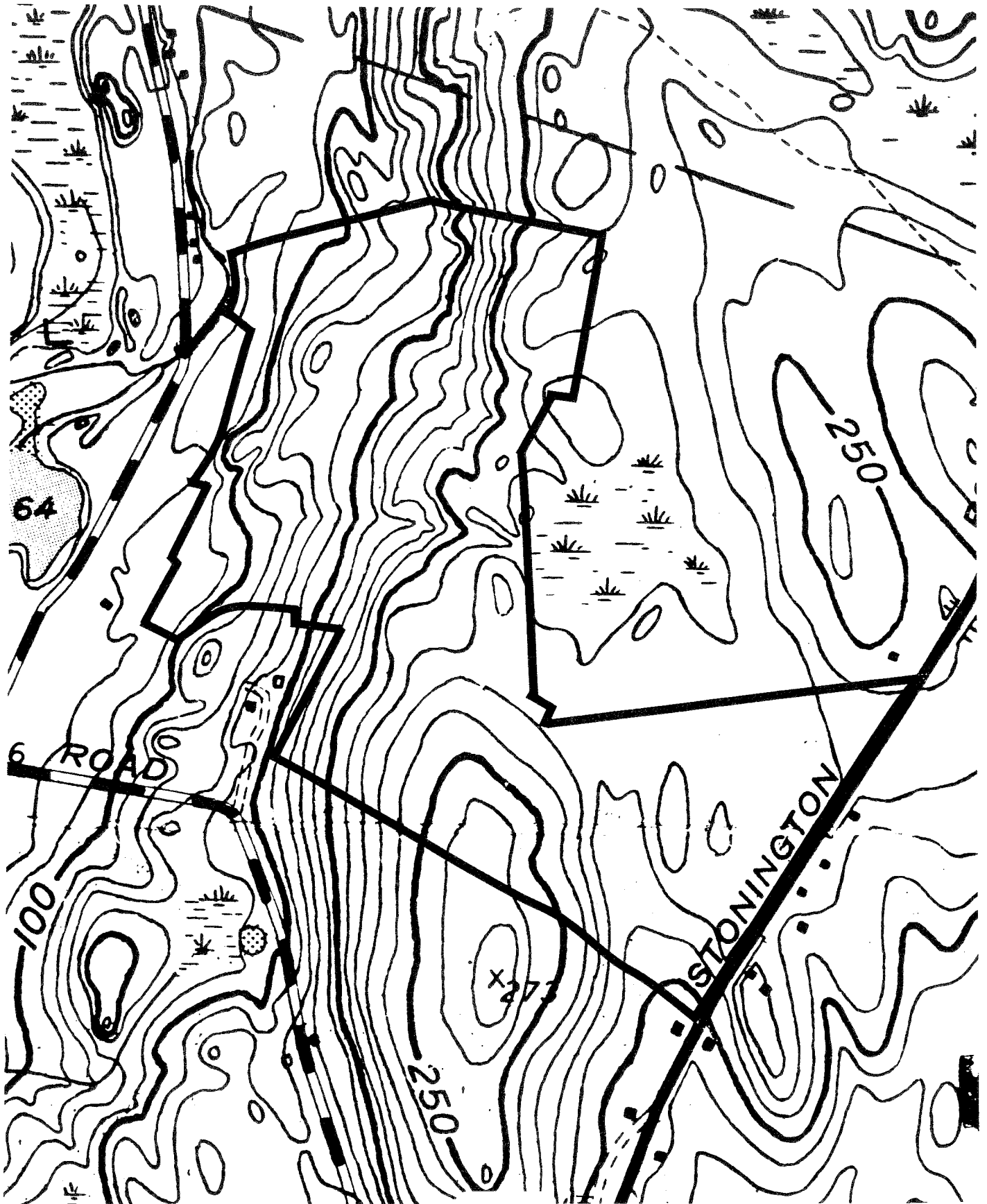
This report is not meant to compete with private consultants by supplying site designs or detailed solutions to development problems. This report identifies the existing resource base and evaluates its significance to the proposed development and also suggests considerations that should be of concern to the Mashantucket Land Trust and the Town of Stonington. The results of this Team action are oriented toward the development of a better environmental quality and the long-term economics of the land use.

The Eastern Connecticut RC&D Project Committee hopes you will find this report of value and assistance in making your decisions on this particular site.

If you require any additional information, please contact: Ms. Jeanne Shelburn, Environmental Review Team Coordinator, Eastern Connecticut RC&D Area, P.O. Box 198, Route 205, Brooklyn, Connecticut 06234, 774-1253.

Topography

— Site Boundary



INTRODUCTION

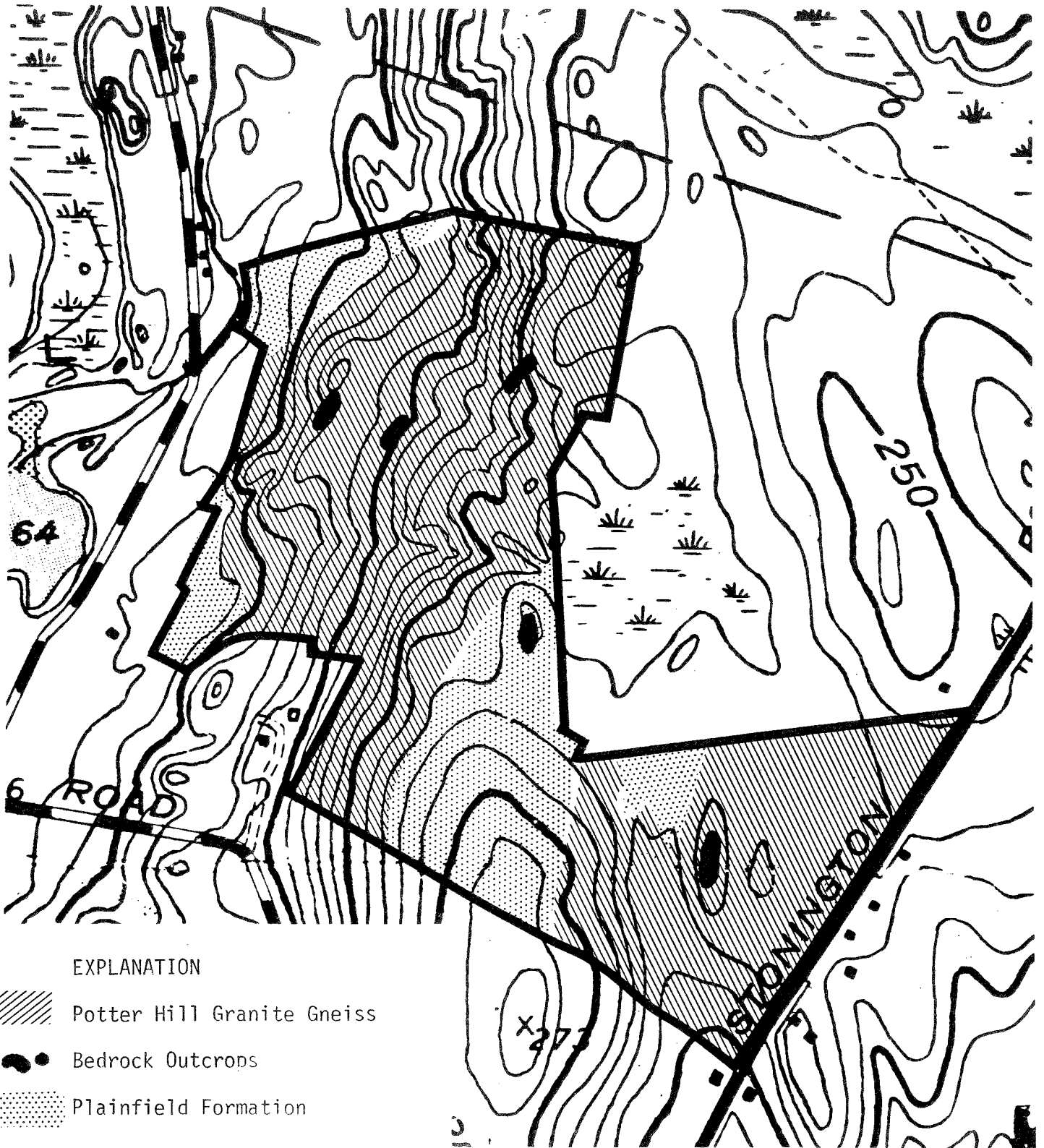
The Eastern Connecticut Environmental Review Team was asked to prepare a natural resource inventory of the Hoffman Evergreen Preserve, a 146± acre site owned by the Mashantucket Land Trust in the Town of Stonington. The property is located east of Lantern Hill Road, north of Wolf Neck Road and west of Route 201. The site has an entrance and road frontage on Route 201.

