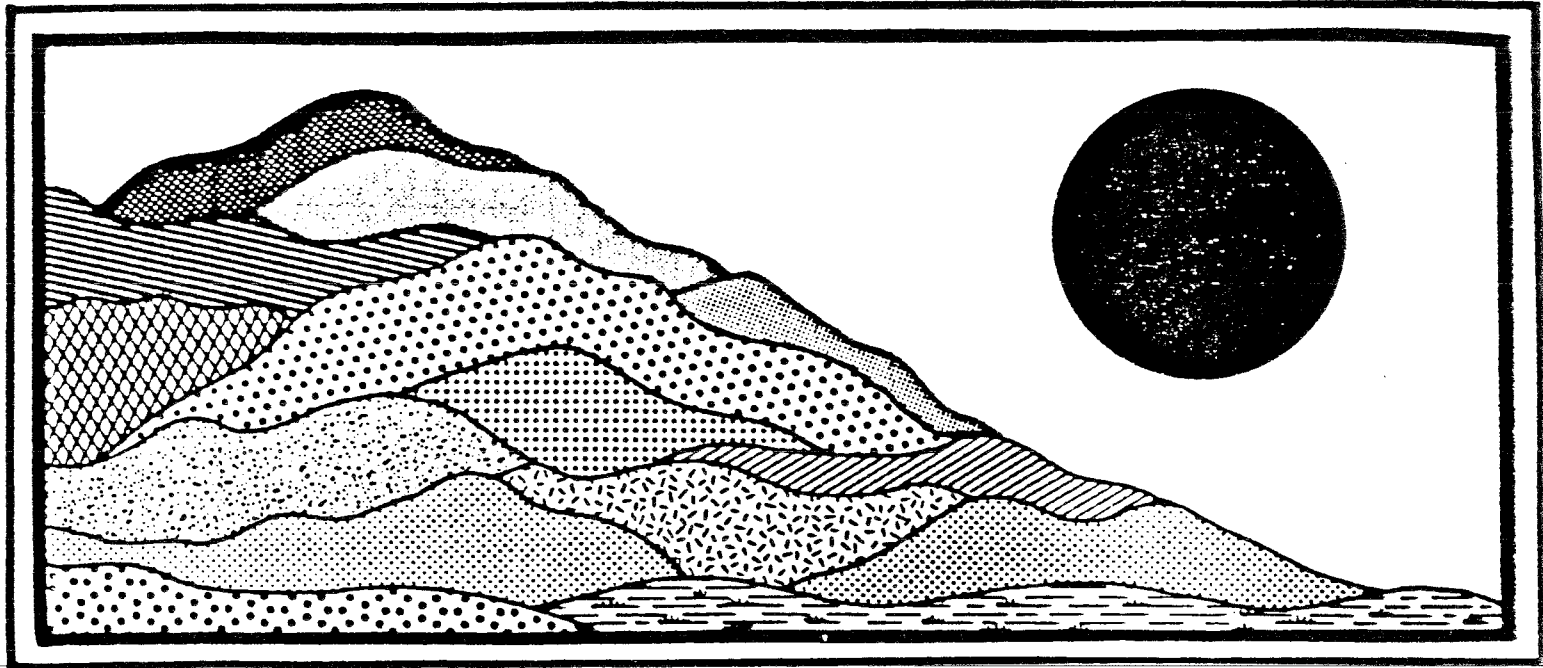


Huckleberry Hill and Found Land

Avon, Connecticut
September 1986



ENVIRONMENTAL

REVIEW TEAM

REPORT

EASTERN CONNECTICUT RESOURCE CONSERVATION AND DEVELOPMENT AREA, INC.

Huckleberry Hill and Found Land

Avon, Connecticut

Review Date: JULY 10, 1986

Report Date: SEPTEMBER 1986



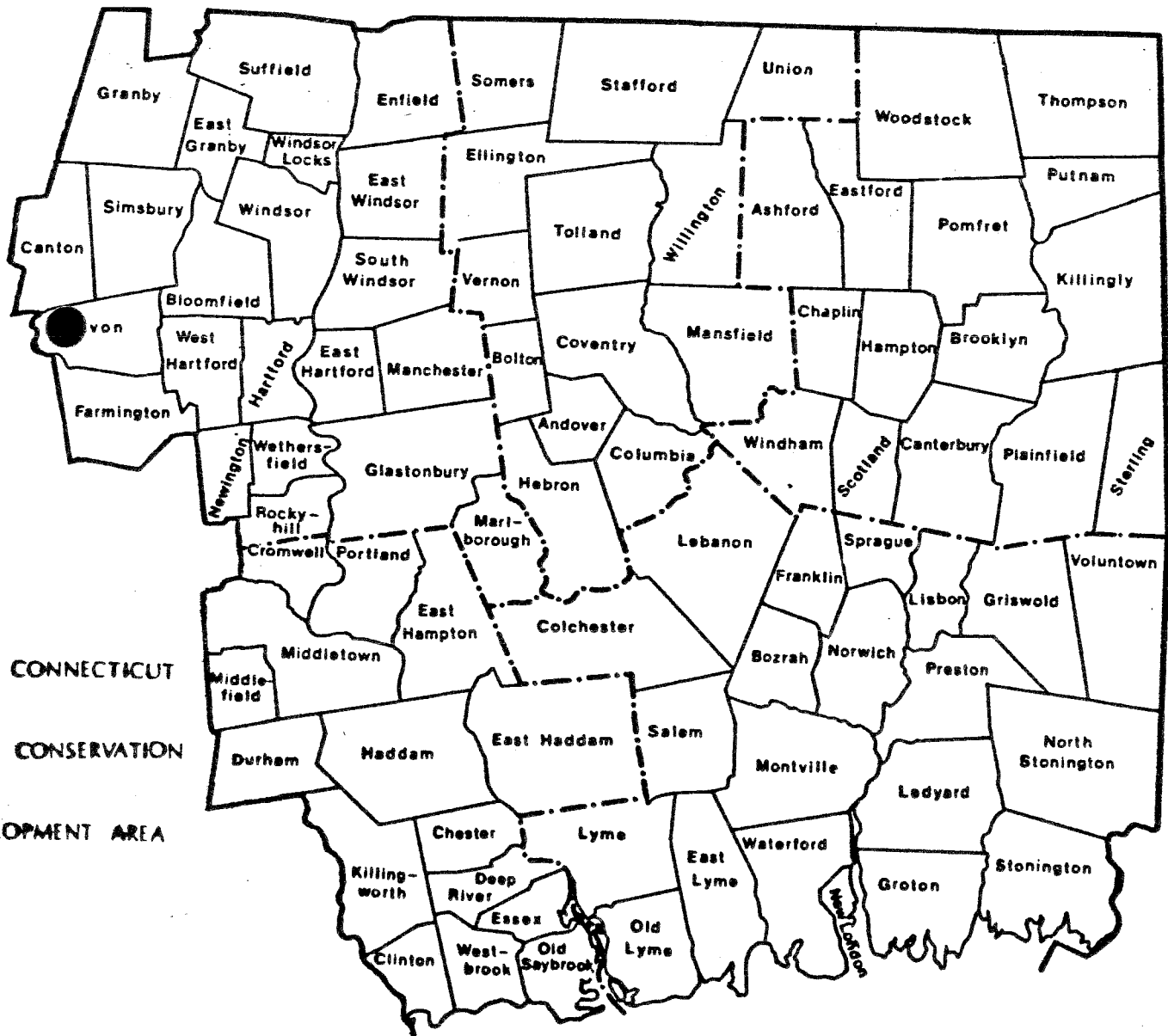
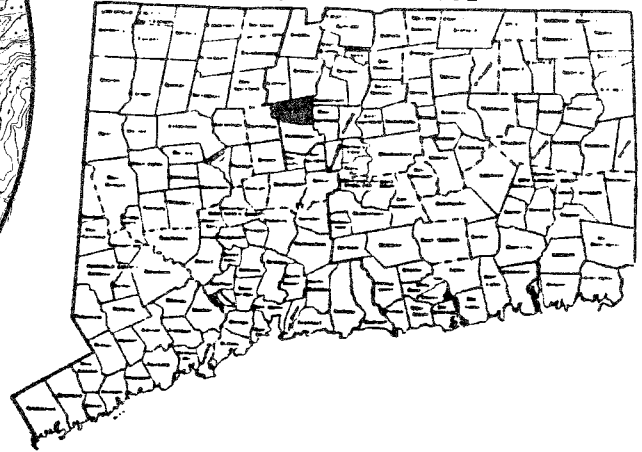
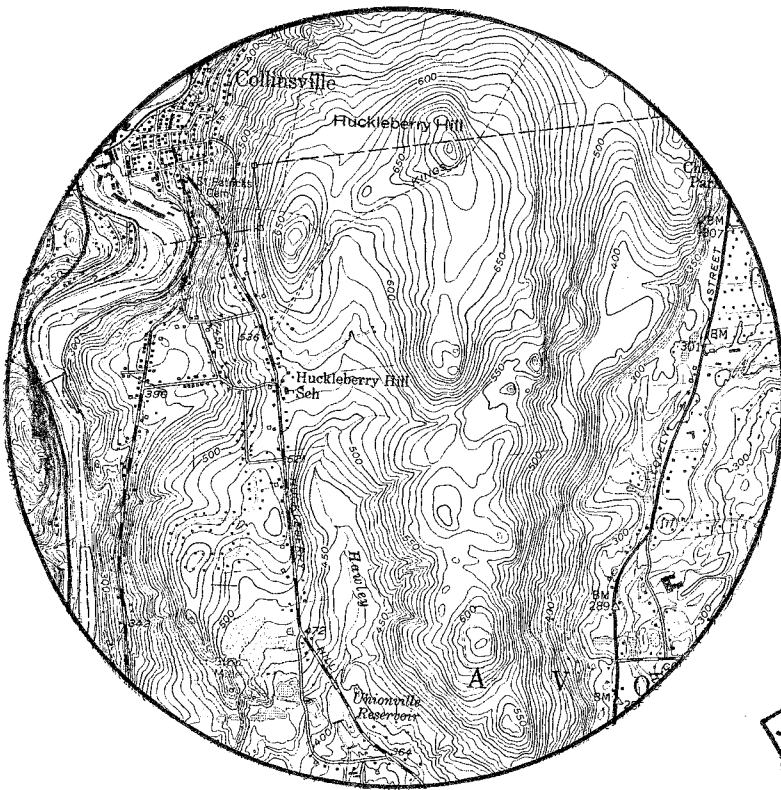
ENVIRONMENTAL REVIEW TEAM

PO BOX 198

BROOKLYN, CONNECTICUT 06234

Site Location

HUCKLEBERRY HILL RECREATION AREA
AND
FOUND LAND
AVON, CONNECTICUT



ENVIRONMENTAL REVIEW TEAM REPORT
ON
HUCKLEBERRY HILL RECREATION AREA AND FOUND LAND
AVON, CONNECTICUT

This report is an outgrowth of a request from the Avon Natural Resources Commission to the Hartford 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. The request was approved and the measure reviewed by the Eastern Connecticut Environmental Review Team (ERT).

The ERT met and field checked the site on July 10, 1986, Thursday. Team members participating on this review included:

Tim Barry	- Fisheries Biologist - Department of Environmental Protection
Doug Cooper	- Principle Environmental Analyst - DEP, Water Resources Unit
Tim Dodge	- Resource Conservationist - USDA Soil Conservation Service
Joe Hickey	- State Park Planner - Department of Environmental Protection
Kip Kolesinkas	- Soil Scientist - USDA Soil Conservation Service
Paul Rothbart	- Wildlife Biologist - Department of Environmental Protection
Larry Rousseau	- Forester - Connecticut Bureau of Forestry
Elaine Sych	- ERT Coordinator - Eastern Connecticut RC&D Area
Bill Warzecha	- Geologist - DEP, Natural Resources Center
Mike Wosniak	- Community Development Planner - Capitol Region Council of Governments

Prior to the review day, each team member received a summary of the proposed project, a list of the Town's concerns, location maps, soils maps and topographic map enlargements. The Team met with, and were accompanied by the town planner, the recreation planner, the town engineer and the head of public works. Following the review, reports from each team member were submitted to the ERT Coordinator for compilation and editing into this final report.

This report represents the Team's findings. It is not meant to compete with private consultants by providing site designs or detailed solutions to development problems. The Team does not recommend what final action should be taken on a proposed project -- all final decisions and conclusions rest with the Town and landowner. 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 developer and the Town.

The results of this Team action are oriented toward the development of better environmental quality and the long-term economics of land use.

The eastern Connecticut RC&D Executive Committee hopes you will find this report of value and assistance in making your decisions on these areas of town owned land.

If you require any additional information, please contact:

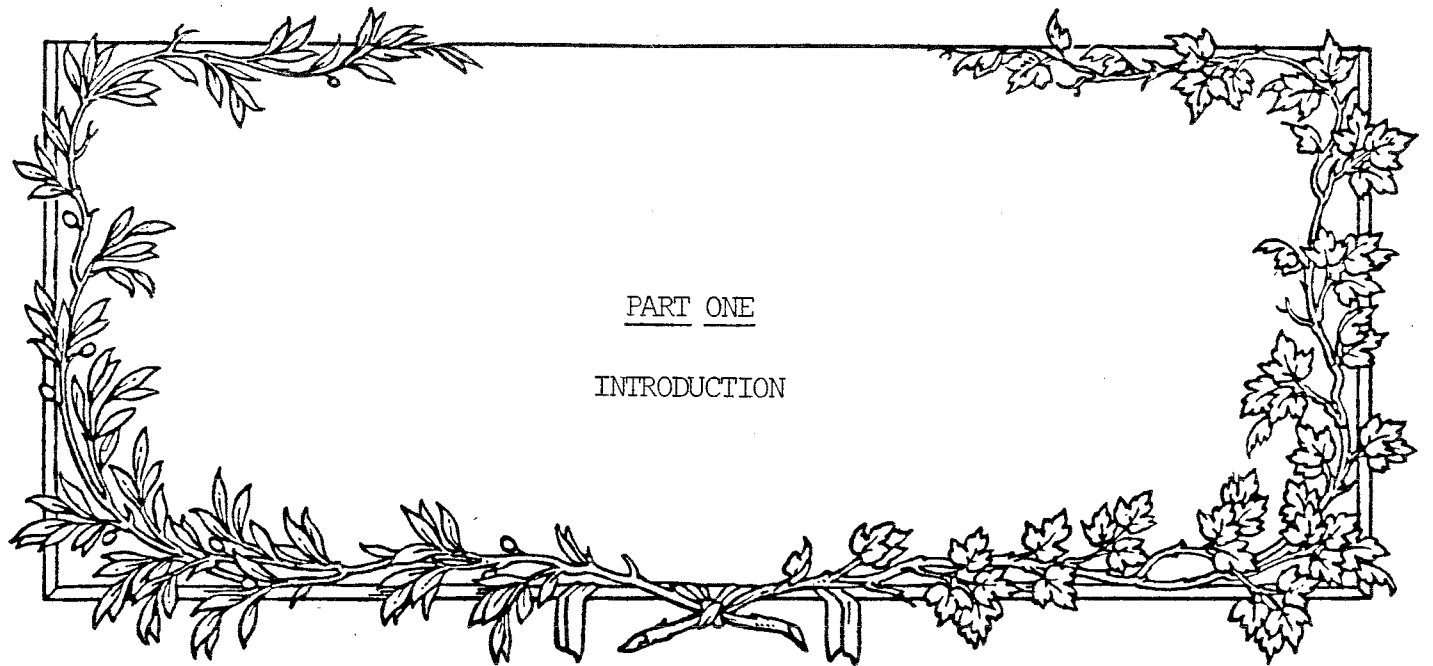
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Brooklyn, CT 06234
(203) 774-1253

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PART ONE

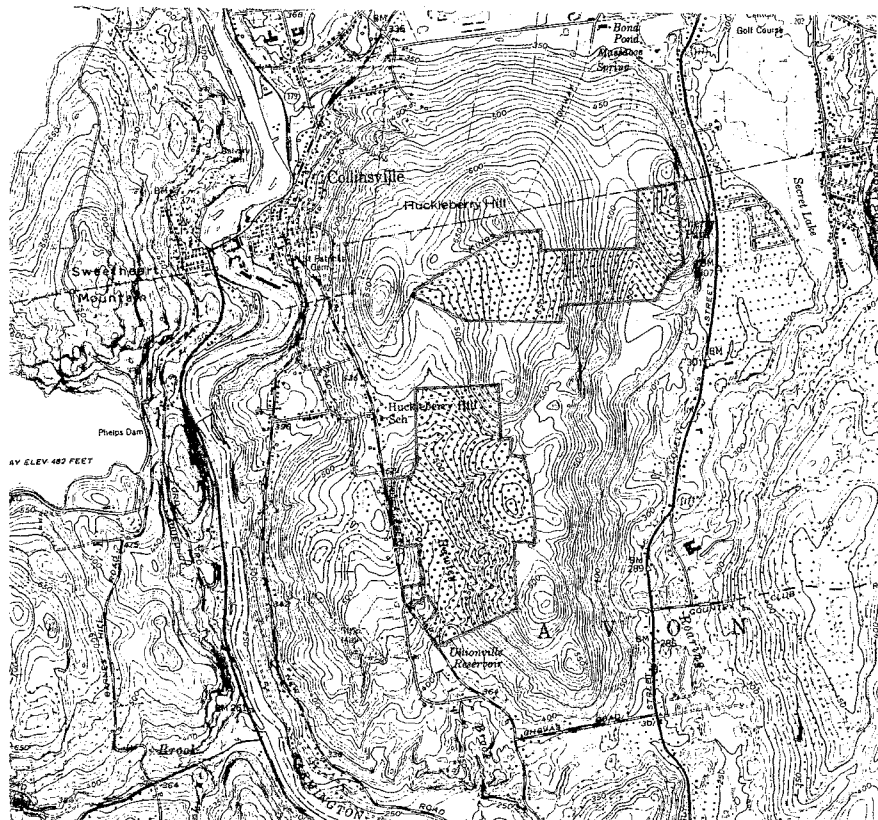
INTRODUCTION

N O T E S

The Avon Natural Resource Commission requested Environmental Review Team assistance in reviewing several parcels of town-owned open space. This report pertains to the Huckleberry Hill Recreation Area and the piece known as Found Land. (The other parcel of town-owned land that was studied is Fisher Meadows, which is covered in a separate report.)

