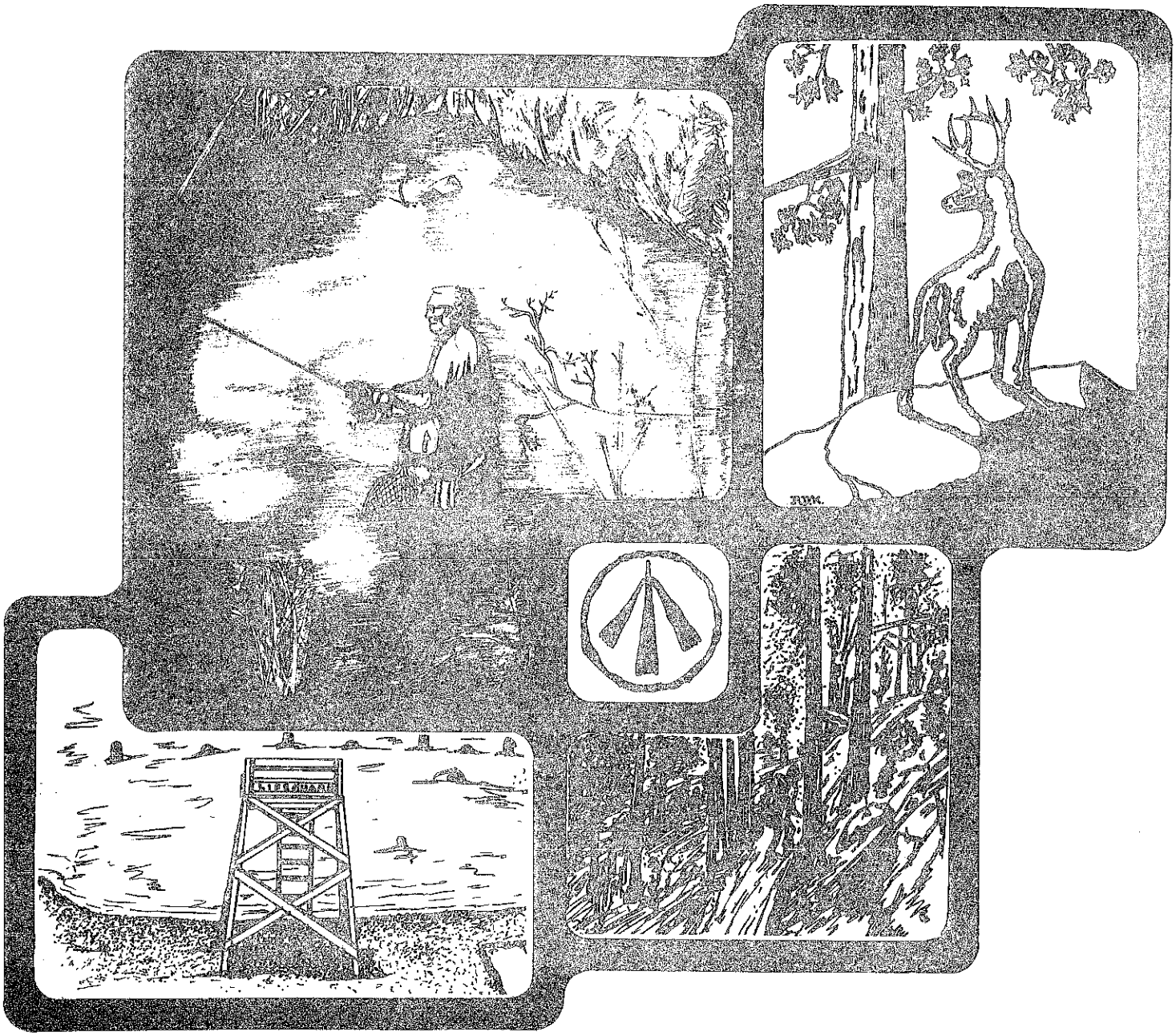
ENVIRONMENTAL REVIEW TEAM REPORT



HARTLAND RECREATION AREA
HARTLAND, CONNECTICUT

KING'S MARK
RESOURCE CONSERVATION AND DEVELOPMENT AREA

KING'S MARK
ENVIRONMENTAL REVIEW TEAM REPORT

On

HARTLAND RECREATION AREA
HARTLAND, CONNECTICUT

AUGUST, 1978

King's Mark Resource Conservation & Development Area

Environmental Review Team

P.O. Box 30

Warren, Connecticut 06754

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
DEPARTMENT OF TRANSPORTATION
UNIVERSITY OF CONNECTICUT COOPERATIVE EXTENSION SERVICE

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
LITCHFIELD HILLS REGIONAL PLANNING AGENCY
CENTRAL NAUGATUCK VALLEY REGIONAL PLANNING AGENCY
HOUSATONIC VALLEY COUNCIL OF ELECTED OFFICIALS
AMERICAN INDIAN ARCHAEOLOGICAL INSTITUTE

x x x x x x

Funding Provided By

CONNECTICUT STATE DEPARTMENT OF ENVIRONMENTAL PROTECTION
Stanley J. Pac, Commissioner

Policy Determined By

KING'S MARK RESOURCE CONSERVATION AND DEVELOPMENT AREA

Victor Allan, Chairman, Executive Committee
Stephen Driver, ERT Committee Chairman
George Sweeney, Coordinator