The property has an interesting history. It was once owned by the Hoffman family; Mr. Hoffman had a love of the Canadian landscape and had tried to recreate it on this site. During his lifetime, Mr. Hoffman planted over 100,000 evergreen seedlings including larch, pine and spruce on this property. American chestnut and native red cedar were also planted. He later willed this land to the Mashantucket Land Trust with the stipulation that it would remain as a nature preserve, no picnicking, camping or other recreational development activity other than walking trails has been allowed.




The Team has provided the detailed information in the following sections of this report to help the Mashantucket Land Trust in making decisions for future planning and management of this tract.

Bedrock Geology

0 660'
scale



EXPLANATION

-  Potter Hill Granite Gneiss
-  Bedrock Outcrops
-  Plainfield Formation

* Adapted from the unpublished Bedrock Geologic map for the Old Mystic topographic quadrangle by Richard Goldsmith and Joseph W. Gaffney. "Preliminary Bedrock Geological Map of Connecticut" by John Rodgers was also consulted.

NATURAL RESOURCE INVENTORY

TOPOGRAPHY

As shown by the accompanying topographic map, the "Hoffman Evergreen Preserve" is approximately 146 acres and is located in northern Stonington, east of Lantern Hill Road, west of Route 201 and north of Wolf Neck Road. The eastern part of the site is characterized by relatively flat slopes. Land surface slopes moderately westward from the central portion of the site to the western property line. Elevations range from a high of ± 260 feet above mean sea level in the southern portions of the parcel to a low of ± 80 above mean sea level along the western property line.

GEOLOGY

Bedrock Geology

The site is located within the Old Mystic topographic quadrangle. The bedrock geologic map for the quadrangle has not been completed to date. Preliminary bedrock and geology information for the quadrangle on file at the Department of Environmental Protection's Natural Resource Center is available for review purposes. The Team's Geologist also referenced John Rodger's "Preliminary Bedrock Geological Map of Connecticut" for this report.

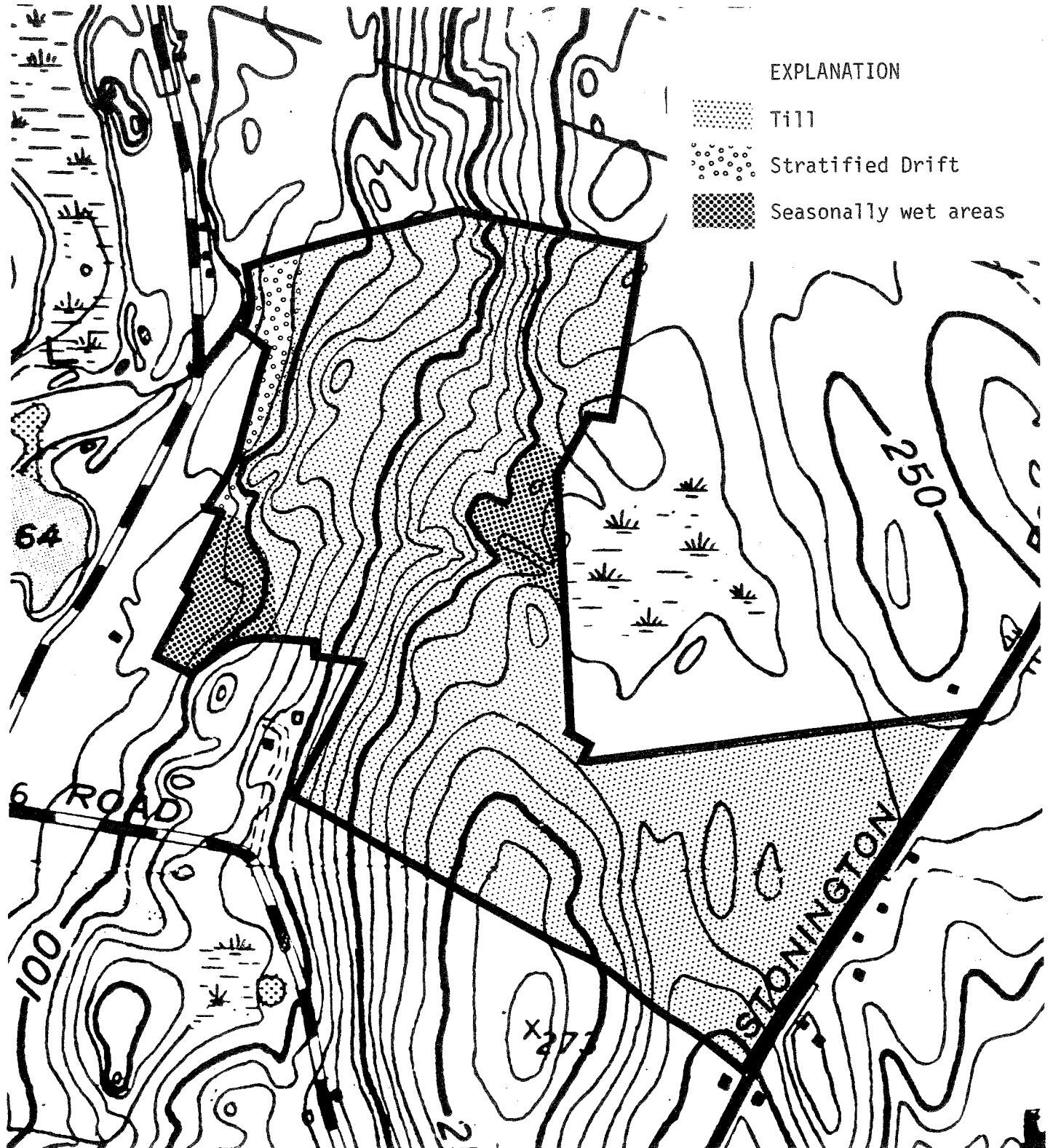
Bedrock outcrops are found in isolated areas in the eastern, central and northcentral portions of the site. According to mapped information, bedrock which outcrops or underlies the property has been classified as Potter Hill Granite Gneiss and the Plainfield Formation.

The Potter Hill Granite Gneiss outcrops and/or underlies the west central and eastern limits of the site. The rock consists of a gray to pinkish gray granitic gneiss composed of the minerals quartz, calcic oligoclase, microcline, and biotite. Minor minerals include magnetite, muscovite and apatite. The term "gneiss" refers to metamorphic rock (a rock altered by high temperatures or pressures in the earth's crust) in which thin bands of aligned minerals alternate with layers of more rounded mineral grains. The adjective "granitic" which precedes the word gneiss above refers to rocks which have a granite composition, i.e., light-colored, high content of quartz and feldspar minerals, of igneous (formed from molten rock) origin. This rock unit has been used in the past for building stones and for other structural purposes.

The Plainfield Formation underlies and/or outcrops in the central and western limits of the site. This rock unit consists of an interlayered thin bedded quartzite, mica schist and a dark gray gneiss. The term "quartzite" refers to a

Surficial Geology

0 660'
scale



* Adapted from the unpublished Surficial Geologic map for the Old Mystic topographic quadrangle and the Soil Survey for New London County prepared by the U.S. Department of Agriculture, Soil Conservation Service.

non-foliated rock which consists wholly of quartz sand that has been cemented with the mineral quartz. "Quartzites" are also metamorphic rocks. A "schist" is a crystalline metamorphic rock in which elongate or flaky minerals have been strongly aligned, giving the rock a slabby or thinly layered structure. Mica (biotite) minerals are abundant in the schist layer. Quartz and feldspar are the primary minerals in the rock. Layers of gneissic rocks, which have been described earlier are also found in the Plainfield Formation. This rock has no known economic value.