The Town Manager and the Commission feel that these parcels are unique natural resources and should receive attention for maintenance, management and use. They have asked for an environmental assessment and a natural resource inventory so they can formulate a plan to assess each parcel's role in the Town's open space/recreation network, and determine the proper management and maintenance techniques.

Part Two and Part Three of this report contain information specific to each parcel. Part Four has information that pertains to both parcels. A brief summary highlighting major points and recommendations may be found in Part Five.

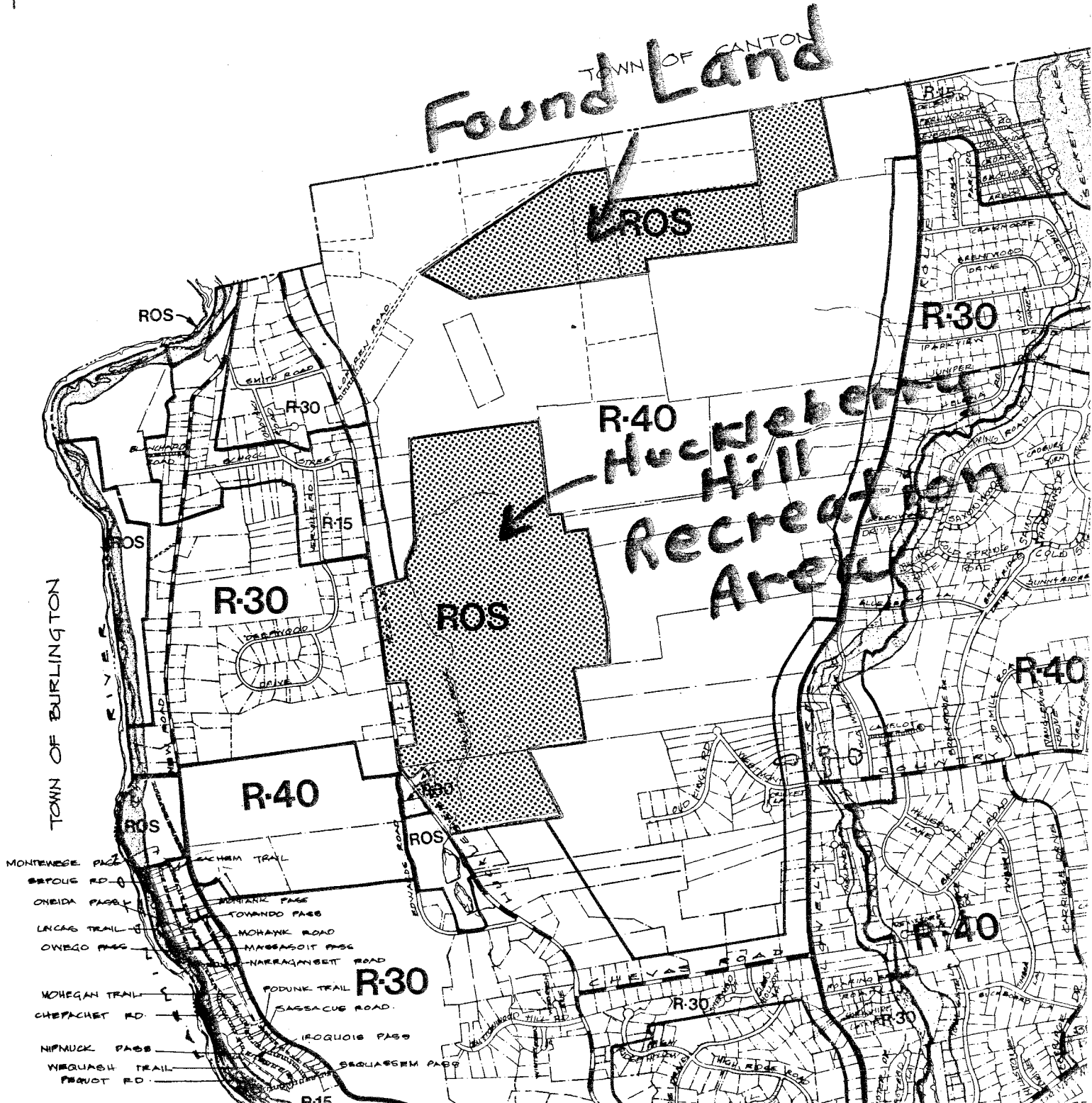


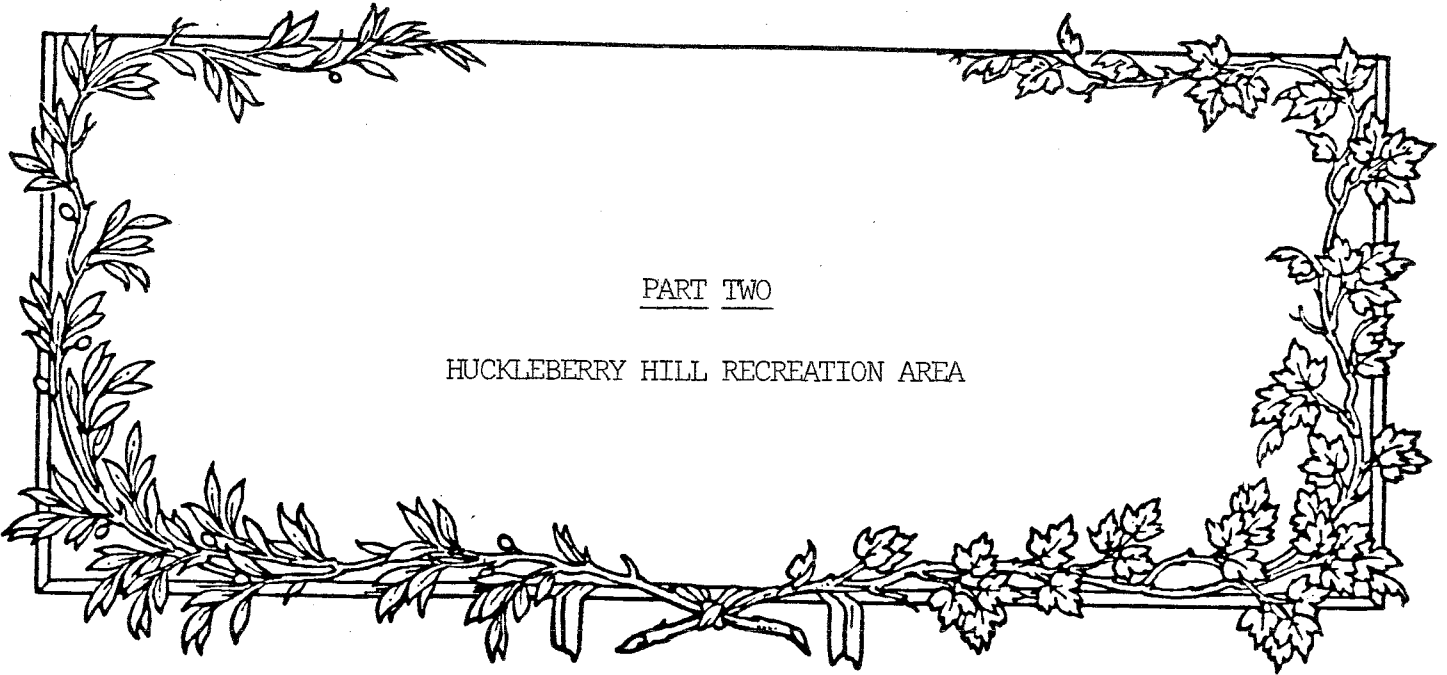
ZONING MAP

TOWN OF AVON, CONNECTICUT

PLANNING AND ZONING COMMISSION

+





PART TWO

HUCKLEBERRY HILL RECREATION AREA

N O T E S

1. TOPOGRAPHY

The Huckleberry Hill Recreation area is ± 260 acres in size and is located in the northwest corner of Avon. As shown by the accompanying topographic map, the land surface slopes gently to moderately to Hawley Brook, which traverses the westcentral parts of the site in a southerly direction. Flat areas characterize the top of elevated portions of the site in the western limits.

Maximum and minimum elevations on the site are about ± 680 feet and 410 feet above mean sea level.

Hawley Brook, which originates from a small spring north of the site is the parcel's major natural feature. Beavers have impounded the streamcourse in the westcentral parts.

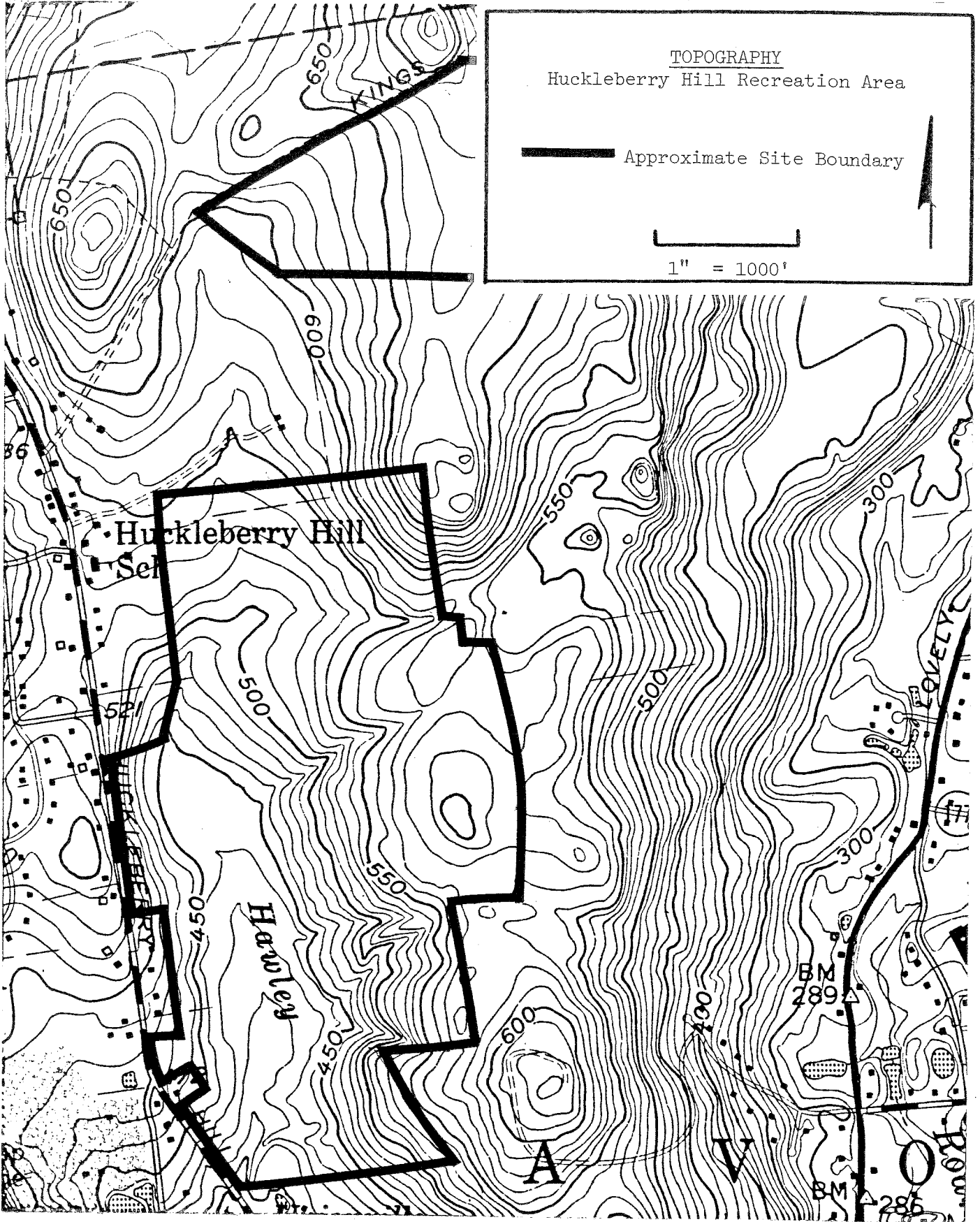
2. GEOLOGY

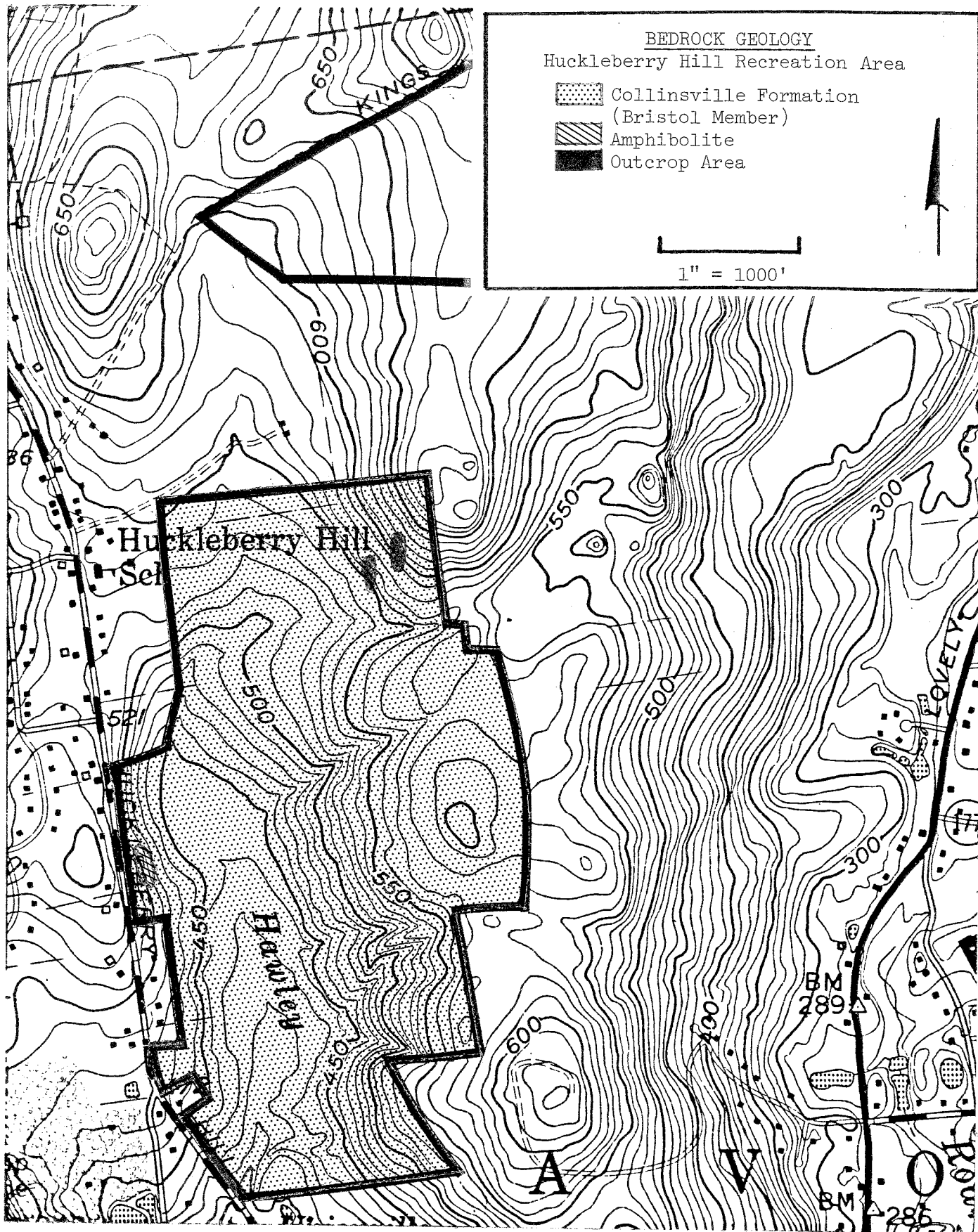
The general bedrock geology of the site is described on the bedrock geologic map (QR-16, by Roger Colton) which has been published by the U. S. Geological Survey. The surficial geologic map for the Collinsville quadrangle has not been published to date. Preliminary information for the quadrangle is available at the Department of Environmental Protection's Natural Resource Center in Hartford. Roger Colton is also the author of this unpublished map.