Staff Administration Provided By

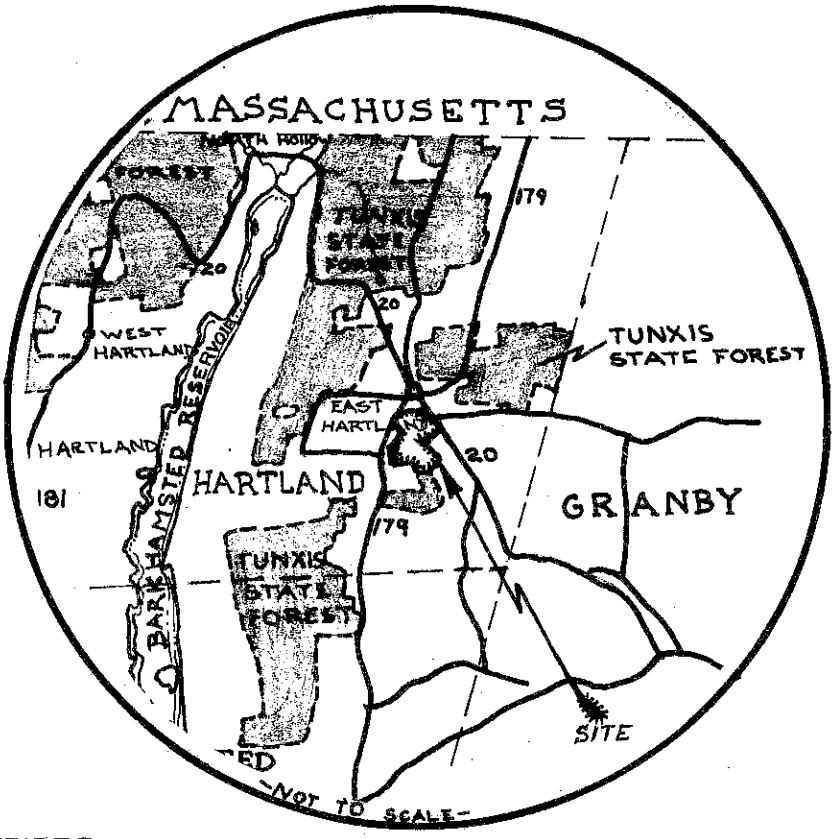
NORTHWESTERN CONNECTICUT REGIONAL PLANNING AGENCY

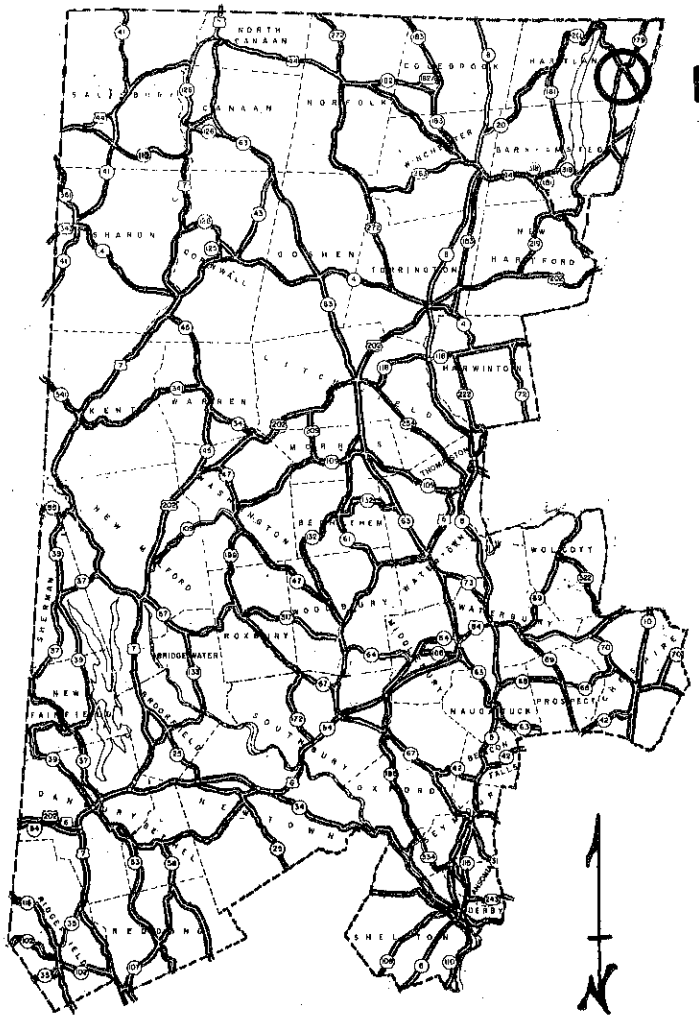
Bruce M. Ridgway, Chairman
Thomas A. J. McGowan, Director
Richard Lynn, ERT Coordinator
Robert D. Kaplan, ERT Draftsman
Irene Nadig, ERT Secretary

TABLE OF CONTENTS

LIST OF FIGURES

LOCATION OF STUDY SITE





HARTLAND RECREATION AREA

HARTLAND, CONNECTICUT

ENVIRONMENTAL REVIEW TEAM REPORT
ON
HARTLAND RECREATION AREA
HARTLAND, CONNECTICUT

I. INTRODUCTION

The Town of Hartland is interested in improving a 110 acre parcel of town-owned land for recreational purposes. The parcel, known locally as the Hartland Recreation Area, is located just south of the center of East Hartland. The land is mostly wooded with ± 8 acres of open field on its eastern border and a small (± 1/2 acre) pond on the southern edge of the tract.

The Town is interested in improving the area for both passive and active recreation. Specifically, the Town is interested in developing the open field area for ballfields, tennis courts, outdoor basketball courts, and a playground. The Town is also interested in developing multi-purpose trails throughout the wooded portion of the site for nature study, hiking, and cross-country skiing. Finally the Town is interested in improving the existing pond. This pond has been utilized to a limited extent in recent years for public swimming and the Town is interested in improving the pond and pond environs to support additional usage.

The Chairman of the Recreation Commission from the Town of Hartland requested the assistance of the King's Mark Environmental Review Team (ERT) to help the Town in analyzing preliminary development plans for the area. The Town requested the ERT to 1) identify the natural resource base of the site, 2) comment on the feasibility of upgrading the pond for public swimming, 3) determine the potential of the site for active and passive recreational development (focusing on recreational activities identified by the Town), and 4) discuss recommended natural resource management techniques (logging, wildlife management).

The ERT met and field reviewed the site on June 14, 1978. Team members for this review consisted of the following:

Philip Morneault	Soil Conservationist	U.S.D.A. Soil Conservation Service
Carl Stamm	Recreation Specialist	State Department of Environmental Protection
Steven Jackson	Wildlife Biologist	State Department of Environmental Protection
Tim Hawley	Forester	State Department of Environmental Protection
Mike Zizka	Geohydrologist	State Department of Environmental Protection
Warren Sadow	Planner	Litchfield Hills Regional Planning Agency
Hudson Birden	Water Quality Specialist	State Department of Health
Larry Bandolin	Fishery Biologist	State Department of Environmental Protection

Prior to the review day, each team member was provided with a summary of the proposed project, a soil survey map, a soils limitation chart, a topographic map of the area, and a checklist of concerns to address. 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 and recommendations. It is hoped this information will assist the Town of Hartland in effectively planning the future use and development of the Hartland Recreation Area.

If any additional information is required, please contact Richard Lynn, (868-7342), Environmental Review Team Coordinator, King's Mark RC&D Area, P. O. Box 30, Warren, Connecticut.

* * * * * * *

II. SUMMARY

1. Most soils on the property have slight to moderate limitations for recreational development.

2. Forest site quality throughout the area is moderate for timber production. A timber sale would improve the health and vigor of the remaining trees, provide small openings for a greater diversity of plant species, increase the diversity and availability of habitats for birds and small game, and generate revenue for the Town.

3. The pond is too small to provide sustained fishing pressure, but does have potential for "put and take" trout fishing prior to the swimming season. The pond also provides a good area for winter skating and the conifer grove just north of the pond offers a nice spot for picnicking.

4. Consideration should be given to raising the elevation of the pond's dam and emergency spillway to enable the principal spillway to function properly.

5. Water quality testing by the State Health Department indicated the sanitary quality of the pond for bathing purposes was "poor" on two of the four testing days. Nonetheless, a sanitary survey turned up no evidence of sewage discharges and, with water quality of the inlet stream generally good, it is suspected the high fecal coliform levels noted in the pond are due to a high bather load combined with low flow through the pond. It is recommended that sampling of the area and analysis by a certified laboratory be carried out on a regular basis.

6. According to the State Department of Health criteria for estimating swimmer capacity (1,000 gallons of dilution water flowing through the bathing area for each person using it during the course of the day) the pond at the Hartland Recreation Area during a normally dry period can safely support a maximum number of 5 - 18 swimmers per day. Wells tapping bedrock or overburden near the area are not likely to provide large yields of groundwater for augmenting inflow to the pond. Dredging will increase pond volume and swimmer capacity but not substantially.

7. The woodland area of the tract is scenic, contains a variety of forest plant communities, and has good potential for passive recreational development. Recommended uses of the area include hiking, ski-touring, and nature study.

8. The open field area off Route 20 has potential for the development of ballfields and other active recreational facilities, but good engineering will be required to mitigate problems of slope, stoniness, and a seasonally high water table.

III. NATURAL RESOURCE BASE

A. SETTING, TOPOGRAPHY, LAND USE

The Hartland Recreation Area is located in East Hartland just south of the junction of Route 20 and Route 179 (see Figure 1). Access to the land is provided by Route 20 on the east, Rengerman Hill Road on the south, and the public school property on the north. The property also has several hundred feet of frontage on Route 179, however, this area is not developed for vehicular access at the present time. There are no well developed interior trails or roads transecting the site.

The property is characterized by gentle to moderate relief with all land sloping towards the pond at the southern edge of the tract. The tract is predominantly woodland with two large fields in the northeastern portion of the property along Route 20. These fields have been used for hayland in the recent past. The small pond at the southern edge of the property is fed by a small stream which flows through the property from the northwest. This pond is presently used for public bathing during the summer months and the Town has developed a small beach and parking lot at the site.

Land use to the west of the tract is characterized by single-family residential development. North of the site is the Town of Hartland's municipal offices and public school. A private Girl Scout Camp (Merrit Camp) borders the property to the east and the Tunxis State Forest is located just south of the site.