Surficial Geology

The site is covered mostly by till, a nonsorted sediment composed of silt, sand, clay, gravel and boulders which was derived from the local bedrock, i.e., gneisses, quartzites, and granites. Till was deposited directly by glacial ice as it was moved through the region more than 12,000 years ago. The upper 3 to 5 feet of till may be sandy, very stony and loose, but at depth, it becomes siltier, less stony and tightly compact. Thicknesses of the till range from zero in areas where rock outcrops at the land surface to probably not more than 10 feet at various points between outcrops. Another type of glacial sediment found along the western limits of the site is stratified drift. "Stratified drift," which covers approximately 3 acres of the site consists of moderately to well sorted sediment, composed mainly of sand and gravel. These sediments were deposited in the Whitford Brook Valley (along the western boundary) by glacial meltwater streams. Thicknesses of the stratified drift on the site probably range from a few inches to not more than 10 feet.

Overlying till and/or bedrock in the central and western sections of the parcel are seasonally wet areas which are extremely stony. These areas are designated as Rn (Ridgebury, Leicester, and Whitman) soils on the accompanying soils map. Areas comprised of this soil group are regulated wetland areas under Public Act 155.

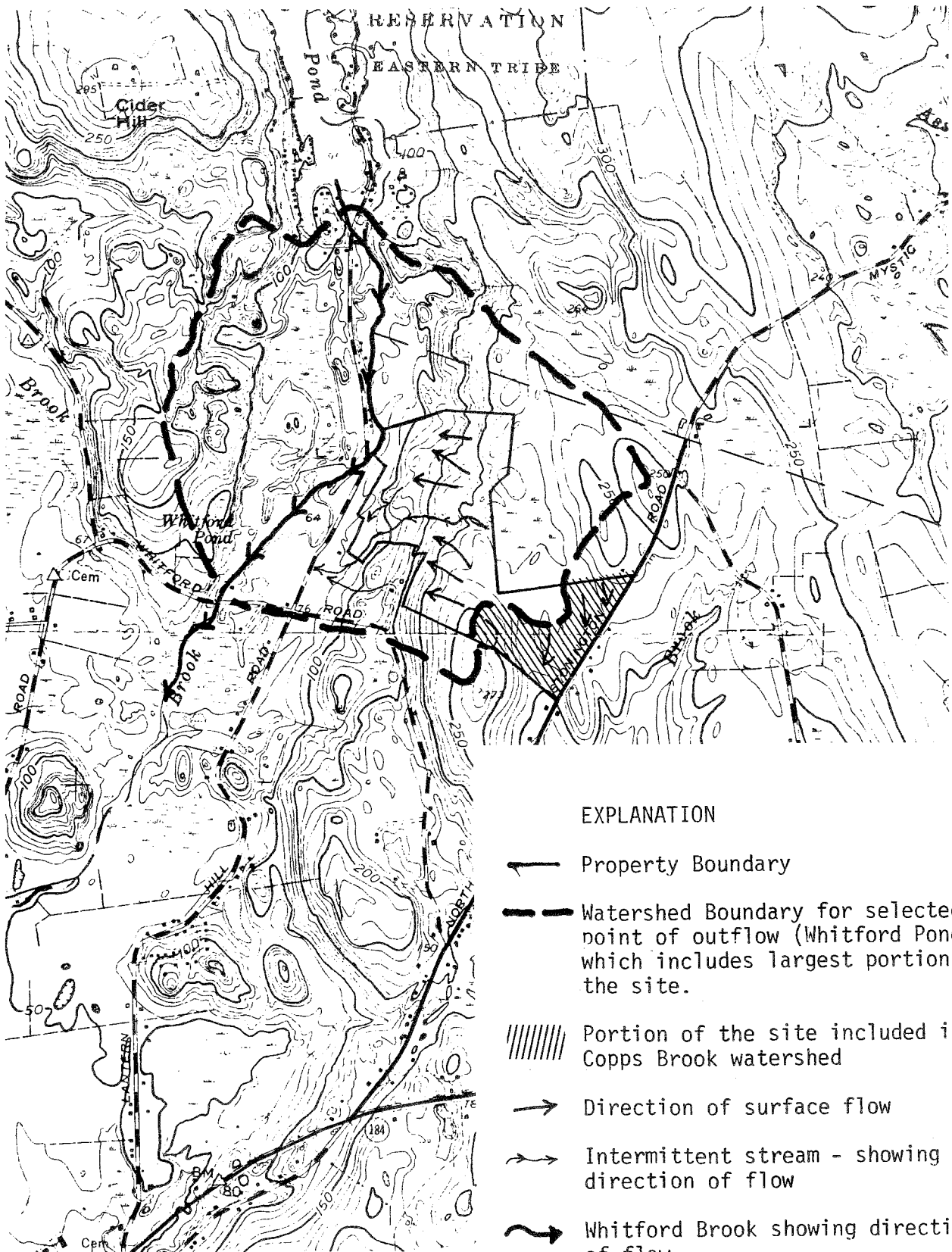
From a geological perspective, it appears that the most appropriate use of the site would continue to be for passive recreation. The flatter areas in the eastern portion of the parcel could probably support active recreational development without any significant problems. Seasonally wet areas would best be left in their natural state.

HYDROLOGY

Approximately 22 percent of the site in the eastern section drains predominantly southward by sheetflow towards a natural swale. This swale, which is located in the southern portion of the site, carried runoff to a tributary of Cops Brook on the east side of North Stonington Road.

The remaining portions of the site lie in the Whitford Brook Watershed. Surface runoff as well as groundwater from the site flows generally westward. Surface water is shed by sheetflow generally downslope toward local discharge areas, primarily intermittent drainage channels. These channels route the water towards Whitford Brook and/or Whitford Pond.

Drainage Areas



EXPLANATION

- Property Boundary
- Watershed Boundary for selected point of outflow (Whitford Pond), which includes largest portion of the site.
- Portion of the site included in the Cops Brook watershed
- Direction of surface flow
- Intermittent stream - showing direction of flow
- Whitford Brook showing direction of flow

The major watercourse on the site appears to be the outlet stream for the small pond in the central sections. The presence of the pond and watercourse make this area an attractive feature of the property. Perhaps narrow paths could be established along sections of the watercourse and/or around the pond to improve access without creating a significant risk of erosion.

Bedrock appears to be the site's principal groundwater supply source. Bedrock is commonly capable of supplying small but sustainable yields of groundwater to individual wells. According to Connecticut Water Resources Bulletin #15 (Lower Thames and Southeastern Coastal River Basin), 90 percent of bedrock wells drilled in this area yield at least 3 gallons per minute. Bedrock wells rarely provide high yields (yields greater than 50 gallons per minute) but also rarely does it produce a dry well.

SOILS

Soil series typical of the site include the Canton-Charlton series, the Charlton-Hollis series, the Haven series, the Hollis-Charlton-Rock outcrop complex, the Narragansett series, the Scarborough series, the Ridgebury, Leicester and Whitman complex, and the Sutton series. These soils and their properties are described in detail below.

(CbB)--Canton and Charlton fine sandy loams, 3 to 8 percent slopes

These gently sloping, well drained soils are on glacial till upland hills, plains, and ridges. Areas of this unit consist of either Canton soil or Charlton soil, or both. These soils were mapped together because there are no major differences in use and management. Permeability of the Canton soil is moderately rapid in the surface layer and subsoil and rapid in the substratum. The available water capacity is moderate. Runoff is medium. This soil warms up and dries out rapidly in the spring. Unless limed, the soil is strongly acid or medium acid.

Permeability of the Charlton soil is moderate or moderately rapid. The available water capacity is moderate. Runoff is medium. The soil warms up and dries out rapidly in the spring. Unless limed, the soil is strongly acid or medium acid.

These soils are well suited to cultivated crops.

(CbD)--Canton and Charlton fine sandy loams, 15 to 25 percent slopes

These moderately steep well drained soils are on glacial till upland hills, plains, and ridges. These soils were mapped together because there are no major differences in use and management. Permeability of the Canton soil is moderately rapid in the surface layer and subsoil and rapid in the substratum. The available water capacity is moderate. Runoff is very rapid. This soil warms up and dries out rapidly in the spring. Unless limed, the soil is strongly acid or medium acid.