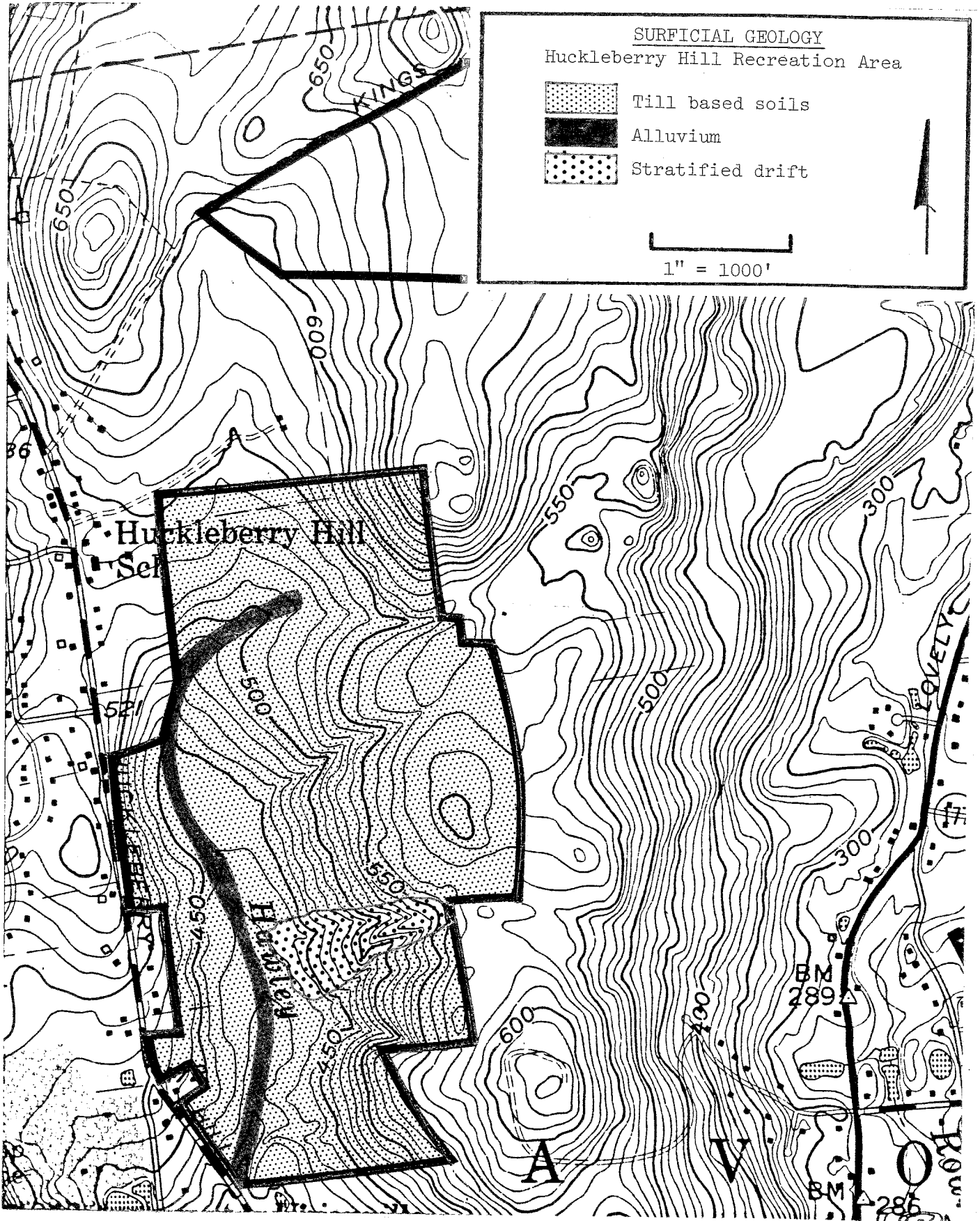
Bedrock is at or near ground surface throughout most of the site. Colton describes the bedrock underlying the site as the Bristol Member of the Collinsville Formation. He describes the rock as an interlayered medium grained garnet-biotite-quartz plagioclase gneiss, a garnet-biotite muscovite-plagioclase quartz gneiss and schist; and amphibolites.

"Schists", "gneisses" and "amphibolites" are crystalline metamorphic rocks. Metamorphic rocks are rocks which were geologically altered at one time by great heat and pressure deep beneath the earth's surface. A "schist" is a rock characterized by elongate or flaky minerals which become aligned, giving the rock a slabby or well-layered structure (this slabby structure is known as foliation). A "gneiss" is a rock in which thin bands of elongate or flaky minerals alternate with layers of more granular minerals. Finally, "amphibolite" is a term given to rocks composed mainly of minerals in the amphibole group (usually hornblende). All three (3) of these metamorphic rocks may be seen grading into one another in a single outcrop.

Bedrock on most of the site is covered by a relatively thin (generally 10 feet or less) layer of a glacial sediment called till. As glacier ice moved through the region, it collected and transported rock particles and pre-existing overburden. Much of this transported debris was redeposited directly from the ice, either by being plastered onto the land from beneath the ice mass or by being let down gently as the ice later wasted. The resulting deposit is known as till. Because of its peculiar origin, till contains a non-sorted mixture of particles ranging in size from clay to large boulders. The till may be sandy,







stony and loose, or silty, less stony and tightly compact. It is generally loose in shallow to bedrock areas. Where the till becomes thicker (5 feet or more), a compact layer may be encountered with depth. It appears that the till on the site is generally the sandy, stony and loose variety. Overlying till in a small area in the southern parts of the site is another type of glacial sediment called "ice-contact stratified drift". These deposits consist of yellowish brown stratified silt, sand, gravel and boulders deposited by glacial meltwater in close proximity to glacial ice. A chunk or block of ice from the main sheet of glacial ice may have occupied the Hawley Brook Valley which provided the source of material for the ice contact stratified drift.

Overlying till along Hawley Brook are more recent surficial deposits called alluvium. Alluvium consists of gravel, sand, and silt deposited by Hawley Brook on flood plains.

The geology of the Huckleberry Hill tract should post no major difficulties in terms of passive recreation, such as hiking trails, jogging trails, cross-country trails, etc. Trails constructed on the steeper slopes could become eroded, however, if not properly constructed and maintained. Also, trails constructed on the steeper slopes may be too rigorous for some users of the property in terms of hiking and jogging. Wet areas on the site should be avoided where possible in designing a trail network.

3. HYDROLOGY

Except for a small area of the parcel in the eastern limits, the site lies within the watershed of Hawley Brook. Hawley Brook, which drains an area of about 714 acres flows in a southerly direction through the westcentral parts of the site. Just south of the site, Hawley Brook flows into Unionville Reservoir and then ultimately discharges into the Farmington River.

Surface and groundwaters on the site flow generally, downslope toward intermittent drainage channels, or directly into Hawley Brook. Waters that flow into intermittent streams on the site are routed into Hawley Brook. The intermittent drainage channels on the site trend primarily in a westerly direction. Surface drainage on the site is controlled largely by the underlying bedrock.

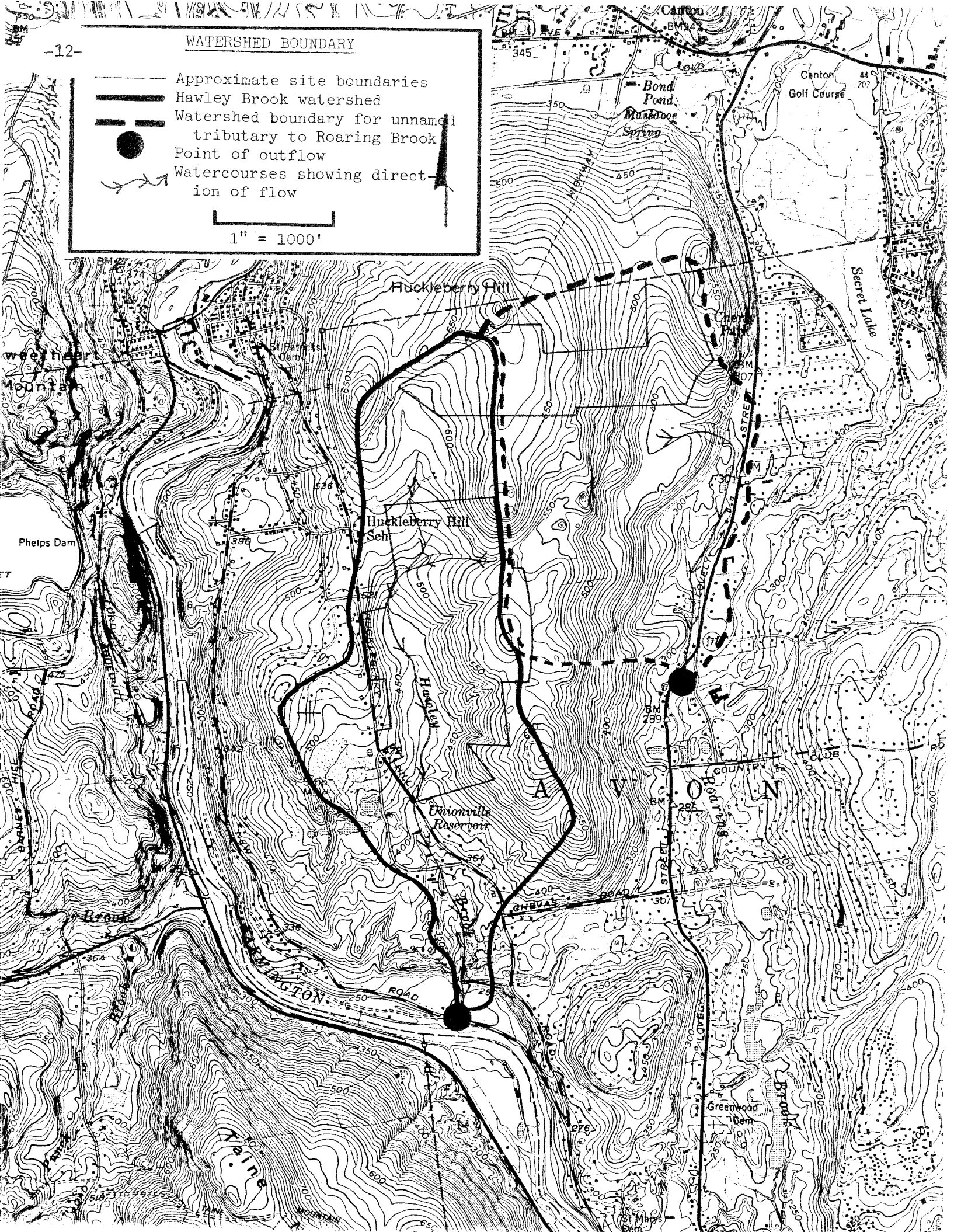
The parcel contains no particularly significant sources of groundwater supplies (aquifers). Bedrock appears to be the only suitable aquifer for a water supply well on the property. Bedrock is normally capable of yielding only small amount so water (less than 5 gallons per minute). However, should the Town ever wish to develop a water supply at the site, such a yield should prove adequate for meeting any passive recreational needs. High yielding wells from bedrock (more than 50 gallons per minute) are rare.

Flood Boundary and Floodway Maps have been published for the town of Avon by the Federal Emergency Management Agency. According to the map, the 100 year flood boundary parallels Hawley Brook through the Huckleberry Hill Recreation Area. A 100-year flood is a flood with one chance in a 100 or a one percent

WATERSHED BOUNDARY

- Approximate site boundaries
- Hawley Brook watershed
- Watershed boundary for unnamed tributary to Roaring Brook
- Point of outflow
- Watercourses showing direction of flow

1" = 1000'



chance that it will happen in any given year. It should be pointed out that this does not mean a flood of a magnitude mentioned above will occur only once in a 100 year period. The probability of occurrence remains the same each year regardless of what happened the previous year.

4. WETLANDS AND WATERCOURSES

Observations:

1.) The wetland watercourse system comprises approximately one-fifth of the total site area. The wetlands consist primarily of Leicester soils which have developed over glacial till. These poorly drained soils are an integral part of the Hawley Brook corridor. This wetland system forms the headwaters for Hawley Brook.

2.) This wetland corridor is a wooded swamp dominated by red maple along with assorted hardwood and evergreens. A fairly lush undergrowth of ferns and brush was also observed at the time of inspection.

3.) Beaver activity along Hawley Brook has created a 2-3 acre deadwood swamp as a result of flooding caused by the beaver dam. This area has been in existence for several years. No evidence of recent beaver activity was noted, however.

Findings:

1.) The wetlands surrounding Hawley Brook on this site are valuable for the maintenance of water quality and sustaining flow in Hawley Brook. This is particularly important to downstream uses of the water flow (such as the town swimming area.)

2.) The presence of beavers in this stretch of watercourse poses no real problem. No evidence of any potential damage to adjacent private lands, roadways, or utilities was found on the review day. By creating ponding areas, the beavers cause some tree mortality which benefits habitat diversity and provides refuge for other wildlife and birdlife species. Detention of runoff behind the beaver dam helps to augment stream flow during drier weather.

Recommendations:

1.) The wetlands along Hawley Brook are in good condition and need little or no management at this time. Some careful selective tree harvesting may be desirable in the future. Such efforts must be carefully conducted to avoid disruption of the watercourse proper.

2.) The beaver community (if still present) should be left undisturbed. They presently enhance the existing wetland functions and values.

3.) Some amount of trail cutting to provide walking access to the wetland at various locations may be desirable. Installation of one or two small foot-bridges across the brook may enable development of a trail loop around the

beaver pond and provide better access for nature study and birdwatching.

5. FISHERIES

It is the opinion of the Team's Fishery Biologist that there is presently a scarcity of suitable fish habitat in the Huckleberry Hill Recreation Area. Hawley Brook provides habitat diversity for wildlife species and appears to have a stable flow during the summer. Minnows were observed in several stretches of the brook during the field review. However, there is very little useable habitat for game species of fish in the brook and due to its small size, habitat improvement work does not seem worthwhile. The ponds which the brook feeds lack fisheries habitat but do have limited potential to provide a fishery. Species of fish expected to be found in the ponds are pumpkinseed sunfish, largemouth bass, and golden shiners. The ponds are tannic stained, have very steep sides and lack fish attracting cover (large boulders, weed beds, stumps, or brush piles). For this reason it is recommended that some sort of fish attracting devices be added to the ponds. Fish attracting devices or artificial reefs have proved to be very effective for enhancing small pond fisheries by increasing the amount of suitable habitat for such species as largemouth bass, sunfish and yellow perch. These devices can be easily made from a variety of materials such as old brush, christmas trees, or tires. The materials are tied together, cemented at the base, and sunk at various locations (both deep and shallow) by either placing them on the ice shortly before ice-out or with the aid of a boat. They can be marked with small floats to enable fisherman to more easily find them or simply left unmarked. The devices have been shown to work quite well by congregating both fish and fisherman to a specific site. Labor to build the artificial reefs could possibly be supplied from youth groups such as the Boy Scouts, Girl Scouts or other organizations. The D.E.P. Western District Fisheries staff could provide some technical assistance in the form of helping with material selection, size and placement of devices, and best time of year to install them.

6. RECREATION POTENTIAL

The basic functions of the Huckleberry Hill Recreation Area should include:

- 1.) Protection of the watershed of the swimming area at Countryside Park.
- 2.) Maintenance of a large block of wooded open space in rapidly-developing Avon. Management options range from a semi-natural area approach to that of a Town Forest managed as a silvicultural showcase model. Because of the range of site types found, environmental education should be considered.
- 3.) Provision of a recreational trail system for hiking, cross-country skiing and possibly equestrian use, both in terms of a self-contained loop system within the area and of connecting links with other blocks of open space and points of interest. Such connecting links could be to Countryside Park to the south, north to the Found Land Tract, and eventually upon closing of the town landfill west to the Farmington River. Trailheads for such a trail system could be at the abandoned Huckleberry Hill School adjoining the tract and at Countryside Park.

4.) Provision of opportunity for Scout and other youth group camping as is presently done.

Based upon these recommended functions, suggested management actions include:

1.) Trail development and replacement of a number of collapsed/collapsing bridges crossing brooks.

2.) Extension of the tract northward to connect with the Found Land Tract, through acquisition and/or dedication of open space during the process of land development.

3.) Related to "2" above, protection of the environs of the excellent spring feeding Hawley Brook and located just south of Kings Highway/Lofgren Road, through acquisition and/or dedications of open space during the process of land development.

4.) Consideration of further expansion of the tract toward the east and southeast, through dedication of open space during the process of land development.

N O T E S



PART THREE

FOUND LAND

N O T E S

1. TOPOGRAPHY

"Found Land" is located northeast of Huckleberry Hill Recreation Area in the northwestern part of Town. The + 150 acre (based on the site map supplied to Team members) sized parcel is located largely in a topographic saddle. From the westernmost point of the site the land rises gently to the top of Huckleberry Hill located in the westcentral parts. It then slopes moderately to the lowest part of the site from which an unnamed tributary to Roaring Brook originates. Finally, from this topographic swale, land surface rises moderately to the eastern limits of the site. Maximum and minimum elevations on the site are + 690 feet and + 400 feet above mean sea levels.

Found Land is land-locked. The Team accessed the site via King's Highway, which is a former stagecoach route and is unpaved. It should be noted that exact property boundaries for the site are unknown.