B. SOILS

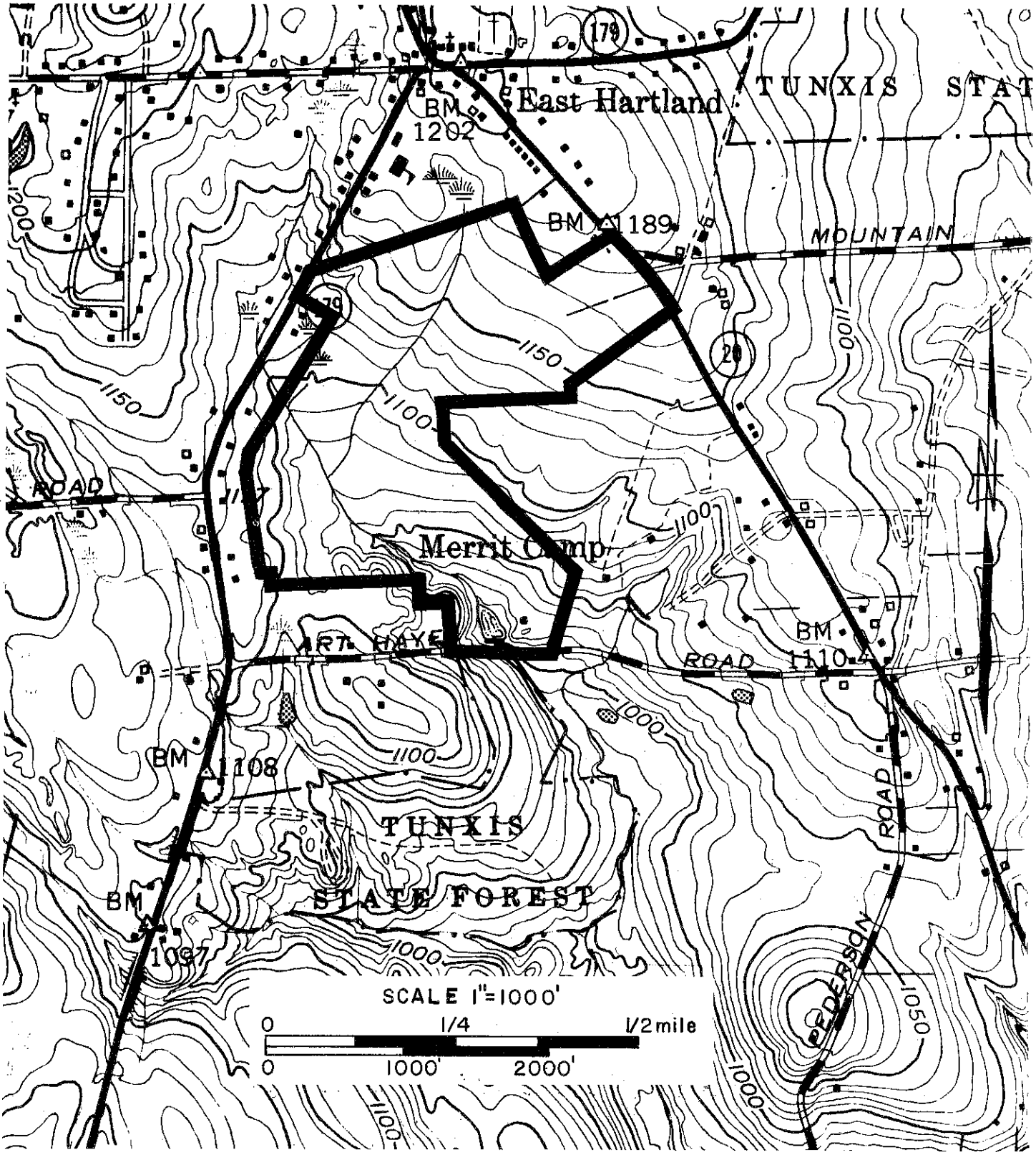
A detailed soil survey map and soils limitation chart of the tract is presented in the Appendix of this report. The soils map illustrates the geographic location of all soils identified on the property. The soils limitation chart identifies limiting factors for various land uses on individual soil types.

Basically, there are six soil types on the property which fall into two natural soil groups. These soil groups include: Group A - Terrace Soils over sands and gravels (27% of site); and Group B - Upland Soils over friable, to firm glacial till (73% of site). Discussion of these natural soil groups is found in a booklet entitled "Know Your Land, Natural Soil Groups for Connecticut", published by the Soil Conservation Service and Connecticut Cooperative Extension Service. Detailed discussion of individual soil types on the property is presented in "Soil Survey, Hartford County, Connecticut" (U.S.D.A. Soil Conservation Service, 1958).

In general, most soils on the property have slight to moderate limitations for recreational development. An exception to this is the area in the northwestern portion of the property underlain by the Leicester, Whitman, and Ridgebury very stony soil complex (LdA). This soil type is considered an inland wetland soil as per Connecticut Public Act 155 as amended. The soil is characterized by a seasonal high water table (0-18 inches from the surface) and presents severe limitations for recreational development. This soil complex is favorable, however for the development of excavated ponds. A pond developed in this area would improve the area for wetland wildlife and might be suitable for fish.

FIGURE I

TOPOGRAPHIC MAP



The Sutton Soils (SxC, SwB) are also characterized by a seasonal high water table (1.5 to 3.5 feet from the surface). This characteristic will present problems in developing the field areas for active recreational use, however good engineering can mitigate all problems.

The remainder of the site is limited only by slope and stoniness which may complicate active recreational development of the property but will not adversely impact passive use of the land.

C. GEOLOGY

The geology of the recreation area is shown in U. S. Geological Survey publication GQ-1257, "Geologic Map of the New Hartford Quadrangle", by R. W. Schnabel (1975).

The principal type of bedrock underlying the property is Straits Schist, a medium grained metamorphic rock whose principal mineral constituents are quartz, plagioclase, muscovite, biotite, and garnet. Smaller amounts of kyanite, sillimanite, graphite, tourmaline, and apatite may also be found within the rock. No economic concentrations of minerals are thought to be present in this type of bedrock.

An unconsolidated blanket of sediments derived from glacial erosion overlies bedrock on the property. Two types of sediment are included: till and stratified drift (see Figure 2). Till, the more abundant of the two types on the property, was deposited directly from the ice. Because glacier ice transports particles without regard to shape, size, or other physical characteristics, most till consists of a heterogeneous mixture of rock debris. Stratified drift, the other major type of sediment on the site, was deposited by rivers of meltwater, which significatly reworked the glacial debris. Because glacial streams tended to have relatively high energies, stratified drift deposits ordinarily consist of sand and gravel.

Although Figure 2 shows stratified drift on the property as being restricted to an area west of the pond, on-site inspections indicated that the till around the eastern shore of the pond is composed largely of sand and gravel as well. The meltwater from which the stratified drift was deposited apparently winnowed the finer rock particles from the adjoining till. Elsewhere on the property, the till is richer in silt and is less well-sorted.

D. HYDROLOGY

Virtually all surface-water runoff from the property, as well as part of the groundwater, flows toward the existing bathing pond. Runoff from some areas outside the property also flows toward the pond. In all, the watershed, or drainage area, that supplies runoff to the pond consists of approximately 365 acres (see Figure 3). Of this area, only 3 percent is covered by stratified drift. This is important because groundwater runoff from bodies of stratified drift generally is supplied to surface streams at a more even rate than is groundwater runoff from till. This phenomenon reflects the greater infiltration and storage capacity of the meltwater deposits. Because of these factors, streams in areas covered largely by stratified drift tend to experience much less variation in flow from wet seasons to dry than streams in till-covered areas.