Permeability of the Charlton soil is moderate or moderately rapid. The available water capacity is moderate. Runoff is very rapid. This soil warms up and dries out rapidly in the spring. Unless limed, the soil is strongly acid or medium acid.

These soils are poorly suited to cultivated crops. The steepness of slopes makes the use of farming equipment difficult.

(CcB)--Canton and Charlton very stony fine sandy loams, 3 to 8 percent slopes

These gently sloping, well drained soils are on glacial till upland hills, plains, and ridges. Stones and boulders cover 1 to 8 percent of the surface. These soils were mapped together because there are no major differences in use and management. Permeability of the Canton soil is moderately rapid in the surface layer and subsoil and rapid in the substratum. The available water capacity is moderate. Runoff is medium. This soil warms up and dries out rapidly in the spring. The soil is strongly acid or medium acid.

Permeability of the Charlton soil is moderate or moderately rapid. The available water capacity is moderate. Runoff is medium. This soil warms up and dries out rapidly in the spring. It is strongly acid or medium acid.

These soils are not suited to cultivated crops. Stones and boulders make the use of farming equipment difficult.

(CcC)--Canton and Charlton very stony fine sandy loams, 8 to 15 percent slopes

These sloping, well drained soils are on glacial till upland hills, plains, and ridges. Stones and boulders cover 1 to 8 percent of the surface. These soils were mapped together because there are no major differences in use and management. Permeability of the Canton soil is moderately rapid in the surface layer and subsoil and rapid in the substratum. The available water capacity is moderate. Runoff is rapid. The soil warms up and dries out rapidly in the spring. It is strongly acid or medium acid.

(CdD)--Canton and Charlton extremely stony fine sandy loams, 15 to 35 percent slopes

These moderately steep to steep, well drained soils are on glacial till upland hills, plains, and ridges. Stones and boulders cover 8 to 25 percent of the surface. Permeability of the Canton soil is moderately rapid in the surface layer and subsoil and rapid in the substratum. The available water capacity is moderate. Runoff is very rapid. The Canton soil warms up and dries out rapidly in the spring. It is strongly acid or medium acid.

Permeability of the Charlton soil is moderate or moderately rapid. The available water capacity is moderate. Runoff is very rapid. The Charlton soil warms up and dries out rapidly in the spring. It is strongly acid or medium acid.

These soils are not suited to cultivated crops. Stones and boulders make the use of farm equipment impractical. The hazard of erosion is severe.

(CrC)--Charlton-Hollis fine sandy loams, very rocky, 3 to 15 percent slopes

This gently sloping to sloping complex consists of somewhat excessively drained and well drained soils on glacial till uplands. Rock outcrops cover up to 10 percent of the surface. Stones and boulders cover 1 to 8 percent of the surface. The soils of this complex are so intermingled on the landscape that it was not practical to separate them in mapping at the scale used. Permeability of the Charlton soil is moderate or moderately rapid. The available water capacity is moderate. Runoff is medium or rapid. Charlton soil warms up and dries out rapidly in the spring. It is strongly acid or medium acid.

Permeability of the Hollis soil is moderate or moderately rapid above the bedrock. The available water capacity is low. Runoff is medium or rapid. Hollis soil warms up and dries out rapidly in the spring. It is strongly acid or medium acid.

These soils are not suited to cultivated crops. Stoniness and rock outcrops generally make the use of farming equipment impractical. The Hollis soil has a shallow rooting depth and is droughty. The hazard of erosion is moderate to severe.

(CrD)--Charlton-Hollis fine sandy loams, very rocky, 15 to 45 percent slopes

This moderately steep to steep complex consists of somewhat excessively drained and well drained soils on glacial till uplands. Rock outcrops cover up to 10 percent of the surface. Stones and boulders cover 1 to 8 percent of the surface. Permeability of the Charlton soil is moderate or moderately rapid. The available water capacity is moderate. Runoff is rapid or very rapid. Charlton soil warms up and dries out rapidly in the spring. It is strongly acid or medium acid.

Permeability of the Hollis soil is moderate or moderately rapid above the bedrock. The available water capacity is low. Runoff is rapid or very rapid. Hollis soil warms up and dries out rapidly in the spring. It is strongly acid or medium acid.

These soils are not suited to cultivated crops. Stoniness and rock outcrops make the use of farming equipment impractical. The Hollis soil has a shallow rooting depth and is droughty.

(HcB)--Haven silt loam, 3 to 8 percent slopes

This gently sloping, well drained soil is on stream terraces and outwash plains. Permeability of the Haven soil is moderate in the surface layer and subsoil and very rapid in the substratum. The available water capacity is high. Runoff is medium. Haven soil warms up and dries out rapidly in the spring. Unless limed, it is strongly acid or medium acid. This soil is well suited to cultivated crops.

(HrC)--Hollis-Charlton-Rock outcrop complex, 3 to 15 percent slopes

This gently sloping to sloping complex consists of somewhat excessively drained and well drained soils and Rock outcrop on glacial till uplands. Stones and boulders cover 1 to 8 percent of the surface. The soils and Rock outcrop in this complex are so intermingled on the landscape that it was not practical to separate them in mapping at the scale used.

Permeability of the Hollis soil is moderate or moderately rapid above the bedrock. The available water capacity is low. Runoff is medium or rapid. Hollis soil warms up and dries out rapidly in the spring. It is strongly acid or medium acid.

Permeability of the Charlton soil is moderate or moderately rapid. The available water capacity is moderate. Runoff is medium or rapid. Charlton soil warms up and dries out rapidly in the spring. It is strongly acid or medium acid.

These soils are not suited to cultivated crops. Stoniness and the Rock outcrop make the use of farming equipment impractical. The hazard of erosion is moderate to severe.

(HrD)--Hollis-Charlton-Rock outcrop complex, 15 to 45 percent slopes

This moderately steep to very steep complex consists of somewhat excessively drained and well drained soils and Rock outcrop on glacial till uplands. Stones and boulders cover 1 to 8 percent of the surface. These soils and Rock outcrop in this complex are so intermingled on the landscape that it was not practical to separate them in mapping at the scale used.

Permeability of the Hollis soil is moderate or moderately rapid above the bedrock. The available water capacity is low. Runoff is rapid or very rapid. Hollis soil warms up and dries out rapidly in the spring. It is strongly acid or medium acid.

Permeability of the Charlton soil is moderate or moderately rapid. The available water capacity is moderate. Runoff is rapid or very rapid. Charlton soil warms up and dries out rapidly in the spring. It is strongly acid or medium acid.

These soils in this complex are not suited to cultivated crops.

(NaB)--Narragansett silt loam, 3 to 8 percent slopes

This gently sloping, well drained soil is on glacial till upland hills, ridges, and plains in the southeastern part of the county. Permeability of the Narragansett soil is moderate in the surface layer and subsoil and moderately rapid or rapid in the substratum. The available water capacity is high. Runoff is medium. Narragansett soil warms up and dries out rapidly in the spring. Unless limed, it is very strongly acid through medium acid. This soil is well suited to cultivated crops. The hazard of erosion is moderate.

(Sf)--Scarboro mucky fine sandy loam

This nearly level, very poorly drained soil is on stream terraces and outwash plains. Slopes range from 0 to 3 percent. The Scarboro soil has a high water table at or near the surface for most of the year. Permeability is rapid in the organic layer and rapid or very rapid in the mineral surface layer and substratum. The available water capacity is low. Runoff is very slow, or the soil is ponded. Scarboro soil is very strongly acid through medium acid. This soil is not suitable for cultivated crops because of wetness.

(Rn)--Ridgebury, Leicester, and Whitman extremely stony fine sandy loams

These nearly level, poorly drained and very poorly drained soils are in drainageways and depressions of glacial till upland hills, ridges, plains, and drumloidal landforms. Stones and boulders cover 8 to 25 percent of the surface. These soils were mapped together because there are no major differences in use and management. The Ridgebury soil has a seasonal high water table at a depth of about 6 inches. Permeability is moderate or moderately rapid in the surface layer and subsoil and slow or very slow in the substratum. The available water capacity is moderate. Runoff is very slow or slow. Ridgebury soil warms up and dries out slowly in the spring. It ranges from strongly acid through slightly acid.