2. GEOLOGY

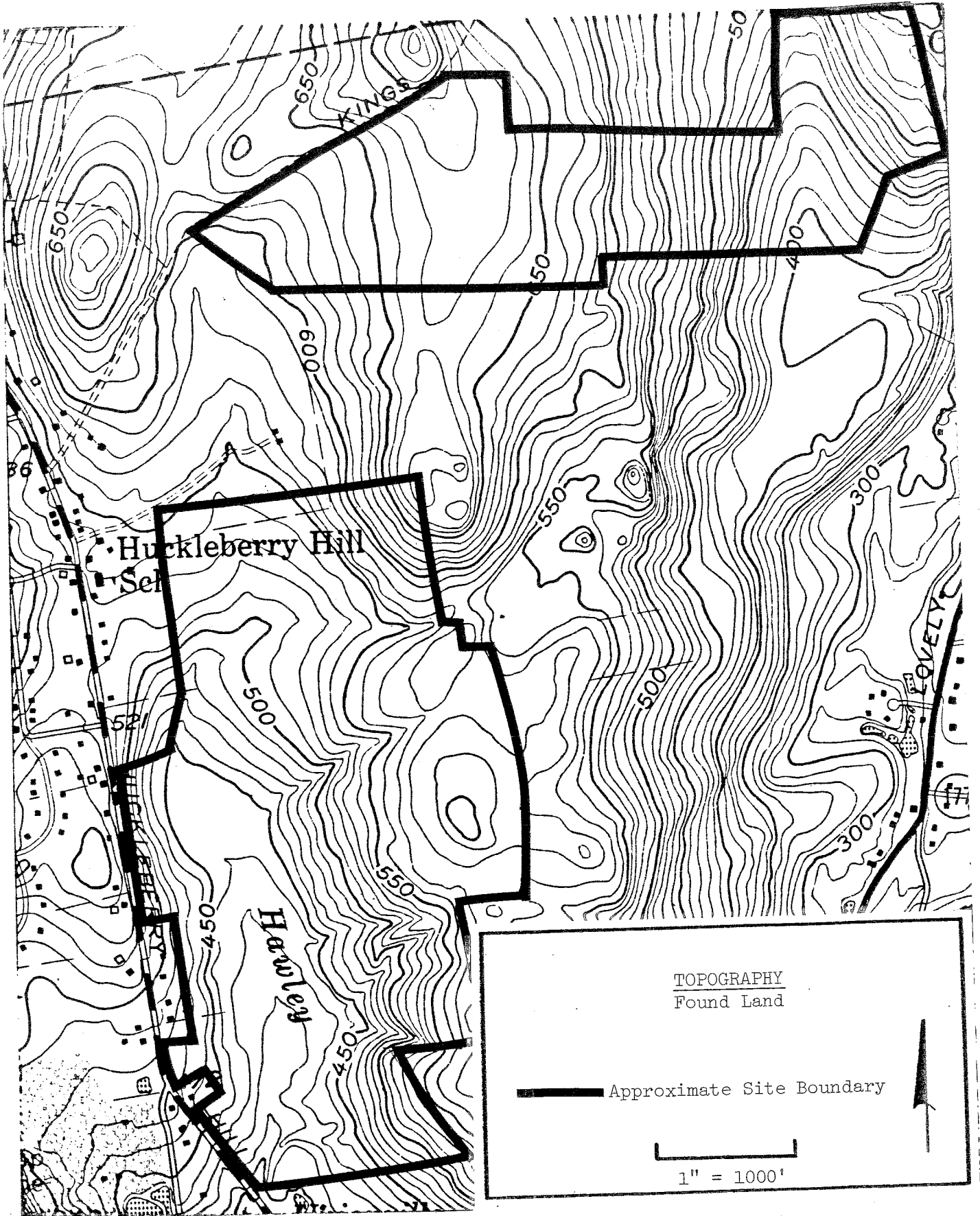
The same geologic maps that were referenced for the Huckleberry Hill Recreation Area were referenced for this report.

The eastern limits of the "Found Land" is controlled by the underlying bedrock. Bedrock is at or near ground surface at many points in most of the eastern parts. According to Colton's bedrock geologic map (QR-16), it is the same type of rock which underlies Huckleberry Hill Recreation Area. However, it should be pointed out that granitic rocks, which contain pink feldspar, intruded the Bristol Member of the Collinsville Formation as a molten liquid following its formation. "Granitic" is a compositional, as well as textural term which describes rocks which are of igneous (formed from molten magma) origin, and which are essentially composed of the minerals, feldspar and quartz. This molten material intruded and filled zones of weaknesses such as faults, cracks and layering in the metamorphic rocks. Subsequently, the material solidified as seen in outcrops on the site today. The granitic rocks, therefore, are younger in age than the metamorphic rocks they intruded. The granitic zones are found in the central and western parts of the site.

Depth to bedrock ranges from zero to probably not much more than 10 feet in between outcrops.

The tract is covered entirely by a glacial sediment called till. Till is a nonsorted sediment that was deposited directly from a former ice sheet. It consists of a complex mixture of clay, silt, sand, gravel and boulders.

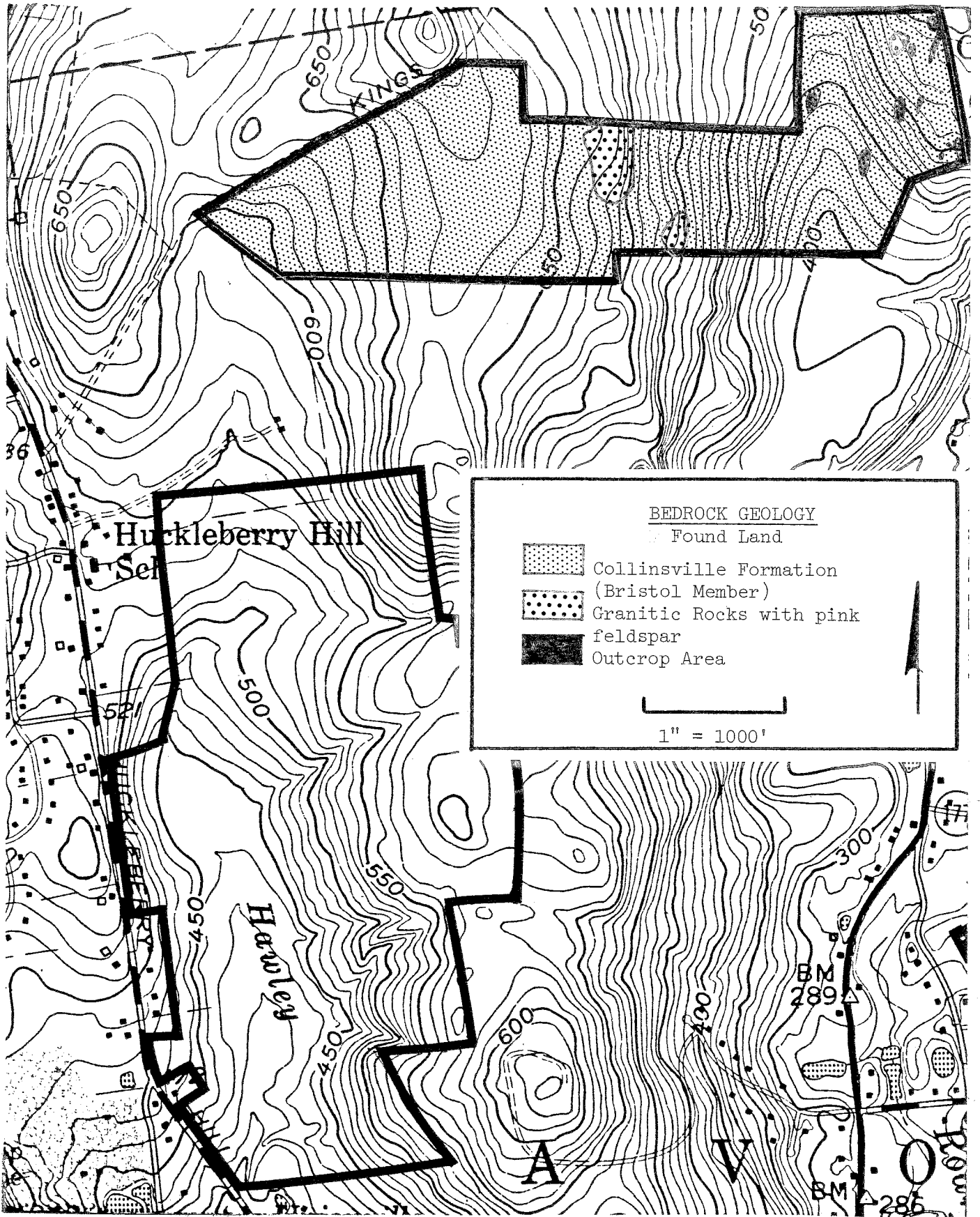
The presence of till soils and bedrock outcrops should not pose a major problem in terms of passive recreational uses, such as hiking, cross-country skiing, etc., on the site. Trails constructed on the steeper slopes in the eastern parts could become eroded if not properly construed and maintained. Also, this area may prove to be quite rigorous for some users.

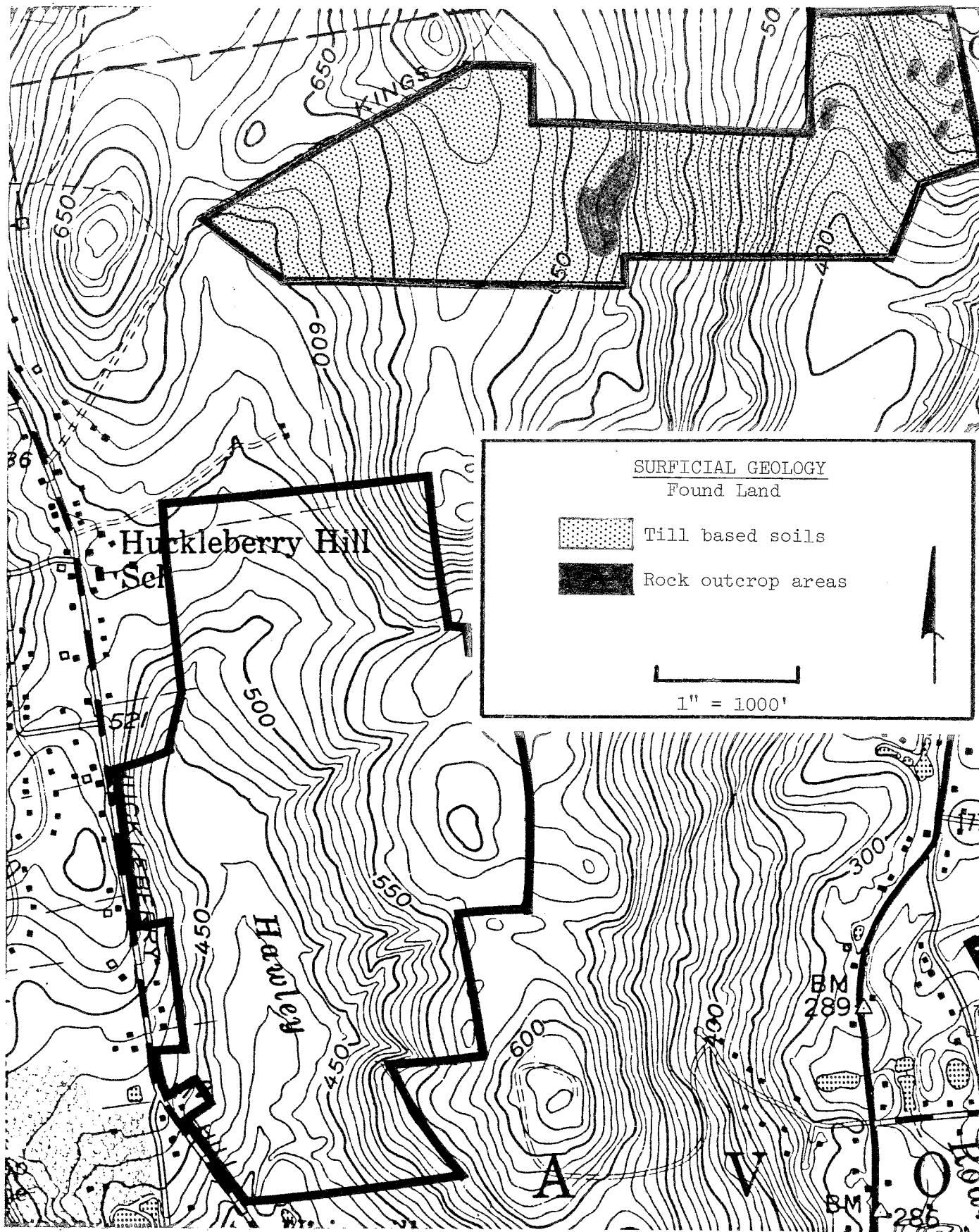


TOPOGRAPHY
Found Land

— Approximate Site Boundary

1" = 1000'





3. HYDROLOGY






Surface and groundwater originating in the central and eastern parts of the site drains to an unnamed tributary to Roaring Brook. Roaring Brook ultimately flows into the Farmington River. Surface water and groundwater originating in the western parts of the site flows downslope to Hawley Brook. Hawley Brook is also a tributary to Farmington River.

There does not appear to be any groundwater resources of particularly significant value underlying the site. The principal aquifer on this parcel is bedrock, which typically is capable of supplying only small yields to undivided wells. Nevertheless, if there is need for a water supply, bedrock underlying the site should be an adequate water source for passive recreational uses.

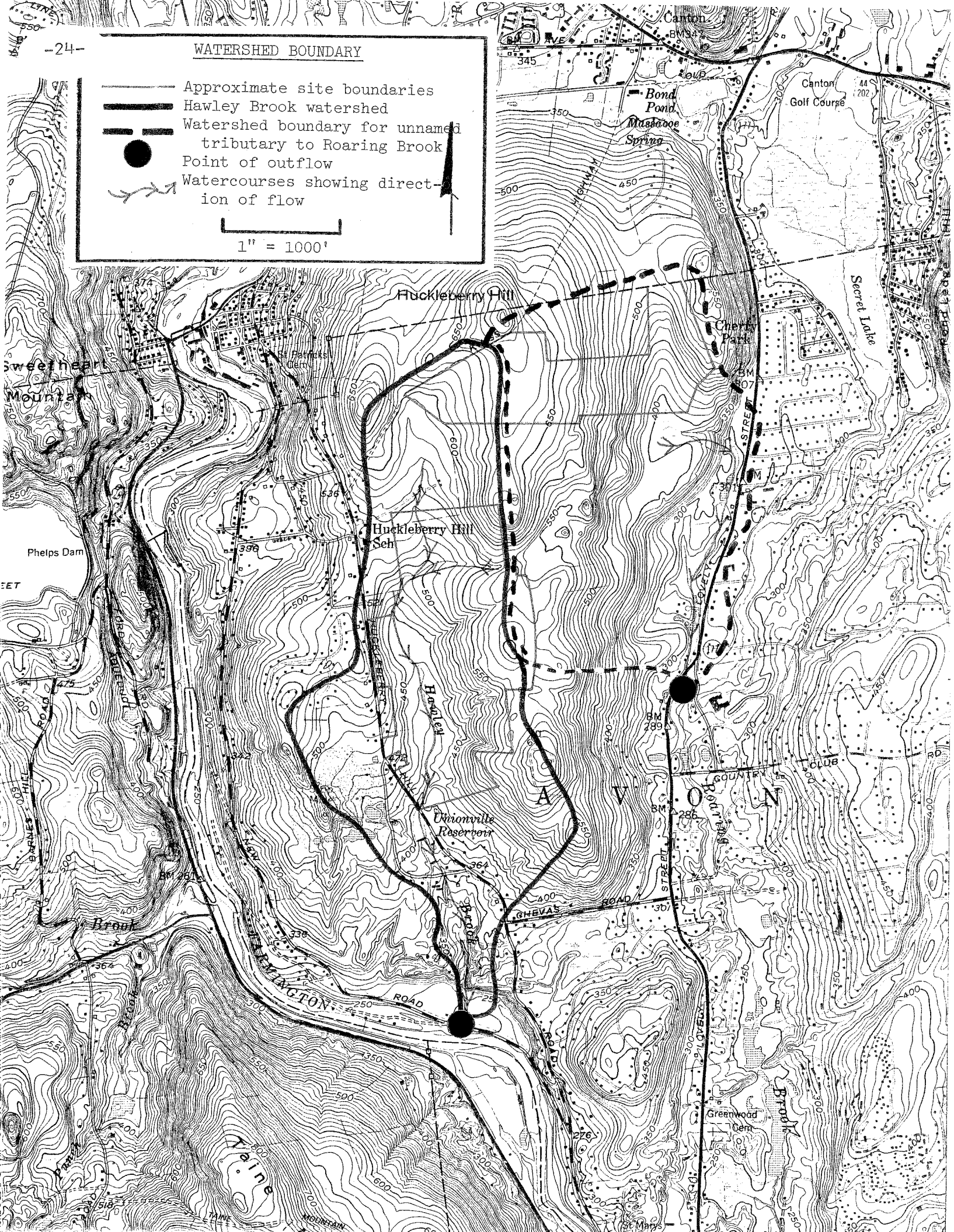
4. RECREATION POTENTIAL

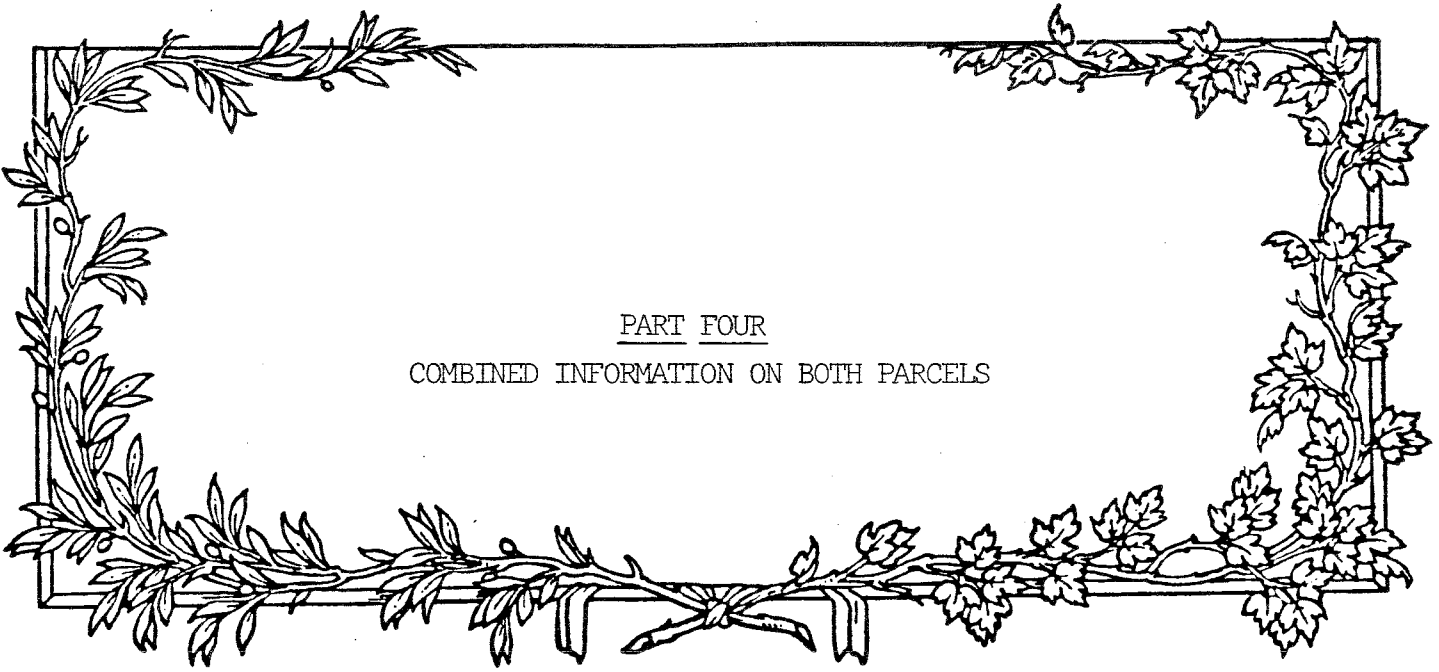
As an area of wooded upland with little or no variety or points of interest, it should be managed primarily as wooded open space, under the same options discussed for the Huckleberry Hill Recreation Area. Some trail use also may be feasible, as part of a trail system also discussed in Part 2. Indeed Kings Highway provides at least a short-term opportunity for an inter-town trail connecting to Canton Center (and to Collinsville along a branch trail). It is also strongly recommended that the Town of Avon protect its interests during any future development which may occur to prevent loss of acreage through encroachment into this presently unsurveyed property.