FIGURE 2

SURFICIAL GEOLOGY MAP

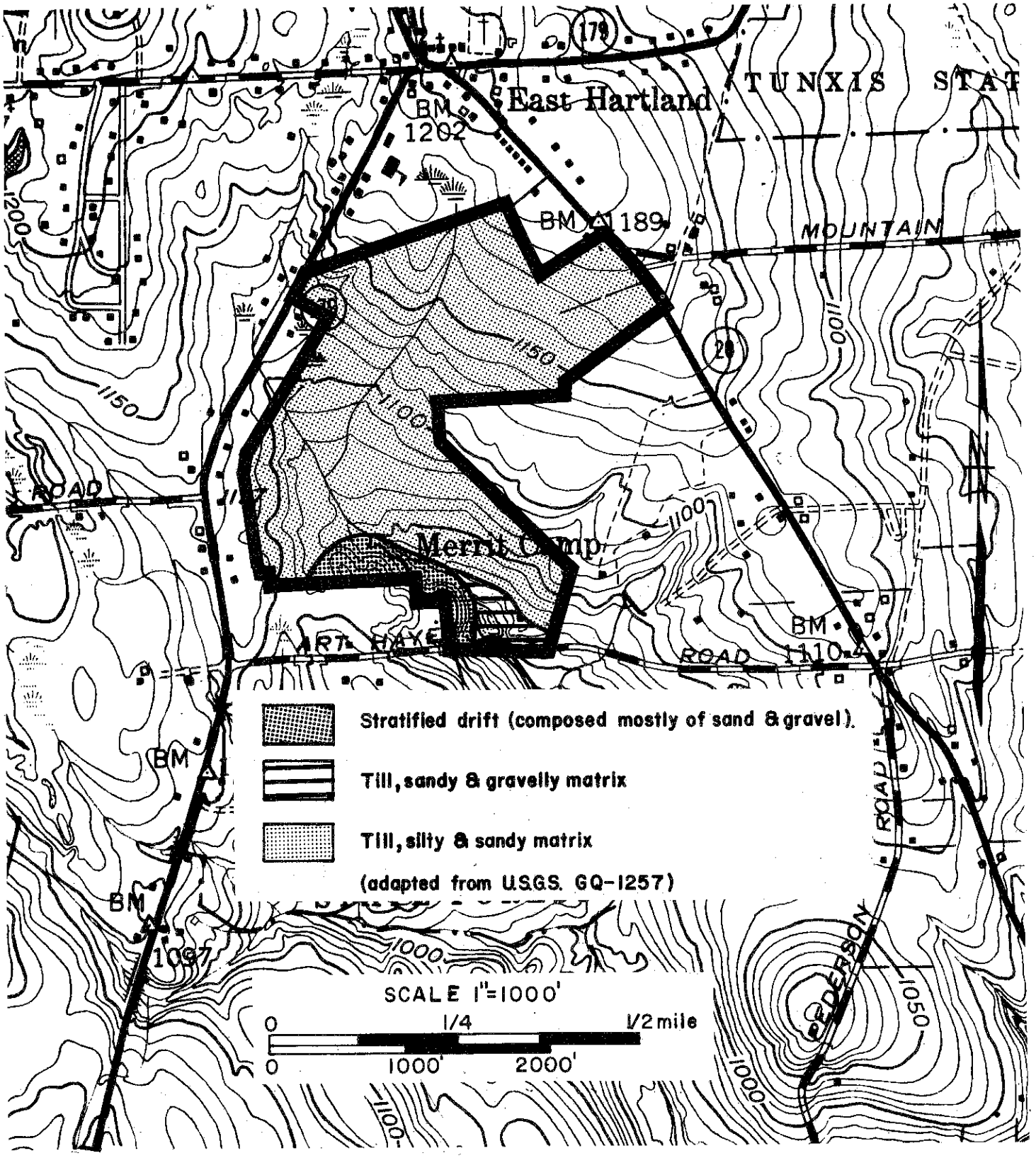
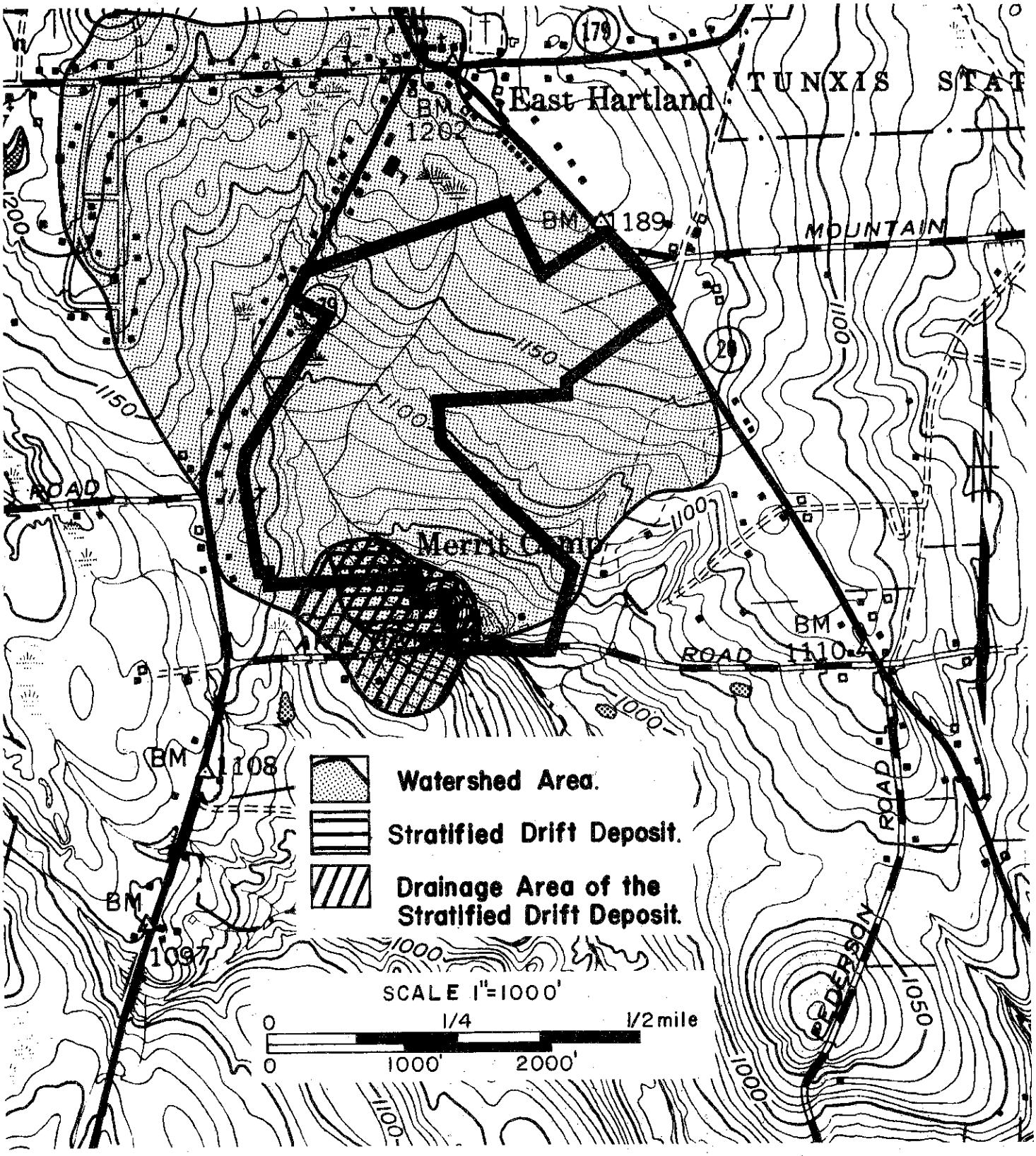


FIGURE 3

WATERSHED MAP



According to the U.S.G.S. topographic map, two small streams exist in the watershed area (see Figure 1). These streams originate in wetland areas in the northwestern portion of the property. The two streams merge about 1/4 mile northwest of the pond and the resultant stream continues flowing south, providing inflow to the pond.

The pond is about 1/2 acre in size and was dredged in recent years to a depth of approximately seven feet. The principal spillway is a concrete drop inlet structure with splash boards for regulating the pond water level. This spillway is located on the southeastern corner of the pond just north of the dam. On the day of the ERT field review, water was not flowing through the principal spillway but rather over the concrete weir emergency spillway on the west side of the pond. Splash boards installed at the principal spillway have raised the water level to the point where the emergency spillway is functioning instead of the principal spillway. This condition should be corrected for safety reasons. In addition, water outflow over the emergency spillway results in the shortest distance of travel through the pond from inflow to outflow. As a result, water flow does not go by the beach area and important water pollution dilution functions are lost.

In light of this situation, it is suggested that both dam and emergency spillway elevations be raised. By raising the emergency spillway, the principal spillway could function at the existing water elevation. This is advantageous for safety reasons and in addition, water flow would be directed through the center of the pond and closer to the beach area.

E. FORESTRY

The Hartland Recreation Area includes 100 acres of well-developed hemlock hardwood forest, 80 - 100 years old. Most of the trees are between 10 and 16 inches in diameter. There is no evidence that the land was cleared for agriculture, although it was partially logged and may have been used as pasture for livestock. There has been little human impact since 1900.

The tree species on the site are typical of the region. Hemlock, beech, red maple, and red oak are abundant. White pine, white ash, yellow and black birch, and hophornbeam are common. Witchhazel, mountain laurel, and beech sprouts form a "brushy" understory. Of particular aesthetic value are small groves of white pine and beech, which have a more open, park-like appearance, and one exceptionally large red maple (see Figure 4).