The Leicester soil has a seasonal high water table at a depth of about 6 inches. Permeability is moderate or moderately rapid. The available water capacity is moderate. Runoff is very slow or slow. Leicester soil warms up and dries out slowly in the spring. It is very strongly acid through medium acid.

The Whitman soil has a high water table at or near the surface for most of the year. Permeability is moderate or moderately rapid in the surface layer and subsoil and slow or very slow in the substratum. The available water capacity is moderate. Runoff is very slow, or the soil is ponded. Whitman soil warms up and dries out very slowly. It is very strongly acid through slightly acid.

These soils are not suited to cultivated crops. Stoniness makes the use of farming equipment impractical.

(SwB)--Sutton very stony fine sandy loam, 0 to 8 percent slopes

This nearly level to gently sloping, moderately well drained soil is on upland glacial till plains, hills, and ridges. Stones and boulders cover 1 to 8 percent of the surface. The Sutton soil has a seasonal high water table at a depth of about 18 inches. Permeability is moderate or moderately rapid. The available water capacity is moderate. Runoff is slow or medium. Sutton soil warms up and dries out slowly in the spring. It is strongly acid or medium acid in the surface layer and subsoil and strongly acid through slightly acid in the substratum. This soil is not suited to cultivated crops. Stones and boulders make the use of farming equipment difficult.

(SxB)--Sutton extremely stony fine sandy loam, 0 to 8 percent slopes

This nearly level to gently sloping, moderately well drained soil is on upland glacial till plains, hills, and ridges. Stones and boulders cover 8 to 25 percent of the surface. The Sutton soil has a seasonally high water table at a depth of about 18 inches. Permeability is moderate or moderately rapid. The available water capacity is moderate. Runoff is slow or medium. Sutton soil warms up and dries out slowly in the spring. It is strongly acid or medium acid in the surface layer and subsoil and strongly acid through slightly acid in the substratum. This soil is not suited to cultivated crops because stoniness makes the use of farming equipment impractical.

Soils Management/Trail Design

There is an extensive trail system located at the Hoffman Evergreen Preserve; however, in the future this trail system may be expanded. Most of the soils located on the property have either slight or moderate limitations for trail development (see appendix for limitations chart); however, two of the soils-- Ridgebury, Leicester, and Whitman (Rn), and Scarboro (Sf), have severe limitations for trail use because of wetness. Both of these soils are designated wetland soils and regulated under P.A. 155.

When trails are designed, provisions should be made to reduce erosion and runoff. Disturbed areas should be vegetated as soon as practical after construction. If soil or climatic conditions preclude the use of vegetation and protection is needed, non-vegetative means such as mulches or gravel may be used. Adequate drainage should be provided and a raised or elevated trail may be required for wet sites that cannot be drained. Ideally, trails should require little or no cutting and filling, have moderate slopes and few or no stones or boulders on the surface. The Soil Conservation Service is available to provide technical assistance with the design of a trail system.

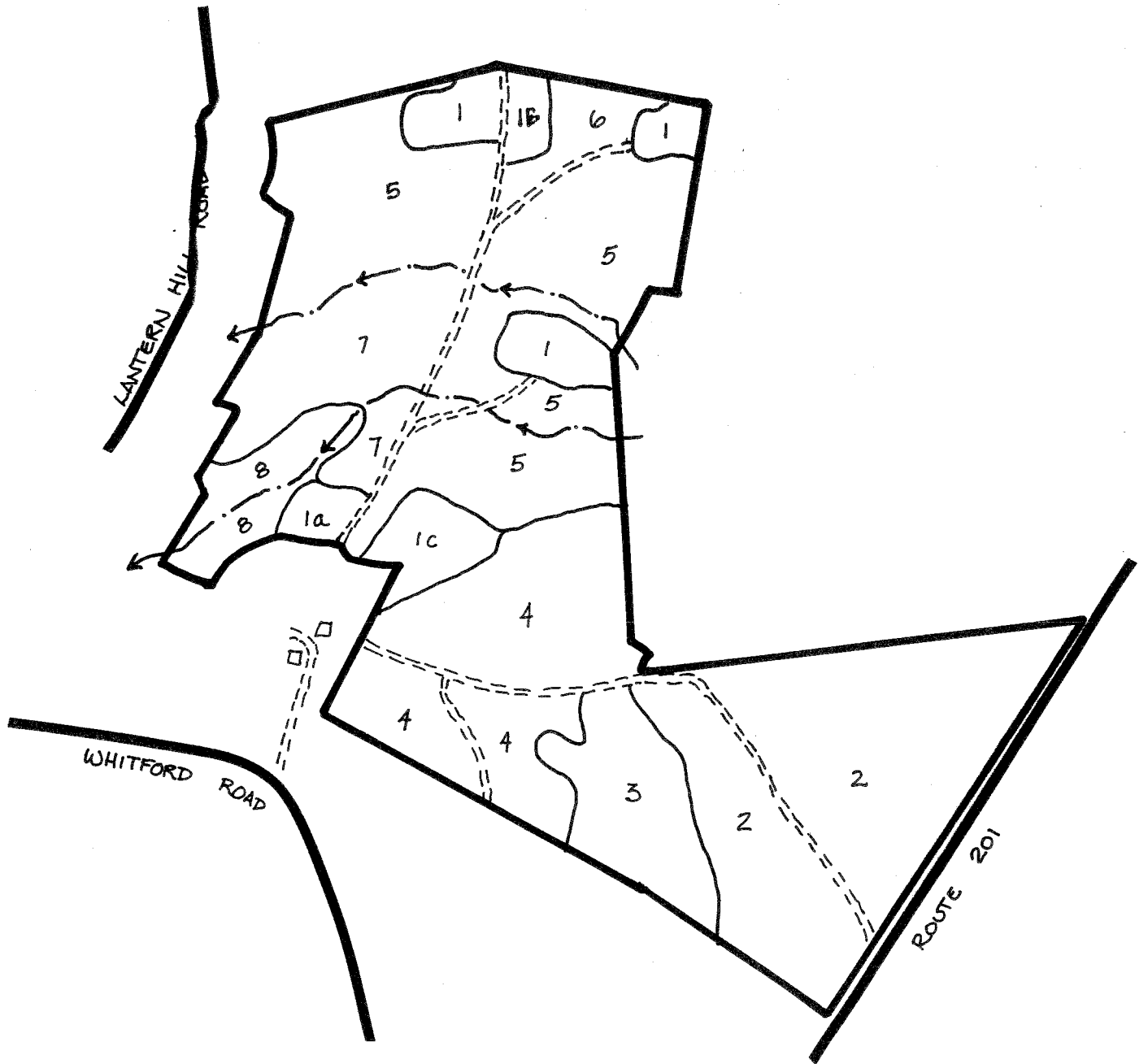
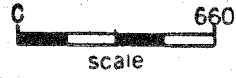
VEGETATION

The area has been broken down by detailed types on the vegetation map, and the different types are numbered to facilitate descriptions and suggested silvicultural management. The suggested silvicultural practices are idealistic and will have to be modified to suit the needs and desires of the Mashantucket Land Trust.

Area #1--White pine plantations. The dominant trees are 8 to 10 inches with many smaller overtopped trees. These plantations have never been thinned and are badly overstocked. At this time, they should be thinned, but there are no saleable products, so a thinning would require cutting the undesirable trees and leaving them to decay or piling them into wildlife cover piles. The best trees, as selected by a forester, should be pruned to create future clear white pine logs.

Area #1a is a younger and very dense stand of white pine, needing no action at this time. In 10 years it should be examined to consider a pre-commercial thinning.

Vegetation



Area #1b is a larch plantation. This area is overstocked as are the larger white pine stands. Here again, the smaller trees should be removed in a pre-commercial thinning, but no pruning of crop trees should be done.

Area #1c is a young plantation of hemlock and white pine. A considerable amount of 2 to 4 inch black birch trees have invaded the plantation. These won't kill out the conifers, but they will certainly retard their growth. With the effort that was put into establishing this plantation, it seems a worthwhile effort to remove some of the competing hardwood to at least release the best of the conifer growth.