WATERSHED BOUNDARY

-  Approximate site boundaries
-  Hawley Brook watershed
-  Watershed boundary for unnamed tributary to Roaring Brook
-  Point of outflow
-  Watercourses showing direction of flow

1" = 1000'





PART FOUR
COMBINED INFORMATION ON BOTH PARCELS

N O T E S

1. SOILS

Due to the steepness in terrain and the fragile nature of the soils, any land use changes which promote intensive development for recreation or any other use, should be viewed with caution. There are few, if any, areas where construction of roads, ballfields, etc., could be done without the danger of erosion and possible siltation into the stream course. For these types of activities, a well-developed erosion and sediment control plan would be in order.

It was determined that because there are changes in the way soils are classified and interpreted in Hartford County, additional soils information was needed. Large portions of both parcels were evaluated with spade and auger, other areas were evaluated by air photo interpretation and the use of the Soil Survey of Hartford County, 1962. Soil maps at a scale of approximately one (1) inch equals 1,000 feet have been included to show the location of the soil map units.

The soils on the two (2) parcels have dominantly formed in deep, very stony, loose till desposits. Other soils have formed in shallow (over bedrock) till deposits, dense till deposits, alluvial materials, and a small area of glacial outwash. Below is some site specific information about the map units used.

CB, CC, CE - These map units are dominated by deep to very deep, very stony, well drained Charlton soils on various slopes. Stones and boulders cover 1 to 8 percent of the surface. Included with these soils in mapping are areas of Paxton and Woodbridge soils with a firm, dense substratum (hardpan). This is particularly true on the eastern side of the two (2) parcels. Also included are areas with a sandy or gravelly substratum, moderately well drained Sutton soils, and small areas of shallow to bedrock soils.

CHC, CHE, HCC - These map units are complexes of very deep to shallow well drained soils on the highest parts of both parcels and the western edge of the Huckleberry Hill parcel. The deep (>40 inches to bedrock) and shallow (<20 inches to bedrock) soils are so intermingled on the landscape that it was not practical to separate them at the scale mapped. The first soil in the map unit name occupies the largest percentage of the unit. Rock outcrops can cover up to 10% of the surface in very rocky units, up to 20% in the rock outcrop unit. Included with these soils in mapping are small areas of Paxton soils on the Found Land parcel, and areas dominated by very deep soils on the Huckleberry Hill parcel.

PB, PC, WC - These map units are dominated by very deep, well to moderately well drained, very stony soils formed in dense till material. Included with these soils in mapping are small areas without surface stones, and areas of Charlton soils.

LA - This unit is a complex of poorly drained, very stony soils and areas of alluvial soils. These soils are so intermingled on the landscape that it was not practical to separate them at the scale mapped. The alluvial soils flood



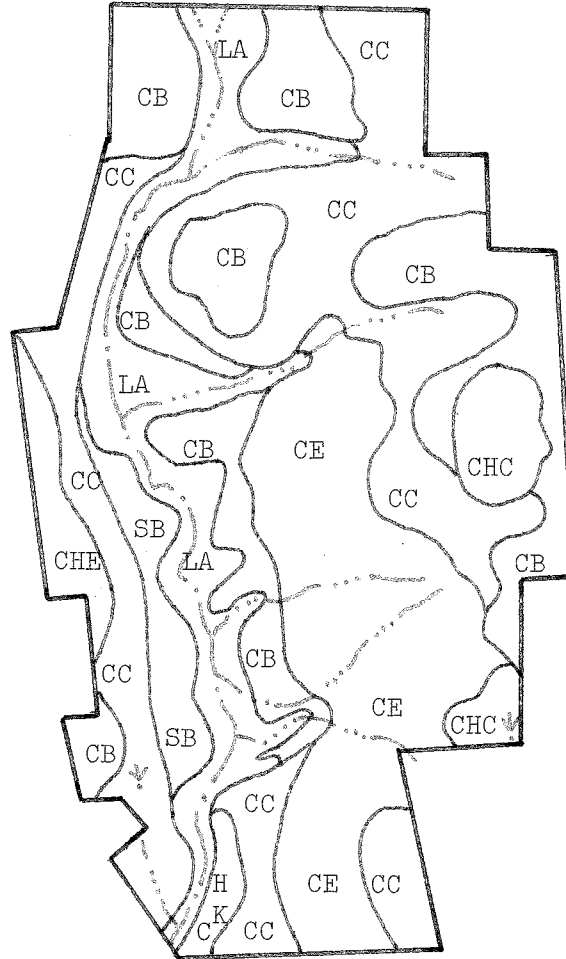
United States
Department of
Agriculture

Soil
Conservation
Service

Hartford County USDA-SCS
Midway Office Park, Room 105B
1101 Kennedy Road
Windsor, CT 06095
688-7725

HUCKLEBERRY HILL RECREATION AREA

SOILS



Scale 1" = 1000'

Perennial Stream

Intermittent Stream

Wet Spot, small area of poorly or very poorly drained soils

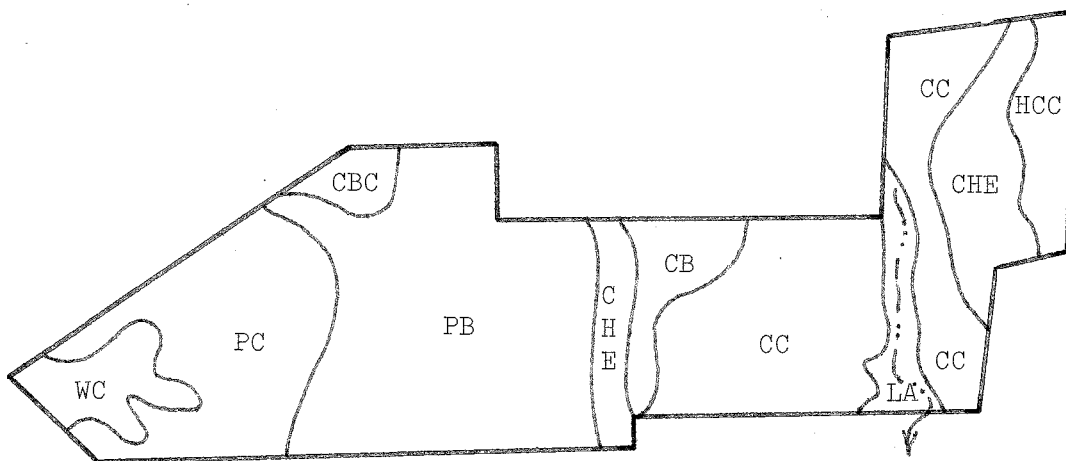


Soil Conservation Service


Hartford County USDA-SCS
Midway Office Park - Room 105B
1101 Kennedy Road
Windsor, CT 06095
688-7725


FOUND LAND


SOILS



Scale 1" = 1000'

 Perennial Stream

 Intermittent Stream

 Wet Spot, small area of poorly or very poorly drained soils

MAP UNIT GENERAL SOIL PROPERTIES DRAINAGE CLASS & DEPTH TO SEASONAL HIGH WATER MAJOR LIMITATIONS FOR THE DEVELOPMENT OF:

CAMP AND PICNIC AREAS PATHS AND TRAILS

CAMP AND PICNIC AREAS

TABLE

MAP UNIT	GENERAL SOIL PROPERTIES	DRAINAGE CLASS & DEPTH TO SEASONAL HIGH WATER	MAJOR LIMITATIONS FOR THE DEVELOPMENT OF:
CE-Charlton very stony fine sandy loams 3 to 8% slopes	Glacial till soils formed in loamy materials	Well drained >4 ft.	Large stones None
CF-Charlton very stony fine sandy loam, 8 to 15% slopes	Glacial till soils formed in loamy materials	Well drained >4 ft.	Slope Large stones None
CG-Charlton very stony fine sandy loam, 15 to 35% slopes	Glacial till soils formed in loamy materials.	Well drained >4 ft.	Slope Large stones None
CH-Charlton-Hollis complex, very rocky, 3 to 15% slopes	Glacial till soils from deep to shallow over bedrock formed in loamy materials	Well drained and excessively drained >6 ft.	Depth to rock variable slopes Large stones None
CHC-Charlton-Hollis 15 to 35% slopes	Glacial till soils from deep to shallow over bedrock formed in loamy materials	Well drained and excessively drained >6 ft.	Slope Depth of rock Large stones
DE-Distributed soils	Cut and filled by man activities. Textures are variable.	Variable	Variable
HCC-Hollis-Charlton- Rock outcrop complex, 3 to 15% slopes	Glacial till soils from shallow to deep over bedrock formed in loamy materials	Excessively drained and well drained >6 ft.	Depth to rock variable slopes Large stones None
HCD-Hickley gravelly loamy sand, 8 to 15% slopes	Glacial outwash soils formed in sandy and gravelly materials	Excessively drained >6 ft.	Slope None

MAP UNIT GENERAL SOIL PROPERTIES DRAINAGE CLASS & DEPTH TO SEASONAL HIGH WATER TABLE CAMP AND PICNIC AREAS PATHS AND TRAILS
 MAJOR LIMITATIONS FOR THE DEVELOPMENT OF:

MAP UNIT	GENERAL SOIL PROPERTIES	DRAINAGE CLASS & DEPTH TO SEASONAL HIGH WATER TABLE	CAMP AND PICNIC AREAS	PATHS AND TRAILS
LA-Lakester-fluvialquent complex, extremely stony	Glacial till soils formed in loamy materials, alluvial soils in variable materials	Poorly drained 0-1.5 ft.	Large stones Wetness Flooding	Wetness Flooding
PE-Pactor very stony fine sandy loam, 3 to 6% slopes	Glacial till soils formed in dense loamy materials	Well drained 1.5 - 2.5 ft.	Large stones	None
PC-Pactor very stony fine sandy loamy 8 to 15% slopes	Glacial till soils formed in dense loamy materials	Well drained 2 - 3 ft.	Slope Large stones	None
WC-Woodbridge very stony fine sandy loam, 8 to 15% slopes	Glacial till soils formed in dense loamy materials	Moderately well drained 1.5 - 2.5 ft.	Large stones Seasonal wetness Slope	Seasonal wetness
SE-Sutton very stony fine sandy loam, 3 to 6%	Glacial till soils formed in loamy materials	Moderately well drained 1.5 - 2.5 ft.	Large stones Seasonal wetness	Seasonal wetness

frequently and are highly variable within short distances. Included as alluvial soils are those very poorly drained areas currently influenced by beaver activity. Included with this complex in mapping are very poorly drained till soils, and small areas of moderately well drained Sutton soils and well drained Charlton soils.

Additional information on these soils can be found on the following charts.

2. VEGETATION AND FORESTRY

The Huckleberry Hill Recreation Area and the Found Land are approximately 260 acres and 150 acres of forested land.

The vegetative description for these parcels can be divided into three (3) broad vegetation cover types. These are mixed hardwood, softwood/mixed hardwood and mixed hardwood swamp. The cover types are described in more detail under the heading Vegetative Type Description. Included is a glossary of forestry terms that may appear in the text.

In general, the properties consist of forest stands of mixed sawtimber which are of moderate commercial value. Of equal or greater value is the lands' aesthetics, watershed, diversified wildlife habitat and passive recreation opportunities. The forest management potential of the properties is good and could complement the other land values.

Vegetative Type Description (See Vegetation map for locations)

The following is a broad breakdown of the vegetation cover types. The types are directly influenced by either soil conditions, past management of the property, or a combination of both. Soil types often dictates the moisture availability which can limit or restrict the vegetation's growth. Historical use of the land also influences the present vegetation type and condition.

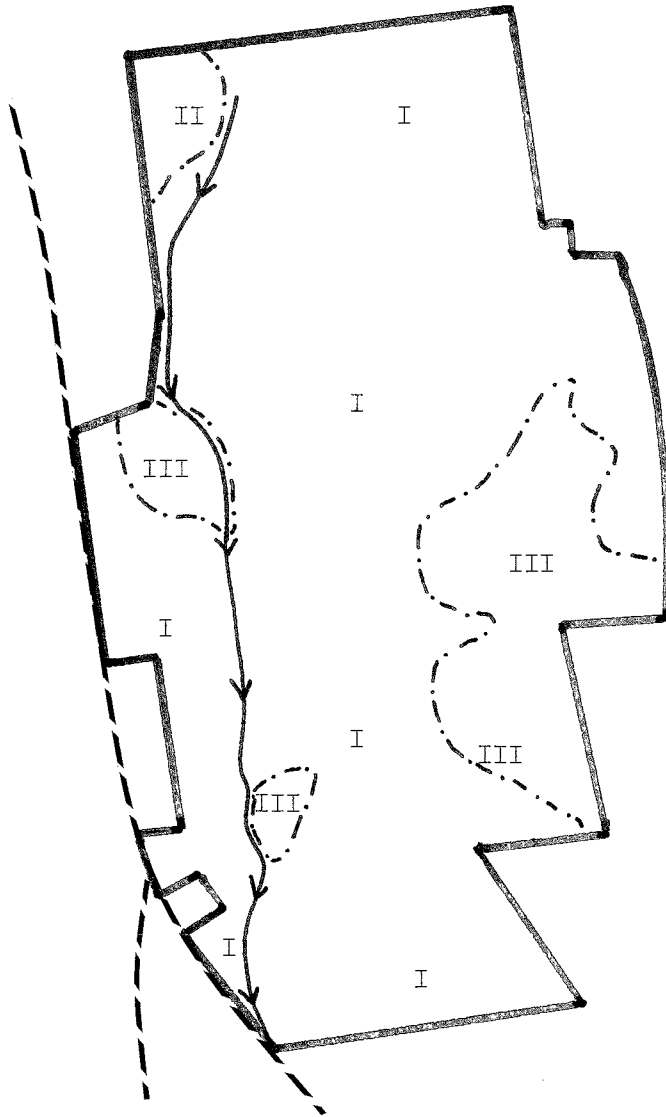
Type I - Mixed Hardwood - Approximately 180 acres of Huckleberry Hill and 120 acres of Found Land are comprised of this type. The hardwood species present are aspen, ash, beech, black birch, white birch, yellow birch, black cherry, hickory, black locust, red maple, sugar maple, yellow poplar, chestnut oak, red oak, white oak. The softwood species present are hemlock and white pine. The trees range in size from pole timber to large sawtimber. On drier sites the tendency is to find beech, white birch, hickory, chestnut oak and white pine. While on moister sites, stands tend to contain a larger percentage of ash, black cherry, black birch, yellow birch, red maple, sugar maple, yellow poplar, red oak, white oak and hemlock.

Quality of the stems for lumber production corresponds to the soil conditions, in so much as the deeper well-drained soils tend to produce better timber.