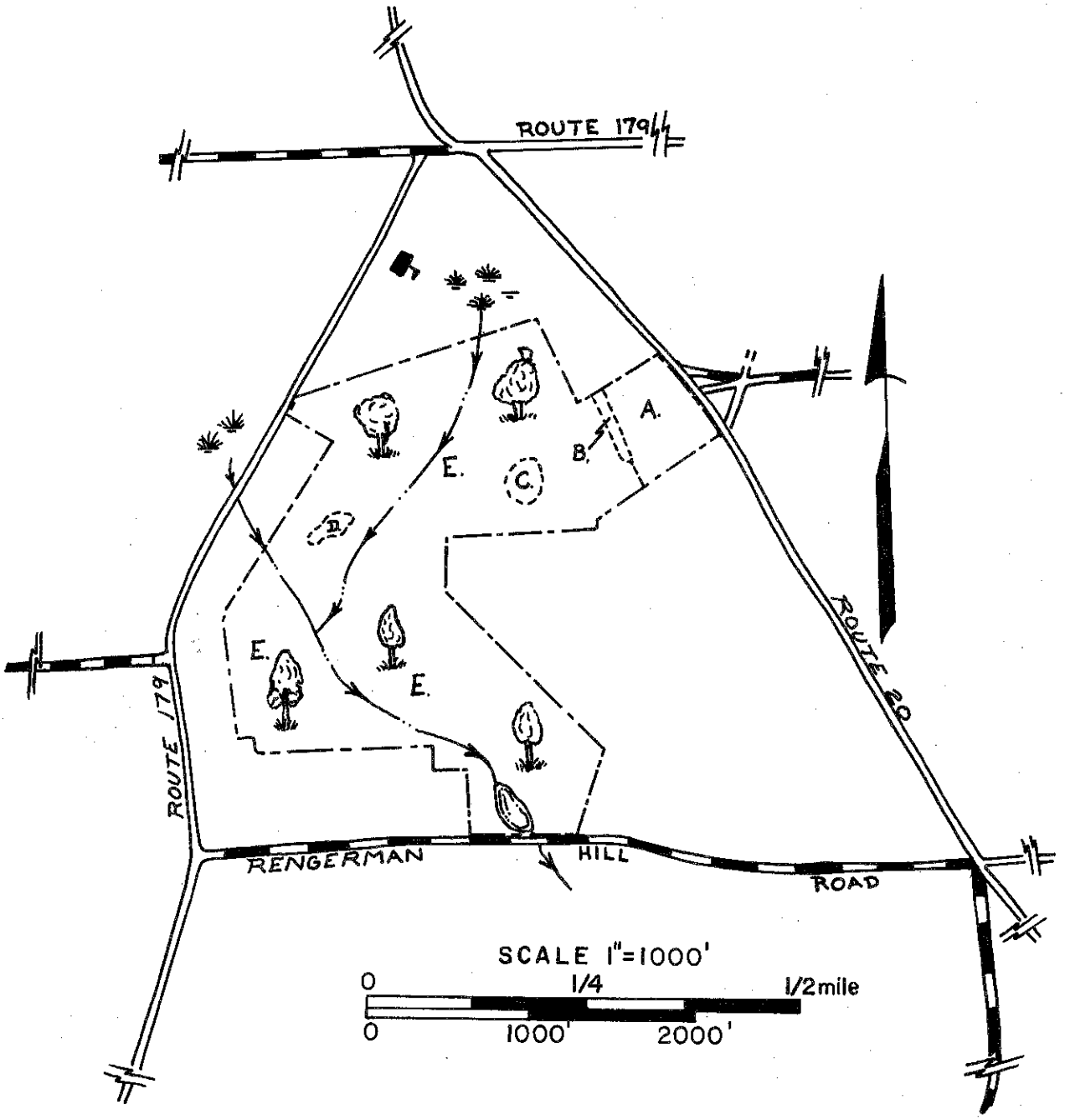
Trails constructed through several small groves of the larger trees and across the stream would have high aesthetic appeal for hikers and skiers. In wet areas, corduroy or split-log bridging will be necessary on year-round trails to prevent rutting, soil compaction, and root damage.

Site quality throughout the area is moderate for timber production. A timber sale in this forest would improve the health and vigor of the remaining trees, provide small openings for a greater diversity of plant species, increase the diversity and availability of habitats for birds and small game, and generate revenue for the Town.

Hemlock, beech, and white pine are long-lived species and will probably survive for another 50 - 100 years. However, it is desirable to harvest trees before decay and storm damage render them unmerchantable. With advance

FIGURE 4

VEGETATION TYPES



VEGETATION TYPES

A. Cleared Land
B. Red Pine
C. Beech Grove with large Red Maple
D. White Pine
E. Hemlock–Hardwoods

Legend

Road
Stream
Swamp
Open Water
Type Boundary

designation of specific small areas which should not be harvested, a profitable logging operation can be completed without diminishing recreational potential. In fact, the cutting of skid trails by the logger will facilitate foot travel through the woods and the creation of small openings will greatly enhance visual appeal in the heavily shaded forest.

Total sawtimber volume present averages 8,500 board feet per acre, roughly 60% hemlock and 40% hardwoods. The timber is of average quality, although hemlock is not a high-value species. Removal of 3,000 board feet per acre, concentrating on poor quality and low-vigor trees, will leave over one-half of all trees intact, thus preserving tree cover over the entire area. Under present market conditions, the minimum price to be expected for this wet site is $25 per thousand board feet. = $75.00 from [illegible]

It should be noted that it is hazardous to cut more than 35% of the total volume of timber on wet sites such as this. Trees on wet ground are shallow rooted and subject to blowdown, thus they benefit from wind shielding by surrounding trees. In addition, hemlock roots require cool, shaded soil. The shade created by residual trees is essential in keeping the soil cool and in preventing a profusion of undesirable brush. Partial shade also favors the regeneration of desirable, long lived timber species, such as red oak, sugar maple, yellow birch, and white ash. Before attempting to sell any timber, the boundaries of the property should be marked. Specific parts of the tract, including trails, on which the Town wishes to exclude harvesting should be so designated prior to arranging the timber sale. Once these considerations are addressed, a private forester should be hired by the Town.

The forester can help identify the boundaries of the property; determine with the help of the landowner, which trees should be harvested; mark and measure the volume of all trees to be harvest; arrange a contract with a logging operator; and supervise the harvest. It is essential that the forester understand what uses the Town intends to make of the property. The communication process is greatly facilitated if several townspeople accompany the forester in the woods.

A contract between the Town and the operator should be drawn up by the forester. Environmental considerations which are contractible include:

- avoiding unnecessary damage to unmarked trees and saplings;
- lopping tops to within four feet of the ground less than 100' from roads or trails;
- removing tops from streambeds, trails, and property lines;
- crossing streams at right angles in few places and only when the stream bottom is hard;
- using corduroy on muddy sections of skid roads;
- back-blading ruts deeper than six inches;
- felling badly damaged and cull trees not useful for wildlife;
- cleaning up all refuse and litter from the operation;
- limiting time of harvest to July 15 to February 28;
- limiting duration of harvest to two years;
- locating landings out of site of public roads

To ensure that the contract is followed, a performance bond of $1,500.00 should be held in escrow until the job is completed to the Town's satisfaction. The contract should also contain a liability release for the Town and a mechanism for arbitrating dispute.

F. WILDLIFE AND FISHERIES

As discussed in the preceeding section, the majority of the property is mature forest. Valuable wildlife species occupying this habitat type include deer, ruffed grouse, songbirds and raccoon. Presently the forest habitat is somewhat mature and continuous to be of maximum value to wildlife. Forest cutting will likely improve the area for wildlife if performed judiciously. Any harvesting operation should preserve some large mast producers such as oak, cherry, and ash, as well as old apple trees, blueberries, and barberries. Hemlock thickets in sheltered areas should also be preserved, however, mature trees may be removed. Passive recreational use of this woodland area will have no significant impact on the value of the area for wildlife.

The open fields on the property are good wildlife areas. This habitat type supports cottontail rabbits, woodchuck, and a variety of songbirds. Recreational development and use of this area will be inversely related to its value for wildlife. Preserving the hedgerow between the two fields is recommended as this will enhance the area for wildlife.

The pond at the site will provide little use for wildlife with the planned activities. The pond is also too small to provide sustained fishing pressure. The pond does have potential, however for "put and take" trout fishing prior to the swimming season. The trout would have to be stocked each year to provide a fishery. The pond is considered too small to provide good largemouth bass fishing.

With the availability of quality fishing in the northwestern Connecticut area, it is not deemed practical to enlarge the pond for fishing purposes alone.

IV. POND USE

As mentioned earlier in this report, the pond at the Hartland Recreation Area is presently used to a limited extent for public bathing. The ERT was asked to comment on the suitability of the pond for public bathing and to explore alternatives for upgrading the pond and pond environs. The Team addressed the following factors: space for swimming and sunning, access, support services, quality of the water resource, and quantity of the water resource (swimmer capacity).

In recent years the Town has developed a $\pm$ 75 foot beach on the northern shore of the pond. Assuming a State Department of Health guideline of at least 1 foot of beachfront for each of the average number of bathers, the beach can support about 75 bathers without overcrowding.