Area #2--This is a fairly level area bordering along Route 201 with an overstory of scarlet oak, with some white oak, black oak and black birch. The understory is planted to hemlock 4 to 20 feet in height; American chestnut sprouts, mountain laurel, and huckleberry. This is a medium to poor site for growing oaks and as evidenced by Mr. Hoffman's extensive underplanting that was planned to produce a mixed softwood-hardwood stand. Unfortunately, with the increase in the seriousness of defoliation by gypsy moths, this whole understory is in serious jeopardy of being lost. With the heavy overstory of oaks, a population of gypsy moths could build up that would also defoliate the hemlock, which only after one year, would be fatal. There is some evidence of damage from the last defoliation.

To avoid this disaster and to follow solid silvicultural principals, some of this overstory should be removed either in strips or patches. This will release the hemlock understory and also break up the continuous oak overstory. This can be done in irregular strips or patches and in stages so that there is a gradual change in appearance, rather than a drastic one-time cut.

Area #3--This is different from Area #2 only in that there are less conifers and both white pine and hemlock are planted. The same silvicultural practices would apply.

Area #4--These areas are also basically a scarlet oak overstory with some white oak, black oak and black birch. Black birch becomes much more prevalent as the land starts to slope downward to the west and northwest. The understory remains about the same where the ground is level, but as the land starts to slope downward there is minimal understory value except for small saplings of black birch.

Area #5--In general, these are two-age stands; that is, there are scattered individuals or small stands of larger overstory trees, generally 14 inches and larger and over 80 years old. There is also a sapling-pole stand of trees 2 to 10 inches, generally 40 years old or less. The older trees are black or white oak, pignut or shagbark hickory, with a few sugar maples, white ash, black birch, and red maples. The sapling-pole stand has the same species, but has more red maple and black birch.

There is spicebush, witch hazel, sweet pepperbush and azalea along the more moist areas near the streams. In other areas the understory is mostly seedlings of black birch or red maple. Technically speaking, the overstory trees (14" diameter and up) should be harvested in a sawlog sale. Some large oaks have died as the result of the "gypsy moth complex."

Area #6--In many ways this is similar to Area #3, with considerable underplanting of both white pine and hemlock, but the overstory is predominantly black birch and red maple with lesser amounts of oaks. This area should be released to allow these planted conifers to develop into a mixed stand, but because of a lack of oaks in the overstory, it is not urgent as is the case in Areas #2 and #3.

Area #7--These are rocky soils broken by ledge outcroppings with poor growth. Part of the area was cut over and has a young growth of white oak, hickory, and scarlet oaks. Between the ledges there are pockets of better soils that contain white ash and sugar maple. In places there are small groves of American beech. The understory is primarily young black birch, beech and red maple. In the hollows there is some sweet pepperbush.

There is little or no need of any harvesting in this area at this time. Stand density is good and because of limitation of access imposed by terrain, a light fuelwood cut would be impractical.

Area #8--These are quite moist sites containing mostly red maple with oaks around the edges. Sweet pepperbush, spicebush, and blue beech are present in the understory. Because of the poor ground conditions, this is the type of area that is usually set aside and not actively managed for forest products.

In summary, there is a potential timber sale in northwestern sections of the property. There is mature timber, some of which has died due to the "gypsy moth complex," but it is not in imminent danger of being lost. These larger trees will die off a few at a time and be lost for timber value. There is some danger in the area nearest Route 201, where the hemlock underplanting could be lost to defoliation by gypsy moths unless the oak overstory is removed in a fuelwood harvest.

The present road system is adequate for both fire protection and forest products removal, although, it is important not to allow the roads to become too crowded for a truck to pass.

WILDLIFE CONCERNS

The presence of and abundance of wildlife in an area is dependent on the physical features of the land, the fertility of the soil, the available water, and the type and quality of vegetation present. Each species has specific requirements for survival which are provided for by certain vegetative classes or different stages of succession. If the animal's requirements are not met, the animal will move to another area.

To attract and/or increase the number and type of wildlife in an area the requirements of each species must be determined and these requirements provided for. By providing different types of habitat or habitat diversity these needs can be met. Food, cover, a water source, nesting and roosting and brood rearing sites must be within reach of the daily movements of the animals. The greater the interspersion or degree to which different habitats are mixed or repeated, the greater the wildlife use of the area will be.

Often times an animal's requirements can be met in a small area. Sometimes a species has a large home range and requires much space for survival. Neighboring land adjacent to that under management can sometimes supply a habitat requirement which is lacking.

Each animal must have all the requirements for survival within its home range or it will migrate to a new area. The home range can vary with seasonal and migratory needs.

All species need a certain amount of space to call their own. They need space for nesting, breeding, feeding and rearing young. Some species have a high tolerance to crowding within their own species and with other species while others do not. Others need large areas with little competition with their own kind or with other species. This is why a fertile piece of land will not produce unlimited amounts of wildlife.

If a certain factor which a species requires is lacking, or in short supply, it is said to be a "limiting factor." The lack of it will limit the population or perhaps even the presence of the species itself.

Within the limitations imposed on an area by the quality and quantity of natural physical features, management can ensure the maximum production of sustained wildlife populations through manipulation of vegetative types and age classes.

One can concentrate on providing the requirements for certain specific or "target species." Ideally, this will allow these species to proliferate to their maximum extent within the limits of the habitat provided. This may incidently benefit other wildlife, but could also be detrimental and lead to their emmigration from the area. A species not being managed for may have the same requirements as the target species and may become an unwanted pest.

By providing a number or variety of habitats or different vegetative classes in different successional stages in a desirable mix or interspersion for the individual, good wildlife habitat can be provided for a variety of species.

Mature woodlands often make up more than half a management area. Ideal habitat can be managed by having approximately three-fourths of the property in even-aged stands (trees all the same age, but not necessarily the same size) and one-quarter in uneven aged stands. Eventually the management unit would approximate one-quarter seedling sapling stands, one-quarter pole stands, one-half sawtimber stands. If these stands of different ages were well mixed, optimum wildlife habitat will result and it will be sustained. Open areas are very useful to wildlife for feeding, brood rearing and nesting sites. About two percent of an area should be kept in permanent grass/legume plots. Approximately 5 percent should be kept in early successional native vegetation.

The area owned by Mashantucket Land Trust is covered by a mature hardwood forest. There are six small evergreen plantations distributed throughout the area. White pine (*Pinus strobus*) and hemlock compose the plantations.

The majority of the hardwood forest is composed of scarlet oak (*Quercus corcinea*) and American beech (*Fagus grandifolia*). Other overstory species include sugar maple (*Acer saccarhinum*), black cherry (*Prunus serotina*), and white ash (*Fraxinus americana*).

The understory is composed of laurel (*Kalmia latifolia*), blueberry (*Vaccinium corybosum*), black cherry and black birch (*Betula lenta*). In some areas the understory is almost all laurel.

There is one small pond on the property with a small seasonal stream leading into it and exiting when the pond level is high enough. Speckled alder (*Alnus rugosa*), phragmites (*Austrelis typhis*), willow (*Salix* spp.) and skunk cabbage are found in the wetter areas around the pond and brook.

At present, the overall habitat for a variety of wildlife is only fair to good. There is a lack of diversity of habitats, interspersions and edge. There is a definite lack of herbaceous and brushy openings.

The species using the area now are those that require a mature hardwood forest type of habitat. Diversity can be increased by small clearcuts, regeneration of pine stands, and thinning and/or clearcutting. These timber stand improvement practices should be small in area and placed throughout the area to increase interspersions. "Edge" area would be greatly increased by these procedures.

Management/Non-active Management

Mashantucket Land Trust officials are aware they have two routes of action they can follow: conservation of the area or preservation of the area. Both involve setting priorities and making decisions and, therefore, both should be considered management.

If Mashantucket Land Trust were simply left alone, nature would take over the "management" of the area. The same types of overall changes would occur to the area, but at a much slower rate. Production of wildlife might not be as great as under conservation or active management.

Openings would be created by blowdowns, diseases, and fire, in some cases. Herbaceous openings and brushy to seedling sapling stages would be created following these changes. Older trees in the forest would die and form snags and cavity trees. Many trees would fall to the ground and serve as hiding places for small mammals like moles, voles and shrews. Certain species would leave the area because requirements would not be met, while others might immigrate because of the changes that had occurred.