Type II - Softwood/Mixed Hardwood - Approximately 45 acres of Huckleberry Hill and 30 acres of Found Land can be considered this type. These are stands where hemlock or white pine make up a majority of the trees present. The hardwoods found in Type I may occur with these softwoods. As in Type I, the

VEGETATIVE COVER MAP

HUCKLEBERRY HILL RECREATION AREA



Type I : Mixed Hardwood

Type II : Softwood/Mixed Hardwood

Type III : Mixed Hardwood Swamp

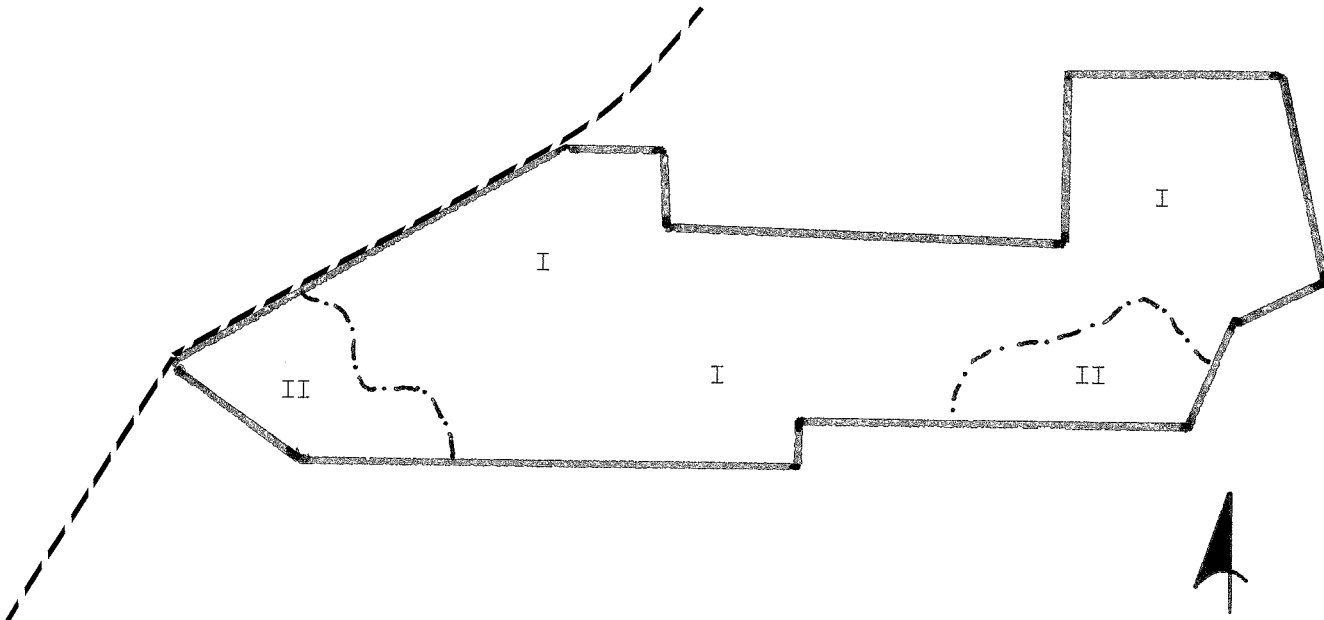
(For full vegetative cover type description see text)

Scale 1" = 1000'



VEGETATIVE COVER MAP

FOUND LAND



Type I : Mixed Hardwood

Type II : Softwood/Mixed Hardwood

(For full vegetative type description see text)

Scale 1" = 1000'

moisture availability of the site influences the occurrence and growth of the softwood species. Hemlocks tend to favor moister soils, while on drier sites, white pine is more prevalent.

Type III - Mixed Hardwood Swamp - Approximately 10-15 acres of Huckleberry Hill has been converted from Type I to Type III by the dam constructing activities of beavers along Hawley Brook. The flooding has killed off the trees that are intolerant to high water levels and have weakened the remaining trees, predisposing them to windthrow. Although the beavers are detrimental to forest management, the wetlands they create are valuable to other wildlife and greatly enhances the property's diversity of habitat.

Limiting Conditions and Potential Hazards

This section will address the factors that could limit forest management activities on either or both properties.

A major limiting factor that is a potential hazard for both properties is the lack of established boundary lines. The importance of such a practice is explained in the section on boundary lines.

Another limiting factor is the lack of access to the properties. Although the Huckleberry Hill land fronts sections of Huckleberry Hill Road, the location of Hawley Brook and the sloping terrain leading from the road to the brook limits equipment access to the majority of the property. The access to the Found Land is along Longren Road, which is town maintained only for a short distance. The legal status of the remaining portion of the road is unknown.

These two (2) factors appear to be the most limiting to managing the properties. It makes little sense to invest in managing a property if it can't be found on the ground and there is no access to it.

The natural factors that may limit operations on the properties are the soils that have poor drainage, the wetlands that were created by the beavers, and Hawley Brook. The potential hazard there is that operating commercial timber harvesting equipment in or around these areas may cause sedimentation to occur in Hawley Brook. This can be avoided by following the Best Management Practices (B.M.P.) concerning timber harvesting activities in such sensitive areas. A pamphlet dealing with timber harvesting and water quality is reproduced in this report.

Management Considerations

Forest management recommendations for the + 390 acres based on observations from walking the properties for only a day would be very general. A detailed forest management plan would require a more intensive forest stand inventory than the E.R.T. process can offer. Further assistance in forest management planning can be obtained from a public service forester with the Connecticut Bureau of Forestry or a private consultant forester. For information about such services or to obtain names of consulting foresters, contact the Connecticut Bureau of Forestry's Pleasant Valley office at 379-7085 or write P. O. Box 161 Pleasant Valley, Connecticut 06063.

Timber Harvesting Considerations

If the Town has already made a decision to selectively harvest timber, special attention should be given to road and skid trail layout. The harvesting process will provide a special opportunity to get trail layout done if that is a desirable goal. Cross-country skiing, hiking, and rough terrain running are all possibilities on either of these parcels. The consultant, retained by the Town, could probably do this but he or she would need input from the townspeople on intensity of use, etc. Much of the terrain is steep and erodible. Therefore, during the harvest operation, proper provisions should be made for erosion control and controlling surface runoff. Natural drainage ways may need structural measures such as amoring with stone. Most E & S provisions would likely be in planning road locations and re-seeding. There are many specimen quality oaks, tulip poplar, and other hardwoods which add to the scenic character of the parcels. If trails are a desirable alternative, they should pass near some of these trees, and these trees be retained from the harvest cut.

CONNECTICUT BUREAU OF FORESTRY - FOREST PRACTICE DESCRIPTION

Boundary Lines:

The adage, "Good fences make good neighbors", can be expanded to include boundary lines. Connecticut is a state with a high population density and generally small, fragmented ownership patterns. Boundaries can be, at times, a maze with no discernable identifying features on the ground.

Boundary lines can be the first line of defense against trespass problems, both accidental and malicious. Well maintained and highly visible boundaries can minimize accidental trespass and, since the possibility of accidental trespass is alleviated, only the most callous timber poacher would chance being caught 'over the line'.

Landowners should consciously allocate sufficient time annually to perform necessary maintenance. Each fall and winter a landowner should locate, brush out, blaze, and paint enough of the boundaries to be able to cover all of them over a 3 or 4 year period.

In general, woodland boundaries should be clear of brush. Trees along the line should be blazed, (a chunk of bark removed with an axe to reveal solid wood), and the blazes painted with a long-lasting latex exterior paint, preferably white. Corners should be prominently identified by locating 3 'witness' trees surrounding the corner and then cutting 3 blazes on each tree, facing the corner point. Again, these blazes should be painted. It probably is not a good idea to blaze and paint your neighbor's trees.

CONNECTICUT BUREAU OF FORESTRY

GENERAL GLOSSARY

BOARD FOOT - A unit of measure represented by a board 1 foot long, 1 foot wide, and 1 inch thick. Abbreviated b.f., (see also M.b.f.)

CONSULTANT FORESTER - A forester who is self-employed, providing services to landowners in the management of their forestland. Many times consultant foresters are granted the right by the landowner to act as the landowner's representative in supervising forest management activities on their forestland.

CORD - A unit of measure of stacked wood measuring 128 cubic feet, normally stacked 4'x4'x8'. This is the only legal unit for the sale of cordwood in Connecticut. Technically, terms such as "truckload", "stack", or "pile" cannot be used in the sale of cordwood.

CROP TREE - A tree which is selected to be among the final crop of trees. Many times thinning is done in stands to provide "crop" trees with additional light and nutrients.

CULL TREE - A live tree which is not now, and never will be, merchantable as sawlogs because of excessive defect, or rot or due to the species being unmarketable.

D.B.H. - Diameter at breast height - The diameter measurement of a tree 4 1/2 feet above the ground.

DIAMETER LIMIT CUT - Refers to the harvest of trees above a certain diameter- for instance- all trees above 14" D.B.H. will be cut. This may or may not be a sound practice.

FORESTER - An individual educated in the profession of forest management. No legal definition exists in the State of Connecticut.

FOREST MANAGEMENT - An attempt to manipulate nature's tendencies. By working with nature's cycles a forester can change growth patterns and alter species composition in order to meet the owner's objectives, be it for sawtimber, fuelwood, wildlife, recreation or other values.

GRADE - The quality of a sawlog or tree based upon its potential for use as high quality products. Grade is influenced by log size, surface blemishes and interior defects.

INDUSTRIAL FORESTER - A forester employed by a wood using firm (usually a sawmill or log broker). Generally the forester is involved in wood procurement.

LANDING - Concentration area where cut trees are brought and cut to log length and await trucking. Also called yarding area.

LOG/SAWLOG - A length of a tree meeting minimum commercial size for the production of lumber. Usually a minimum of 8 feet long with a minimum small end diameter of 8 inches.

LOP - To cut logging slash into segments so that it will not exceed a specified height above the ground. For example, some contracts may require that all slash be lopped to within 6 feet of the ground.

M.B.F. - Thousand Board Feet- Logs and standing sawtimber are usually bought and sold on a per thousand board feet basis. A landowner might sell his trees for \$ XX.XX per M.B.F.

PERFORMANCE BOND - A bond to ensure satisfactory performance of a job. Many timber sales are sold with the owner holding a performance bond to ensure compliance with the sales agreement.

POLE/POLE-SIZED - Refers to trees that are between 4 and 11 inches in diameter. Measurement taken at D.B.H.

REGENERATION - The act of establishing a new generation of trees whether by natural or artificial means. The young crop itself is usually referred to as reproduction.

SALES AGREEMENT - Commonly called a contract. A written agreement between the seller of forest products and a purchaser detailing the terms under which those products are sold.

SAPLING - Refers to trees less than 4" in diameter but greater than 1" in diameter. Measurement taken at D.B.H.

SAWLOG - See log.

SAWTIMBER - Refers to trees greater than 11" in diameter and meeting the minimum requirements for producing sawlog material. Measurement taken at D.B.H.

SCALING - Measuring the volume of trees, logs or other wood products (cordwood), using customary units such as board feet or cords.

SEEDLING - Refers to trees less than 1" in diameter. Measurement taken at D.B.H.

SELECTIVE CUT - One of the most common, least understood, and most abused terms. The selection system, by definition, is a system used to create or maintain an unevenaged forest. A selective cut is commonly applied to a sawtimber harvest where the criteria for "selection" is expressed as "those trees which should come out."

SILVICS - The underlying laws of nature governing the growth of single trees and of the forest as a biological unit.

SILVICULTURE - The art of producing and tending a forest through the theory and practice of controlling its establishment, composition and growth.

SITE INDEX - A measurement of the potential of a given site for growing trees. In the eastern United States growing sites are evaluated by determining how tall a certain tree species will grow in fifty years. As an example, a red oak that achieves a height of 70 feet after growing 50 years would indicate a site index of 70.

SKIDDER - A four wheeled drive, articulating, rubber tired machine used to move logs (usually tree length) from stump site to a landing area.

SLASH - Woody material or debris left on the ground after an area has been logged. May include tops of sawtimber trees that were removed as well as smaller trees that are severely damaged or bent over.

STAND - A basic forest management unit. A group of trees which are uniform enough in species composition, age arrangement, and condition so as to be distinguishable from the forest in adjoining areas.

STUMPAGE - Refers to timber volume (sawtimber or poletimber) found in standing trees.

STUMPAGE VALUE - refers to the value of standing trees, be it for logs (\$ per M.B.F.) or cordwood (\$ per cord).

SUCCESSION - The gradual replacement of one plant community by another. Pioneer species are the first to inhabit an area and are generally not tolerant of shade, whereas a climax community is the last, and is tolerant of shade.

TIMBER MANAGEMENT - Management of the forest with the prime objective being the production of timber crops.

T.S.I. - Timber Stand Improvement - Removal of unacceptable growing stock and cull material not part of a commercial operation. Purpose is to improve species composition, condition, quality, or rate of growth.

TOPS - Limbs left from large trees removed in a timber sale. Part of the slash.

VENEER LOGS - High quality logs that are peeled or sliced into thin sheets for fine products (paneling, furniture). Highest quality log available.

TREES ARE A CONNECTICUT RENEWABLE RESOURCE



Managing a woodland improves the forest, provides better wildlife habitat, helps local industry, is a source of fuelwood, provides income to the landowner and is an important investment in the future.

Printed as a service to the public by the Connecticut Forest and Park Association, Inc., 1010 Main Street, P.O. Box 388, East Hartford, CT 06108.

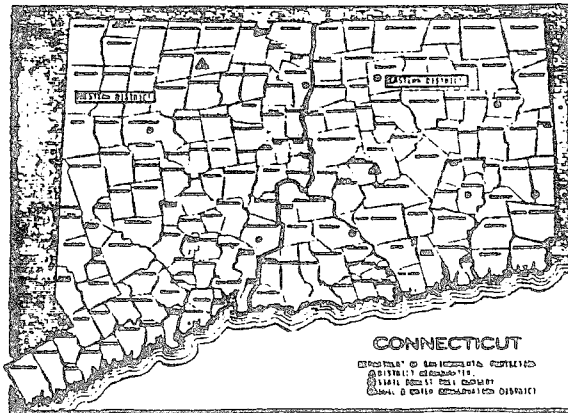
LOGGING AND WATER QUALITY IN CONNECTICUT



A Practical Guide For Protecting Water Quality While Harvesting Forest Products

Developed by the Connecticut 208 Forestry Advisory Committee, 1982.

During the past few years, the importance of protecting water resources from pollution has been recognized at national, state and local levels of government. New plans and programs directed toward the control of water pollution are being formulated and implemented. Clearly, cooperation between the private sector and responsible government agencies, under the guidance of regulatory monitoring where necessary, is central to the attainment of clean water planning goals.



This document has been financed in part through a grant from the Environmental Protection Agency under the provisions of Section 208 of the Federal Water Pollution Control Act, Amendments of 1972, and was developed under the direction of the Department of Environmental Protection, State of Connecticut.

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While some pollutants are easy to identify and control, others, particularly those associated with agriculture and forest management activities, are more difficult to address. In particular, soil loss from logging operations is now perceived by the public as a source of pollution in our rivers and streams. Loggers, foresters and landowners can expect increasing pressure from the public to do a better job of protecting forest soils and of minimizing the impact of harvesting activity on water resources.

In short, those involved with cutting cordwood, cordwood or other forest products will have to do a better job of protecting natural resources voluntarily or the public will impose controls through state and local regulation.

In 1979, a field study and analysis of some thirty Connecticut logging operations was conducted. Detailed results of that survey are available at the State Forestry Unit, 365 Capitol Avenue, Hartford, CT, 06115 (556-3348). In brief, the study found no serious water quality degradation associated with forest management activities in Connecticut. It did point out, however, that site-specific problems could occur, particularly with sedimentation.

The recommendations presented in this pamphlet were developed by a statewide committee of interested citizens representing many natural resource interests, including the Wood Producers Association of Connecticut. The Committee, formed under the auspices of Section 205 of the Federal Water Pollution Control Act of 1972, suggests that these Best Management Practices (BMP's) are effective, are practical, but do require planning, and, most important of all, require cooperation of loggers, landowners and foresters.

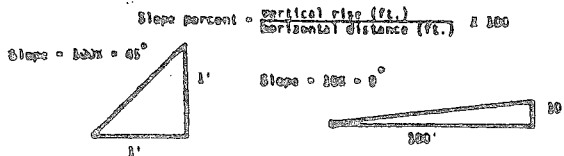
Unusual situations may arise or pollution control measures other than those recommended here may be found. Common sense is most often the best guide to what is needed. Readers should realize that other forest management practices, such as use of pesticides or fertilizer, and forest fires can also lead to water quality problems but are not included in this publication.

Robert L. Corrahy
 Robert L. Corrahy
 State Forester

DEFINITIONS

Terms used in this pamphlet are defined as follows:

- Access Road:** generally a gravel surfaced or improved haul road upon which forest products are transported by truck or trailer. Skidding of logs along the road surface rarely occurs.
- Skid Trail:** roads or trails upon which logs are skidded from the stump to a processing area or landing. Skid trails may be used for only a few to a great many logs. Trail surfaces are rough and often subject to erosion.
- Landing:** loading area where logs are gathered, cut to length, sorted and loaded on trucks for transport to a mill.
- BMP:** best management practice -- a practical, economical and effective management or control practice which will reduce or prevent the generation of pollution.
- Water Pollution:** any condition which leads to poorer water quality. In forestry, pollutants may be sediment, logging debris, chemicals and soil nutrients or increased water temperature.
- Erosion:** the movement of soil by running water.
- Sedimentation:** soil and organic material deposited in low areas and water bodies by flowing water. There must be erosion to have sedimentation. Because sediment is material introduced into a water body or wetland, it is considered to be a pollutant.
- Conservation Seed Mix:** commercially available seed mixtures used to revegetate skid roads, landing areas, etc.. Plant species included germinate quickly, grow rapidly and are often attractive as food for a variety of wildlife. Additional information is available at the local County Soil and Water Conservation District Offices.
- Slope Percent:** the angle of a hill slope expressed in terms of "degrees" or "percent". A vertical rise of one foot in a horizontal distance of one foot equals a 100 percent or 45 degree slope.