Access to the area, off Rengerman Hill Road, is good. The present parking area is suitable for 25 - 30 cars and should be adequate for anticipated use. There is suitable land available towards the town road to expand the parking lot if necessary.

A number of support services are advisable with the development of any public bathing facility. These include potable water supply, sanitary facilities, and changing space. In general, land conditions at this site should not restrict the development of these facilities. The cabin to the northeast of the pond could be developed to function as a bathhouse with running water for drinking and possibly showering purposes. Though flush toilets could be installed into the lower section of the cabins, the two vault type privies presently serving the site are considered satisfactory. In fact, vault type privies are considered more practicable than flush toilets in this particular instance as privies offer year-round versatility.

A. WATER QUALITY

Water samples were taken by the State Health Department on four different occassions. These samples were taken of the stream feeding the pond (inlet) about 50 yards upstream from the pond, and in the pond itself at the outlet spillway (outlet).

Results of the water sample analysis, which were done by the State of Connecticut Laboratory are as follows:

		Coliform (MF)	Coliform (MPN)	Fecal Coliform (MPN)
JUNE 15	inlet	2100		
	outlet	2400		
JUNE 27	inlet	60	230	3.6
	outlet	120	430	93.0
JULY 11	inlet	280	93	23
	outlet	8300	24,000 or greater	24,000 or greater
	spillway	14000	24,000 or greater	11,000 or greater
JULY 24	inlet	80	15	less than 3.0
	outlet	190	150	23
	beach area	160	230	43

MF = membrane filter coliform count per 100 ml of sample
MPN = most probable number per 100 ml of sample

* * * * *

Interpretation of Laboratory Results:

Coliform organisms are normally present in all surface waters. However, the presence of any significant amount of such bacteria is taken to indicate the presence of sewage and the possibility of sewage-borne disease organisms. The coliform content of any surface water will characteristically fluctuate depending on such factors as size of water body, water flow over spillway, number of bathers, rainfall, watershed survey, population concentration, sewage discharge, commercial and industrial development, farms and farm animals. Therefore, the average coliform content of a number of water samples collected from several locations in the area is considerably more significant than the results of individual samples in evaluating the sanitary quality of any bathing water.

The following interpretation is recommended as to suitability for bathing purposes:

Average Coliform Content Per 100 ml (MF)	Sanitary Quality for Bathing Purposes
0 - 200	Good
201 - 1,000	Fair - Final evaluation should be based on sanitary survey information.
Greater than 1,000	Poor - Public bathing area should be closed if results are confirmed by additional sampling and a sanitary survey.

It should be noted that a membrane filter (MF) count of 1,000 per 100 ml corresponds to an MPN value of 2300 per 100 ml, which is generally considered to be the maximum allowable coliform MPN for acceptable bathing waters.

It is clear upon comparing water quality test results with sanitary standards that for two of the four testing days, the pond was not acceptable for public bathing according to State Health Department standards.

A sanitary survey conducted by the State Health Department, however, turned up no evidence of sewage discharges. With water quality of the inlet stream generally good, it is suspected the high fecal coliform levels noted in the pond are due to a high bather load combined with low flow through the pond.

As mentioned above, ponds are subject to short term deterioration of water quality. In light of this, it is recommended that sampling of this area and analysis by a certified laboratory be carried out on a regular basis. It is also recommended that periodic broadcast chlorination be carried out to bring bacteria counts down to an acceptable level. Exact procedures to be followed can be worked out between the Hartland Recreation Commission and the State Health Department.

It was noted during the sanitary survey that off-road motorcycles have been riding through the stream at several points, causing increased erosion. This could prove deterimental to the water quality in the stream and to the natural setting of the area and should be discouraged if possible.

B. SWIMMER CAPACITY

Another consideration in evaluating the sanitary quality of a pond for use as a bathing area is the amount of dilution water flowing through the bathing area.

Experience has shown that the bathers themselves will introduce a considerable amount of contamination into the bathing area during bathing activity. In order to prevent a build-up of bacteria in the bathing waters, it is found desirable that there be approximately 1,000 gallons of dilution

water flowing through the bathing area for each person using it during the course of the day. The amount of dilution water is based on the average number of bathers, and peaks up to twice the number may be accommodated without producing a significant bacterial deterioration, providing the peak usage does not exceed two or three days. It is evident that the amount of dilution water flowing through the bathing area will vary considerably during the course of the season. The critical consideration, therefore, would be the minimum amount of dilution water available during a normally dry period.

The Department of Health formula for estimating swimmer capacity in an impoundment is:

$$N = \frac{(V/180) + F}{1000}$$

where N is the number of swimmers per day, V is the volume of the pond in gallons, and F is the inflow to the pond in gallons per day (gpd). Using this formula, it is important to determine the value of F during a normally dry period. Two useful measures are the 7-day, 2-year low flow and the 7-day, 10-year low flow. The term "7-day" in each value means that flow in the stream feeding the pond does not rise above the stated figure for seven consecutive days. The number of years mentioned in each value refers to the average recurrence interval of the low-flow period; for example, the 7-day, 10-year low flow occurs at an average rate of once every ten years. One caution must be stated: the recurrence interval mentioned in each term applies only to that situation in which the designated flow is not exceeded for an entire 7-day period. Flows equal to or less than the designated number may occur for shorter periods of time more frequently. For instance, the flow value given for a 7-day, 10-year condition may occur for one or two days each year.

To estimate the values of the 7-day, 2-year and the 7-day, 10-year low flows for the stream feeding the pond in the proposed recreation area, reference may be made to figure 18B in Connecticut Water Resources Bulletin No. 21, a U. S. Geological Survey publication (1972). The graph shown in this figure was designed for a different geographic region of the State, but the topography and geology of the Hartland area is quite similar. It can be estimated from the graph that the 7-day, 2-year inflow to the pond is no less than 15000 gpd. The 7-day, 10-year inflow is actually too small to appear on the graph, but it may be extrapolated from the plotted data as being less than 2000 gpd. Hartland residents have stated that the stream virtually dries up during some hot summer days.

Using the Department of Health formula, it can be seen that inflow alone could support only 15 swimmers per day during a 7-day, 2-year low-flow period and no more than 2 swimmers during a 7-day, 10-year low flow. If bathing were restricted to weekends, up to twice those numbers could possibly be accommodated without problems. The volume of the pond is not known, but it is estimated to be approximately 490,000 gallons (assuming a 1/2 acre pond at 3 foot average depth). This volume would support an additional 3 swimmers per day. Hence, assuming no restrictions on days of use, the maximum number of swimmers that should be allowed in the pond during any day is between 5 and 18. Clearly, inflow to the pond would have to be significantly bolstered to

provide a bathing facility that would meet the expected needs of the Town. Table 1 shows the additional inflow that would have to be provided to make the pond acceptable for use by different numbers of swimmers (assuming a base allowance of 10).

Table 1. Additional inflow required to make the pond suitable for use by different numbers of swimmers. Pond is considered to be capable of supporting 10 swimmers per day under present conditions.

	Total Number of Swimmers			
	50	75	100	125
No restrictions on days of use	40,000	65,000	90,000	115,000 (gpd)
	27	45	62	79 (gpm)
Use restricted to weekends	30,000	55,000	80,000	105,000 (gpd)
	21	38	56	73 (gpm)

C. AUGMENTING FLOW TO THE POND

Wells tapping the bedrock aquifer are not likely to provide large yields of groundwater for augmenting inflow to the pond. Connecticut Water Resources Bulletin No. 28 indicates that many bedrock wells in the vicinity of the recreation area have very low yields of 2 gallons per minute (gpm) or less. It may be possible to find a high-yielding bedrock source in the vicinity, but this possibility cannot be guaranteed and the search process would be very expensive. Nevertheless, a bedrock well should prove adequate to meet drinking water or other small needs in the active recreation areas.

Wells finished in overburden are similarly unlikely to be able to bolster inflow significantly. The stratified drift deposit west of the pond is small and is located on a hillside. In addition, the recharge area of the deposit is not much larger than the deposit itself. As a result, the saturated thickness of the stratified drift is probably quite small and would therefore be unable to sustain a high yield. Till is a more abundant material, but its water-transmitting capacities are generally poor. It is not likely to be able to provide a solution.

A suggestion was made to capture groundwater emerging from the base of the stratified drift deposit and to channel it northward to an entry point in the stream just above the pond. The theory was that the channel would prevent the water from being absorbed by the silty flood plain area adjacent to the pond, and thence being lost to the atmosphere by transpiration. However, this alternative is not likely to be able to provide much support to the swimming area because of the very small size (approximately 25 acres) of the drainage area of the stratified drift body (see Figure 3). Moreover, if an open diversion channel were created, evaporation of water from the channel might offset the savings of water from reduced transpiration by plants.