It should be kept in mind that most changes brought about by nature are suppressed by man. Fire is a good example. Most fires are put out and not allowed to burn, thus the natural cycle of succession being set back is interrupted.

In general, the area would be less productive in the number and variety of wildlife species found there.

Conservation or wise use of a resource under management would bring about vegetational changes much more quickly. Results could be seen in the near future, not in the next lifetime. Greater production and a richer variety of wildlife would result due to management.

The following general recommendations will create diversity of habitats in the area and thus increase interspersion and edge. Because more general wildlife requirements will be supplied, a greater variety of wildlife will be able to utilize the area. Both the kind and abundance of most species of wildlife will increase.

Clearcuts--clearcutting sets back succession and provides a greater variety of vegetation for use by wildlife. Where slope and soil permit, clearcuts should be made to provide cover and food. Two types of habitat can be produced from clearcuts. The type produced depends on what is done after the cut, and also what type of vegetation was there previously.

- 1) Brush areas are produced by clearcutting and allowing the native shrubs and vines to come back in. The seedling sapling stage follows this. Approximately 12 acres for every 50 acres of forestland should be maintained in a brushy/seedling sapling stage. Openings will last in a brush stage from 8 to 12 years (the seedling sapling stage follows) with the greatest wildlife potential being around 6 to 8 years.
- 2) The second type of habitat that can be produced from clearcutting is a permanent herbaceous opening. These areas are created by clearcutting, bulldozing to clear stumps, disking, fertilizing and then seeding the soil. Plants most commonly used include ladino clover, birdsfoot trefoil, perennial rye grass, millet, sorghum, buckwheat, and timothy grass. These openings provide food and cover for a variety of birds and small mammals. Game and nongame birds utilize the edges for nesting areas.

Nonseeded openings usually result in blackberry, pokeweed, and elderberry and greenbriar along the southern coastal areas of Connecticut. Herbaceous plants are made up of annuals and perennials. Annuals are preferred by seed eating wildlife, but are crowded out by perennials in 2 or 3 years. Disking every 2 to 3 years alleviates the crowding out syndrome. Openings should be irregular in shape to provide maximum edge. If possible, they should be oriented in an east/west direction and be approximately 1 acre in size. Approximately 1 to 3 acres per every 50 acres of forest land should be kept in an herbaceous stage (or 2%).

Evergreen Stands--the value of evergreens to wildlife is dependent on their age and nearness to other cover and feeding sites. Mature evergreen stands provide roosting sites for some species of wildlife, especially birds. In general, younger stands of evergreens ranging in heights from approximately 6 to 15 feet provide the densest cover to most wildlife. The most effective evergreen cover is located near brushy areas and herbaceous openings. Evergreen stands should be planted in irregular stands rather than blocks to provide maximum edge. Evergreens can be topped (the leader cut back) when they reach a height of approximately 15 to 20 feet high. This will prevent them from getting any taller and thus losing their bottom branches by shading. Keeping the evergreens dense with branches from the ground to a height of about 20 feet provides the most valuable cover.

Laurel also serves as useful cover for wildlife if not overly mature. Small stands of younger laurel is ideal because it offers the densest cover close to the ground. Large extensive stands are not needed since laurel has little value as food. Small laurel stands interspersed over a large area serve wildlife needs the best.

Ten percent of a 100-acre forest land in 2 to 5 acre conifer patches provides a good supply of shelter and escape cover and roosting sites for many species of wildlife. The most effective evergreen cover is located near brushy areas or small herbaceous openings.

Pond Enlargement--The present pond is very small and probably supports only a minimum amount of wildlife. For many species the pond is too small to supply their requirements for food and perhaps nesting and brood rearing sites. If the present pond were expanded, its value for wildlife would be increased. Another alternative would be to create another pond along the brook where a natural depression already exists. Either action would increase the amount of wetland habitat available for wildlife and this would make the area much more attractive to wildlife in general. Species such as ducks, geese, muskrats, otters, beaver, green herons, blue herons and many others.

One-half or one-third of the perimeter around the pond area should be cut. This would set back succession and allow more light to reach the forest floor. This would allow vegetation such as grasses and cattails to come in close around the pond. Shrubs such as sweet pepperbush, alder and other species of the brushy stage would offer food and cover to a wide variety of wildlife. It would be even more valuable because of its nearness to the water.

Any snag or cavity trees should be left around the pond for use by cavity nesting birds such as woodpeckers, owls, and mammals like squirrels and raccoons.

Brush Piles--Tree tops and slash left from some types of forestry cutting operations should be piled. Brush piles are used by a variety of animals such as cottontails, mice and birds for cover.

At present, Mashantucket Land Trust offers fair to good habitat for some species of wildlife. If properly managed the area could support and attract a much richer variety of wildlife. This would probably greatly increase people's enjoyment of the area.

RECREATION POTENTIAL

The Hoffman Evergreen Preserve, consisting of approximately 146 acres, was willed to the Mashantucket Land Trust with the stipulation that it would remain as a nature preserve. Recreational use of the property has been restricted to certain forms of passive recreation by the Land Trust to insure the protection and preservation of this natural area.

A trail system has been developed for walking and hiking. On occasion, these trails are used by equestrians and cross country skiers. Neither picnicking or camping are permitted on the property.

The Land Trust policy of limiting the use of the property for certain forms of passive recreation will: (1) provide for the protection and preservation of the land's natural state; and (2) provide passive recreational opportunities for individuals who enjoy and appreciate nature.

The existing Red and Blue trail system provides good access to the property and visitor exposure to many of the Preserve's natural, cultural and historical features.

The development of an interpretive program would add immeasurably to the visitor's enjoyment of the area. It would provide them with a keener awareness, appreciation and understanding of the natural, cultural and historical features of the Preserve. An initial step in planning to develop an interpretive program is to take an inventory of all the property's assets. This inventory might include different kinds of habitats, trees, flowers, plants, ferns, mosses, etc.; wildlife varieties; bodies of water, such as the pond, small brook, marsh or swamp area; historical and cultural features as the cemetery, dump site and the stone wall. From the inventory of resources, a selection can be made of those which might be of particular interest to visitors and should be included in the interpretive program.

The leaflet or brochure should include a sketch of the trail system, the identification of the item and the interpretative text, and an illustration or photograph of the item being interpreted. Other items which might be considered for inclusion to the leaflet are: a message of welcome to the Preserve, a historical sketch about Mr. Hoffman and the property, an environmental message, and a brief overview of the Mashantucket Land Trust and its work.