EROSION

The most common pollution problem associated with logging is erosion, the process by which the ground surface is worn away by water. The eroded material often finds its way into streams and water bodies as sediment. Most erosion comes from logging roads, skid trails, and landings. It almost always looks bad, may result in public complaints, and can lead to difficult operating conditions. Resulting sedimentation can create serious water quality problems.

- Virtually all erosion caused by timber harvesting in Connecticut occurs during logging operations or during the year following logging.
- Effective erosion control measures do not require specialized equipment or knowledge. Regular logging equipment and common sense is all that is necessary.
- In most cases, control of erosion enables more efficient operations and most certainly provides for improved public relations.

WATER PROBLEMS

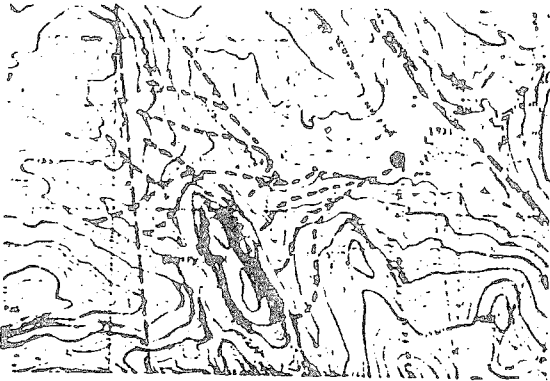
Water that moves rapidly and water that does not move at all creates problems. The key to erosion control and efficient harvesting is keeping water from concentrating in confined areas on logging roads, skid trails and landing areas.

- Confined, rapidly-flowing water causes erosion and gullying.
- Confined, non-flowing water creates mud holes and may lead to serious rutting, but does not cause erosion.
- Deterioration of logging roads, skid trails and landings causes difficult working conditions, increased costs of operations and criticism from landowners and the public.

Control of water should be a major consideration during the entire harvesting operation:

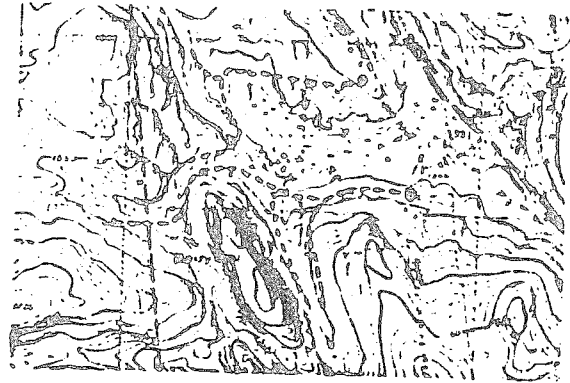
- During the planning process (and every job should be planned).
- During logging.
- After logging is completed.

Typical logging layout - unplanned



Note skid trails going straight up and down hills and crossing creek and the location of the landing adjacent to a swampy area -- Many potential water problems.

-6-



Planning eliminated stream crossings, reduced the steepness of skid trails and, by utilizing two landings, skidding distances were greatly reduced.

LAYOUT OF SKID TRAILS

Proper placement of logging roads, skid trails and landings is the most effective method of controlling water problems and erosion associated with forest products harvesting. Before beginning an operation, a harvest plan should be made. A plan may be as simple as a walk through the woodlot to identify potential problem areas, or as detailed as a proposal complete with maps and specific instructions. In any instance, the time spent in planning will pay for itself in more efficient operations.

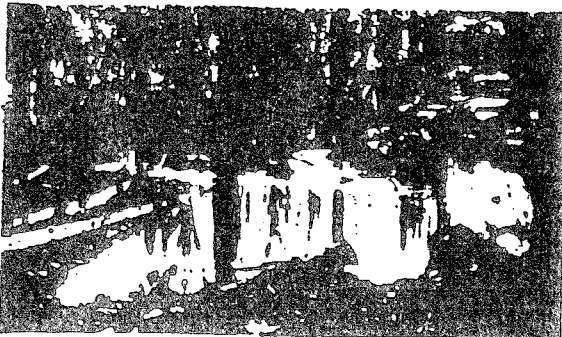
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STEEP SLOPES



Skid trails and logging roads should avoid slopes exceeding twenty percent, except for short distances. (A skidder will coast on slopes of five - ten percent; logs will roll on slopes steeper than fifteen percent.)

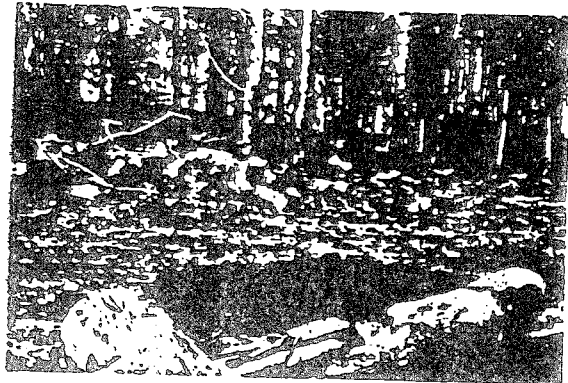
FLATS OR NO SLOPE



-8-

Avoid wet flats (less than two percent slope), boulders, benches or other areas where water cannot be drained away, or log these sections when frozen or dry. Side hill locations with slope sufficient for controlled drainage are preferred for skid trail routes.

NET LANDINGS



Landings should be located on well-drained soils, with a slight slope away from the access road. Good chips, bark or sawdust can improve operating conditions, but should not be used as a substitute for a proper location.

-9-

STREAM CROSSINGS:

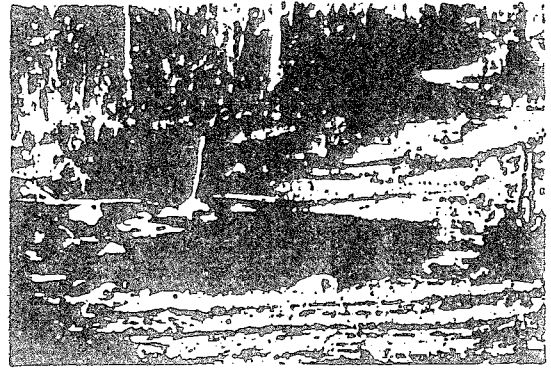
Avoid crossing brooks and streams when practical. However, there are so many water courses that some crossings are inevitable. Locate crossings at right angles to stream flow and avoid steep approaches to the stream bed. If possible, a sediment-catching pool, either natural or man-made, should be located immediately downstream from a skid trail crossing.

POOR LOCATION:



This poorly-located crossing will continue to cause water quality problems long after the logging is completed.

GOOD LOCATION:

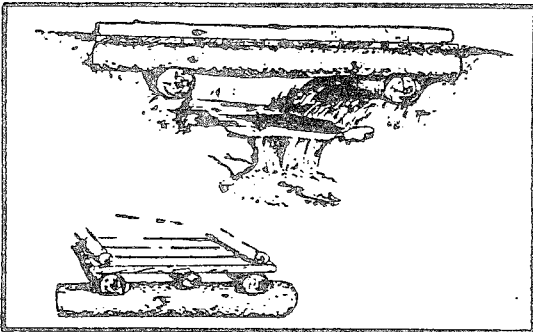


Hard stream bottom minimizes bed disturbance. Gentle approach slopes lessen bank erosion. Rock taken from old stone fences can improve crossing sites so long as the stream channel is neither altered or damaged. At completion of operations, stream banks and approaches should be graded to approximate natural conditions.

BRIDGING:

If a suitable stream crossing site cannot be located, a simple log bridge should be used. Log corduroy (crossing on logs piled in stream channel) is not usually recommended because of the potential for channeling water and subsequent uncontrolled washout. Culvert installation may require a permit for depositing fill in a wetland area. Streams too large to bridge probably should not be crossed at all. All temporary structures used in stream crossing must be removed at completion of operation.

SIMPLE BRIDGE



Bridge must be wide enough to accept the largest log to be skidded over it. Bumper logs may aid in keeping material from slipping off bridge. Plank deck is relatively inexpensive, safe and helps prevent shifting of support logs.

BUFFER STRIPS

To protect water courses further, buffer strips of undisturbed land should be left between the water and skid trails, roads and landings. Depending on slope, buffer strips should be from 20 to 100 feet in width. Graded material will settle out on these areas before reaching the water course. Some cutting may be allowed in a buffer strip, but the use of a skidder or tractor in the area should be avoided.

III. HARVESTING OPERATIONS

During active harvesting operations, the potential for damage to logging roads, skid trails and landings from water erosion is greatest. Continual soil disturbance by logging equipment creates a condition where even light rain can cause erosion. Control measures must minimize the amount of soil disturbance and erosion and prevent soil that is eroded from entering water courses as sediment.

GRAVEL ROADS

Most roads in Connecticut are publicly maintained. Loggers who must construct access roads to landings should be sure that there is adequate side drainage, that sufficient gravel is used to provide a firm travel surface, and that there is enough crown to prevent standing water. Sediment basins should be constructed where roadside ditches approach water courses.

SKID TRAILS

Since skid trail surfaces are subject to constant disturbance, construction of water control measures on them is usually not practical.

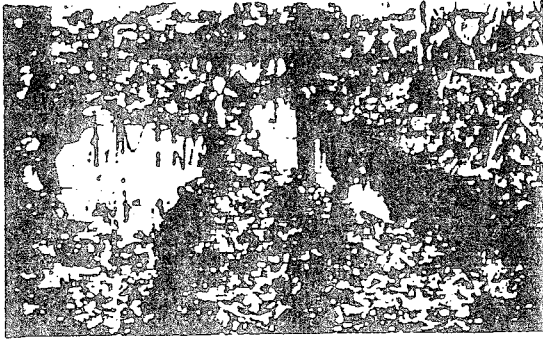
The keys to skid trail maintenance are:

1. Minimize the amount of water reaching the trail, and
2. get water off the trail as quickly as possible.

The best methods for controlling water on skid trails are:

1. proper location of the trails in the planning process,
2. keeping natural drains open, and
2. improving drainage where necessary.

NATURAL DRAIN - INCORRECT



The area shown above could have been improved greatly if the natural drain pattern was kept open. Unless water is removed, a mud hole will only get worse.

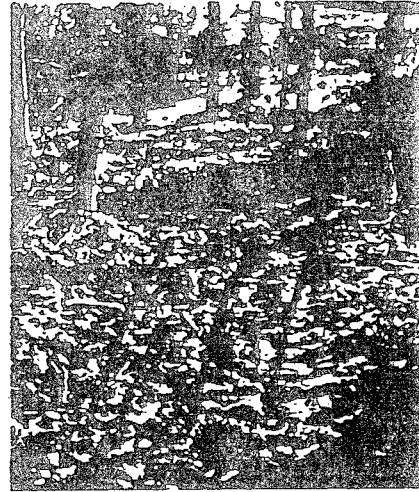
NATURAL DRAIN - CORRECT



Periodic cleaning of debris and mud kept this natural drain open and prevented the development of impassable condition.

WATER BARS

A water bar is a ridge of soil and stone, after reinforced with a log, constructed at an angle to the slope of a skid trail, which causes water run off the side of a trail rather than running down it.



To be effective, a water bar must be correctly angled, be high enough to prevent overtopping by water flow and be broad enough to sustain some traffic use.

Water bars are easy to install with a blade of a skidder or tractor. Spacing of water bars depends on the steepness of slope. While there are several formulas for determining spacing, common sense dictates that diversion is necessary whenever there is an uninterrupted grade of 80 - 100 feet in length. However, traffic on a main skid trail will destroy water bars quickly, so other drainage systems are preferable during operation.

2. Avoid wet areas. No tree is worth getting stuck. Work in an alternate area until wet locations dry out in the summer or freeze in the winter.
3. Take special care in buffer zones near water bodies. Trees should be felled away from water. Any that fall into water courses should be removed, tops and all.
4. Use the winch! While winching may require more time than driving a skidder to each log, site disturbance, particularly in buffer zones and wetlands is minimized with judicious winch use.
5. Avoid driving up steep slopes. While a skidder may well traverse a 30-degree incline, spinning wheels and repeated trips create ruts which lead to erosion.
6. Stick to established skid trails. Too often a wet spot develops and the skid trail is moved a few feet to the side to go around the problem. Water then fills in the new trail and another move is made, eventually resulting in major disturbance. Locate original skid road to avoid wet areas and, if necessary, relocate the trail far enough from the problem location to avoid "multiple-lane" situations.

LANDINGS

Inadequate landing facilities are often the "bottleneck" that restricts a harvesting operation. Landing areas should be:

1. Of adequate size: use two landings if one is not large enough.
2. Set back from public roads: a screen of uncut forest will minimize complaints.
3. Well-drained: building a short access road to a suitable site is less expensive in the long run than fighting a wet area closer to a public road.
4. Clean: short blocks, branches, oil cans, excess scrap metal and tires can take over a landing. Clean up trash and push back sawdust and blocks on a regular basis. A clean landing is a better work area and provides a more attractive appearance for the public.
5. Free of oil dumps: crankcase drainings and hydraulic oil spills can pollute nearby water for years. Be careful of spills. Dispose of old lubricants in an approved manner. Store in leakproof metal drums and return to a collection point (service station or auto repair shop) for recycling.

DRAINAGE DIPS

A drainage dip is a depression created in a skid trail for the specific purpose of slowly diverting the flow of water. The dip may be 20 - 40 feet in length, with gradual slopes and the deepest point approximately one foot below the average grade line. Constructed with the blade of a skidder or tractor, a dip does not interrupt traffic, wears at the same rate as the rest of the trail and, if the runoff end is kept clear, will serve as an effective and long-lasting drain.

DRAINAGE DIP DESIGN



Spacing Between Drainage Dips

Road Grade (Percent)	Approximate Distance Needed Between Dips (feet)
1	200
2	300
5	150
10	80

Drainage dips will not work on a steep slope because water runs over the low side, but they do work well at the feet of a slope.

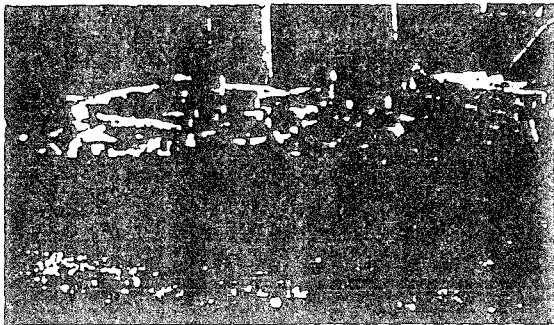
IMPORTANT: Proper location of skid trails minimizes the need for water control structures during the operation.

RECOMMENDED PRACTICES

The best skidder operation in the world will create unnecessary disturbance if the trees cut are not readily accessible. The timber feller must be familiar with the skidder capabilities. Both feller and skidder operator should know the cutting area layout and plan for harvesting. A forester involved with timber marking should know the extraction problems faced by harvesting crews. To minimize unnecessary disturbance, the following suggestions are offered:

1. Trees marked for harvesting must be accessible. Enough stems must be removed to allow the feller to get trees down and the skidder to remove them. Cutting an additional tree is usually preferable to requiring an additional skid trail.

BUILT-UP SKID TRAIL LANDING



Note there is adequate space to drop a turn of logs, to buck and sort and to load a truck. The surface area is dry and uncluttered.

III: COMPLETING THE JOB

Like the planning phase of logging operations, closing down a logging job requires time and effort that does not make money and may, in fact, cost some. However, the condition and appearance of a woodlot after cutting makes the reputation of the logger. When someone leaves a mess, the word gets out quickly. Conscientious loggers rarely have trouble finding woodlots.

Any harvest operation creates disturbance, but the area should be left in a condition that insures no continuing effects after the loggers have gone. Water, of course, is still the major concern. A skidder rut can become a gully. Tree tops in streams may cause channel bank erosion. Sediment from landings may damage streams and ponds.

After the logging operation is completed, begin immediately to install erosion control measures. Skid trails, roads not suited to continued use, and landings should be "put to bed".

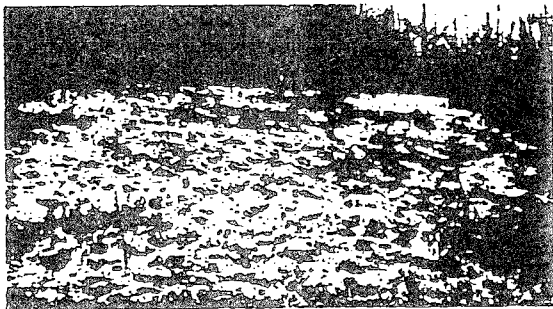
1. Back-blade major skid trails to fill in ruts and smooth the surface. It does little else and does much to soothe the landowners' feelings.
2. Install water bars where necessary and clean out drainage dips and natural drain areas. It is better to have extra drainage than not enough.
3. Place brush and slash in the skidway, in ditches or in graded areas to slow water flow and retain sediment.
4. Culverts, bridges or other temporary structures placed in water courses should be removed.
5. Grade approaches to stream crossings to approximate original conditions.
6. Clean-up and grade landings. No logging debris or trash should be left and the landing surface should be graded so water flows away from the access road.
7. Limb and seed the landing, approaches to stream crossings and steep skid trail sections. Annual rye or a commercial mix of conservation plant species gives excellent, quick cover, providing additional erosion protection and making the area look more attractive. Wood chips, sawdust and old hay make excellent cover material for critical areas, providing protection from erosion until natural vegetation becomes established.