D. POND MODIFICATIONS

As discussed in the "Hydrology" section of this report, it is recommended that the dam and emergency spillway elevation be raised. This is recommended primarily for safety reasons, but the action would provide a side benefit by directing water flow closer to the beach area. Another modification which might prove beneficial is the installation of an underwater deflecting structure at the inlet of the pond. This structure, positioned to direct more flow towards the beach area, would serve to enhance water dilution functions.

It may also be feasible to dredge the pond, thereby increasing both its volume and its ability to support swimmers. The nature of the substrate underlying the pond at depth is not known, but it is likely that the material is till with a sandy or finer grained matrix. Seepage of the ponds water through the substrate is not likely to be a problem unless dredging uncovers a layer of clear sand and gravel. A check of this possibility could be made by draining the pond and digging a hole to the desired depth of dredging with a backhoe.

Except for the beach area, slopes within the pond may be safely graded to a maximum 3:1 slope. The number of additional swimmers the pond could support would be directly proportional to the additional volume created within the pond. For example, doubling the average depth of the pond from 3 to 6 feet would support an additional 3 swimmers per day (assuming a 1/2 acre pond). Tripling the average depth of the pond from 3 feet to 9 feet would support an additional 6 swimmers per day.

V. GENERAL RECREATIONAL USE

The Hartland Recreation Area has good possibilities for the development of many types of recreation. Potential uses include picnicking, swimming and swimming instruction, baseball and other field sports, hard surface court games, hiking, fishing, ice skating, nature study, exercise trails, and cross-country skiing. For purposes of discussion, the area has been divided into three general areas: the pond area, the woodland area, the open field area.

A. POND AREA

As previously discussed, the pond appears to be suitable for swimming on a controlled scale. The pond also has potential for "put and take" trout fishing prior to the swimming season. Other suitable activities in the pond include:

Skating - The pond provides a good area for winter skating. The existing cabin could be developed as a warming shelter.

Picnicking - use of the cabin and the flat conifer groves behind it for small group picnics or for family type picnics is recommended.

As noted previously, access to the pond area is good and the area has suitable parking space for anticipated use. Consideration should be given to developing a potable water supply at the site and renovating the existing cabin to function as a bathhouse/warming shelter.

The banks along the access road to the pond are unvegetated and pose an erosion and sedimentation problem. Seeding of these bare areas will reduce the erosion and resultant sedimentation. Another erosion problem exists at the southwest corner of the pond. This area should be loamed and seeded or planted to confiers. Beach sand erosion may prove to be a minor problem, but this can be ameliorated by berms and grassed diversion ditches along the top edge of the beach.

B. WOODLAND AREA

Opportunities for passive recreational development are good throughout this area. The area is scenic and offers a variety of forest plant communities. Recommended uses of the area include hiking, ski-touring, and nature study.

With the property abutting the existing school, opportunities are particularly good for the development of an interpretive nature trail for environmental education. Examples of items to interpret, lable, or develop include: tree and shrub species; ferns, herbs and wildflowers; succession; insect and disease damage; animal homes and tracks; plant/soil relationships; soil profiles; and types of rocks.

Development of a trail system should be carefully planned to enhance environmental education use and also to support additional uses such as cross-country skiing and hiking. All trail development should avoid fragile and sensitive lands such as wetlands, easily erodible slopes, etc. In some areas, however, elevated walkways could be used to make wetlands crossable and accessible. A recently published reference that may prove helpful in additional trail development is the "AMC Field Guide to Trail Building and Maintenance", (Appalachian Mountain Club, 1977). It would be highly desirable if trails could be developed connecting the pond area to the playing field area. Another desirable trail would be to link the existing school property with the playing field area. This same trail could be developed as an exercise trail with various exercise stations.

If timber is to be harvested in the woodland area, the access roads developed for the harvesting could be seeded after the harvest. These same access roads could then be used as trails for hiking or cross-country skiing. Again, access road alignment should take into consideration the topography and soils on the property.

Use of trails by equestrians, snowmobilers, and trail bike riders will present additional development and maintenance problems. Due to the small size of the site, these uses are not recommended. Camping on the site is also not recommended since most of the site is composed of rather wet soils.

C. OPEN FIELD AREA

The open field area off Route 20 has moderate limitations for development of ballfields. The limitations are due to stoniness, slope, and a seasonally high water table. Grading of the area will be needed for use as playing fields. Such grading may reduce the depth of soil to the water table, in which case tile drainage will be required to remove excess groundwater.

With development of this area for active recreational use, a road and parking lot is recommended to service the area. One alternative development plan would consist of a road bisecting the property leaving ample space for two ballfields, one on each side of the road (see Figure 5). This road would branch into two parking areas capable of handling thirty cars each. This parking area should provide enough spaces for baseball use and could also service a picnic area if developed behind the baseball fields (see Figure 5). Development of a picnic area is suggested here as the red pine grove in this area is of high aesthetic value and would make a nice picnicking spot. Although this spot is scenic, it may prove to be wet in the spring.

Alternative recreational facilities such as tennis courts, basketball courts and playgrounds could also be developed at this site. With careful design, such facilities could probably be developed without sacrificing development of the ballfields. Which facilities to, in fact, develop can only be decided by the townspeople of Hartland after consideration of Town needs, desires, and available capital resources.

VI. ADDITIONAL PLANNING CONSIDERATIONS

According to the Zoning Regulations for the Town of Hartland the Hartland Recreation Area is located in the Residence (R1) Zone which permits the development of "recreational uses....by a....governmental unit". The Town has never adopted nor is it in the process of preparing a Plan of Development by which development of the Recreation Area could be judged against long term needs.

Population Characteristics

According to the State Department of Health, the estimated 1977 population of the Town is 1400. Below is a table of the area's population during various years:

1960	1040	(source - The population of CT: A Decade of Change 1960-1970, UCONN, 1973.)
1970	1303	(source - The population of CT: A Decade of Change 1960-1970, UCONN, 1973.)
1980	1500	(source - Conn. Dept. of Planning and Energy Policy Population Projections.)

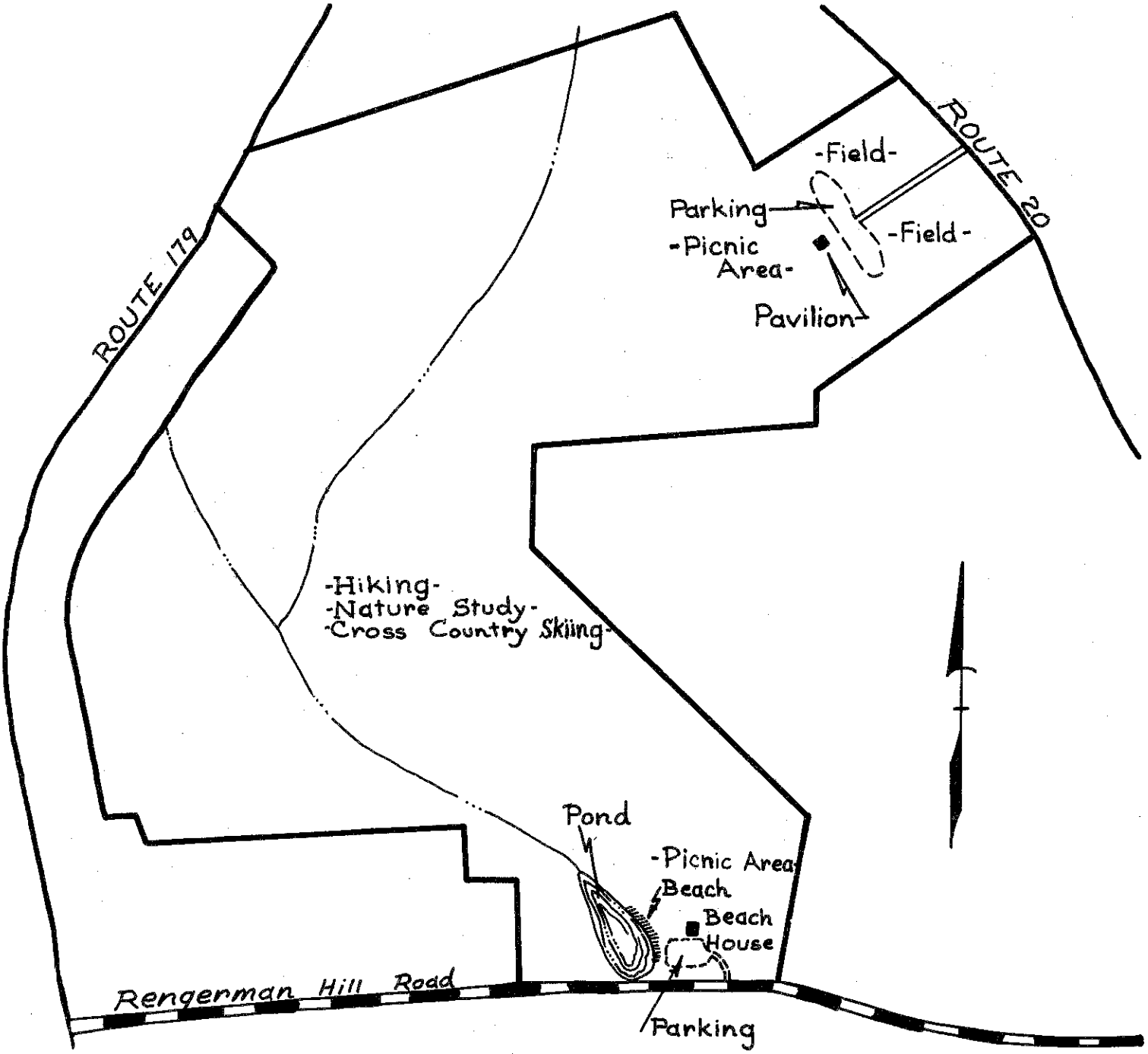
Although Hartland previously contained only upper income established families, during the past six years young immigrants have become more common as the Town is becoming a bedroom community for persons working in such communities as Windsor, Winsted, Torrington, and Bloomfield.