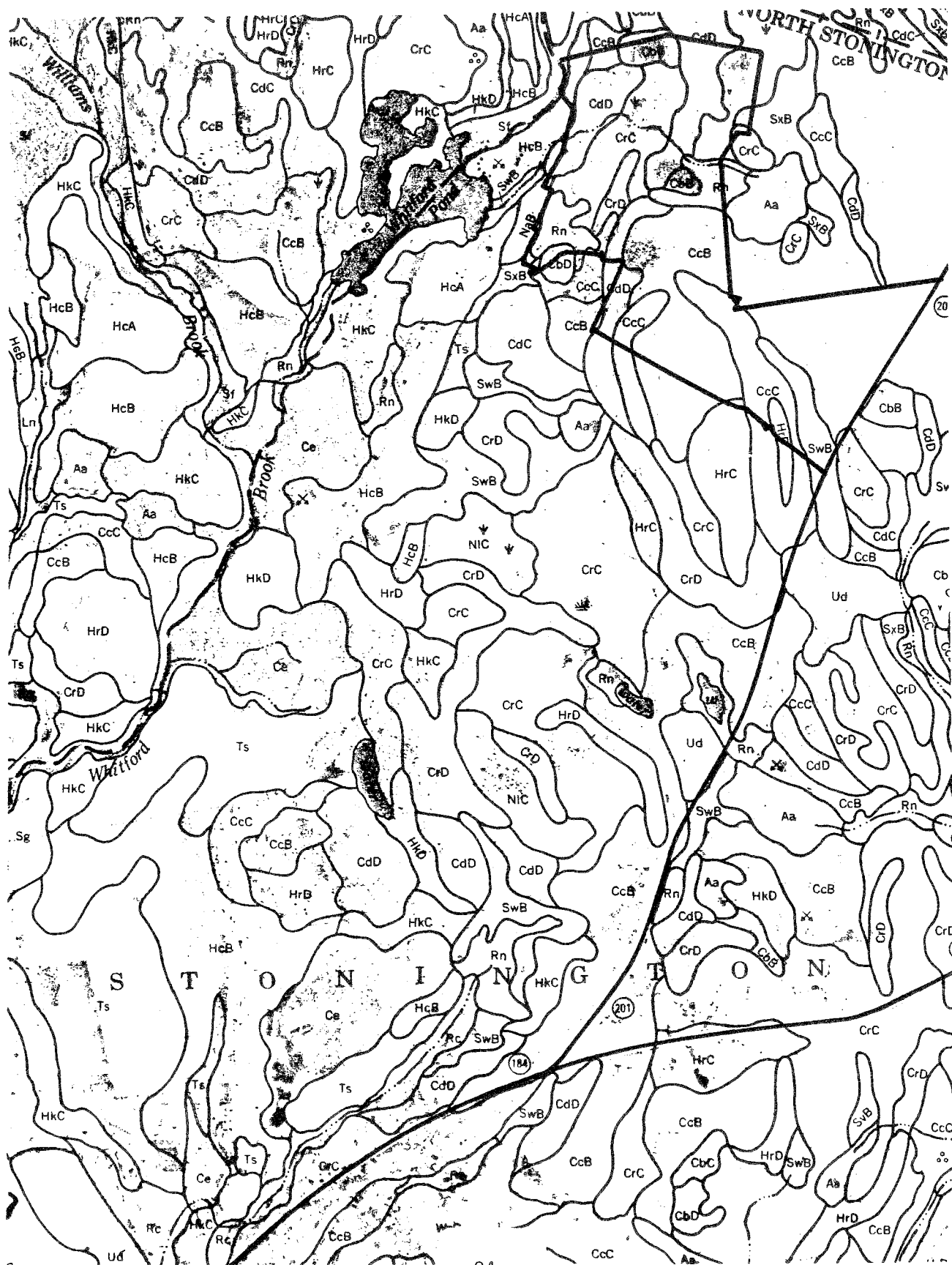
Most of the items selected for interpretation may be located on the existing trail network. However, other interesting features may be discovered which may necessitate the expansion of existing trails or the development of new ones.

Multiple use of the trails for walking, hiking and interpretive activities are not compatible with horseback riding. However, the infrequent, occasional use of the trails by equestrians should not pose an immediate problem. An increase in this kind of use may necessitate a policy decision regarding multiple use in the future.

Some of the existing trails provide excellent potential for cross country skiing. However, many sections of the trail system would need additional width and vertical clearing. Use of the trails for cross country skiing would be a compatible use of the property. It would not endanger the protection or preservation efforts for the Preserve.

Appendix

Soils



HOFFMAN EVERGREEN PRESERVE
MASHANTUCKET LAND TRUST
ROUTE 201
STONINGTON, CT.

Soil Symbol	Recreational Development: Limitations for Paths and Trails	Soil Name	Potential for Habitual Elements:			Potential as Habitat for:		
			Hardwood Trees	Coniferous Trees	Openland Wildlife	Woodland Wildlife	Wetland Wildlife	
CbB * 1	Slight	Charlton	Good	Good	Good	Good	Very poor	Very poor
CbD *	Moderate:slope	"	Good	Good	Fair	Good	Very poor	Very poor
CcB *	Slight	"	Good	Good	Poor	Good	Very poor	Very poor
CcC *	Slight	"	Good	Good	Poor	Good	Very poor	Very poor
CdD *	Moderate:slope	"	Good	Good	Poor	Fair	Very poor	Very poor
CrC *	Slight	Charlton	Good	Good	Poor	Good	Very poor	Very poor
CrD *	Moderate:slope	Hollis	Poor	Poor	Poor	Poor	Very poor	Very poor
HcB *	Moderate:erodes easily	Charlton	Good	Good	Poor	Good	Very poor	Very poor
HrC *	Slight	Hollis	Good	Good	Poor	Poor	Very poor	Very poor
HrD *	Moderate:slope	Haven	Poor	Poor	Good	Good	Very poor	Very poor
		Hollis	Good	Good	Poor	Poor	Very poor	Very poor
		Charlton	Good	Good	Poor	Good	Very poor	Very poor
		(Rock outcrop)	Good	Good	Poor	Good	Very poor	Very poor
		Hollis	Poor	Poor	Poor	Poor	Very poor	Very poor
		Charlton	Good	Good	Poor	Good	Very poor	Very poor
		(Rock outcrop)	Good	Good	Good	Good	Very poor	Very poor
NaB 1	Slight	Narragansett	Good	Good	Good	Good	Fair	Fair
Rn * 2	Severe:wetness	Ridgebury	Fair	Fair	Poor	Fair	Fair	Fair
	Severe:wetness	Leicester	Fair	Fair	Poor	Fair	Fair	Fair
	Severe:ponding	Whitman	Poor	Poor	Very poor	Poor	Fair	Fair
Sf 2	Severe:ponding, excess humus	Scarboro	Poor	Poor	Poor	Poor	Good	Good
SwB	Moderate:wetness	Sutton	Good	Good	Poor	Good	Very poor	Very poor
SxB	Moderate:wetness	"	Good	Good	Poor	Fair	Very poor	Very poor

* = See description of the map unit for composition and behavior characteristics of the map unit.

1 = CbB and NaB are designated prime farmland

2 = Rn and Sf are designated wetlands regulated under P.A. 155.

SOIL INTERPRETATIONS FOR URBAN USES

The ratings of the soils for elements of community and recreational development uses consist of three degrees of "limitations:" slight or no limitations; moderate limitations; and severe limitations. In the interpretive scheme various physical properties are weighed before judging their relative severity of limitations.

The user is cautioned that the suitability ratings, degree of limitations and other interpretations are based on the typical soil in each mapping unit. At any given point the actual conditions may differ from the information presented here because of the inclusion of other soils which were impractical to map separately at the scale of mapping used. On-site investigations are suggested where the proposed soil use involves heavy loads, deep excavations, or high cost. Limitations, even though severe, do not always preclude the use of land for development. If economics permit greater expenditures for land development and the intended land use is consistent with the objectives of local or regional development, many soils and sites with difficult problems can be used.

Slight Limitations

Areas rated as slight have relatively few limitations in terms of soil suitability for a particular use. The degree of suitability is such that a minimum of time or cost would be needed to overcome relatively minor soil limitations.

Moderate Limitations

In areas rated moderate, it is relatively more difficult and more costly to correct the natural limitations of the soil for certain uses than for soils rated as having slight limitations.

Severe Limitations

Areas designated as having severe limitations would require more extensive and more costly measures than soils rated with moderate limitations in order to overcome natural soil limitations. The soil may have more than one limiting characteristic causing it to be rated severe.

About the Team

The Eastern Connecticut Environmental Review Team (ERT) is a group of professionals in environmental fields drawn together from a variety of federal, state, and regional agencies. Specialists on the Team include geologists, biologists, foresters, climatologists, soil scientists, landscape architects, archeologists, recreation specialists, engineers and planners. The ERT operates with state funding under the supervision of the Eastern Connecticut Resource Conservation and Development (RC&D) Area.

The Team is available as a public service at no cost to Connecticut towns.

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 reviewing a wide range of projects including subdivisions, sanitary landfills, commercial and industrial developments, sand and gravel operations, elderly housing, recreation/open space projects, watershed studies and resource inventories.

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 officials of a municipality or the chairman of town commissions such as planning and zoning, conservation, inland wetlands, parks and recreation or economic development. Requests should be directed to the Chairman of your local Soil and Water Conservation District. This request letter should include a summary of the proposed project, a location map of the project site, written permission from the landowner 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 Eastern Connecticut RC&D Executive Council, the Team will undertake the review on a priority basis.

For additional information regarding the Environmental Review Team, please contact Jeanne Shelburn (774-1253), Environmental Review Team Coordinator, Eastern Connecticut RC&D Area, P.O. Box 198, Brooklyn, Connecticut 06234.