Conservation plant mixes, available at farm supply stores, also provide food for and cover for wildlife -- the landing then becomes a resource benefit.

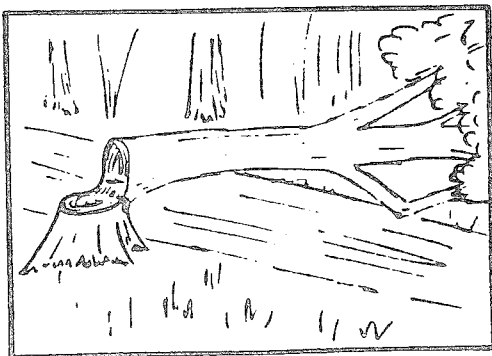
8. PREVENT CONTINUING ACCESS unless part of the skid trail system is to be used on a regular basis. Heavy use by motorcycles and horses can have an effect more detrimental than the original logging. An effective barrier is a medium-sized tree felled so the top is in the skid trail and the butt is still partially connected to the stump. The tree cannot be moved without additional cutting and stays partially alive for a long period. Because of potential hazard liability, chains and cables are not recommended for gates.

REMEMBER: a small amount of extra effort at the end of the harvesting operation can go a long way in protecting the soil and water and in maintaining good landowner and public relations.

LANDING: "PUT TO REST"



TREE-TOP TRAIL BARRIER



ACKNOWLEDGEMENT

This guide was developed through the cooperative efforts of the Connecticut 205 Forestry Advisory Committee. Group members represent public and private resource management agencies, conservation groups, industry, private landowners and the public at large. The intent of the publication is to promote better harvesting practices in Connecticut woodlands.

Guidelines do not solve problems -- people do. However, it is hoped that by accepting and adhering to these recommendations, foresters, loggers and landowners, working together, can avoid situations that create a need for local regulation of the industry.

Additional technical advice and information on best management practices or other aspects of forest products harvesting may be obtained from:

State Forester's Office
165 Capitol Avenue
Hartford, CT 06115
Tel. 866-5346

Eastern District Hdqrs., DEP
209 Mebron Road
Charlborough, CT 06447
Tel. 295-9523

Western District Hdqrs., DEP
P.O. Box 161
Pleasant Valley, CT 06053
Tel. 379-

State Forest Tree Nursery
RFD #1, Box 23A
Valentia, CT 06364
Tel. 376-2513

2025

Carol Venable
SCAD/Intension Forester
Box 4-87
University of Connecticut
Storrs, CT 06269
Tel. 485-2079

Assistance and advice concerning soils, erosion control, drainage systems, and construction of road and ponds may be obtained from the Soil and Water Conservation District in your county.

#0115

Fairfield County SSWCD
Route 6, Stony Hill
Bethel, CT 05601
Tel. 743-6453

Middlesex County SSWCD
Extension Center
Madison, CT 05426
Tel. 245-0511

Hitchcock County SSWCD
Agricultural Center
Hitchfield, CT 05709
Tel. 657-0266

New London County SSWCD
652 New London Turnpike
Norwich, CT 06250
Tel. 887-4163

New Haven County SSWCD
Agricultural Center
322 North Main Street
Bellingford, CT 06492
Tel. 269-7509

Windham County SSWCD
Agricultural Center
P.O. Box 112
Brooklyn, CT 06234
Tel. 774-0224

Meriden County SSWCD
346 Broad Street
Glimmer, CT 06095
Tel. 656-0946

Tolland County SSWCD
Tolland Agricultural Center
24 Hyde Avenue
Vernon, CT 06066
Tel. 875-2881

USDA Soil Conservation Service
Hansfield Professional Park
Route 63A
Storrs, CT 06268
Tel. 829-9361

3. WILDLIFE

The study site (+ 390 acres) consists of two (2) parcels of land separated by 1500 feet of private land. The northern parcel named Found Land (+ 150 acres) is a forested area comprised of mixed hardwood and softwood/hardwood types in the low sites and red oak on the steeper terrain. The southern parcel named Huckleberry Hill Recreation Area (+ 260 acres) is predominantly forested with mixed hardwoods and several smaller areas with conifers. There also are wetlands consisting of Hawley Brook and two (2) beaver created impoundments of approximately 1/2 acre and five (5) acres within the Huckleberry Hill site.

Mixed Hardwood/Oak Forestland

This habitat type includes a variety of hardwood species dominated by red oak. Other species include birch, ash, hickory, red maple, white oak, and tulip. On steeper terrain the forest type becomes a red oak site.

Understory vegetation is diverse including laurel, hardwood seedling/saplings, poison ivy, virginia creeper, club moss, viburnum, spicebush, arrowwood, raspberry, and barberry.

Wildlife frequenting such sites include deer, turkey, gray and flying squirrels, woodpeckers, various passerines and numerous other non-game species (i.e. shrews, chipmunks, mice, amphibians and reptiles).

Conifers

Conifer cover within the study site includes small stands of white pine, hemlock and softwood/mixed hardwood types. This vegetation is important as roosting, nesting, and escape cover for various birds such as owls, hawks, and mourning doves. They also provide habitat for seed eating birds such as black capped chickadees and ruby and golden crowned kinglets.

Wetlands

The wetland type (non-active recreation) consists of two (2) small beaver impoundments (1/2 and 5 acres) associated with Hawley Brook within the mixed hardwood forest. In addition to various tree species surrounding the impoundments vegetation includes nettle, arrowwood, spicebush, alder, jewelweed, trillium, skunk cabbage, ferns, and sedges and rushes. There is a good distribution of snags (a standing dead or partially dead tree) and downed timber.

Wildlife observed at this site were great blue heron, deer, muskrat, red winged blackbird, flicker, and warblers. Other species typically utilizing such habitat include beaver, otter, mink, raccoon, waterfowl (i.e. wood duck, mallard, black duck), woodpeckers, passerines and numerous amphibians and reptiles. The two (2) sites do not appear to have beaver presently.

Discussion

In a small, but heavily developed and highly populated state like Connecticut, where available habitat continues to decline on a daily basis, it is critical to maintain and enhance existing wildlife habitat. The manipulation of vegetation is a major part of wildlife management. Sustaining wildlife populations means regulating on a continual basis the kind, the amount, and the spatial arrangement of food and cover plants to provide the needs of wildlife.

Wildlife goals for the site should include production of optimum habitat diversity to maximize production of wildlife species compatible with carrying capacity and current land uses. This can be done by creating and/or maintaining a diversity of food and cover with a mosaic of nesting, resting, and loafing sites scattered throughout the site. The following guidelines will help to improve conditions within the various habitat types as well as provide a basis for environmental education.

Forestland Guidelines

Increase forestland diversity by making small (1/4-1 acre) openings in an east to west direction (maximize sunlight). This will encourage fruit producing shrubs valuable to many wildlife species. The edges of the openings should gradually blend into the forested habitat (feathered edges).

Pile brush (6 feet--8 feet high by 10 feet diameter) along edges of openings to create cover for birds and small mammals.

Encourage mast producing trees (oak, hickory, beech).

Leave 5--7 snags per acre for food and nesting values.

Trees with vines (berry producers) should be encouraged.

Exceptionally tall trees are utilized by raptors as perching and nesting sites and should be encouraged.

Planting of white pine seedlings within openings and as underplantings to increase the amount and distribution of conifer cover.

Wetland Guidelines

Leave buffer strips (100 feet) of natural vegetation along wetland areas to help filter and trap silt and sediments.

The two (2) beaver impoundments should be maintained as they provide valuable wetland habitat which greatly enhances the wildlife diversity within the study site.

Trapping should be allowed during the regulated trapping season (December 1 to February) to control beaver numbers at a level compatible with adjacent land use practices.

Placement of wood duck boxes on the two (2) impoundments.

Environmental Education

Another potential use of the study site would be the development of an environmental education trail system with an accompanying informational pamphlet. If management suggestions are implemented they should be included in the guide (i.e. openings, brush piles, wood dock boxes). Wildlife discussion should concentrate on vegetation succession and wetland habitat.

For any further assistance feel free to contact the Western District Headquarters, 485-0226.

4. PLANNING CONSIDERATIONS

It is noted that both Huckleberry Hill Recreation Area and Found Land are predominantly wooded with rolling topography and some steeply sloped areas. Although groves of pines are present in places, the forest for the most part is composed of hardwood species (oak-maple). The forest appears to vary in age but it seems likely that many areas had been logged about 30-40 years ago, producing what is now a middle aged forest of predominantly healthy trees.

Low-lying areas of the Huckleberry Hill site exhibit more diverse stands with some older larger diameter trees mixed with area of dense undergrowth. These areas along Hawley Brook in particular could be improved with selective cutting and thinning of undergrowth to accommodate better access and improve the health of the forest. As a suggestion, creating a series of clearings along the brook would allow sunlight to pierce the tree top canopy in the summer, thus:

- reducing mosquito infestation
- creating a more diverse habitat for wildlife
- creating a more appealing visual experience for hiking
- providing areas for vegetation which requires direct sunlight to become established (wild flowers, evergreens, etc.)

Certainly the potential for creating a trail along Hawley Brook to connect the Huckleberry Hill Recreation Area with Countryside Park should be investigated. Although the expense of creating and maintaining such a trail may not at this time be warranted; as residential development continues to occur in that portion of Town, increased tax revenues may allow for additional site improvements. It is important to note that clearing of forest areas along the brook would increase stormwater runoff and therefore, the downstream impact at Countryside Park would have to be analyzed thoroughly before undertaking such an endeavor. (See Wildlife Section)

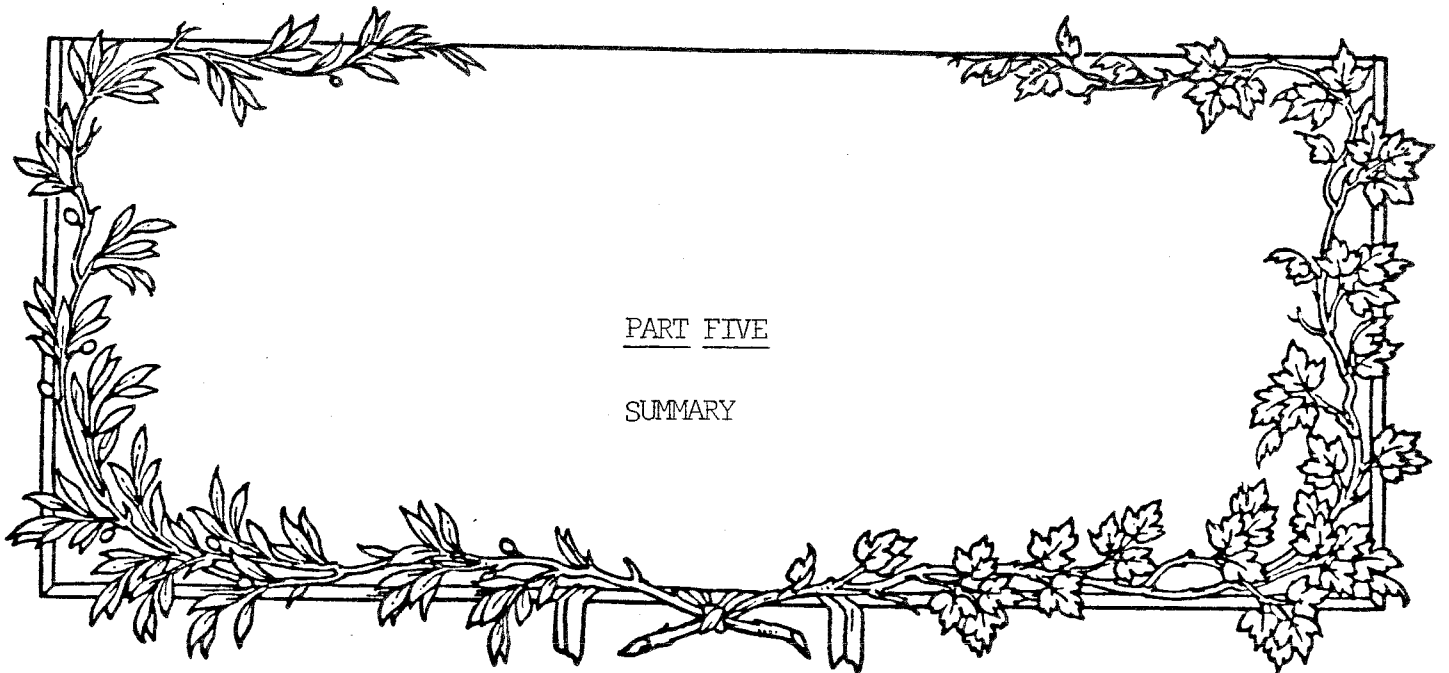
It would seem appropriate to encourage the continued use of the Huckleberry Hill site for hiking, cross-country skiing and Boy Scout camping. The demand for more facility oriented recreational amenities is not currently present in

that portion of Avon. Because of rolling (sometimes steep) topography, the site does not lend itself to easy access or development of facilities such as ball fields. The hiking trail created by the Boy Scouts is in relatively good condition and could be maintained with a very limited amount of work. An arrangement of shared maintenance responsibilities between the Town and the Boy Scouts should be pursued so that access to the site via the trail can be preserved.

Since the Found Land is landlocked with no easy access from a public street, it is suggested that public use of that land should not be encouraged at this time. A suggestion would be that the possibility of securing a right-of-way for access between the Found Land and Huckleberry Hill be looked into. Both parcels are somewhat isolated from development by topography and surrounding land use. Yet both offer a diversity of woodland vegetation, wildlife habitat, each is relatively undisturbed and quite scenic. Consequently, it seems logical to connect the two (2), if possible, by the addition of land acquisitions. If the Found Land has vague boundaries and no certain access, all the more reason to connect the two (2). If land purchase is not possible, the Town might consider conservation easements, deeded right-of-ways or some other conveyance as a means of linking the parcels. Connecticut law might still require the abutting landowners along the old King's Highway to grant access if it was historically provided. What might not be possible are improvements which would allow vehicle access. If no access is available to the Found Land, then little can be done until some arrangement for access is made. Planning efforts should, with this question, be the first order of business. Another option is to simply let the land continue without definition of boundary or access--sort of a stock-pile or set aside for the future. However, without a survey, others might, over time, successfully erode the acreage base while adding to their holdings.

From a planning perspective the opportunity of creating a green/open space buffer between areas of existing/future residential use presented by Town ownership of the Found Land, Huckleberry Hill Recreation Area, and the Countryside Park is a very exciting one. Given current development trends the properties adjacent to these town-owned lands will be developed for residential use in coming years; which brings up the question of access to the site. As development proposals for properties along Lovely Street (east of site) are reviewed by Town officials special effort should be made to provide public access points to the Huckleberry Hill site. It appears that the area just to the east of the site would be a likely location for a street because it is relatively flat. If such a street is eventually developed it would be appropriate for the Town of Avon to secure a public right-of-way to the Huckleberry Hill site.

Although public recreational use of the Huckleberry Hill and Found Land sites is not great at this time, these areas should be recognized both by the Town and by adjacent landowners as a valuable resource. Town ownership of these properties will help to control residential density in the area, provide a natural buffer between residential developments and will offer passive recreational opportunities to a local population destined to grow considerably.



PART FIVE

SUMMARY

FOUND LAND

--The till soils and bedrock outcrops present on the site should not pose a major problem for any passive recreation uses.

--Bedrock well(s) would be able to provide adequate water for passive recreational needs.

--This area should be managed primarily as wooded open space with some trail use possible. King's Highway provides an opportunity for an inter-town trail connecting to Canton Center.

--Since public access to Found Land is unclear at this time, it is suggested that public use of the land not be encouraged. Connecting Found Land to the Huckleberry Hill Recreation Area should be given priority after the establishment of boundary lines.

COMBINED INFORMATION ON BOTH PARCELS

--The major limiting factor that is a potential hazard for both properties is the lack of established boundary lines. Without a survey, others might, over time, successfully erode the acreage base.

--Due to the steepness of the terrain and the fragile nature of the soil, any land use change which would promote intensive development should be viewed with caution.

--Another limiting factor is the lack of access to the properties. Huckleberry Hill has adequate access for passive recreation, but not for equipment access. Other points of access should be reviewed. The access to the Found Land is ambiguous at this point in time.

--Forest management recommendations require a much more in-depth inventory than could be conducted by the ERT. Further assistance should be obtained from a public service forester or a private consultant.

--If a decision has already been made to selectively harvest timber than the Town should give special attention to road and skid trail lay-out.

--Wildlife goals should include production of optimum habitat diversity to maximize production of wildlife species compatible with carrying capacity and current land uses. This can be done by creating and maintaining a diversity of food and cover with nesting, resting and loafing sites scattered throughout the sites. There are recommended guidelines to follow.

--An environmental education trail system with an informational pamphlet is another potential use of the sites.

--Although public recreational use of these two (2) sites is not great at this time, these areas should be recognized as a valuable resource, they help to control residential density in the area, provide a natural buffer between residential developments and offer opportunities for passive recreation and environmental education.

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--an 86 town 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, a statement identifying the specific areas of concern the Team should address, and the time available for completion of the ERT study. 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 Elaine A. Sych (774-1253), Environmental Review Team Coordinator, Eastern Connecticut RC&D Area, P.O. Box 198, Brooklyn, Connecticut 06234.