Local and Regional Open Space/Recreation Facilities

The extent and variety of recreational facilities within the Town of Hartland is quite limited at the present time. Other than the pond at the Recreation Area, there is no public outdoor swimming facility. In addition, active recreational facilities are reportedly present only at the Hartland School and are limited in number (i.e. one tennis court, one ballfield, one hard-surface court). It is clear that development of the Hartland Recreation Area, as planned

FIGURE 5

SKETCH SITE PLAN



Scale 1"=500'

will relieve some of the pressure on existing facilities and offer a broader variety of recreational activities than are now available within the Town.

The 11-town Litchfield Hills Region contains approximately 51,500 acres of open space, primarily in the form of State parks and forests. Additional nearby public outdoor areas are available within the northwestern corner of the Capital Region of the State. Those nearby State parks offering swimming include Burr Pond, John A. Minetto, Stratton Brook and Sunnybrook. While these facilities also offer picnicking and hiking, they cannot compete with the type of services proposed for the Hartland Recreation Area (i.e. ballfields, exercise trails, and nature study areas).

Transportation Facilities

Analysis of the traffic volumes and capacities projected by the Connecticut Department of Transportation indicates that all major roadways leading to the Hartland Recreational Facility are and will continue to be underutilized. For this reason it is not recommended in the 1977-1990 Litchfield Hills Regional Transportation Plan that major improvements or realignments be made to any of the highway facilities in or around the site area. Furthermore, none of these roadways were proposed by Hartland officials for inclusion in the updated "LHRPA Highway Priority List".

Although Routes 20 and 179 and Rengerman Hill Road do not have any volume/capacity problems, road surface and shoulder maintenance is a problem on Route 20. There are also a few isolated visible grade and curvature problems along Route 20. Thus the Litchfield Hills Regional Planning Agency staff recommends that these matters be addressed in order to provide safe access if and when the facility is further developed.

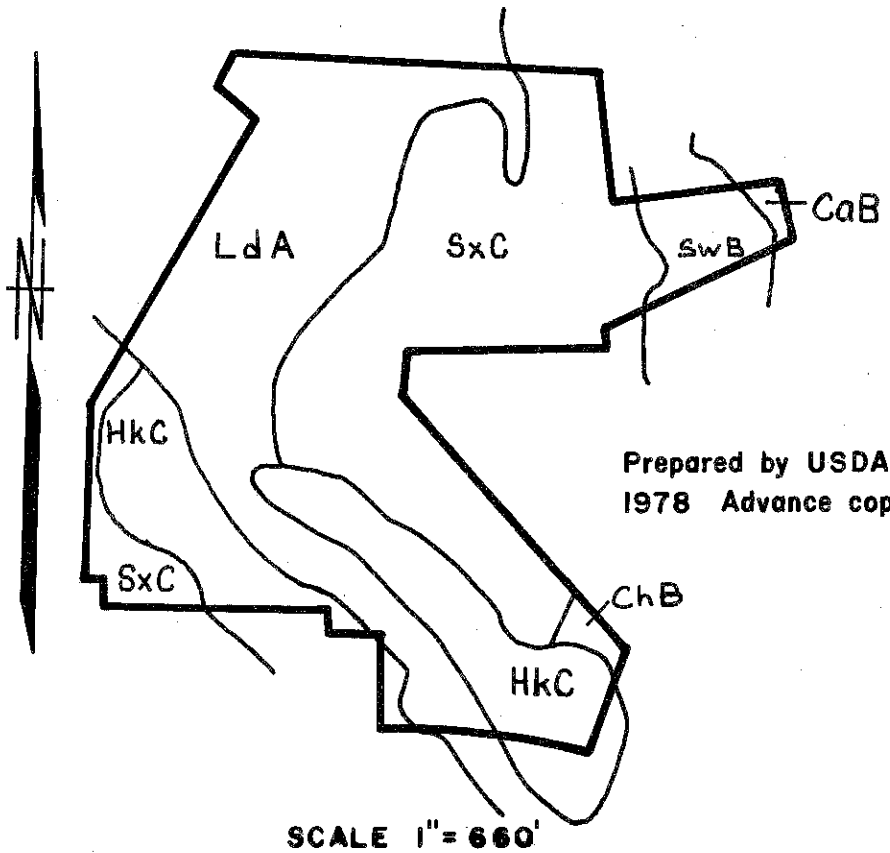
Historic Perspective of Area

The Litchfield Hills Regional Planning Agency has no knowledge of any historic site or structure within or adjacent to the recreation area which will be impacted by the proposed use of the property.

* * * * *

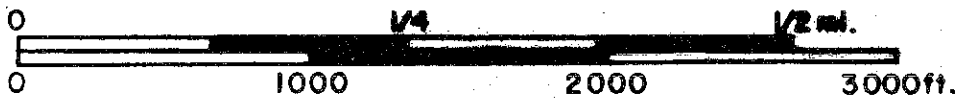
APPENDIX

SOILS MAP



Prepared by USDA-SCS
1978 Advance copy subject to change.

SCALE 1"= 660'



Note: As this map is an enlargement from the original 1320'/inch scale, the soil boundary lines should not be viewed as precise boundaries, but rather as guidelines to the distribution of soil types on the property.

Soils Limitation Chart
HARTLAND RECREATION AREA
HARTLAND, CT.

Natural Soil Group	Mapping Symbol	Soil Name	Acres	%of Total Acres	Limitations For:* Camp Areas	Bldg. in Rec. Areas	Picnic Areas	Intensive Play Areas	Paths & Trails	Reason for Limitation
B-3b	LdA	Leicester, Whitman & Ridgebury, very stony soils, 0-5% slopes.	30	27.3	3	3	3	3	3	Drainage - Stoniness
B-2b	SxC	Sutton & Acton, very stony loams, 3-15% slopes	30	27.3	2	2	2	3	2	Stoniness - Slope Drainage
A-1b	HkC	Hinckley gravelly sandy loam, 3-15% slopes	30	27.3	2	2	2	3	1	Slope
B-2a	SwB	Sutton stony loam, 3-8% slopes	10	9.1	2	1	1	2	1	Stoniness, Drainage
B-1a	ChB	Charlton stony fine sandy loam, 3-8% slopes	5	4.5	2	2	1	2	2	Stoniness
B1a	CaB	Charlton fine sandy loam, 3-8% slopes	5	4.5	1	1	1	2	1	Slope

*EXPLANATION OF RATING SYSTEM

1. SLIGHT LIMITATION: indicates that any property of the soil affecting use of the soil is relatively unimportant and can be overcome at little expense.
2. MODERATE LIMITATION: indicates that any property of the soil affecting use can be overcome at a somewhat higher expense.
3. 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.